DISASTER NURSING EDUCATION: A QUALITATIVE CASE STUDY TO DETERMINE THE KEY CONCEPTS FOR NATIONAL EDUCATION IN THE KINGDOM OF SAUDI ARABIA (KSA)

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Abstract

The global incidence of disasters is increasing, including in the Kingdom of Saudi Arabia (KSA). However, available evidence indicates knowledge gaps in nurses' capabilities in the KSA for effective responses to disaster events. The current study examines requirements for effective disaster nursing education in the KSA by establishing what nurses in the KSA identify as key concepts for educational provisions and support mechanisms that will enable them to contribute effectively to disaster management. Specifically, this study examined current evidence-base that underpins disaster nursing education and identified concepts that an effective disaster nursing education programme must contain. A qualitative case study approach was used together with a scoping review of available evidence on disaster preparedness and response of nurses. Six hospitals across KSA were selected as cases and Emergency Response Plans (ERPs) were collected from all selected hospitals for review. Six focus group discussions were undertaken for nurses recruited from selected hospitals and four semi-structured interviews were conducted for nursing educators and policymakers from the KSA. Thematic analysis of transcripts of the focus group discussions and the interviews was conducted. Results obtained indicated that all selected hospitals have ERPs but there are problems associated with the implementation of ERPs by nurses. It was observed that the current nursing training programmes in the KSA lack emergency preparedness and response contents. Nurses in the KSA also lack non-clinical skills such as leadership, critical thinking and communication that is required for effective disaster response. The KSA lacks policy guidance for the training of nurses in disaster response and the knowledge of available policies among nurses and nursing educators is poor. This study recommends a framework of a disaster nursing education system which improves nurses' capacity for disaster response planning and management, and skills required for policy making, communication, negotiation, leadership, and coordination.

Declaration

I declare that the current study is all original work conducted individually, which has not been presented for any previous award at this particular University, or any other. All included sources are presented in the reference section.

Mufleh Alomrani
December, 2021

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…INSHAALLAH…BY THE WILL OF GOD…

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AACN	American Association of Colleges of Nursing
ALNAP	Active Learning Network for Accountability and Performance
ANA	American Nurses Association
ARC	American Red Cross
BRC	British Red Cross
CDC	Centre for Disease Control and Prevention
CINAHL	Cumulative Index to Nursing Allied Health Literature
CPD	Continuous Professional Development
CRED	Centre for Research on the Epidemiology of Disasters
DAC	Development Assistance Committee
EM-DAT	Emergency Event Database
ERIC	Education Resources Information Centre
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
GDP	Gross Domestic Product
HCP	Healthcare Professionals
IFRC	International Federation of Red Cross and Red Crescent
KSA	Kingdom of Saudi Arabia
MCE	Mass Casualty Event
MoH	Ministry of Health
NCSBN	National Council of State Board of Nursing
NEPEC	Nursing Emergency Preparedness Education Coalition
NICE	National Institute for Health and Care Excellence
OECD	Organisation for Economic Co-operation and Development
PCC	Population, Concept, and Context
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PTSD	Post-Traumatic Stress Disorder
UNISDR	United Nations Office for Disaster Risks Reduction
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
WHO	World Health Organisation

Chapter One: Introduction

This chapter introduces the significance of this PhD research in reference to contemporary disaster nursing scholarship in the context of the Kingdom of Saudi Arabia (KSA), prior to detailing the motivations and experiences of the author that informed its design. Thereafter, justifications for the research will be set out and the structure and content of the thesis defined. Finally, information concerning the impact of the COVID-19 pandemic on the process of producing the thesis will be presented.

1.1 Importance of this PhD Research

This thesis investigates the key concepts of the ongoing educational provision for the delivery of effective disaster management nursing in the KSA, identifying those aspects that comprise essential support for professional nurses. The primary motivation for conducting this study came from researcher's observations in real disaster zones that revealed notable gaps in the nurses' abilities in the KSA, for their effective responses to disasters, signifying a clear need for a programme that could effectively address these gaps. Therefore, this research employs a qualitative research design, to critically analyse current evidence-based underpinnings in nursing education for emergency preparedness, including a qualitative analysis to identify the current level of knowledge and skills and the key concepts and elements required by nurses for them to become better prepared in order for improved disaster responses.

The aim of the current research is to examine those gaps in the skills and competencies of nurses in the KSA that prevent them from effectively responding to disaster situations. Furthermore, as the available evidence indicates that the probability of various types of disasters occurring is rising globally (Horiick-Jones et al., 2019; Boccard, 2021), there is an immense need to develop strategies and programmes to improve healthcare providers' ability and skills to respond effectively to all types and kinds of disaster. Data to date currently indicates that the adverse effects of disasters are more extreme in areas of the world where adequate strategies for preventing disaster, preparing for emergencies, and response capacity are poor (Horiick-Jones et al., 2019). Emerging data from the KSA indicates that, similar to many other regions of the world, there has been a rise in the number of emergency situations and disasters. Moreover, adequate disaster management is particularly important in the KSA, as due to the religious significance of the country, several million people visit annually on

religious pilgrimages, predisposing it to potentially disastrous mass casualty events and emergency scenarios. The Hajj pilgrimage is considered one of the world's largest mass gatherings.

Therefore, planners always need to prepare for infectious and non-communicable disease outbreaks, varied illnesses and injuries, severe crowd control, and disaster responses to unanticipated natural or human-made dangers during Hajj pilgrimage. This can often significantly burden Makkah's healthcare system and deplete its supply of resources (Alamri, 2010); especially as it frequently exceeds the country's capacity to respond to disasters. In accordance, Almoaid (2014) states that disasters that occur during Hajj are due to poor planning, communication and inadequate directional information; with pilgrims crushed and stampedes caused by poor movement control and/or inadequate guidance during the course of rituals. As previously stated, the unavoidable congestion in such a restricted place raises the danger of injury, heat exposure, and a variety of infectious illnesses. In particular, the danger of infection was obvious in meningococcal W135 strain outbreaks in 2000 and 2001, which were associated with significant mortality and the potential for worldwide transmission. What is more, the yearly Hajj pilgrimage has been marred by other calamities, such as fires at tent sites, congested tunnels and collapsing cranes (Aitsi-Selmi et al., 2016).

The role of nurses in disaster management cannot be overemphasised. Subsequently, the impact of nurses' inability to adequately respond to emergency situations can prove to be significant. Within the context of the KSA, nurses are considered an important part of health care workers who respond to disaster situations. Therfore, due to the complexity of disaster situations, and the need for medical services to be able to react to various possible scenarios, it is mandatory to explore how we can improve the response abilty of nurses to disasters events, which can result in the loss of people's lives or serious injury/disability.

Contemporary scholars, such as Ibrahim (2014), Alzahrani and Kyratsis (2017), Alshehri (2017), and Sultan et al. (2020) have indicated a significant deficiency in both the knowledge and skills that are the requirements for disaster response, with many Saudi nurses expressing uncertainty regarding their practical skills, capabilities and capacity to evaluate their actions during a disaster. However, the factors contributing to the observed gap and the deficient skills remain poorly understood. Crucially, it is unclear whether current nursing education programmes across the KSA prepare nurses sufficiently well enough to deliver effective and adequate disaster management. To address the challenges currently being faced, this PhD

thesis explores aspects of current nursing education provision in the KSA pertaining to disaster response. It highlights key concepts of the ongoing educational provision for the delivery of effective disaster management nursing in the KSA, identifying those aspects that comprise essential support for professional nurses, the support professional nurses within KSA have explained is essential to respond to disasters adequately and effectively.

1.2 Motivations Underpinning the Research

1.2.1 Identification of Problems Faced by Nurses

I was motivated to undertake this study because of my own background in nursing, experience in responding to disasters, and my desire to resolve the problems facing nurses who are managing disaster situations. Nurses help in saving lives and in reducing the impact of disasters. I was also motivated by Proehl's (2009) description of the role of the emergency nurse, which states:

> *We see all comers, from the worried well to the critically ill; from birth to death; and with conditions involving all parts of the mind, body, and spirit; from brain trauma to ingrown toenails. Our patients come to us trusting that we will respect their concerns and that we will provide care for them. As emergency nurses, we have a responsibility to respect that trust and provide our patients with the skill and expert knowledge required for their care.* (Proehl, 2009, p.11)

This description resonates deeply with my experience in the field as an emergency nurse, as it was my passion for saving the lives of people who are sick or wounded that motivated me to pursue a career in emergency nursing. Moreover, Proehl (2009) highlights the significance of ensuring emergency nurses have the necessary skills and capabilities to handle disasters, as patients place their trust in them. Accordingly, they need to possess the requisite knowledge and skills that make it possible to deliver reliable and comprehensive emergency service to patients. This is particularly relevant in the context of essential ongoing educational provision, as adequate support is vital if professional nurses are to deliver effective disaster management nursing. Nurses are generally the main group healthcare professionals in a disaster setting, and consequently play a critical role in mitigating their effects, explaining the immense demand for nurses to attend emergency situations.

As it is anticipated that nurses will also be expected to continue to respond to the diverse natural and human-made disasters that will undoubtedly occur in the coming years, the preparedness of nurses must be improved, to minimise loss of life in disaster situations. Nursing is vital as these professionals play a central role in any healthcare delivery setting, with the quality of nurses being directly linked to the medical outcome of victims in the context of disasters.

To be able to advocate for and care for patients during disasters – which differs from normal (non-disaster) situations – nurses must utilise their nursing care skills in addition to their critical thinking, adaptability, teamwork, and leadership abilities. As a result, the scope of the nurses' work may expand beyond normal tasks. The nurses must simultaneously consider both individual and collective patient treatment. Creativity and critical thinking will be required, for instance, when there are insufficient supplies, and the nurse must devise alternative time-sensitive methods that are not normally employed.

1.2.2 Researcher's Nursing Experience

Nursing has been my passion since I was ten years old: I was initially encouraged to follow this profession by my father, who was an army officer during the first Gulf War and supported me in volunteering for the Army's Medical Corps. In order to pursue my dream of being a nurse, I enrolled for a nursing diploma programme at a Saudi Arabian institute shortly after completing secondary school in 1997, and graduated in 1999. Following graduation, I was employed as a nurse practitioner and posted to the Medical Department of a general hospital, where my responsibilities included recording the medical histories of patients in detail and ordering diagnostic tests and treatments for patients with acute and chronic medical disorders.

Due to the hospital's policy of posting nurses to a new department every two years, I worked in the Medical Department and the Surgical Department, before being redeployed to the Emergency Department, after which I was promoted to the position of Senior Nursing Officer. At that time, supported by my Head of Department (in the Emergency Department) I facilitated the development of training for newly qualified nurses and student nurses on their clinical placements, also promoting cordial relationships between employees and trainees. This led me to develop a preceptorship and mentorship programme to improve the clinical

learning experiences of students and assist newly qualified nurses when making the transition into clinical nursing practice.

1.2.3 Personal Experiences of the Researcher Working in Disaster Zones

I have sixteen years' experience working as an advanced nurse practitioner in the KSA. My expertise in disaster management and staff supervision also provided useful insights when conducting this research. I have referred to my personal experiences and observations throughout the process of writing this thesis, as reflected in use of the first-person pronoun. As I wrote this thesis, I aimed to combine my perspective with the data to mutually inform and validate the evidence and guide identification of the current gaps in this area of training and practice. Moreover, I have been motivated by my previous experiences meeting and working with other disaster responders, including the police, Civil Defence, the KSA Red Crescent Society, and other civil and military bodies, in addition to discussions held with many specialists with a variety of scientific and practical backgrounds in fields beyond the Ministry of Health. These interactions have allowed me to understand how society may best prepare for and respond to disasters, enabling me to appreciate the roles of involved parties, including healthcare providers in general and nurses in particular when disasters occur.

My experiences have imparted an in-depth understanding of the implementation of plans on the ground. My knowledge has been derived from lectures, workshops and virtual experiments, but was transformed into practical, on-the-ground knowledge when disasters took place in the KSA, e.g., wars, earthquakes, floods and disasters arising during Hajj. These experiences helped me to understand the challenges healthcare providers' face, and attending symposiums both inside and outside the KSA, as well as participating in workshops, seminars, table-top exercises, functional exercises, and drills all added to my motivation to commence this project.

1.2.4 Researcher's Experiences in Disaster Management

While employed at a hospital in Tabouk, the KSA, in 2004, I was transferred to Emergency and Crisis Administration to work as a paramedic nurse. Here I encountered unfamiliar working conditions and an environment that demanded I switch out of a prescribed daily nursing routine to enact a disaster response with limited availability of both time and resources.

In the hospital setting, nurses are trained to use a structured system of triage and initial assessment, with the final decision concerning course of treatment being passed the remit of a doctor. Disaster nursing, on the other hand, requires additional skillsets that are different to and are often not taught via the regular nursing programme in KSA, namely non-clinical interpersonal skills and practical skills in a disaster context – these, along with the Key Concepts and findings that inform them, are discussed in depth later in the thesis. One such skill, for instance, is that when nurses provide high-quality care under pressure with limited resources, or when they care for a large number of patients in a brief amount of time during disaster, adaptability is essential. For nurses to be able to assist colleagues and help victims during a disaster, they must be able to maintain calmness in chaotic, stressful, unprecedented situations, thinking clearly, acting professionally and with complete confidence (Powers & Daily, 2010). Due to a dearth of education and training in disaster situations, the majority of nurses lack confidence in their knowledge and ability to perform during disasters, according to my prior experience and several studies (Schmidt, 2011). As a result of their coordination and delegation abilities, as well as their care management experience, nurses can assume leadership roles in healthcare during disasters. During disaster preparedness planning, and to provide more robust disaster competence skillsets to nurses, these roles should typically be assigned to charge nurses, nursing managers, or head nurses. However, all nurses should be prepared and capable of assuming leadership roles in the event that the assigned leader is absent or if immediate actions are required to solve problems in the absence of clear protocols or guidelines. As such, some nurses would require new competencies, in addition to expanding their existing ones.

Based on my prior experience with disaster management, nurses should be more aware of the availability of resources and should be better able to identify supply requirements and workforce issues than other healthcare providers. In addition, nurses with their technical skills and knowledge of epidemiology, physiology, pharmacology, cultural issues, and psychosocial aspect can aid in disaster preparedness programmes and during disasters through the adaptation of their existing competencies. As team members, nurses should therefore be able to play a strategic role in collaboration with health and social disciplines, government bodies, community groups, and non-governmental organisations, including humanitarian organisations.

As a nursing graduate from a Saudi Univeristy, we had no formal training in disaster management during our education in nursing schools, to outline how we as nurses might effectively prepare and respond to disasters, and there were no courses available from the Ministry of Health post-employment. Additionally, we were unprepared to face disasters, lacking disaster competence, including low awareness of the roles and skills needed to confront disaster events stemming from the aforementioned lack of education and training. I also worked on the nursing Hajj programme, which attends to the large population that comes together within a very small geographical area at one specified time of year, frequently placing excessive pressure on the available healthcare resources. Such circumstances therefore required rapid assessment skills and the ability to treat physical injuries rapidly. In addition, incidents such as the conflict of 2015 also formed my perception of preparedness for disaster response in the KSA.

Furthermore, my work in areas where flooding resulted in a considerable loss of life and infrastructure led me to recognise that it is vital that disasters be considered in terms of broader ecological health. This became particularly clear when I worked to provide care following an earthquake in the city of Aleise, in the KSA. This was an extremely challenging context, which highlighted the need for greater preparedness for such eventualities. I likewise worked in public, military, and field hospitals during conflicts in the south of the KSA, treating both soldiers and citizens presenting with an extensive range of injuries. During this time, I observed that, despite their vital role in the healthcare sector, hospital management failed to take nurses' input into consideration, as nurses were not provided with an opportunity to share the challenges they encountered with those responsible for decision-making, hospital management, or nurses in hospitals or at the Ministry of Health. There was simply no mechanism with which to evaluate feedback from previous disasters and drills, and nurses were not invited to share the challenges they faced.

This stems from the emphasis on the preeminent role of doctors in decision making, leading to the perception that the experiences and perspectives of nurses are less important when responding to disasters, and additional factors that will be explained in future chapters. Frequently-recurring questions that I heard from nurses working in such conditions were characterised by the paucity of ambulances and poor communication, and included: (1) 'what should we do?'; (2) 'will we be safe?'; (3) 'how can we be safe?'; (4) 'what kind of care should we deliver?'; (6) 'what sort of assessment and triage is expected??'; (7) 'who is in

charge / who is leading us?'; (8) 'who should we take orders from?'; (9) 'where should we transport our patients to?'; and (10) 'which system or policy should we follow?'. Meanwhile, I found it impossible to draw on expertise drawn from prior experiences and carve the time to offer training to colleagues, as we were naturally focused on saving lives.

Having acquired disaster nursing skills in multiple countries, such as the KSA, Jordan, Canada and the UK, as well as having experience working with other organisations outside the Ministry of Health in the KSA, such as the military and civil defence, the Saudi Arabian national guard, and the municipal administration office in Tabouk, I had hoped to apply my skills to providing disaster management training to my colleagues. I felt that my responsibility towards my patients forced me to seek the knowledge outside the remit of the Ministry of Health to fill in the gaps in my knowledge and expand my skillset. I had primarily focused on gaining specific skills and knowledge related to preparing and responding to disasters, and also benefited from the courses I attended during my time studying abroad. I took a variety of disaster management courses at Bournemouth University, UK; a course entitled Nurses on the Front Line: Preparing for and Responding to Emergencies and Disasters at the School of Nursing, George Washington University, USA; a course entitled Public Health in Humanitarian Crises at the John Hopkins University, USA; and a course called Disaster Preparedness at the University of Pittsburgh, USA. In addition, I attended and took advantage of training programmes made available by other organisations, and benefitted from my experiences in real disaster situations obtained from multiple agencies and organisations. My studies, training, and real-world experience provided me with the requisite knowledge to approach these modules, courses and training programmes in a manner that enabled me to establish in-depth knowledge of disaster management, also allowing me to observe the gaps in knowledge/skills in other nurses. This experience motivated me to seek greater understanding derived from evidence-based research, and therefore, I conducted this PhD research.

1.3 Preliminary Observations of Nursing in the KSA

In KSA, education programs for nurses follow two different pathways: the bridging nursing programme (BNP); and a regular nursing programme (RNP). The BNP is a two-year programme after the completion of which students are awarded diploma certificates upon the completion of a six-month internship program, whereas the RNP is a four-year course followed by an internship of one year. There are also Bachelor's programmes in nursing that

take the form of a 52-week training course that then includes four weeks of internship. In order to better prepare students for potential roles in nursing, the internship programme affords experience in emergency, maternity, paediatric, medical-surgical, and the intensive care healthcare environments essential to nurses. Furthermore, when completing their undergraduate programs, nurses receive training using high-fidelity simulation manikins, that help to improve their experience and practical knowledge. Each nurse must be trained in these skills, as it improves their commitment and increases patients' faith in their abilities. However, as previously mentioned, there is a paucity of training to prepare nurses in disaster response.

The experience outlined above, and my work as an advanced nurse practitioner, as well as my experience in disaster management roles, has led me to identify a need for greater multi-disciplinary cohesion, and the inclusion of the nursing community within management decisions relating to preparedness. This is vital, as nurses are key care providers both during and after disasters, meriting an internal and external reach to the wider community to ensure their needs can be met in real time. It is therefore vital to promote collaboration between healthcare professionals, especially nurses, owing to their role as primary caregivers during disasters. I also believe that morale and performance in the workforce would be enhanced if nurses were to feel that they were being heard and given opportunities to share their day-to-day practices and experiences in the working environment in an actionable manner. This therefore highlighted to me the importance of engaging in primary data collection for this study, so as to identify the needs of nurses in relation to disaster preparedness, particularly as the available literature reveals a dearth of research to inform existing courses (Daily et al., 2010; Ling and Daily, 2016; Al Harthi, Al Thobaity, Al Ahmari and Almalki, 2020).

1.4. Justifications for the Research

My personal experience working in disaster situations revealed to me the prevalece of preparedness among the nursing community and the widespread inability of my colleagues to handle rapid escalations in situations. A particular challenge for nurses proved to be the change in requirements when transitioning from normal hospital practices to disaster management protocols. Significantly, as Mao, Fung, Hu, and Loke (2018) pointed out, addressing this situation requires additional training to enable nurses to respond rapidly in the form of nurse-led patient assessment and triage. The additional literature supports the contention of insufficient evidence concerning the most important nursing competencies

required during disasters (Kako and Mitani, 2010; Karnjuš, Prosen and Ličen, 2010; Ling and Daily, 2016; Al Thobaity, Plummer and Williams, 2017), including input from nurses themselves. While various qualitative works have highlighted general disasters (Shih et al., 2002; Pattillo and O'Day, 2009), the particular roles of nurses in these settings has mostly remained without research (Fung, 2008; Alzahrani and Kyratsis, 2017; Goniewicz, Burkle and Khorram-Manesh, 2021). Therefore, there is a clear need for an evidence-based solution to mitigate current levels of unpreparedness.

The above observations are supported by recent data concerning the preparedness of nurses for emergency situations within the KSA, which point to a significant skills gap (Ibrahim, 2014; Alzahrani & Kyratsis, 2017; Alshehri, 2017; Sultan et al., 2020). It is apparent that contributory factors are poorly understood, yet it remains opaque as to whether current nursing education programmes across KSA prepare nurses sufficiently for effective and adequate disaster response. Thus, in order to address these challenges, this PhD thesis examines aspects of the current nursing education provisions in KSA alongside the support that has been identified by professional nurses as essential for effective disaster management.

1.4.1 Researcher's Unique Perspective

I consider that my work as a nurse on the front line of various disasters, and as someone exposed to the realities of management, provides me with unique multifaceted insights into the issues concerning disaster preparedness and response in nursing. My experiences have further enabled me to understand this issue from both perspectives and allow me to understand the challenges faced by the nursing profession. I also feel a responsibility to use my knowledge and experiences to develop myself and impart positive changes to benefit the KSA.

Throughout the process of researching this thesis, I have sought to find a way to use my skills to assist others, including nurses, patients, the healthcare system and wider community. My experiences have given me an understanding of the current issues, and this thesis augments this understanding through evidence-based research and a review of the current literature. Having observed first-hand the key role played by nurses when responding to disasters, I wish to develop their confidence and productivity by providing recommendations for effective disaster management training based on qualitative research and a realistic understanding of the challenges to their implementation.

This study is therefore firmly rooted in the author's first-hand professional experience, with a primary focus on education within the nursing system. As such it aims to address key questions that have remained with me throughout my professional career, validated by evidence-based research; as Gaddis correctly noted (2004, p.1), "to keep nurses in nursing, nurses must be part of the solution". The current study therefore aims to offer recommendations to overcome the deficits in disaster preparedness among nurses in an educational setting, and thereby contribute to saving lives, acknowledging that every moment is critical, and taking a significant step towards enhanced disaster preparedness and response.

Additionally, I would like to highlight that this PhD not only represents an attempt to educate other healthcare professionals and those involved in disaster preparedness and response, but first and foremost to educate myself as a means of disseminating the findings. My reflections along my career path have improved my understanding of the working environment, both inside and outside of hospitals. Andrés (2019) has observed that higher education allows individuals to transfer their learning experiences into the language of employability, which led me to embark on this PhD.

I have previously considered studying chiefly to progress my own career, accruing further qualifications and equipping myself with the necessary skills to help to save lives and decrease any disaster's impact. However, in undertaking this current study, I have recognised that I have a wider responsibility to develop healthcare practices so that more lives may be saved. By listening to my colleagues and drawing from my own experience, I wish to elevate the work currently undertaken by my fellow disaster nurses to save lives and reduce the impact of tragic events. In addition, my aim is to gather information from those working in disaster zones, thereby presenting both a reflection of reality on the ground in the KSA and offering a relevant, applicable solution capable of meeting the needs of the country overall. Moreover, as a PhD student, I now have the responsibility to develop health care practice in pursuit of the noble objective of saving lives far beyond my own individual practice.

In addition, I consider it to be essential to improve the morale of nurses and their links with managers by promoting teamwork and the inclusion of the views of nurses to improve disaster preparedness. The primary data collection process identified nurses' requirements in relation to disaster preparedness, including suggestions regarding ways to improve training. The current research programme is therefore also considered a response to insufficient evidence available in the scholarly literature that may inform the preparation of such courses,

one that has led me to address this paucity of information by listening to my colleagues and drawing upon their experiences.

I believe this work will have greater reach if I utilise my skills, experience and knowledge both on and off the field, enabling other nurses and myself to fulfil our moral obligation in a more efficient and effective way. This PhD is therefore an important opportunity to develop nursing practices and overcome the deficits in my fellow nursing colleagues' competencies on the front line, informed by the evidence from the literature review.

1.4.2 External Factors that Justify the Research

The justification for this research is predicated on two major factors: the increasing incidence of disasters in the KSA and the deficiencies observed regarding the ability of nurses in the KSA to respond to disasters effectively.

1.4.2.1 The Increasing Incidence of Disasters in the KSA

The consequences of disasters can include massive loss of life, displacement, property destruction, lack of food/water, and exhaustion of healthcare supplies/services. Furthermore, psychological consequences can often be amplified following disasters, particularly post-traumatic stress disorder (PTSD) and feelings of depression and anxiety, both of which can cause secondary physical effects, including both non-specific medical symptoms and cardiovascular/respiratory diseases (Galea, Nandi & Vlahov, 2005). Moreover, disaster situations often produce negative economic implications in affected nations, such as reduced national gross domestic product (GDP), depletion of financial reserves, and fiscal deficits arising from the enormous disaster-associated spending (Austin et al., 2016). For example, the Japan earthquake of 2011 destroyed 125 million houses and a nuclear power plant, resulting in associated costs of approximately 35 billion USD (Yi & Jang, 2014). Japan also suffered a 4.9% drop in the Nikkei stock exchange thereafter, and approximately 2 million homes went without electricity, 1.4 million without water, and millions of people suffered the consequences of inadequate food supplies and heating during what was incredibly cold weather (Yi & Jang, 2014). Accordingly, all these after-effects can result in secondary consequences that negatively affect peoples' health.

Similar to many other countries worldwide, the KSA is prone to various types of disasters, each necessitating a unique response. The situation is especially complicated in the KSA, due

to each province being prone to different types of disasters; for instance, flooding is predominant in the Central and Western regions, earthquakes and volcanic eruptions occur in the North-West, dust storms strike the Central and Eastern areas, and landslides threaten the Southwest (Al-Bassam et al., 2014). In addition, religious practices can also contribute to health hazards in the KSA as previously mentioned. The Hajj in particular, is a mass pilgrimage in which Muslims from around the globe descend on the Holy Mosque over a period of five days (in October or November). During Hajj season, Makkah's population increases from 200,000 to over three million inhabitants (Alshehri, Rezgui & Li, 2013). Accordingly, there is heightened risk of mass-trampling and crushing. For example, 1,426 people were caught in a stampede in a pedestrian tunnel leading to Makkah in 1990 (Alshehri, Rezgui & Li, 2013); likewise, tent fires have also killed people staying in Makkah. More recently, in 2006, 346 people died on the Jamarat Bridge in Mina as a direct result of overcrowding.

Health is a vital concept in disaster management, as disasters directly impact individual, communal and societal health. Accordingly, there is a need for adequate levels of preparedness for any event that could adversely affect great amounts of peoples' health within the general population (Alraga, 2017). Generally, nurses are the largest group of healthcare professionals in the KSA and are frontline responders to emergency situations (WHO, 2020). Moreover, nurses play a critical role in disaster response, as evidenced by the demand for nurses during a disaster eclipsing that of other health care professionals (Fung et al., 2009; Lavin, 2006). Crucially, the clinical outcomes of the victims of disasters are reliant upon the skills and competence of the responding nurses (World Health Organisation, 2009).

1.4.2.2 Observed Deficiencies in Disaster Response among Nurses

Nurses work on the frontline, providing health services to victims of disasters, including immediate response, care provision, coordination of services, and provision of information, as well as simultaneously serving as comprehensive primary health care providers during disaster events (WHO, 2007). Consequently, nurses must be adequately trained, and possess the capability to respond adequately to any type of disaster. Available data from the Ministry of Health (MoH) in the KSA indicates that there are approximately 248,000 healthcare professionals in the country, of whom 56% work as nurses (MoH, 2018). As previously mentioned, I have had personal experiences dealing with the realities of hospital nursing and nursing in disaster scenarios, in addition to experience working as a paramedic, all of which

clarified to me the need to improve healthcare standards in the nursing profession, a contention that arose from the observation that nurses working in disaster scenarios were not always implementing effective, evidence-based practices.

In a hospital setting, nurses are trained according to a structured system that provides treatment following triage and initial assessment before final assessment is conducted by a doctor. However, emergency situations often require a different approach to triage and initial assessment; one which is frequently omitted from pre-registration nursing education in the KSA or additional professional training programmes. This is just one of many knowledge gaps identified in the findings of this study, which inform the Key Concepts required for nurses to be adequately educated and prepared for disaster response discussed in Chapter 9. The overarching sense is that whilst nurses are generally found (in this research) to be well educated in foundational nursing education such as good nursing practice and in the clinical domains in a hospital setting, they are deficient in cross-cutting themes required for disaster response contexts and therefore the confidence to apply the required approach in that context. The Key Concepts identified and discussed later in the thesis seek to fullfill that dearth in nursing knowledge and experience for disaster response preparedness, via the proposed curriculum that is also discussed in forthcoming chapters.

In order to meet the requirements of the community they serve, nurses should be prepared for their role during large-scale disasters with the appropriate knowledge and skills (Arbon et al., 2006). The personal observations of the researcher have been confirmed in several studies that have reported the effectiveness of disaster response in the KSA (Al Thobaity et al., 2016; Pourvakhshoori et al., 2017). Meanwhile, key findings from the scoping review conducted as part of this PhD project indicate that training programmes (covered extensively in Chapter Three) designed to develop nurses' capabilities with regard to emergency preparedness and response generally prove insufficient to cover the demands placed on nurses in the KSA. Despite the frequency and incidence of disasters, there is no disaster nursing education programme that effectively educates nurses in disaster health management in the country (Alraga, 2017).

1.4.2.3 Key Emerging Themes

Nursing education is not a novel topic of interest in Saudi Arabia, as it has been more than half a century since nurses were first formally educated there. Long before that time, Rufaida

Al-Asalmiya was described as the first woman to practice nursing within the region (Almalki et al., 2011). Similar to Florence Nightingale, Rufaida Al-Asalmiya reportedly provided care to wounded soldiers in the early era of Islamic history. She was also reported to have established clinics to train nurses and provide community nursing care (Almalki et al., 2011). The Ministry of Health in the KSA established the nursing profession in 1958, and in collaboration with the WHO, a 1-year Health Institute Programme was established in Riyadh (Almalki et al., 2011). In 1960, another health institute was established in Jeddah, and interest in the profession grew thereafter. After the opening of Health Colleges for Nursing (3 years after high school) and University Colleges (4 years of study and one year of distinction), specialists were granted.

Despite the amount of Saudi nursing personnel in the health sector constantly increasing, there remains a significant shortage in the number of nurses in the country. Several factors have been identified to explain the scarcity of nurses in the KSA, including the poor public image of nursing in the KSA, the relatively low wages of nurses, poor rates of enrolment in nursing schools and negative socio-cultural perceptions of nursing (Alsufyani et al., 2020). With respect to enrolment in nursing schools, Saied et al. (2016) reported that poor enrolment may be associated with poor societal recognition for nurses. However, Alkhamis (2012) opined that the problem arises from the centralised management of nursing by the Ministry of Health (MoH) in the KSA. Lovering (2013) highlighted that the shortage may also be exacerbated by the fact that there is no national professional body for the regulation of nursing practice and training in the KSA. There is no organisation offering independent oversight over nursing practices, establishing a code of ethics for the profession in the KSA. Abu-Zinadah and Banjar (2006) indicated that a Scientific Nursing Board was established in 2002 with the responsibility of establishing guidelines pertaining to nursing practice, assessing the adequacy of hospitals and health centres as education centres, and instituting ethical standards. However, this organisation lacked the power to regulate the profession. Furthermore, Alsufyani et al. (2020) reported that there is no clearly articulated scope for nursing practice in the KSA.

However, as part of a wider programme to address development issues and prepare the KSA for the next phase in its development, the government has developed a strategic programme termed 'Vision 2030' to impart innovation and development in key areas including healthcare systems, trade, education, science and technology, communication, and nursing. Alsufyani et

al. (2020) reported that in addressing developmental issues in healthcare delivery, the Vision 2030 strategy targets improvements in nursing education. In this regard, the strategy proposed increasing the number of scholarships for nursing, bestowing greater responsibility on nursing educators and promoting the attractiveness of the profession, and tasking nursing colleges with the development of a high-level nursing curriculum. The strategy also hopes to delineate the scope of nursing practice. While the challenges and problems affecting the nursing profession in the KSA also have implications for disaster nursing, it is unclear how plans to improve nursing practice and education in the KSA will translate to improved disaster nursing. Based on these, the overall aim of this research is to establish what professional nurses identify as key concepts for educational provisions and support that they would require to ensure the effectiveness of nursing preparation in the KSA. This will then be used as a basis for the development of an effective disaster nursing training programme for the KSA.

1.5 Aims and Objectives

The current study's main aim is to establish what professional nurses identify as essential ongoing educational provisions and support that they would require to ensure the effectiveness of nursing preparation in the KSA. This research provides a rich, in-depth understanding of these concepts from the perspectives of nurses, delivering recommendations to develop and implement an appropriate programme of study.

There are three specific objectives associated with achieving the aims of this research. These are:

1. To examine the current evidence base that underpins nursing education for emergency preparedness and disaster response in the KSA;

2. To assess the current level of knowledge and skills among nurses, as well as the performance of emergency nurses in relation to disaster preparedness/response in the KSA; and,

3. To identify the concepts and elements that could prepare nurses to effectively respond to disasters.

1.6 Research Questions

Furthermore, the aim of the study aims is to provide answers to the three research questions below:

1. What is the current evidence base that underpins nursing education for emergency preparedness and disaster responses in the KSA?

2. What is the current level of knowledge in terms of disaster preparedness/response among emergency nurses in the KSA?

3. What key concepts comprise the essential components of a nursing educational programme that would adequately instruct nurses in effective disaster preparedness/response?

1.7 Methodological Framework

Overall, this thesis utilises a qualitative research method through a case study to collect data from selected hospitals in various regions of the KSA, with participants from these hospitals being recruited to assist with the focus group discussions and semi-structured interviews conducted in this research. Details of the application of the approaches to the case study research design used in this thesis, and the implementation of the research methodology are detailed in Chapter Four of this thesis.

1.8 Impact of COVID-19 on the Research

The COVID-19 pandemic significantly impacted upon the current, impeding both the data collection and analysis processes. The impact of COVID-19 also proved detrimental to my data collection efforts, as the recruitment of participants, which was scheduled to take place between January 2020 and March 2020, coincided with the emergence of the pandemic. Accordingly, I encountered considerable difficulties recruiting participants for the study, as well as unexpected barriers impeding the organisation of focus group discussions and interviews. Furthermore, as the data collection sites were spread across the KSA, I was forced to travel long distances in a very short period of time in order to collect data from six hospitals, two universities, and two policymakers before the Saudi government enacted stricter COVID-19 restrictions. Strict regulations were implemented in March 2020, preventing the recruitment of additional participants and bringing further focus group

discussions and semi-structured interviews to a halt. Additionally, due to my target demographic of nursing professionals and policymakers being on the front line of the effort to contain the pandemic, I found it difficult to conduct meetings – even those which were planned to be online – and academics became equally busy as a result of their universities demanding that they develop new teaching methods and adapt their roles to the unexpected changes wrought by COVID-19 regulations.

Furthermore, during this time, it remained unclear when the world would recover from the pandemic, resulting in extreme social and economic complexities, as all countries diverted their resources to combat COVID-19. The climate of increased demand was particularly exaggerated for workers in healthcare systems – especially nurses, who formed my largest group of participants. Therefore, the immense demands placed upon them by the responsibility to combat the pandemic on the front line meant that I found it nearly impossible to conduct any interviews with these individuals.

However, other than the effects of COVID-19 on data collection, the pandemic did not affect the validity or quality of data collected in this study. In fact, the pandemic justified the importance of this study to everybody involved in this research and the trying experiences on the frontlines of the pandemic clarified to participants why disaster response should be taken seriously. While some participants were initially reluctant to participate or contribute to discussions held during the study, the experiences during the COVID-19 pandemic helped them to comprehend the importance of this research programme and encouraged their participation in it.

Appropriate measures were taken to assure the trustworthiness of this study as detailed by Harding and Whitehead (2013), fulfilling the four criteria of credibility, auditability, fittingness, and confirmability as they pertain to the context of qualitative research. Credibility was ensured by encouraging participants to provide rich, detailed data during focus group discussions and semi-structured interviews and analysing this information in an objective manner with the involvement of supervisors. Auditability was likewise safeguarded by undergoing formal procedures for approving the ethical content of the research and keeping detailed records of information obtained from focus group discussions and semi-structured interviews. The transferability of the research was confirmed by ensuring the selection of participants who reflected the realities on the ground within the context of Saudi Arabia. Finally, the confirmability of the research was ensured by cross-checking findings

with supervisors to ensure no methodological errors were made and that the conclusions of the study were entailed by the data gathered. Further information regarding the trustworthiness of this study will be detailed in section 5.4.

1.9 Summary and Rationale for Significant Alterations made during this Research

This section outlines a number of significant changes made to my approach during my doctoral journey. The previous objectives set for this study were broad, rendering them particularly difficult to achieve. However, revisions undertaken with my supervisors' assistance, and the guidance of the Thesis Advisory Panel (TAP) ensured they became more focused and achievable. I also needed to undertake a more in-depth consideration of the time and resources required to complete this study. This impacted on my previous aim to develop a curriculum, which was later modified to identifying Key Concepts for preparedness and response for disaster. This prepared the ground for further investigations regarding developing the curriculum, and resulted in achieving the broad aim of contributing to the current knowledge.

As a result, the title was changed to the current version:

Disaster nursing education: a qualitative case study to determine the key concepts for national education in the Kingdom of Saudi Arabia

In addition, I discovered that in the context of the pandemic my target population was too broad, which led me to focus on those best able to assist me in answering the research questions, allowing for the creation of a more manageable time frame.

1.10 The Study's Structure

The current study commences by providing background information regarding disaster concepts, disaster preparedness, and the role of nurses in disaster preparedness and response. Thereafter, a detailed rationale of the study highlighting the objectives of the thesis is provided in chapters 1 and 2. This is followed by a detailed scoping review highlighting existing information related to factors that promote or prevent nurses from working effectively from a global perspective when a disaster occurs, details of existing educational programmes for the training of nurses in effective disaster response, definition and evaluation of delivery methods and current approaches to these programmes, and finally, the

identification of best practices and gaps in contemporary nursing education in the KSA (Chapter 3).

As was mentioned above, the thesis adopts a qualitative research approach with case study design to investigate the various objectives stated. Details of the justification for the methodological approach adopted, descriptions of hospital settings selected as cases, and descriptions of project sites and locations appear in Chapter 4. Details of all methods of data collection, including focus group meetings, semi-structured interviews, and document analysis, are also detailed in Chapter 4 along with participant details, recruitment strategies, sample sizes and sampling techniques employed. The implementation of the data collection methods for all the selected cases, as well as data analysis strategies are also presented in Chapter 5. Chapters 6 and 7 present the results' findings and analysis, respectively. Cross analysis of the finding and the discussion are presented in Chapter 8 and 9. Conclusions and recommendations are finally presented in Chapter 10.

1.11 Conclusion

This chapter described the importance of this PhD thesis and justified the researcher's rationale, design and motivations in conducting it. It also demonstrated more observed incidences of disasters in the KSA and the gaps in nurses' knowledge and ability, which make it challenging for them to respond effectively, necessitating this research. Furthermore, the current research's aims and objectives, as well as the research questions, have been stated in this chapter. Emerging issues pertaining to nursing education and practices in the KSA with implications for this study were also stated in this Chapter. In addition, an outline of the thesis structure was provided, and reference made to the impact of COVID-19 on the current research.

Chapter Two: Background

2.1 Introduction

This chapter provides background information to clarify the aims and significance of this research. It offers a working definition of Key Concepts covered in this research, and then describes disasters from an international perspective, and contexts unique to the KSA. In addition, the roles of nurses when responding to disaster will be identified and discussed from both global and domestic perspectives. Finally, this chapter will clarify the requirement to strengthen the preparedness of nurses in the KSA, to equip them with the skills to respond effectively to disasters.

2.2 Defining Disasters

Multiple definitions and examples of disaster have been conceived of and set out by numerous authors and organisations. The United Nations Office for Disaster Risks Reduction (UNISDR, 2018) defined a disaster to seriously disrupt a community/society of any size, as dangerous events that interact with exposure, vulnerability, and capacity, result in a variety of potential consequences: human, material, economic and environmental losses and impacts. All disasters can have immediate and localised effects that are frequently widespread and last for a period of time. The effects often prove to be challenging to the capability of communities to cope with necessary resources that are available, and thus, externally source help is often required, which can include from proximate jurisdictions or the national or international community.

Similarly, the International Federation of Red Cross and Red Crescent (IFRC, 2018) define a disaster as:

> *"A sudden, calamitous event that seriously disrupts the functioning of a community or society and cause human, material, and economic or environmental losses that exceed the community's ability to cope using its own resources. Though often caused by nature, disaster can have human origins. A combination of hazards, vulnerability and inability to reduce the potential negative consequences of risk results in disaster.*"

Furthermore, the Centre for Research on the Epidemiology of Disasters (CRED) identified a disaster as "situation or event which overwhelms local capacity, necessitating a request for external assistance on a national or international level". Other definitions of disasters given in contemporary literature include "*a complex mix of natural hazards and human action*" (Wisner et al., 2003.p.5) and as "*any event that leads to a response beyond what the affected community can deal with locally*" (Adelman & Gray, 2009, p.2).

Thus, there are myriad ways in which the concept of a 'disaster' can be defined, and the word 'disaster' is often substituted with terms such as 'collapse' or 'tragedy'. Kreps and Drabek (1996) described a disaster as an incident that is identifiable historically, whereby subsections of a population (or its entirety) suffered significant destruction or interference in their normal patterns of life. The United Nations International Strategy for Disaster Recovery (2003) offered a slightly different categorisation, contending that a disaster is a significant intervention in the patterns of activity within a community or the wider social fabric that initiates broad destruction in financial, physical, environmental, or human terms, such that the damage that arises falls beyond the capacity of that community to address it. The Multilingual Dictionary of Disaster Medicine and International Relief (1990) provides consider a disaster to be a widespread incident that occurs with little warning, causing the community in question to require significant assistance, frequently international aid or additional external assistance to manage it. From this perspective, a disaster is effectively an ecological fissure between humanity and the environment (Sundnes, 2004).

According to the above definitions, it is clear that all authorities concur that human actions and interactions are prominent themes in disasters, although each prioritise different elements of cause and effect. It is thus necessary to work towards a definition that covers the human actions or interactions required in such circumstances, thereby providing a novel definition of disaster. This, however, is beyond the scope of this study, which instead adopts an operational definition of a disaster as an event leading to human, material, economic, and environmental damage, and/or losses, where preparedness and response provisions are insufficient. Such events can be immediately recognised as large-scale disasters with immediate effects, or slowly emerging disasters. Events in this category are not bound by geographical or temporal definitions, nor are they typically pre-emptible.

2.3 Definition

(a) *Disaster preparedness*

In the current research, disaster preparedness is defined as the "broad skills, knowledge, abilities, and actions that are crucial to effectively prepare for and respond to a potential or actual threat, which may be chemical, nuclear, radiological, biological or explosive in nature" (Slepski, 2005, p. 2).

(b) Disaster nurse

A disaster nurse is understood to be "*any nurse who provides direct nursing care for patients at emergency hospital departments and may be on the front line of any emergency, regardless of whether they have a diploma or an associates/bachelor's degree*" (Gaber, 2015, p. 4).

(c) Disaster nursing

Throughout this study, disaster nursing will be interpreted as comprising all the various roles of nurses involved in the provision of health-related services to victims of disasters, including those roles that are collectively aimed at the provision of immediate healthcare to victims. These roles may start from duties issuing notices about impending or actual disaster events (Chapman & Arbon, 2008) and extend to those associated with a sudden influx of patients into the healthcare setting. In certain instances, such as in regards to infectious diseases, the arrival of victims at hospital may begin slowly before escalating to a point at which the accelerating influx of patients rapidly depletes healthcare resources. In such instances, nurses are required to be skilful at envisioning the impact of these events, and able to rapidly execute relevant aspects of their organisation's emergency response plan (Drenkard et al., 2002; Veenema, 2018).

(d) Preparedness of nurses

Herein, the preparedness of nurses will be measured by nurses' proficiency in executing the necessary skills and competencies required to respond to a disaster in an effective and timely manner. The frequency and scale of both naturally occurring and manmade disasters has increased significantly (AlQahtany & Abubakar, 2020), a fact that has engendered increasing demand for nurses trained to offer the care required once a disaster occurs. These responsibilities are often associated with problems and challenges arising from poor

organisational response levels, inadequate resources, and unrealistic demands placed upon nurses to perform duties outside the range of their normal, day-to-day/regular duties. Consequently, nurses' level of preparedness is a high priority for researchers, policymakers, and nursing educators. Accordingly, key stakeholders within the healthcare sector have sought to improve and expand disaster preparedness for nurses through the delivery of appropriate educational programmes (Littleton-Kearney & Slepski, 2008; Al Khalaileh et al., 2010).

2.4 Background Information Concerning Disasters on a Global Scale

2.4.1 The Scope and Prevalence of Disasters

Disasters have been a common human experience since the dawn of civilisation, and have raised mortality rates, reduced quality of life, displaced people, and negatively impacted entire populations (Veenema, 2018, p.2). Globally, the rate at which disasters are occurring is increasing, as are the numbers of deaths, morbidity, suffering, economic loss, and environmental damage resulting from them (Usher & Mayner, 2011). To manage the current situation and that in the future, planning for emergency situations and disaster preparedness is imperative (Veneema, 2015). While there is often no way to predict or prevent disasters, it is possible to prevent or mitigate their deleterious effects, especially human casualties and negative economic impacts. For example, the World Health Organisation's (WHO, 1999) disaster prevention or mitigation methods include changing the natures of economies and implementing physical and spatial planning measures.

Over the last 50 years, approximately 10,000 disasters of various sizes have been reported globally. These have affected around 12 billion people and leading to approximately 12 million fatalities globally (Chapman & Arbon, 2008). Furthermore, mass casualty events (MCE), both naturally occurring hazards or human-made catastrophes, demand a rapid response beyond that which the local/regional capacity of authorities can manage (World Health Organisation, 2009). EM-DAT's data collected during 2017 (EM-DAT) and the International Disasters Database (2018) indicated that in just one year 318 natural disasters had occurred, causing a total of 9,503 deaths, and affecting 96 million people across 122 countries, leading to about US $314 billion worth of material damage (Figure 2.1). Data presented in Figure 2.1 could indicate that the number of disasters is increasing from year to

year. However, advances in communication technologies which enable people to be more aware of disasters may be responsible for the observed increase in the prevalence of disasters.
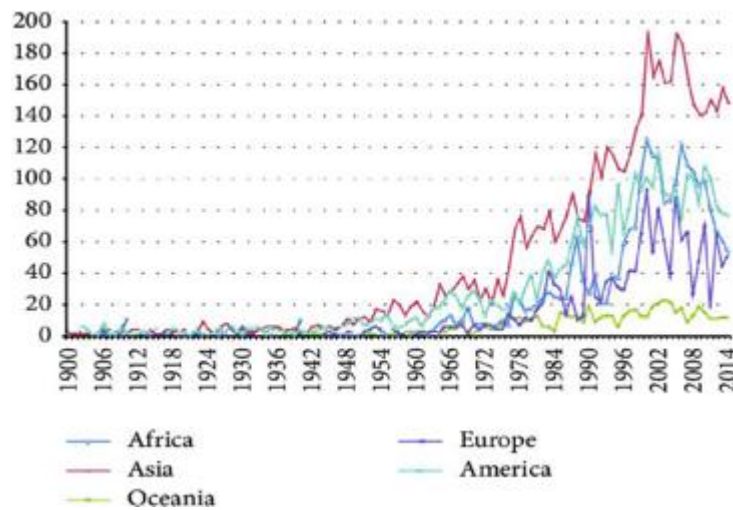
Figure 2.1: The Number of Natural Hazards per Year from 1900 to 2014

(Centre for Research on the Epidemiology of Disasters, 2018)

Rose (2007) indicated that disasters can arise from natural and manmade hazards. Natural hazards could be geophysical (e.g., landslides, earthquakes, tsunamis, and volcanic eruptions), climatological (e.g., wildfires, drought, and extreme temperature fluctuations), hydrological (e.g., avalanches and floods), meteorological (e.g., cyclones, storms, and tidal waves), or biological (e.g., disease epidemics). Examples of disasters arising from natural hazards include the 2004 Tsunami in the Indian Ocean, the 2011 Tohoku earthquake/tsunami, Cyclone Yasi, which struck Australia in 2011, the 2009–2010 H1N1 Influenza pandemic, and the Coronavirus pandemic (COVID-19) which began in 2019 and continued during the preparation of this thesis. By contrast, human made (or technological) hazards are those caused by human beings: examples of which include emergencies, accidents, clashes/conflicts, famine, and transport/industrial accidents. Moreover, human-made hazards also include those resulting from prior environmental degradation, pollution, and ecological accidents (Rose, 2007) such as the Bhopal disaster of 1984, the Chernobyl disaster of 1986, the Gulf War oil spill of 1991, and the 2018 'Camp Fire' in California, USA. Figure 2.2 provides a taxonomy of these different types of hazards.
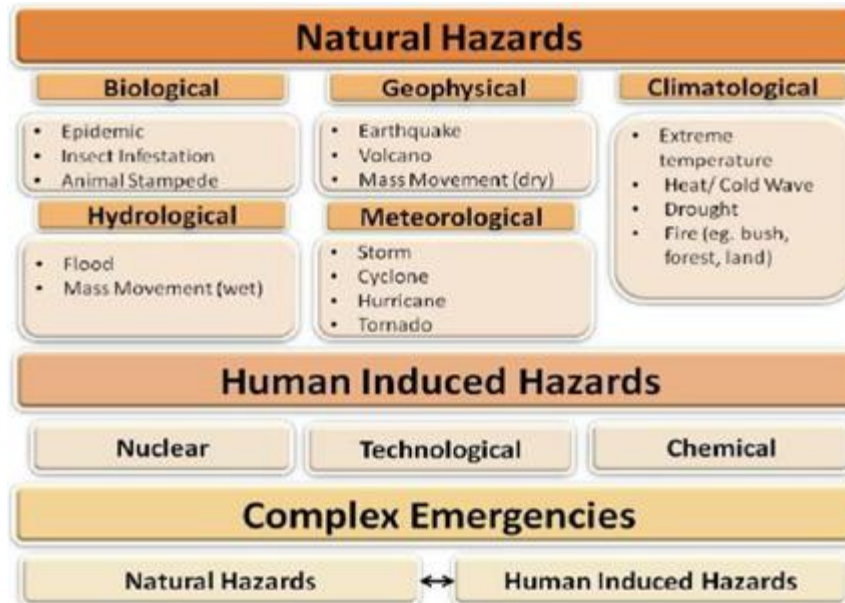
Figure 2.2: Variety and Types of Hazards Leading to Disaster

(EM-DAT, 2017: The International Disasters Database, 2018)

Given the copious and varied information and definitions detailing the diverse typologies, and types of disasters, it is unsurprising that it is difficult to encapsulate all these terms and definitions within a single overarching definition. Additionally, scholars to date disagree regarding what constitutes a disaster and the types of response that are applicable. It appears to be impossible to accommodate all of this information under a definition that would comprehensively define the term 'disaster'. Nevertheless, it is vital that there is acknowledgment of necessary preparations for the healthcare sector to respond to those types of disaster that may occur in the future, regardless of type. Healthcare professionals should and must be prepared to recognise and meet the requirements of responding to a 'disaster' to the best of their abilities in a standardised fashion.

The aforementioned operational definition of a 'disaster' works to ensure inclusion, while also considering the notion of health ecology, such that the response to an 'event' within this definition does not discriminate between manmade/natural disasters. It also works to highlight the need for an expanded and standardised conception of the term 'disaster' that reflects the current realities in its outlook when considering origins, temporality, uncertainty, and contextual occurrences related to the 'disaster'. Accordingly, this thesis contends that all

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such 'events' be met with the same 'disaster' recognition in the domain of healthcare and merit the same response preparation.

2.4.2 Impacts of Disasters

The immediate consequences of disaster situations include loss of life, destruction of property, disruptions to essential services such as education and healthcare, and food and water scarcity (Davis et al., 2010). Additionally, psychological consequences associated with experiencing a disaster include posttraumatic stress disorder, depression, and anxiety, as well as secondary physical reactions such as respiratory and cardiovascular difficulties (Galea, Nandi & Vlahov, 2005; Van den Berg et al., 2005). Additionally, Okuyama and Santos (2014) have emphasised how the negative impacts of disasters on the economies of affected nations can lead to reductions in national income, higher inflation rates, difficulties engaging in international trade, increased national expenditure, fiscal deficits, and loss of reserves. Costs associated with the 2011 Japan Earthquake included a monetary cost of 35 billion USD, the destruction of 125 million houses, irreparable damage to a nuclear power plant, a stock market fall of 4.9%, power outages affecting 2 million houses, the loss of water supply to 1.4 million houses, and widespread food scarcity and homelessness, which impacted on millions of people (Carafano, 2011).

The impacts of disasters frequently manifest as a range of social, political, cultural, economic, and environmental consequences, all of which are separate phenomena yet intertwined and it is vital for disaster nurses to consider them all. Each area undoubtedly merits attention at an individual level, but it is impossible to consider and manage the varied consequences of disasters discretely. Healthcare environments exist as an intersectional point where phenomena overlap. This in part reflects awareness of the significance of considering the ecology of health as a concern in present day society, as a result of acknowledging a growing need for matters of human health to be considered as inherently interconnected with the ecological context. It is therefore of paramount importance that the concept of what health entails be expanded within the healthcare sphere to meet such challenges. This must take place from the ground up through the training of health care providers to work as initial points of contact on a broad scale.

2.5 Background to Disasters: The Kingdom of Saudi Arabia (KSA)

The KSA's total population is 35,415,874 (General Authority for Statistics, 2021), and it spans across a large geographical area with substantial distances separating cities. Moreover, the country has historically experienced – and continues to experience – multiple types of disaster, each necessitating a unique response. Specifically, flooding is common in the Central and Western regions; earthquakes and volcanic hazards frequently strike the North-Western region; dust storms pummel the Central and Eastern areas, and landslides are common in the Southwestern region (Al-Bassam, Zaidi & Hussein, 2014).

Furthermore, approximately 3.7 million pilgrims from around the world visit Makkah annually to participate in the Hajj. The volume of people present constitutes an increased risk of disasters, such as stampedes, food and water shortages, and the spread of infectious diseases (such as COVID-19) (Alshehri, Rezgui & Li, 2013; Algaissi et al, 2020). The city of Dahran Aljanoob is located on the Saudi-Yemeni border and is prone to violence resulting in both military and civilian casualties as a result of conflicts between the Melishi in Yemen and the United Arab Countries (Popp, 2015). In contrast, Jeddah and Tabouk are coastal cities that are susceptible to flooding and earthquakes (Youssef et al., 2015; Abosuliman, Kumar & Alam, 2013; Alshehri, Rezgui & Li, 2013).

In addition, oil exploration and production activities in the KSA make the country vulnerable to disasters (Al-Qahtani, 2014) related to the industry, such as oil leakages and spills, well accidents, fires, and explosions, all of which have adverse effects on health. A further danger is from terrorist attacks, and there have been several such tragedies in the KSA in recent years.

2.6 Nurses as Key Responders to Disaster: The Global Context

Globally, nurses often outnumber other healthcare professionals at the scene of disasters and in locations where disaster response operations are located (Department of Labour, DOL, Bureau of Labour Statistics, 2012; U.S. Department of Labour Statistics, 2014; American Nurses Association, ANA, 2018; US Bureau of Labour Statistics, 2018). The critical nature of their role may partially explain the immense demand for nurses in emergency situations (Fung, Lai & Loke, 2009; Lavin, 2006). Nurses are often trained to detect, manage, and mitigate the impacts of disasters. They are also trained to enhance the physical, emotional, and psychological well-being of patients (WHO, 2009; International Council of Nurses,

2009). Consequently, developing key competencies in emergency preparedness and response is important for nurses in the KSA (Baack & Alfred, 2013).

Nurses need to be able to respond to natural and human-made disasters, but any approach aimed at ensuring an effective response must be evidence-based. On this point, several researchers have asserted that nurses do not possess the requisite competencies to respond to disasters (Slepski, 2007; Chapman & Arbon, 2008; Duong, 2009; Usher, 2010; Khalaileh et al., 2012). It has therefore been argued that the preparedness of nurses must be improved, particularly in view of the link between preparedness and loss of life in disaster situations (Collander et al., 2008; Sher & Mayner, 2011; Putra et al., 2011).

Nurses' roles in the domain of disaster response are varied, but largely focus on actions aimed at delivering urgent and immediate healthcare to victims. Their role often commences with an initial immediate notice of an impending or actual event (Drenkard et al., 2002; Chapman & Arbon, 2008), resulting in an unexpected or unplanned influx of patients. In certain events, nevertheless, including outbreaks of infectious diseases, the build-up of patients in the hospital is slow initially. In such cases, nurses must recognise that the impact of such events on health may be slow, and they must accordingly effectively assess the influence of these events on healthcare provision to recommend the most suitable care/response, including the possible execution of an emergency response plan (Fahlgren & Drenkard, 2002; Veenema, 2018).

Furthermore, nurses must also learn to coordinate their responses to emergencies, working with other healthcare facilities/agencies when responding to disasters. In addition, nurses must also have the capacity to follow procedures previously established by the hospital emergency operations centre, and perform other activities stated in their Emergency Response Plan (Powers & Daily, 2010). A nurse's role is not restricted to internal management of disaster responses, but extends to working externally in facilities designated for response activities. Accordingly, nurses need to be able to provide thorough assessment of the needs of community members, including distributing provisional shelters, and food and water to individuals when required. Additionally, nurses may need to organise staff vaccinations or distribution centres or implement programmes to deliver vital psychosocial assistance (Powers & Daily, 2010; Stevermer, 2012). Moreover, nurses may frequently be required to provide care at the scene of an event or at a field hospital established to administer supplemental care within the community (Fernandez et al., 2012).

In summary, nurses frequently represent the largest group of healthcare professionals at the scene of an incident, adopting essential roles in disaster response (Pattillo & O'Day, 2009). Thus, nurses clearly need to be suitably trained to perform multiple roles effectively (Yamashita & Kudo, 2014). A nurse's previous experience and training informs his/her preparedness, and by extension his/her awareness of what is required in a disaster scenario, as well as the confidence, and skills required to effectively respond to an emergency (Seyedin et al., 2015). The American Nurses Association (ANA, 2018) indicated that the implementation of disaster-nursing education is vital, because when nurses are properly trained, the safety and well-being of the community will benefit when disaster events occur. Furthermore, the American Association of Colleges of Nursing (AACN), and the Nursing Emergency Preparedness Education Coalition (NEPEC), deem it necessary for nurses to possess a minimum level of competence in emergency preparedness concerning both their knowledge, skillsets, and other factors, in order for them to respond in an effective manner to disasters. These organisations therefore advocate that disaster-nursing education be taken seriously (Nash, 2017).

2.7 Nurses as Key Responders to Disasters: The Context of the KSA

Nurses play a central role in any healthcare system, accounting for over 50% of the medical workforce (Al-Darazi, 2008). The roles they play include delivery of health promotion and awareness programmes, the implementation of patient education and self-management programmes, the provision of care, and the rehabilitation of patients (Oulton, 2006). As is the case in many other countries, there is currently a shortage of nurses in the KSA. The growing elderly population, and the additional requirements for long-term care caused by higher life expectancies and improvements in medical care have been implicated as a major contributor to the observed inadequacies in nursing staff (Abu-Zinadah, 2005). In addition, a number of other factors arising from individuals' social, societal, systemic and individualistic natures have also been implicated in this regard (Miller, 2007). Miller (2007) observed that these pressures have contributed to a dwindling number of nursing graduates, creating a gap between the rate at which nurses are being trained and the demand for nursing staff members within the country. In addition, several studies have reported that gaps in the administration and planning of nursing training constitute a major contributor to the poor level of nursing service observed in the KSA (Gifford et al., 2002; Miller, 2007).

Furthermore, concerns regarding the adequacy of the current nursing programme in the KSA and its capacity to prepare nurses to respond effectively to disasters merits discussion. Studies investigating the effectiveness of existing programmes have largely reported widespread inadequacy in terms of their capability to prepare nurses to respond to disasters (Karaoz, 2004; Whittock et al., 2002). In their research, Sharma and Dhar (2016) investigated the impact of good nursing education and the ability of nurses to effectively respond to disasters, positing a strong positive association between these two variables. Similarly, Rambur et al. (2005) examined the impact of academic degrees on nurses' job performance, noting that nurses with bachelor's degrees are more effective professionally than those with diplomas. Furthermore, the study indicated that obtaining a bachelor's degree provided a measurable return on investment for both nurses and employers. However, studies have also demonstrated the existence of poor public perceptions of nursing in the KSA (El-Sanabary, 2003). Watson (2006) identified three factors that contribute to this, including the perception of nursing training as vocational training rather than academic, the misconception that the nurses' role is primarily focussed around the administration of drugs, and the false belief that nurses are not held accountable for their actions.

In reference to disaster response, Watson (2006) recommended developing an education programme to ensure nurses developed the necessary qualities and skills. In regard to the KSA particularly, El-Sanabary (2003) and Hamdi and Al-Hyder (1995) also recommended that any education programme covering this specialism be at the degree level, as diploma level education is viewed as a technical and low-level qualification. Moreover, it is essential to understand the practical experiences of nurses when developing such a programme. For example, studies have shown that in-house/on-the-job training may prove effective in this regard (Gazzaz, 2009). The study particularly indicated that training should take the form of continuous professional development (CPD) programmes for nurses, as it was reported that nurses indicated the availability of a CPD programme to be essential for their development as well as being a significant predictor of job satisfaction and retention. Thus, it is considered of critical importance to understand the current context of nursing education in the KSA, and how nursing education could impact the nurse's ability for propoer disaster response.

2.8 Nursing Education Development in the KSA

Education programmes of nursing are not a recent development in Saudi Arabia, as it has been more than half a century since nurses were first formally educated in the Kingdom

(Tumulty, 2001). The first references to nursing in Saudi Arabia stem from the Prophetic era (613-632), when a female nurse was recorded as serving in the Muslim army during times of war (Al-Osimy, 1994). Rufaida Al-Asalmiya is reported to be first woman to practice nursing within the region according to Muslim historians (Almalki et al., 2011). She cared for wounded soldiers during the early Islamic period (Miller-Rosser, Chapman & Francis, 2006). She also established clinics to train nurses providing community nursing care (Almalki et al., 2011).

In the modern era, nursing education in the KSA was initiated by parties/authorities external to the Ministry of Education (MoE) (Aljohani K., 2020), probably because technical education fell outside the MoE's mandate at the time. In 1948, a male American nurse working for the Arabian-American Oil Company established the first recognised nursing education sessions (Aljohani K., 2020). After introducing nursing as a profession in the MOH in 1954, the Saudi government established the first official nursing school in 1958, enrolling 15 male primary school students in the initial one-year nursing programme. In 1961, the program's length was extended by two years (Aljohani K., 2020), with two nursing programme pathways made available within the scope of nursing education (Tumulty, 2001; Felemban, O'Connor & McKenna, 2012; Aljohani K., 2020).

The trend towards government-recognised nursing programmes emerged from necessity, as government departments such as the Ministry of Health and the Ministry of Defence required staff to operate the health sector (Deng, 2022). Male and female students who had finished six years of elimintary school education were recruited to complete these programmes. In 1981, the entry criterion was raised to intermediate level (ninth grade) and subsequently to Senior Secondary School certificate (year twelve) in 1992. It is worth mention that, In Saudi Arabia, the system of education is known as 'general education', which consists of three distinct stages: elementary for 6 years; intermediate for 3 years; and secondary education for 3 years.

In 1975, the year that the ministry of education MoE was established, university-level programmes were initiated. All the students enrolling in these programmes were female, and male students were only accepted to the programme after 2004. The option to bridge to a bachelor's programme in nursing was available to those who had completed professional programmes, such as a nursing diploma or an associate's degree. Successful students would graduate with a Bachelor of Science in Nursing (BSN) (AlYami & Watson, 2014).

In the 1980s, King Saud University in Riyadh developed the first Master of Science in Nursing (MSN) programme for female nurses. In 2013, the same university launched an equivalent programme to train male nurses. A royal decree issued in July 2011 directed the transfer of authority for 39 health institutes and colleges from the MoH to the MoE. Thereafter, these institutes were merged to create 15 government universities. According to the university system running these programmes, all students graduated with a BSN degree from then on. The SCFHS, meanwhile, resumed vocational nursing programmes in 2018. With the launch of these training programmes, public and commercial healthcare companies were encouraged to participate in the programmes' operations, providing training centres in order to meet workforce demands without the need for university degrees (Al-Shehri & AACHE, 2013; Aljohani K., 2020; Alluhidan et al., 2022).

In summary, nursing education programs have now been offered in KSA for 40 years (Miller-Rosser, Chapman & Francis, 2006) through the medium of hospital education programmes for students of diverse educational backgrounds. Recently, the Saudi Commission for Health Specialties (SCFHS) has established a two-year diploma that can be delivered to graduates. Furthermore, two new programmes are currently available in clinical practice, as well as an additional programme in Advanced Nursing Practice (ANP), both of which focus on clinical practice. Additional details are provided in the following section.

2.9 The Current Context of Nursing Education in the KSA

Aljohani (2020) and Harb (2019) offered a useful summary and discussion regarding the current state of nursing education in the KSA. Initially, the bachelor's nursing programmes in the KSA followed two paths in accordance with nursing education regulations: the regular nursing programme (RNP) and the bridging nursing programme (BNP). The RNP has always been structured as four years of academic study followed by one year of internship, whereas the BNP is a two-year programme including a six-month internship for students who are already registered nurses and hold a diploma degree. The National Commission for Academic Accreditation and Assessment (NCAAA) was established in 2004 as a regulatory body responsible for the accreditation and assessment of education and training in the KSA. Its objective is to improve the quality and efficiency of academic programmes, as well as improving their contribution to the national economy and the nation's overall development ("NCAAA", n.d.).

The NCAAA monitors Bachelor's programmes under the supervision of the MoE, and ensures that universities fulfil their statutory obligations. The first year of the RNP focuses on establishing the students' background knowledge in science in the first two semesters. The students must study general science classes and English alongside communication and learning skills, the completion of which are required elements to successfully graduate. In the second and third years, general nursing science courses are introduced, and specialty nursing courses, such as those pertaining to critical/emergency nursing care or geriatric nursing care are delivered in the fourth year.

The university organises and monitors internships thereafter, whereas particular internship locations offer training deemed relevant to the internships. Nursing interns rotate through emergency, intensive care, medical-surgical, paediatric, maternity (for female students only), and psychiatric departments, and general health care clinics. Maternity nursing is taught to male and female students in two separate courses. Unfortunately, male students are not given the opportunity to gain real-world experience in prenatal care settings. In order to compensate for this lack of expertise, they receive extensive training using high-fidelity simulation manikins and equipment during their undergraduate studies. It is also worth mentioning that, in order to be eligible to practise as a registered nurse following completion of their internship programme, students must pass the Saudi Nursing Licensing exam during or after they finish their internship (Miller-Rosser, Chapman & Francis, 2006).

2.9.1 Postgraduate Nursing Education in the KSA

In 1987, King Saud University established the first master's degree in nursing in Saudi Arabia, enrolling female students only. In 2013, male nurses were permitted to enrol at the same university to complete a master's degree (Gazzaz, 2009). There are now various master's degrees in nursing available, provided by government-run colleges. These programmes typically last two years and are only available as full-time courses. Typically, the first semester contains a breadth of courses in various nursing specialisation programmes, via which students learn about nursing theories, advanced learning and teaching abilities, and nursing research and biostatistics (Aljohani K., 2020; Deng, 2022).

According to the Unified Law Organizing Graduate Studies in Saudi Universities, the ratio of theoretical to clinical components in 42 credit-hour nursing courses varies between specialisations. The primary nursing specialities provided at universities include community

health, psychiatric and mental health, nursing administration and education, medical-surgical nursing, and maternal-child nursing. The only Ph.D. programme in nursing in the country is offered by King Saud University, and was introduced in the academic year commencing 2019. In addition, a new initiative providing a Doctorate in Nursing Practice (DNP) is now in place through a collaboration between Saudi Aramco and Johns Hopkins University.

However, as part of a wider programme to address developmental issues and prepare the KSA for its next phase of development, the government has developed a strategic programmed termed "Vision 2030" to deliver innovation and development in key areas. These include healthcare, trade, education, science and technology, communication, and nursing. Alsufyani et al. (2020) reported that when addressing developmental issues pertaining to the delivery of healthcare, the Vision 2030 strategy targets improvement in nursing education. Thus, the strategy proposed an increase in the number of nursing scholarships, affording greater responsibility to nursing educators to promote the attractiveness of the profession, and tasking nursing colleges with the development of a high-quality nursing curriculum. The strategy also aims to delineate the scope of nursing practice. While challenges and problems impacting the entire nursing profession in the KSA also have implications for disaster nursing, it is unclear how plans to improve existing nursing practice and education in KSA will translate into improved disaster nursing throughout the country.

2.9.2 The Organisation of Nursing in the KSA

In KSA, the Saudi Commission for Health Specialties (SCFHS) is responsible for the professional categorisation and registration of health specialisations. The SCFHS must approve all health specialisations associated with higher education programmes. For example, it approves details of the required knowledge base and competencies for students graduating from various health programmes, as well as granting licences to those who pass their exams to allow them to work for the Ministry of Civil Services. Nurses wishing to renew their SCFHS licence must complete 15 hours of Nursing Continuing Education. Continuing education activities include attending conferences, seminars, workshops, training courses, and the publication of papers or books. Accredited online health-related activities and panel discussions are also eligible (Aljohani, 2020; Alluhidan et al., 2022) for consideration in the category of Nursing Continuing Education.

According to the Saudi Commission for Health Specialties' Regulations of Nurses Classification, nurses in the KSA fall into three categories (SCFHS). As the government has recently mandated the closure of nurse technician schools, the nursing technician classification and registration will no longer be in use. Currently, the nurse specialist is the first of the three classes, holding a bachelor's degree in nursing or an equivalent degree from a recognised educational organisation in the country of issue. The second category is the senior nurse specialist, who holds a master's degree in nursing and at least two years of clinical experience. Finally, a nurse consultant has a Ph.D. in nursing with a minimum of three years clinical experience following completion of their Ph.D. programme (Homepage, Saudi Commission for Health Specialties, 2022).

Currently, the perception of nursing in the KSA is poor, despite the fact that nursing was regarded as a prestigious profession during the 19th Century (Ghaznawi, 1982; Gazzaz, 2009). Despite theoretical recognition, there are multiple challenges that nurses face in the KSA, including a range of social to policy challenges. These challenges may explain the reluctance of many families to acknowledge the importance of the nursing profession and their unwillingness to permit their children to study nursing. On the one hand, choosing a career in nursing may help young people secure a job quickly, and this is especially true for females. However, several barriers face those wishing to access the profession, many of which stem from the perceived responsibilities of women as homemakers. Potentially female nurses may be required to work night shifts, limiting female nurses' ability to perform their duties in the home, and this is often seen as a barrier to women entering the profession. This issue has been implicated as responsible for a 50% reduction in the number of female nurses, as husbands or fathers frequently issue ultimatums to choose between a career and a life as a mother/spouse.

Several studies have confirmed the existence of negative public perceptions of nursing in KSA (Amarsi, 2003; Sarfati, 2003; Karaoz, 2004). Their findings suggest the public perception of nursing is that it is an unskilled and low-paid job only intended for women. Studies have also shown that in comparison to other healthcare professions, nursing is often ranked as least popular choice (Okasha & Ziady, 2001; Boyle & Salman, 2003; Shukri 2005). Additionally, members of society often perceive nursing students as having achieved low academic performance at High School or as coming from impoverished families (Husseni, 2006). In fact, there is a widely held belief within society that even those at elementary

education level or with no formal qualification could study nursing. These factors have discouraged native Saudi citizens from studying nursing, which explains why foreigners currently comprise the majority of nursing professionals in the KSA (Amarsi, 2003; Karaoz, 2004). Altogether, negative perceptions among the population may have implications for the type of training provided to nurses in the KSA, and, by extension, influence the competence of nurses in responding to disasters.

To address this problem, Savel and Munro (2011) observed that the nursing profession is similar to many other professions considered honourable. Unfortunately, many Saudis view nurses as less competent than doctors, contending that medicine is a prestigious profession with the remaining healthcare professions merely serving as supporting agents. The nursing profession has never been part of the school curricula in the KSA. Boys are normally given the choice of becoming a doctor, officer, engineer, teacher, or a farmer, whereas girls are encouraged to become teachers, and in more recent years, doctors. These curriculum standards help to explain the professional orientations of previous generations. As a consequence, there can be contentious relationships between nurses and patients resulting from feelings of disrespect and disdain, as well as between nurses and their colleagues in the workplace (i.e. doctors and administrators). Unfortunately, negative stereotypes concerning nursing are present at all levels, and there is an immense need for a national programme to correct the image of the nursing profession that prevails in Saudi society. Everyone, without exception, views it as one of the lowly professions, such that the average citizen regards nurses as little more than "hospital maids".

A further factor challenging improvements to the image of nursing as a profession has been the global trend to reduce and rationalise healthcare spending, which has led to reductions in the number of workers in the health sector, including nurses (Al-Johari, 2001). This has also resulted in nurses being assigned long working hours (including mandatory overtime), which negatively affects the level of medical care provided due to staff members' exhaustion and stress, as apparent from the increased numbor of medical errors (Gazzaz, 2009). Naturally, this has a negative impact on patient satisfaction, which is commensurate to the reduction in the quality of services rendered by nurses. All of this produces negative effects affecting the reputation of the nursing profession as a whole.

Al-Johari (2001) and Mansour (1992) identified factors such as poor working conditions, mixed-gender working environments, long working hours, and difficult shift patterns at work

as among the barriers facing nurses in the KSA. From social perspectives, studies have indicated that females in the KSA frequently view nursing as a socially unacceptable career. When a woman considers entering the nursing profession, she knows she will be expected work for low pay, receive little appreciation for her work, have difficulties finding suitable and safe childcare provision, and face family pressure to leave the nursing profession. There is also a prevailing perception that being a nurse reduces a woman's chances of getting married (Al-Johari, 2001; Mansour, 1992; Rothrock, 2007; Gazzaz, 2009; Al-Rabiah, 1994; Tumulty, 2001). It is evident that all these barriers have a direct impact on the capacity of nurses to be adequately prepared to offer effective disaster response and mitigation.

Almalki et al. (2011) proposed that the government could offer financial support to nursing students to stimulate more interest in the profession, which would subsequently translate to more effective nursing practices to deliver adequate disaster response in the KSA. The study also proposed that the training period could be reduced from five years to three to lower the entry barriers to the profession. Public awareness campaigns to alter perceptions of nursing among the general public are also vital, and mass media platforms may potentially be used to achieve this objective. Efforts to encourage Saudi residents to enrol in nursing must also increase as the current state of nursing contradicts the Saudi Vision 2030 regarding the improvement of the working environment for nurses in order to retain and empower them.

In addition, significant aversions to pursuing a job in the nursing profession also stem from the perceived dangers associated with the profession. Sharp containers are often overfilled, while slippery floors, the requirement to lift heavy patients, exposure to infection from patients with high-risk infectious diseases, and the abusive behaviour of other healthcare professionals such as administrators, doctors, and other members of the Care Team. Additionally, the possibility of sexual harassment, particularly for female nurses, and the failure to enforce anti-harassment and job abuse laws in practice also lowers the standing of the nursing profession. Moreover, as proof of competency is of critical importance in the profession, maintaining continuous education, seeking higher degrees, and training to work with advancements in technology also causes a large number of nurses to struggle, as they already have a long and arduous work schedule and there is a lack of specialised courses. The element of the Vision 2030 strategy to develop nurse education in KSA seeks to address and overcome such issues. Furthermore, the recent COVID-19 pandemic and its attendant effects (including the deaths of numerous nurses worldwide) have further contributed to ongoing

concerns about the adequacy and preparedness of nurses but also the desirability of the profession (Duncan, 2020).

Disaster preparedness, according to Yasuyuki Sawada, Chief Economist of the Asian Development Bank and Associate Professor at the University of Tokyo's Graduate School of Economics, essentially differentiates managed disasters from uncontrolled tragedies (Aldrich, 2019). Moreover, the increase in the number of disasters globally is creating growing pressure to increase the preparedness of healthcare workers to respond (Aldrich, 2019). Disasters disrupt nurses' everyday routines as they must manage an increased number of patients in a short period of time, and also potentially navigate staff absenteeism and changes in the scope of practice, as occurred during the COVID-19 pandemic.

In a disaster scenario, the scope of practice differs from the normal range that nurses expect to encounter within the hospital environment. Nurses in such situations have explained that they are working in pressurised environments, supporting patients with complex needs often with limited resources, while working at the very edge of their frame of reference (Al Harthi et al., 2020). The initial concern expressed by nurses in disaster situations concerns the ability to provide the highest standard of care to their patients. Notably, healthcare professionals may suffer long-term psychological damage due to making decisions with regards to how limited resources should be allocated, while simultaneously feeling vulnerable due to legal and ethical implications that may be associated with negative consequences healthcare decisions for patients (Aliakbari et al., 2015). It is imperative that nurses feel safe in their work, so in disaster nursing contexts they need to learn how safely assess and avoid dangers, as they may inadvertently cause injuries or even deaths, leading to a failure to respond to events and the collapse of the health system (Aliakbari et al., 2015). Similarly, disasters can force nurses and medical service providers in general to make difficult or challenging decisions, as they must often take actions that differ entirely from what they are accustomed to as a result of typical features of disasters, such as an increased numbers of patients in the hospital alongside limited time and resources (Priest, 2009).

However, the research shows that the reality is that the present education system and training provided to nurses in the KSA does not include the necessary skills to respond to disasters, with the result evidencing that nurses feel poorly prepared to respond (Labrague et al., 2018). This research regards these necessary skills as the soft/interpersonal non-clinical skills and the practical/situational skills which fall under the cross-cutting themes of disaster nursing

education outlined in more detail in Chapter 9 of the thesis. From the raising demands on the curriculum, sub-standard competencies in the development of the curriculum, insufficient teaching tools and budget, minimal experience of disasters and limited disaster nursing experience, education programmes into disaster nursing have not been given priority. Furthermore, there is a lack of confidence among the members of teaching faculties, as they feel unprepared to teach disaster nursing. Research, and therefore the evidence base concerning disaster nursing is inadequate to meet the challenges facing the profession, and accordingly disaster education is generally excluded from nursing curricula (Labrague et al., 2018) (Al Thobaity, Plummer & Williams, 2017).

2.10 The Need to Strengthen the Disaster Preparedness of Nurses

Recent disasters have highlighted the lack of disaster response and management knowledge that can engender confusion among responders, thereby delaying an effective humanitarian response (Pradhananga & ElZomor, 2021). As shown above, the sporadic nature of disaster nursing education has resulted in a work force with limited capacity to respond to disasters, develop policies to manage them, educate the public, or willingness to accept leadership roles. Disasters represent unique circumstances that require healthcare professionals to adapt to changing environments and working conditions. As nurses comprise the largest segment of the healthcare workforce, excluding nurses from preparations and knowledge of the disaster continuum holds a substantial risk for the population (Park & Kim, 2017; Karnjuš, Prosen & Ličen, 2021).

Furthermore, as the previous section has detailed, nursing education in the KSA is overly broad, and as such does not provide either theoretical or practical preparation for nurses engaged in disaster situations. The overall assumption of the nursing profession, as it exists within the KSA, is that nurses play a role supporting the work of doctors within hospitals, with little to no consideration given to the immense role they may play in minimising the damage to lives caused by disasters that strike the country. Accordingly, a great deal of injury and loss of life can be linked by the inability of nurses to respond to disasters and the lack of a conceptual framework to inform a disaster nursing training programme. The following section serves to highlight the impact of such gaps in knowledge so as to justify this study and makes specific mention of those barriers that prevent nurses from effectively reacting to disasters.

2.10.1 Impact of Gaps in Knowledge and Improving Disaster Nursing Education in the KSA

Insufficient accepted competencies and gaps in education have added to the difficulties in recruiting nurses adequately who possess the preparedness to respond to disasters and provide assistance effectively. A central principle to disaster preparedness is education and training, as nurses often possess only limited comprehension of relevant disaster response procedures, and thus, they can only cope with disasters with limited confidence and commonly react to situations with panic. Hence, education and training help to increase the stages of planning, preparedness, response, and recovery procedures experienced by nurses when disasters strike.

Even though some nurses have had experience responding to disasters, and therefore, have developed expertise in disaster response through experience, the number of such nurses is insufficient to meet the needs of the profession. The shortage may be due to the fact that some nurses may abandon their core clinical duties and work for organisations specialising in disaster relief and humanitarian aid. It is worth noting the distinction here between disaster response (the focus of this study) and disaster recovery, where disaster recovery roles may offer nurses a slower paced, better planned and supported, less stressful and more highly regarded role within disaster managment. Nurses who opt to work in the recovery phase are better able to employ their knowledge, to provide holistic care in the most difficult circumstances at the advanced stage in disaster cycle management, in hindsight. Nurses working in humanitarian action at the response stage do not have such frameworks, and are inevitably succeptable to heightened stress, uncertainly, more time-sensetive demands with limited resources, amongst other issues, rendering the response role potentially less attractive withing disaster management nursing roles. The identified Key Concepts in this study are intended to provide the disaster response nursing role with better support in uncertain conditions, to keep them safe whilst responding effectively when disaster occurs. Longterm, it is hope that this will mitigate the potentially less attractive perceptions of the disaster response nursing role, and the uptake and retention of nurses within that field.

Without understanding the significance of the role they may play in a disaster scenario, other nurses may have little motivation to train in disaster nursing in advance. The most recent example of a disaster scenario in the KSA is the ongoing COVID-19 pandemic, which not only personally affected many individuals but also impaired the country's economic capabilities (Saudi Press Agency, 2020). The advent of this pandemic, along with a

demonstrable increase in natural disasters over the last two decades, has focused policymakers' attention on the importance of healthcare responders and disaster preparedness. Nonetheless, there remains a dearth of education and training available to nurses, reflecting the shortage of health trainers in this field. Despite this, the disaster preparation and management programmes aimed at educating nurses have been demonstrated to deliver positive outcomes, including reduced mortality, improved health services, and reduced costs associated with disasters (Huh & Kang, 2018; Stangeland, 2010). The chief objective of disaster education for nurses is to equip them with essential knowledge and skills to meet the challenges posed by unexpected events, thereby enabling them to take on more active roles in disasters.

Disaster preparedness, according to Slepski (2005), includes the broad skills, knowledge, abilities, and actions that are necessary to prepare for, and respond effectively to, potential or actual threats, which could be chemical, nuclear, radiological, biological, or explosive in nature. The less need for an emergency healthcare delivery system, the better organised and adequately prepared one assumes the system to be. Regrettably, as COVID-19 proved, the practical realities of the disaster capacity of the healthcare system are often less encouraging. Members of disaster rescue teams, including nurses, have routinely expressed significant concerns about the capability and readiness of healthcare systems to respond adequately and aptly to disaster situations (Kollek & Cwinn, 2009; Kanter & Moran, 2007). These authors reported and demonstrated that most nurses are generally unprepared for disaster management. This, therefore, further substantiates the report by the World Health Organisation and the International Council of Nurses (2009), which suggests that only a small proportion of nurses have the requisite expertise and experience to work at disaster times, and the majority are not fully prepared to do so. Education required is not limited to disaster sites. But inside and outside health facilities and at all levels. All nurses need to be trained because even nurses who are not at the disaster site may be required to provide clinical services to victims of disasters that are rushed to the hospital or respond to disasters that may occur inside hospitals.

According to Bagatell and Wiese (2008), the major reason for this deficit is the limited disaster preparedness training available for healthcare professionals, whereas Hsu et al. (2006) indicated that even though disaster management experts frequently do not have expertise in healthcare, no effort has been made to bridge the gap between these two groups. Accordingly, there is a diffusion of responsibility at local, state, and federal levels of disaster

management, with the most extreme separation at the federal level (Djalali, 2012). To overcome this challenge, Veneema (2006) suggested nursing education programmes be developed to ensure that nurses are trained in the basic knowledge of disaster management and the critical elements of disaster preparedness. The study therefore indicated that nurse must be trained in critical concepts relating to the definitions, classification systems, major disaster incidents, prevalence and health implications of disasters. The focus of this training should be on increasing the familiarity of nurses with the disaster management in all stage of disaster cycle of preparedness, mitigation, response and recovery, while also elucidating the major challenges associated with disaster response. Furthermore, Veenema (2006) suggested nurses must master certain skills, such as performing rapid physical assessment and disaster triage, risk assessment, and hazard identification and mapping with the ability to analyse vulnerability, in addition to training in decontamination and use of individual protective devices.

Another reason proposed to explain lack of preparedness for disaster management is the absence of any routine formal assessment of healthcare organisations' disaster preparedness throughout the country (Djalali, 2012). The paucity of formal and evidence-based disaster assessments is the foundation from which other problems emerge, because when our deficits are not measured, it becomes difficult to remedy them. Previous literature demonstrates that disaster response education to provide nurses with real, practical and relevant training to deal with disasters is an urgent priority. Education programmes enable nurses to improve their relevant abilities, and thus, increase self–confidence, disaster awareness and commitment levels. There is also evidently a requirement for comprehensive planning to ensure nurses are adequately prepared and resourced to handle disaster events. Therefore, Saudi national curriculum should include components to educate nurses to effectively respond to diverse disasters – this is a proposal based on the aim of this study. As health sectors respond to disasters in conjunction with other organisations, such as the police, Civil Defence, and military, it is apparent that healthcare in general and nurses in particular need to coordinate and communicate with these groups and work in a team. Interactions between these groups should be also included in nusing curriculum to aid nurses in creating and maintaining safe operations during disasters, thereby reducing risks, as nurses are not equipped or trained to deal with fires or the destruction of buildings, for instance.

2.10.2 Non-clinical Skills and Justifications for Reforms in Disaster Nursing Education

As demonstrated, in this Chapter so far, there is a pressing need to implement disaster education and planning, including regular drills to ensure that procedures will be practiced and understood. Furthermore, an approach focused on practical training may ensure that nurses' opinions and concerns are considered. The aforementioned factors need to be considered to effectively develop disaster education and ensure that nurses within the KSA are able to demonstrate quality-levels of preparedness to manage natural disasters or human-made tragedies. Despite the progress and attention nursing is receiving in Saudi Arabia, the gap between nursing education and the realities of responding to disasters remains large, and accordingly merits further attention. Undoubtedly, the realities of how nurses should ideally respond to disasters must be incorporated into models to develop the nursing profession. Furthermore, the roles of nurses need to be expanded to cover disaster situations if death rates are to be reduced and the impacts of disasters on health lessened. Thus, interactions between policymakers, nurses in practice, and academia will undoubtedly play an important role in effective responses to disasters, as insufficient disaster response education ultimately results in a lack of fulfilling the role of nursing or to meet professional standards, thereby resulting in job dissatisfaction, exhaustion and resignations.

In summary, the aim of nurses is to help during disasters and similar events of crises, as the devastation brought about by a disaster activates their moral and professional sense of duty to respond. However, in the case of the KSA, as discussed above, many are hindered by lack of training, either regarding safely navigating the situation or understanding the specific needs of the population. In such situations, their role is unclear, and they often struggle to use their skills and knowledge effectively in disaster situations. Thus, they endanger themselves and others, risking becoming a burden to other workers during times of hardship and stress. The outcome, even with the best intentions, is the addition of more chaos to an already chaotic situation.

Undeniably, it is difficult to change daily activities of nursing practice to disaster operations, and for nurses without disaster training or education, it is notably more challenging, as adapting to unfamiliar situations and managing large populations' health needs, possibly in a shelter, but certainly under less-than-ideal conditions, can be difficult for any nurse, especially those lacking knowledge of disaster management, or a conceptual familiarity with

the various roles of responders. In addition, nurses often make personal sacrifices to assist in the disasters and so failure understand the structure and organisation of the disaster response framework diminishes the ability of nurses to be effective leading to high levels of frustration. Importantly, broadening nursing education to encompass issues relevant to disaster nursing would enable stakeholders to fill any conceptual gaps and allow nurses to respond effectively, as they would have an adequate knowledge-base and skills, allowing them to think critically during a disaster.

Both natural and human-made disasters continue to occur around the world, and in some cases greatly impact upon major urban centres. In the development of disaster preparedness, it is vital that all different healthcare providers are knowledgeable, skilled, and able to respond to various threats. In this research, the Key Concepts that inform disaster nursing education will be collected from a combination of participant feedback and articles selected via a scoping review. According to the Oxford English dictionary, a 'concept' is defined as an idea that underlies or governs the design or content of a product (Oed.com, 2019). The phrase "concept" will be interpreted as an aspect of nursing knowledge or practice and content that an educational programme must contain to ensure adequate disaster preparedness and response training.

2.11 Conclusion

After defining the key terms and ideas discussed in this thesis, i.e., disaster, disaster nursing and disaster preparedness, this chapter provided background information regarding the scope, impact and nature of disaster at both local (KSA) and global perspectives. In addition, the important role of nurses in responding to disasters globally as well as locally within the KSA has been elucidated. Additionally, the challenges facing the preparedness of nurses for effective disaster response in the KSA was set forth, as were potential solutions to them. This chapter has discussed how natural hazards and human-made disasters can have catastrophic consequences for people, communities, and healthcare systems. Previous studies have presented a plethora of information addressing many gaps in the knowledge and skills of healthcare professionals and responders with regard to disaster preparedness and responses, particularly in the KSA (Al-Bassam et al., 2014). As discussed, nurses comprise the largest group of professional health workers, and so play a pivotal role in effective disaster response.

This role will be developed by the nurses who are able to develop their own knowledge and skill base to the fullest extent.

Moreover, the chapter considered how currently nurses in the KSA are undervalued, and their contributions are under appreciated. Previous researchers have also highlighted the need to address this, as disaster nursing and management education for nurses would generate positive outcomes, such as a reduction in mortality, improvements in health services, and reduced costs (Huh & Kang, 2018; Stangeland, 2010). To achieve these goals, disaster education for nurses is vital to equip them with the necessary knowledge and skills required to meet the challenges of unexpected events. As each disaster is unique and complex, the successful management of disasters is to a large extent contingent upon the level of preparedness of individual healthcare professionals. In addition, it is important to consider that the potential for nurses to assist in such circumstances can only be fully realised if their number is increased; this will in turn help to improve health, support economic development, and promote gender equality (WHO, 2019).

In addition, a review of the available evidence indicated a dearth of appropriate educational programmes for training nurses in disaster response, both globally and in the KSA. Thus, the remainder of the current study will aim to provide useful information to establish Key Concepts applicable to the development of an appropriate educational programme to equip nurses with the skills and competences required for effective disaster preparedness and response in the KSA. In particular, it will identify gaps in the knowledge base and skillset of nurses, assessing their actual performance and setting requirements for an effective disaster response. It also imperative that this research set out Key Concepts to provide a framework for the development of effective and culturally appropriate education and training for nurses in disaster preparedness and response in the Saudi context. To this end, the next chapter provides a scoping review, conducted to identify the nature and level of preparedness of nurses in the KSA, and to determine what comprises an effective response to a disaster, and the challenges associated with achieving one.

Chapter Three: Scoping Review

3.1 Introduction

The primary intention of this thesis is to examines requirements for effective disaster nursing education in the KSA by establishing what nurses in the KSA identify as key concepts for educational provisions and support mechanisms that will enable them to contribute effectively to disaster management. Accordingly, the main objective of this scoping review is to determine factors influencing disaster preparedness among nurses while appraising the current approaches and evaluation methods used in providing disaster education to nurses in order to gain insight into how nurses might be able to enhance their theoretical and practical readiness for emergencies and disasters. Furthermore, this thesis is a direct response to the core principles set forth in the Alma-Ata Declaration, which posits that nurses play a vital role as the central point of change in how the healthcare sector responds to disasters. In pursuance of these principles, this chapter will employ a scoping review method to collate knowledge from contemporary literature on the topic of disaster preparedness, knowledge base, and capabilities among nursing professionals, thereby identifying the most influential gaps and challenging areas that affect nurses' level of preparedness and their ability to respond to disasters from a global perspective.

The scoping review technique has been identified as a useful method for providing a conceptual map of available information regarding a subject under investigation (Munn et al., 2018). This method is somewhat limited, however, by the fact that it does not provide a formal quality assessment of the studies reviewed. Nevertheless, this drawback will be alleviated in this study by the innovative implementation of an evaluation tool adopted from the Active Learning Network for Accountability and Performance (ALNAP) guide (Slim & Bonwick, 2006; Elliot et al., 2016). The guide appraises data using criteria produced by the Organisation for Economic Co-operation and Development (OECD) and the Development Assistance Committee (DAC) to evaluate the quality of service within a humanitarian context. OECD and DAC serve as fora for the discussion of issues surrounding aid, development, and poverty-reduction in developing countries. Furthermore, the transparency of the scoping review approach – a broad and comprehensive methodology – provides readers with the opportunity to consider the quality of all the included studies themselves.

The dispensation of formal or more traditional quality appraisal methods also enables a wider range of inclusion in terms of methodologies and study designs (Elliot et al., 2016).

The review conducted in this chapter focuses on empirical evidence provided by studies focusing on disaster nursing preparedness on a global scale with a specific emphasis on studies conducted within the region surrounding the KSA (such as Jordan and Israel), as these countries share similar geographical characteristics with the KSA. This scoping review will particularly focus on the effectiveness of nurses in providing care for disaster victims. The decision to focus on the efficacy of nurses is founded on the fact that their skills and abilities will determine clinical outcomes for many victims in the event of a disaster. Moreover, communities oftentimes suffer in the face of disasters when responders are unable to provide the level of care expected of them (Powers & Daily, 2010). The effects of disasters are ubiquitous and often overwhelm nurses who are attending to direct victims. Accordingly, disasters could make health providers less responsive when providing care, particularly when working under intense stress that would most certainly be amplified by a lack of preparedness. Therefore, if there is lack of proper training and relevant experience, the response operation may result in increased damage and hazards to people.

3.2 Aim and Objectives

This review aims to examine evidence relating to the current level of preparedness among nurses concerning disaster risk reduction, particularly focusing on how effectively nursing education prepares nurses to respond to disasters. Based on this, the review questions for this scoping review are: what is the current level of preparedness for disaster response among nurses, and what are the gaps in disaster preparedness and responses to disasters that impede healthcare professionals from responding effectively to disasters?

The review was guided by the following specific objectives:

1. The analysis of factors which promote/prevent healthcare professionals working appropriately and effectively when a disaster happens? This analysis will cover and consider (non-exhaustively) the types of knowledge and skills required for disaster management.

2. The examination of existing education programmes and how *available* these programmes are to prepare nurses, (who have the required skills and knowledge) for disaster risk reduction.

3. The definition of *approaches* used in the delivery of nursing education and contents of the effective disaster nursing programmes.

4. The understanding of how available education opportunities are *evaluated*.

5. The determination of best practice and gaps in current education, with the purpose of forming recommendations to enhance the disaster training and education of nurses in the health sector.

It is expected that the scoping review will reveal knowledge of the *availability*, *approaches*, and *evaluation* of the disaster preparedness education that nurses are currently receiving, along with an understanding of whether and how nurses are sufficiently prepared. The expected outcome is to use this summary of evidence to advance knowledge and use the study findings to understand the improvements required for nurses' preparedness for disaster risk reduction, particularly that of nurses.

3.3 Background to the Scoping Review

This scoping review is primarily based on Arksey and O'Malley's (2005) description of scoping reviews as an approach which sought to *'examine the extent, range and nature of available research'* and to *'summarise and disseminate research findings across a body of research evidence and identify research gaps in the literature'*. Moreover, reports by Tricco et al., (2016) and Colquhoun (2016) also informed the structural format of this scoping review, where the aim is to implement the best contemporary evidence-based practice of this methodological approach. Tricco et al. (2016) conducted a comprehensive study of 494 scoping reviews taken from relevant literature, most of which focused on understanding the 'breadth and extent of the evidence' in health-related topics, making their paper highly relevant and informative to the current research (O'Brien et al., 2016, p.3).

This scoping review re-conceptualises recommendations for effective disaster preparedness and the level of competencies required for nurses, using an evidence-based approach. It is geared towards the examination of lessons learned previously regarding roles,

interrelationship, activities, knowledge, skills, competencies as well as processes and procedures that increase nurses' ability to respond to disasters effectively. By integrating literature evidence relating to past disasters, this study seeks to further clarify existing knowledge, and identify gaps in the knowledge in disaster management processes as well as preparedness of nurses.

Disaster management is still developing as an area of research; particularly in connection with the healthcare sector (Sawada & Zen, 2014). It emerges from and exists within a multidisciplinary context. It is therefore unsurprising that there is little consensus over the definition of disasters. While conventional definitions of disaster are categorised from the point of view of natural disaster 'triggers', this thesis adopts an approach based more on 'vulnerability, where response to disaster is based on an aim to *provide more precise advice on linkages that transmit root causes into very specific unsafe conditions'* (Wisner, 2003, p.4). This approach to understanding disaster offers a starting point based within a dynamic humanitarian context, in which health care professionals, nurses in particular, are required to respond adequately through an informed process implemented by a healthcare system which recognizes the socio-economic vulnerabilities of the affected community.

In 1978, the Alma-Ata Declaration called on "*governments, WHO…UNICEF and other international organisations, as well as multilateral and bilateral agencies, nongovernmental organisations, funding agencies, all health workers and the whole world community to support national and international commitment to primary healthcare and channel increased technical and financial support to it, particularly in developing countries… to collaborate in introducing, developing and maintaining primary health care in accordance with the spirit and content of this declaration.*"

Similarly, this thesis is a direct response to the core principles set in the Alma-Ata Declaration, positing the role of nurses as the central point of vital change in the healthcare sector as it relates to disaster response. This position is informed by this author's first-hand experience on the ground as well as literature, which is derived, in the main, from the perspective of nurses in relation to disaster response and preparedness. It is from the above first-hand professional experiences (detailed in Section 1.2.2) that this study emerges, focusing primarily on education within the nursing system, and aiming to respond to these same questions that have remained a haunting concern for the researcher throughout their professional career. This review seeks to offer insights that lead to interventions which will

begin to bridge the fundamental gaps in nurse disaster preparedness, in the educational context and look toward providing effective humanitarian action, rooted in the professional experience of the researcher, and validated by evidence-based study and research.

Based on the foregoing, the central focus of this review is to evaluate the current literature evidence regarding nurses' preparedness for disaster response and to identify the current evidence relating to how to prepare these healthcare professionals for effective disasters response from a global perspective. As an extension or prerequisite of this overarching enquiry, this review examines the research methodologies used to evaluate the preparedness of nurses to identify strengths, weaknesses, challenges, and opportunities (gaps) for future research.

3.4 Scoping Review Methodology and Methods

3.4.1 Methodology

The methodological framework of this scoping review was informed primarily by Arksey and O'Malley (2005), while also taking into consideration work carried out by Colquhoun (2014) and Tricco et al. (2016). The methods sourced from these works were used to inform the scoping review framework in advance, as a means of reducing the risk of bias inclusion in the review. Based on recommendations made by Colquhoun (2014), a general protocol search was conducted to ensure a scoping review for this topic had not already been carried out. The International prospective register of systematic reviews (PROSPERO) was searched using the key words 'disaster preparedness', 'disaster management' and 'disaster preparedness nurses'. This search yielded a total of five reviews, dated between 2015 and 2021. However, these were all discounted as they were all classed as 'on-going' and were either rapid or systematic reviews (Schiavo, 2019).

The methods' manual produced by the Joanna Briggs Institute (Tricco et al., 2016) recommends five main stages for a scoping review, which is based on the framework proposed by Arksey and O'Malley (2005). These include:

1. Protocol, title, background, identifying review questions and objectives

2. Eligibility criteria and comprehensive searching to identify relevant studies/sources of evidence

3. Study/source of evidence selection (screening)

4. Extracting and charting the results/data

5. Conclusion and recommendations

Modifications to the following scoping review methodological framework are documented in this thesis. Briefly, the title of this scoping review is intentionally broad, to enable an unbiased inquiry into the assessment of the research question to identify the gaps in nurses' disaster preparedness and response in line with the scoping review model presented by Arksey and O'Malley (2005). Also, in accordance with the Population, Concept, and Context (PCC) mnemonic outlined by Colquhoun (2014), the review included Population (nurses), Concept (preparedness and management), and Context (disaster). Recommendations by Colquhoun (2014) and Tricco et al. (2016) were used to refine the review question, considering the need for a comprehensive assessment of nurses' preparedness for disaster management.

The Patient/Population Interventions Comparisons Outcome and Study design [PICOS] was adopted in designing descriptors used in the development of search terms for article identification in this study. Details of descriptors designed using the PICOS approach is outlined in Table 3.1 (Methley et al., 2014, p.3). The search syntax, developed using descriptors in Table 3.1, used for initial database queries in this study is ("Disaster preparedness" OR "Emergency preparedness") AND ("Nursing programme" OR "Nursing Education") AND "Effective disaster response" OR "Effective emergency response".

Table 3.1: PICOS Scoping Review Question Design

Parameters	Descriptors
The Patient/Population (P)	Nurses
The Intervention (I)	Disaster preparedness nursing education
The Comparisons (C)	Not applicable
The Outcomes (O)	Effective disaster response
Study Design (S)	Quantitative or qualitative, mixed method or evaluation

(Source: Author, 2021)

3.4.2 Inclusion and Exclusion Criteria

To select the most appropriate articles for review, specific inclusion and exclusion criteria for were set. This criterion has commonly been shown to be beneficial in the literature, as it assists in the selection of the most relevant research studies (Torgerson, 2003). Eligibility criteria played a crucial role in guiding this review and were, as discussed earlier, established prior to the identification of relevant studies. This was different to the structure proposed by Arksey and O'Malley (2005), in which the eligibility criteria are presented after study selection. The approach in this study was adopted from the reports of Tricco et al. (2016) and Colquhoun's (2016), which highlighted strategies for reducing bias when selecting evidence. Inclusion and exclusion criteria used in this review are summarised in Table 3.2.

Table 3.2: Summary of Inclusion and Exclusion Criteria

Category	Inclusion Criteria	Exclusion Criteria	Justification
Date of publication	Published between 2009-present to get most up to date data	Published prior to 2009	Studies conducted in the last 10 years prior to the review represent recent data. It is expected that situations reported in articles older than 10 years may have changed. This review was conducted in 2019.
Focus of the study	Articles exploring the following will be included: ● What education is available to prepare nurses to manage disaster ● What education approaches are used to deliver the education and what that education includes ● How these education opportunities are evaluated ● Whether and how nurses are adequately prepared for disaster management	Studies with the following focus were excluded: ● Studies not related to disaster nursing preparedness ● Studies focused on nursing students or military nurses ● Studies exploring nurses' roles in conjunction with other healthcare providers	Studies focusing on nursing students will be excluded because the focus of the thesis is post-qualification nursing. Also, studies focusing on military nurses will be excluded because disaster recovery may likely be involved in the usual military training and these nurses may not be lacking disaster recovery skills. The focus of ths study is also on nurses working within the government establishments.
Study type	Only original research articles, case studies, surveys and descriptive studies were included in this review to get a high gality of evedances	Conference papers, opinion-based papers, letters, reviews, editorials and comments were excluded from this scoping review.	These publications will be excluded because they are not peer-reviewed.
Language	Only articles published in English were reviewed	Articles published in languages other than English were excluded	It may be difficult to properly comprehend texts originally published in another language as meaning could be lost during translation. It may also be difficult to get the right translation tool for different languages.

(Source: Author, 2021)

The eligibility criteria were modified to exclude evidence sources dated prior to 2009 on the basis of the desire for contemporary evidence, and the fact that it was in 2009 that The United

Nations Office for Disaster Risk Reduction (UNISDR) made affirmative policy commitments during the Sendai Framework. Reports of the meeting were drawn together in a Disaster Risk Management for Health fact sheet by the WHO, the Health Protection Agency, and the Sendai Framework. Furthermore, 2009 also serves as the starting point of a more informed and funded timescale for these measures of disaster risk management. Therefore, I hope to cover the period when these policies would have had time to settle within the healthcare infrastructure, and wider commitments to disaster risk management were being implemented. Studies relating to nursing education but does not focus on disaster response or management education were excluded due to the fact that the focus of such papers differ from the aim of this study.

This review also excluded editorials, reviews, and commentaries. While these may have been valuable to informing the discussion of the study, these publications do not contain primary data. Studies focusing on student nurses are excluded because students may not have sufficient experience of disaster response. Also, the military are often trained in emergency response. Therefore, their inclusion may skew the data collected in the thesis. Studies related to military nursing were also excluded on the basis that the people involved function as part of a prevailing military culture and not merely nurses. Indeed, the military creates unique characteristics for individuals within it which consequently influence the practice of nurses. Accordingly, a military nurse's role and duties are distinct as they have the requirement to provide care for injured individuals whilst also being able to use a weapon in order to protect themselves (Griffiths & Jasper, 2008) and inextricably links the identity of a military nurse to wearing a uniform and holding rank (Elliott, 2015). Army nurses are more than nurses: they are soldiers who must be competent in soldierly medical field skills and combat.

In addition, studies published in Arabic were also excluded. This is to avoid ambiguity that may arise from translation, which at times could lead to loss of meaning (Balk, 2012). Moreover, other factors such as time and resource limitations, lack of translation resources and the prohibitive cost of translation contributed to this decision.

3.4.3 Search Strategy and Data Sources

The search strategy used began with perusing a broad range of electronic databases, followed by additional searches to identify potentially relevant published and unpublished research. All articles investigating nursing roles in disaster contexts, including emergency response and

preparedness education, as well as the factors involved, were obtained from the Cumulative Index to Nursing Allied Health Literature (CINAHL) and MEDLINE databases (EBSCO, OVID), which, according to Brazier and Begley (1996), contain the main nursing articles dated from 2009 to the present. In addition, the American Journal of Nursing, British Nursing Index and National Institute for Health and Care Excellence (NICE) were also utilised. To ensure the search conducted for relevant studies was comprehensive, searches of the Cochrane Collaboration, ScienceDirect, and the Education Resources Information Centre (ERIC) databases were also employed.

As a further step to identify potentially relevant grey literature, the websites from major healthcare organisations were also searched. The main focus was on organisations that bring together resources and publications such as the WHO, the American Red Cross (ARC), the British Red Cross [BRC], the Nursing and Midwifery Council (NMC), School-based Disaster Preparedness, CRED, UNISDR, the Federal Emergency Management Agency (FEMA), the Centres for Disease Control and Prevention (CDC), the International Committee Of The Red Cross (ICRC), ALNAP, the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), and the National Council of State Board of Nursing (NCSBN). Studies from grey literature were also included as these provide facts and suggestions of relevance to this study (Seyedin et al., 2019).

In addition to the syntax detailed in Section 3.4.1, additional keywords were used to identify the target information. These include "qualified nurses", "emergency nurse", "paramedic nurse", "staff nurse", "preparedness", "crisis", "conflict", "war", "disasters", "emergency", "patients", "floods", "hazards", "risks", "mass casualty", "conflict", "famine", "climate change", "chemical or biological threats", and "accident". Although the initial scoping review was conducted in 2018-2019 at the beginning of the researcher's PhD journey, the review was later updated to capture findings for the years 2019 to 2021. This was achieved by repeating the literature searches conducted at the beginning of the study (using the same search terms and databases) extending the years covered to 2021 (see Appendix 1). Prior to submission, the search was again updated to 2022 to cover any publication that had emerged in the interim.

3.4.4 Search Results and Article Selection

The electronic database search, based on keywords and their synonyms, yielded 3,204 citations. Following the removal of duplicates, a screening process was conducted utilizing predetermined eligibility criteria for stage one (n = 2,351). Titles and abstracts were examined, and the studies selected for full-text retrieval. A second stage of independent screening ensued (n = 309) through assessment of whole articles, so as to exclude studies that did not meet the inclusion criteria for the remaining articles. Forty-three citations were identified as suitable for the purposes of the current review. Reference lists of relevant articles were also searched to identify other relevant articles. This yielded a small number (n = 34) of additional relevant articles, of which eleven (n = 16) met the eligibility criteria for inclusion in this study. An outline of the selected citations can be found in Appendix 1.

In total, 3,145 citations were excluded for failing to meet the eligibility criteria outlined for this review. For example, 120 studies investigated the role of healthcare providers during disaster events but did not consider nurses. A further 62 citations were excluded because it was not possible to access the articles, and 853 citations were excluded due to duplication. Of the remaining 2351 papers, 309 were retrievable in full text format. These 309 selected citations were evaluated based on their relevance to the objectives of this review, as illustrated in the PRISMA diagram (Figure 3.1). Those studies that investigated the role of nurses in disasters together with other healthcare providers were also excluded. This is because this study's objective was not comparative considerations, but rather nurses' disaster preparedness and the current availability, approaches to, and evaluation methods used in the disaster education of nurses, in order to consider how nurses might be able to enhance their education and skills to navigate emergencies and disasters.
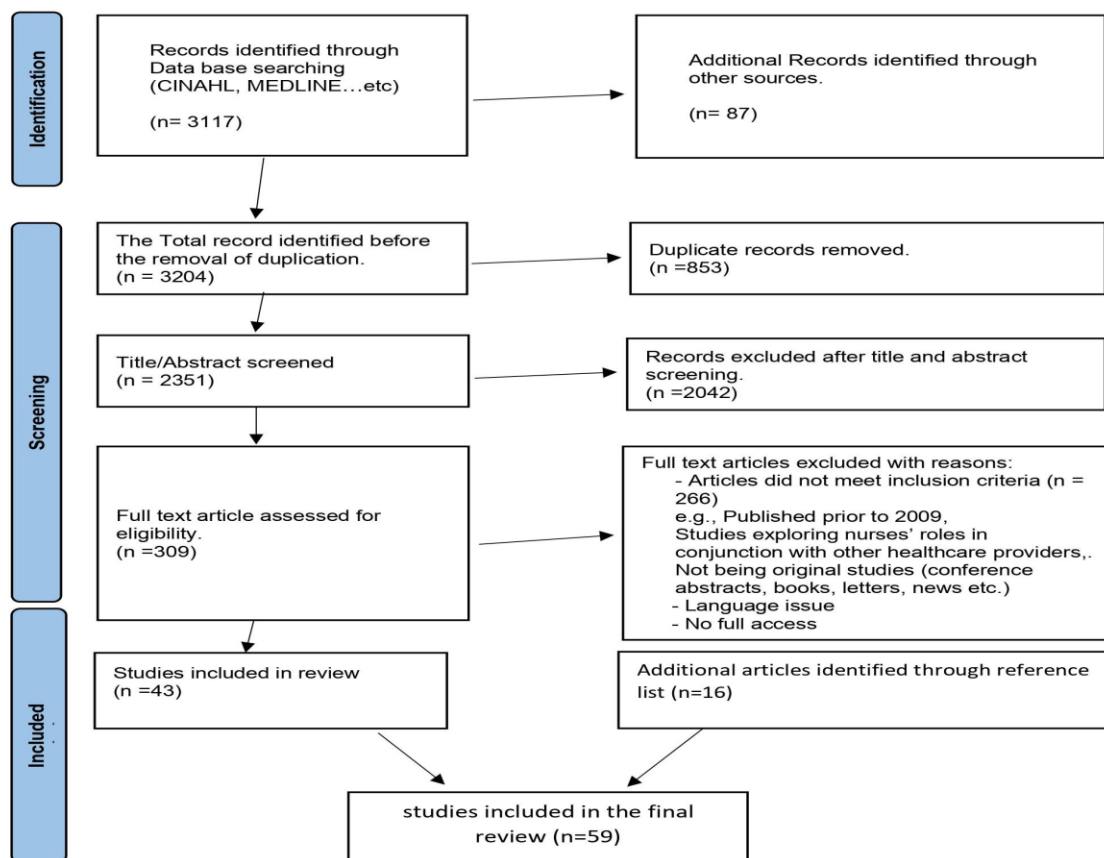
Figure 3.1: PRISMA Flowchart for article selection

In conclusion, the most appropriate and suitable citations found to match the current study objectives numbered 59 studies, with 7 having a mixed method design, 20 having a qualitative study design and 32 having a quantitative study design. Details of these 59 studies are presented in Appendix 1.

3.4.5 Overview of the Included Studies

The following sections only cover original studies, as scoping review studies were presented during the research background. It also serves to provide a broad conceptual map of the geographic and methodological composition of the 59 studies chosen for this scoping review. Moreover, it serves to justify the inclusion of this particular range of studies, highlighting the requirement to draw on a diverse range of settings, contexts, and research methodologies, such that the importance of the present study in advancing the nursing profession becomes clear.

3.4.5.1 Data Extraction and Classification of Relevant Studies

According to Arksey and O'Malley (2005), data extraction can be thought of as 'charting the data' in the case of scoping reviews. The aim of data extraction is to develop a descriptive summary of findings to address a scoping review's objectives and (ideally) answer the questions posed in the review. To maintain a standardised approach, the same sets of data were extracted for each of the sources included in the review. That is, the data collected included details of the authors, the year of publication, the article title, the objectives of the study, research design and the data collection methods employed by the authors, sample type/size, the geographic context (i.e. country) and the clinical setting of the study, its key findings and their implications for disaster nursing – particularly as they relate to barriers to nurses working effectively towards disaster risk reduction, the factors that enable nurses to reduce the toll of disasters, and conclusions/comments/issues for future consideration. Additional points of analysis considered included healthcare system level 'barriers' (healthcare system, organisational, team or advanced practitioner level) and healthcare system level 'enablers'. Trends observed to be associated with the place of publication, access to sources of funding to examine higher organisational involvement, best practices, gaps, and their impact were also noted. However, to ensure a more focused review analysis within the framework outline, additional points proposed included further research considerations. All the data collected from the selected articles was explicated in Appendix 1 (methodological details) and Appendix 2 (barriers and enablers). Templates from the data extraction tables were presented in Tables 3.4 and 3.5.

Table 3.4: Template for Extraction of Methodological Details

S/No	Author (Year)	Title	Setting and country context	Aim of the research	Research design and data collection method	Sample type and size	Key finding and implication for disaster nursing	Conclusion

(Source: Author, 2021)

Table 3.5: Template for Extraction of Data on Barriers and Enablers of Nurses' Preparedness Capacity

S/No	Author (Year)	Title	Setting and country context	Aim of the research	Barriers to nurses disaster risk reduction	Enablers of nurses disaster risk reduction

(Source: Author, 2021)

3.4.5.2 Geographic Locations for the Selected Studies

The research studies within the scoping review were undertaken in public, private, and university institutions of healthcare, as well as in universities located in numerous countries throughout Australia, Asia, Europe, Africa, and the USA (See Table 3.6).

Locating studies from diverse and disperse geographical regions was considered ideal for this review, as it provided a global impression of the levels of preparedness for disaster nursing, to inform existing and potential practices within the KSA. Seven of the studies were conducted in the KSA to assess the level of preparedness of nurses and the degree to which nurses are able to respond to disasters. Nine studies were conducted in countries neighbouring the KSA, namely Egypt, Iran, Oman, Israel and Jordan, which were selected for their geographical proximity and similar working conditions. Five further studies were selected from various regions in the USA, in order to gain a broader understanding of disaster nursing preparedness over a large area within that country. Eight studies were carried out in China, one in Turkey, one in Hong Kong, one in Malaysia, four in Indonesia, and one each in South Korea, Nepal, Bangladesh, and Japan. These countries were chosen because, although

they are geographically remote, they effectively utilised knowledge gained from disasters. Finally, four studies from Southern Australia, and seven from Europe, were used to analyse disaster preparedness in developed countries with a Eurocentric culture, to determine whether culture and resources impact upon disaster preparedness.

Despite the geographic variability of the studies, six articles related to only one geographical area from each country. A study carried out by VanDevanter et al. (2017) took place in one New York University Langone Medical Cent Emergency Room within the USA. Similarly, Whetzel et al. (2013) conducted a study in the same country but within a different region, namely the New Jersey ENA Emergency Care Conference, the USA, which effectively reflects upon diverse communities and presents a wide range in the targeted population. In the same vein, studies were performed in southern Australia, and were carried out at the disaster site in eight Hospitals in Adelaide, Australia (Hammad et al., 2010). Ranse et al. (2010) also carried out his study in another region of Australia. In a study conducted by Baack and Alfred (2013), the participants were selected from two major hospitals and two small rural hospitals in Texas. Furthermore, a study by Younos et al. (2021) was conducted in six hospitals in three disaster-prone districts of Bangladesh; namely, Sirajganj, Patuakhali, and Sylhet of Bangladesh. This was also the case for a study by Azizpour (2022), conducted in Ardabil Province, north-western Iran.

In Worall's (2012) study, the participants were selected from minor injury units (MIUs) in Wilshire, UK. Meanwhile, Seroney's (2014) study focused on patients from a district hospital in Nandi, Kenya, while Hargreaves and Golding (2017) inquired into disaster nursing with Médecins Sans Frontières, UK. Witt and Gebbie's (2016) study was conducted in universities throughout Brazil. Loke and Fung (2014), by contrast, selected a number of hospitals in Hong Kong. Research conducted by Ahayalimudin et al. (2012) focused on Emergency Departments and Health clinics in Selangor, Malaysia, while Mitchell et al. (2012) examined Emergency Departments in Northern Ireland. Diab and Mabrouk's (2015) studied pertained to a university hospital in Menoufia Governorate, Egypt. McMullan et al. (2016) conducted studies in Acute General Hospitals in Dublin, Ireland. Husna et al. (2011) conducted research at a provincial hospital in Banda Aceh, Indonesia, while Pourvakhshoori et al. (2017) conducted similar studies in Iran, although it is unclear from that study in which particular region of Iran the hospital was located. This was also the case of the study conducted by Aliakbari et al. (2015). However, Mirzaei et al. (2019) mentioned that the site of his study

was the Shahid Rahnemoon Hospital in Yazd, Iran. In the same country Younos et al. (2021) investigated the emergency departments of six hospitals in Qazvin, Iran. In China, Li et al. (2015) studied hospitals in Jiangxi Province, while in Hubei Province, Wenji et al. (2015) carried out studies on similar hospitals. The same was true for Wang et al. (2021) who carried out research in emergency departments at 26 public hospitals in Guangdong province (the Pearl River Delta, Eastern, Western, and Northern regions in Guangdong province), which covers a broad geographical area. Likewise, Xiao et al. (2016) conducted research on hospitals in Central China. In the wider region of East Asia, Tzeng et al. (2016) conducted a study at a hospital in Taiwan, whereas Park and Kim (2017) researched twelve hospitals in South Korea.

Moreover, some studies selected participants from multiple counties, like that of Hammad et al. (2017), who collected data from various countries around the world, conducting interviews about the experiences of nurses working in Emergency Departments during disasters in the same country. Usher et al. (2014) also conducted similar research in Indonesia, Israel, Japan, Kenya, Palestine, the KSA and the USA. This international style of research explores the experiences of nurses across many countries, settings, and disaster types, identifying commonalities within their experiences and depicting the reality of working as a nurse in the ED during a disaster.

In contrast to this approach, studies by Yin et al. (2011) on the Wenchuan earthquake disaster site, and that by Melnikov et al. (2013) were confined to one geographical area. As a result, it is important to exercise caution when generalising findings to other hospitals or areas, due to the unpredictable nature of disasters and the unique requirements of different hospital and regions. To increase the relevance of data gathered from such studies, Al Khalaileh et al. (2012) interviewed nurses from regions throughout Jordan. Likewise, Usher et al. (2015) chose hospitals from across Bangladesh, Bhutan, Cambodia, China, Laos, Nepal, and the Solomon Islands to examine the data collectively. In China, Conlon et al. (2011), at the West China University's Faculty of Nursing examined multiple hospitals, and Yan et al. (2015) conducted research at 38 hospitals in 13 provinces across China. Meanwhile, Basnet et al. (2016) researched 14 public and private hospitals in Nepal.

The review also identified some smaller scale studies, including that by Mao et al. (2020), which was confined to Sichuan Provincial People's Hospital, and research by Pesiridis et al. (2015) covering two tertiary public hospitals in the Athens and Thessaloniki metropolitan

areas in Greece. Thobaity et al. (2016) also conducted studies at emergency departments in two hospitals in the KSA. Focusing on the same region, Abdelghany (2014) conducted a study at a university in Saudi Arabia, whereas Alzahrani and Kyratsis (2016) researched four hospitals in one region of the country, as did Al Harthi et al. (2021). Likewise, Alshehri (2016) conducted a study at two public hospitals in the city of Riyadh, and Sultan et al. (2020) conducted a study of 10 Ministry of Health (MOH) hospitals in Najran, the KSA. Examining a broader selection of hospitals from within the same country affords researchers the possibility to use their studies' results to the wider target population.

In Japan, Kanbara et al. (2017) conducted a study in a single hospital, whereas Öztekin et al. (2016) expanded their study to cover three prefectural hospitals and three private hospitals in Japan. In neighbouring Indonesia, Putra et al. (2014) conducted research at 27 public health centres in Aceh, Indonesia, as did Rizqillah and Sunaa (2018), who studied four hospitals located in Central Java, Indonesia. Additionally, Setyawati et al. (2020) researched two government hospitals in Bengkulu, Indonesia. Within the same region, Geum (2017) researched tertiary hospitals in Seoul, Korea, while Labrague and McEnroe-Petitte (2015) conducted studies in the Central Philippines. Similar studies were also conducted by Achora and Kamanyire (2015) in Oman, and by Goniewicz et al. (2021) in Lublin, Poland.

Veenema et al. (2016) conducted a study at an invitational daylong workshop that the Veterans Emergency Management Evaluation Centre, from the USA, hosted; and also carried out another study in the USA in 2017. Finally, Taskiran and Baykal (2019) conducted a study at a university hospital in the Aegean Region of Turkey, whilst Basal and Ahmed (2018) focused on the Tanta University Emergency Hospital in Egypt.

Table 3.6: Geographic Locations of the Studies from this Scoping Review

Location	Number of studies
USA	5
UK	3
Australia	3
Jordan	1
China	8
Kenya	1
Nepal	1
Brazil	1
Hong Kong	1
Malaysia	1
Kingdom of Saudi Arabia	7
Asia–pacific region (Bangladesh, Bhutan, China, Cambodia, Laos, Nepal, and the Solomon Islands)	1
Japan	2
Egypt	2
Ireland	1
Greece	1
Indonesia	4
Iran	5
Taiwan	1
South Korea	2
Philippines	1
Oman	1
Turkey	1
Poland	1
Australia, Indonesia, Israel, Japan, Kenya, Palestine, Saudi Arabia and the United States of America	1
Bangladesh	1

(Source: Author, 2023)

It is apparent, then, that the selected studies constitute a diverse range of sources from which to draw meaningful insights into disaster nursing worldwide. Particular emphasis was placed on selecting studies that reported implications beyond their context; moreover, multiple studies were selected from regions of particular importance, such as the KSA. While some of the studies, as mentioned, were limited in scope, they nevertheless contribute to the overall data by providing insights into how nurses react to disasters around the globe.

3.4.5.3 Purposes Underpinning the Selected Articles

The different studies as part of the scoping review addressed their main aims and objectives very clearly. A wide range of purposes were defined for the selected studies, despite some having been carried out within the same country. For example, in the region of Mecca in Saudi Arabia, Abdelghany (2014) devised his study to analyse the knowledge, attitudes, practices and familiarity of nurses with the requirements for disaster and emergency preparedness; while Thobaity et al. (2016) focused on creating valid, reliable scale in order to explore the central disaster nursing concepts, as well as nurses' roles in disaster management, and different barriers that would be present in developing competent disaster nursing in the KSA. Correspondingly, Alzahrani and Kyratsis (2016) analysed the self-reported knowledge, role awareness and abilities by hospital emergency nurses' in disaster responses based on the Hajj mass gathering in Mecca. Similarly, Alshehri (2016) aimed to determine emergency nurses' disaster preparedness in Riyadh. Separately, Sultan et al. (2020) assessed the theoretical and practical MID readiness of emergency nurses in southern Najran; while, Al Harthi et al. (2021) explored strategies that would help to improve disaster nursing in the KSA. Likewise, Younos et al. (2021) assessed Bangladeshi nurses' disaster preparedness in order to determine the different factors connected with nurses' disaster management. That particular study was carried out in order to evaluate the levels of disaster core competencies and the preparedness of nurses in emergency departments. Meanwhile, research was conducted in the Ardabil region of Iran to determine both hospital and pre-hospital emergency nurses' knowledge of disaster preparedness and how triage decision-making would be affected (Azizpour, 2022).

Furthermore, numerous studies have been undertaken in Australia, including Ranse et al. (2010), who evaluated the nurses' clinical backgrounds, disaster training and education, together with their roles in regards to the responses to different serious incidents, such as bushfires. Hammad et al. (2010) also analysed relevant knowledge and perceptions of nurses'

roles in disaster responses in an acute setting. Meanwhile, research conducted in the USA, has been geographically diverse, which has included a variety of differing purposes, as shown by Saliba et al. (2004), who focused on the function of nursing facilities and nurses' roles post-disasters, Baack and Alfred (2013), comparatively, aimed to evaluate rural nurses' readiness to manage events of disaster. Another study in the USA analysed nurses' needs and concerns during disaster planning following Hurricane Floyd in 1999 (French et al., 2002). Additionally, another study was undertaken in the USA, which focused on nurses' perspectives regarding the challenges and resources that are required in order for nurses to comply with their responsibilities in disaster preparedness (VanDevanter et al., 2017).

In contrast, Yan et al. (2015) evaluated the skills, knowledge, and attitudes required of registered nurses in different regions of China following three large earthquakes. Li et al. (2015) also analysed Chinese nurses following earthquakes and started to create a substantive theory of earthquake disaster nursing, which would assist in developing future educational programmes for disaster nursing. Similarly, Wenji et al. (2015) presented findings of Chinese nurses who had worked in disaster relief following the Wenchuan and Yushu earthquakes. Yin et al. (2011) meanwhile considered the selection criteria for respondent nurses during disasters, where the aim was to show relevant skills required in the process of disaster nursing, as well as to present recommendations that would improve nurses' capabilities in response to natural disasters. Likewise, Conlon et al. (2011) conducted a study that detailed an Emergency and Disaster Nursing course conducted in Chengdu, Sichuan Province, China, in June 2006 – six weeks post-Sichuan earthquake.

In addition, Wang et al. (2021) evaluated emergency nurses' disaster preparedness and examined the different factors that may influence disaster preparedness in the Guangdong Province, China. There have also been three other studies conducted by Xiao et al. (2016), Yin et al. (2011), and Mao et al. (2020) that aimed to determine nurses' knowledge and attitudes regarding climate change, together with their roles in addressing health-related impacts from climate change in Central China. Those studies also focused on exploring the selection criteria for respondent nurses during disaster events, the scope of practice for disaster relief nurses, and relevant nurse/medical practitioner ratio at disaster sites. Further, they attempted to detail the actions and incident management of the APN at a disaster operation team from a hospital in Sichuan which was deployed in response to the global

COVID-19 outbreak in order to evaluate how it connected to the International Council of Nurses Core Competencies in Disaster Nursing Version 2.0 (ICN CCDN V2.0).

What is more, Turkish research by Taskiran and Baykal (2019) attempted to present the perceptions of nurses regarding their own levels of disaster preparedness and core competencies; while Basal and Ahmed (2018) conducted a study in Egypt based on nurses' perceptions of their roles, preparedness, and management skills during hospital disasters. Diab and Mabrouk (2015) also carried our research in Egypt, which evaluated the effect of a guidance booklet on nurses' knowledge and attitudes in relation to disaster preparedness. There has also been a study conducted in Jordan that examined the self-reported understanding of nurses in the country regarding their preparedness for disaster management (Murad et al., 2011).

The participants in the studies selected for this scoping review covered 14,682 nurses, with a sample size ranging from 7 nurses (Hargreaves & Golding, 2017) to 1686 nurses (VanDevanter et al., 2017). The majority of participants in these studies were women, with the female-male ratio ranging from 62.9% (Seroney, 2014) to 100% (Yin et al., 2011; Yin et al. (2012). As is apparent from the data, these studies ostensibly differed in their aims and objectives, but were connected by shared themes, and their relevance to the topic of disaster preparedness among nurses. Accordingly, they represented a suitable foundation of data on which the present study can build, and are invaluable sources that informed the objectives, methodology, and scope of this study.

3.4.6 Quality Appraisal of Data

This section will serve to set out a framework in which the quality of data provided by contemporary literature may be appraised through systematic, objective, and methodological processes. In particular, it will serve to elucidate the vital role played by the OECD-DAC criteria, describing the terminology and structure of the OCED-DAC framework, as well as the practical scope of its implementation within this particular thesis. The review of the selected literature provided the researcher with a foundation of background knowledge to assist with the present study, allowing the author to make an informed contribution to the existing corpus of knowledge (Paré & Kitsiou, 2017). In general, the final objective of studies within the nursing field is to advance the practices of nurses. Therefore, evidence-based practices are vital when carrying out detailed assessments of earlier studies (Li, Cao, and

Zhu, 2019). This section will serve to synthesise the existing literature and highlight knowledge gaps addressed through empirical investigation (Sylvester, Tate & Johnstone, 2013).

Undoubtedly, one of the limitations of the scoping review method is that it does not provide a formal quality assessment of the studies reviewed. However, this drawback can be somewhat alleviated by the implementation of an evaluation tool, such as that provided by the Active Learning Network for Accountability and Performance [ALNAP]. This tool clarifies the OECD/DAC criteria for evaluating literature and is commonly employed in the disaster management field to appraise data using the OECD-DAC criteria to evaluate quality within humanitarian contexts. The Organisation for Economic Co-operation and Development [OECD], and the Development Assistance Committee [DAC] is a forum that discusses issues surrounding aid, development, and poverty-reduction in developing countries. For the purposes of this study, the use of this tool will be extended to the field of disaster nursing in an innovative manner. In doing so, the drawbacks of the scoping review method will be alleviated by using this appropriate and relevant tool. Furthermore, the transparency of the scoping review approach, which is a broad and comprehensive methodology, will provide readers with the opportunity to consider for themselves the quality of all the included studies. The dispensation of formal or more traditional quality appraisal methods also enables a broader range of inclusion in terms of methodologies and study designs (Elliot et al., 2016).

Generally, evaluations function to analyse complex issues and present intended and unintended impacts that occur due to a project/programme. They are beneficial as they focus on why parts of a project/programme have been implemented or not. Indeed, evaluations help when a project or programme needs to be analysed, as this can help to produce interpretations for results, and show what has been developed and potential future strategies. Evaluations must therefore be included as part of a project document, as they contribute to optimisation of quality and impact the development of interventions. They also help the developers of projects and programmes manage and improve the implementation of their research programmes. However, an evaluation should not determine whether a project or programme may continue or not. Evaluations are "systematic and objective assessments of an ongoing or complete project, programme or policy, its design, implementation and results" (Kusek, 2010, p.12). They are used with the intention of determining the relevance and fulfilment of objectives, and to improve efficiency, effectiveness, impact and sustainability. An evaluation

needs to provide credible and beneficial information, which helps lessons to be learned during decision–making from both recipients and donors. What is more, evaluations help the process of determining the importance of activities, policies or programmes; these should be "as systematic and objective as possible, detailing planned, on-going, or completed interventions" (OECD-DAC, 2002, pp.21-22).

The ALNAP guide outlines seven DAC criteria (ALNAP, 2006), three of which are relevant to this review and are discussed in this thesis; namely effectiveness, impact and relevance. Here, the tool has been employed to appraise the disaster nursing literature, thereby allowing the researcher to examine the relevance, effectiveness, and impact of literature in the field of disaster nursing education. Therefore, data collected in this study was subjected to quality appraisal to correlate with the adapted ALNAP guide, in which the interpretation of key OECD-DAC criteria to evaluate humanitarian action were used (Table 3.7). A significant factor in the selection and application of this evaluation tool was that its central ethos and intention focus on real life experience, and it was designed for teams on the ground. This type of evaluation assist with the analysis of the complex issues covered in the article, helping to capture the intended and unintended impacts of projects or programmes. Additionally, this type of evaluation facilitates the investigation of possible reasons that explain why certain aspects of a project or programme were not implemented, enabling the use of this knowledge to develop future strategies.

According to the OECD-DAC (2002), the evaluation of humanitarian actions is defined thus:

> *"[T]he systematic and objective assessment of an ongoing or complete project, programme or policy, its design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, development efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision–making process of both recipients and donors."*
> (OECD-DAC (2002, pp. 21-22)

The OECD-DAC (2002, pp.21-22) further indicates that "evaluation also refers to the process of determining the worth or significance of an activity, policy or program. It is an assessment, as systematic and objective as possible, of a planned, on-going, or completed development intervention".

While the ALNAP guide outlines seven DAC criteria, only three were deemed relevant to this review (ALNAP, 2006). Definitions for the relevant criteria (effectiveness, impact, and relevance) are summarised in Table 3.7. The reduction of criteria used in the current study from seven to the three identified above was partly a consequence of the scoping review function, because, while quality appraisal was important for assessing the findings, time and resources were focused on exploring existing knowledge and literature relating to the topic. Therefore, the selection of three criteria was intended to address one of the major criticisms of the scoping review method, which is that it lacks quality appraisal, while retaining focus on the intention of the review. The three criteria were selected for their evaluative functions. For instance, efficiency was not selected for the adapted model, as its function mainly covers types of evaluations where adequate financial information is available, which was not the case in most, if not all the literature retrieved and selected here. Ultimately, the three criteria were identified as beneficial because of their links to quality education programmes, whereby effectiveness is assessed in relation to whether the objectives of development interventions were being met, the scale of their impact was measured in relation to wider or overall developmental objectives, and relevance was considered through the assessment of ethics and relatedness to local and national contexts.

Table 3.7: Definitions of OECD-DAC Criteria

Criteria	Definition
Effectiveness	"Effectiveness measures the extent to which an activity achieves its purpose, or whether this can be expected to happen based on the outputs. Implicit within the criterion of effectiveness is timeliness"
Impact	"Impact looks at the wider effects of the project – social, economic, technical, and environmental – on individuals, gender- and age-groups, communities and institutions. Impacts can be intended and unintended, positive and negative, macro (sector) and micro (household)"
Relevance/ Appropriateness	"Relevance assesses whether the project is in line with local needs and priorities (as well as donor policy). Appropriateness is the tailoring of humanitarian activities to local needs, accordingly increasing ownership, accountability and cost-effectiveness"

(Source: Adapted from OECD-DAC Criteria for Evaluation, 2006)

The following section synthesises what the literature has revealed about nurses' preparedness for disaster situations, drawing on the initial objectives of the review, while remaining sensitive to the emergent themes in the literature.

3.4.7 Data Synthesis

The synthesis and discussion of evaluations was distributed across four sections, based on the core emergent themes identified, namely:

1. A clear need to educate nurses in disaster preparedness and response.
2. A lack of evaluation or appraisals of existing educational programmes.
3. Significant gaps in existing education; and
4. The need for further training and education of nurses in disaster preparedness and response.

These themes were discussed in reference to relevance, effectiveness and impact criteria from the OECD-DAC for measuring interventions (See Table 3.7). However, to perform a more focused review analysis within the framework outlined, additional points are proposed as

further research considerations. Two tables (Appendix 1 and 2) were used to collate the data presented in Table 4: Findings (Basic Data) and Table 5: Findings (Barriers and Enablers). The data from these tables was then appraised using an adapted form of the ALNAP guide, in which the interpretation of key OECD-DAC criteria for the evaluation of humanitarian action was used. An imperative factor in the selection and application of this evaluation tool was that its central ethos and intention focused on real life experience and was designed for teams on the ground.

3.5 Findings and Discussions

Findings obtained from the review of the 59 articles selected for this study were categorised under the four themes listed in Section 3.4.7. Additional themes present in the literature included climate change and health, public health, coordination, emergency planning, lessons learned, and knowledge sharing. The distribution of themes based on the OECD-DAC evaluation criteria is presented in Table 3.8. The data presented in Table 3.8 indicates that, with respect to the theme of needing to educate nurses in disaster preparedness and response, the need for interventions targeted at improving level of preparedness was evident. As described by VanDevanter et al. (2017), "nurses experienced considerable challenges in responding to this disaster due to limited prior disaster experience, training, and education". Moreover, Al Harthi et al. (2021) confirmed that in his study "The lack of preparedness is another issue for nurses in the KSA, as an effective response requires adequate preparedness from both healthcare providers and health organisations". Accordingly, the present study is warranted, in order to provide a framework to facilitate the training and education of nurses, so they are able to respond effectively to disasters.

Table 3.8: Thematic Distribution across OECD-DAC Evaluation Criteria

Emerging themes	Effectiveness	Impact	Relevance
Clear need to educate nurses in disaster preparedness and response	1. Increase the confidence of nurses 2. Important to design and deliver practice-based education	1. Need for globally recognized training and education programmes	1. Lack of various core competencies identified at global and national levels 2. Core humanitarian principles should be central
Lack of evaluation and appraisal of existing educational programmes	1. The are no clear guidelines on how learning is operationalized	1. Lack of clarity and outcomes from simulations and drills	1. Lack of clarity regarding application to disaster preparedness and response
Significant gaps in existing education	1. Lack of comprehensive curriculum 2. Lack of research	1. Lack of research-led education	1. Lack of commitment from authorities
Nurses need further training and education in disaster preparedness and response	1. Need to drive nursing education, make more systematic and knowledge-driven	1. Always deal with frontline issues with communities 2. Nurse education is key to prevention of and response to health disasters 3. Self-care for nurses 4. Connect WHO global standards to national levels	1. Need to develop conceptual clarity for the role of nurses 2. Need for further research into the nursing role 3. Need for continuing training and education on the job 4. Need for national government policy shifts
Others	1. Climate change and health 2. Coordination 3. Emergency planning 4. Knowledge sharing		

All the reviewed studies indicated a need for quality preparedness training to enhance the confidence of nurses. Furthermore, it is evident that the education programmes available are

not practice-based, as "many nurses are not confident of their abilities to respond effectively to disasters and are unsure of their roles" (Baack & Alfred, 2013). In contrast, Adams and Canclini (2008) indicated that "those with experience and training report feeling more confident to respond", which suggests that training programmes must impart simulated experiences to engender confidence in nurses. Concerning the impact criterion, it was clear that a globally recognised training and education programme for adoption in low-resource settings would be highly valued, as described by participants in the same study, in the section titled "Implications for education and training".

The majority of the participants in Adams and Canclini's (2008) study expressed a need for additional training covering disaster preparedness, both in the context of professional education and within the workplace; indeed, one participant stated:

> *"From my experience, we didn't know what to expect. So, there was a bit of a culture shock associated with this – even the hospital administration may have been prepared for this but we didn't know who we have to talk to, how to get the ambulances here – they were prepared, we weren't … so in the future I think that [as] part of nursing education … there should be a component [covering] disaster preparedness, [clarifying] what happens in the event of a disaster, if you are working in a hospital, what may you be called on to do."*
> (p.2)

Similarly, another participant suggested nurses across the city should be educated concerning their possible deployment to other hospitals during a disaster scenario, and the expectations of receiving facilities. Similarly, Wang et al. (2021) revealed that over half of the nurses they interviewed had a low level of disaster preparedness. This result is consistent with research findings from other locations, which indicate low to moderate readiness among nurses in Cambodia, China, Laos, Nepal, the USA and the Solomon Islands (Sultan et al., 2020). Similarly, in the Philippines, three-quarters of nurses (80%) reported that they were under prepared to provide care during disasters (Younos et al., 2021). As has also been mentioned, there is an acute lack of core competences among emergency response nurses globally and in the KSA. As described by Chegini et al. (2022) "There are still gaps in disaster preparedness and core competencies for emergency nurses that need to be addressed". The findings of the study confirm those found in the limited literature pertaining to nurses and disaster preparedness, indicating that nurses play an important role in disaster response (Gebbie &

Qureshi, 2006; IOM, 2010) and that those with experience and training are more confident in their abilities to do so (Park & Kim, 2017). Furthermore, according to the findings of Baack and Alfred (2013), despite the importance of confidence, "most nurses are not confident in their ability to respond to large-scale disasters. Confident nurses were more likely to have actual past experience in emergencies or shelters". VanDevanter et al. (2017) likewise concluded that "disaster preparedness education in schools of nursing and practice settings should include more hands-on disaster preparation exercises, more 'low-tech' options to address power loss, and specific policies on nurses' 'disaster roles'".

Furthermore, the results of the Younos et al.'s (2021) study were also supported by several previous studies, highlighting inadequate levels of readiness, poor formal education, a lack of research, ethical and legal difficulties, and issues related to the catastrophes themselves. As the range of studies done in this area are non-specific, it is vital to determine the competences of nurses in specific crisis scenarios and contexts. However, "Most nurses are not yet psychologically or educationally prepared to respond appropriately to disasters." Many of the studies also emphasised that more disaster nursing research, based on multiple settings and scenarios, is vital to improve nursing professionals' knowledge, abilities, and capacity to deal with global disasters, such as the recent COVID-19 pandemic (Al Thobaity & Alshammari, 2020, Loke et al., 2021). However, despite efforts to empower nurses to fulfil their roles during disasters, nurses continue to have deficits in preparedness in terms of abilities and core competencies (Aliakbari et al., 2014; Hammad et al., 2011; Nejadshafiee et al., 2020).

In addition, the review conducted made it apparent that there is a lack of evaluation and appraisal of existing educational programmes, as suggested by Seroney (2014). In the same vein, Al Harthi et al. (2021) assessed the factors effecting nurses' preparedness to provide care at disasters in the KSA following training and concluded that "disaster nursing in Saudi Arabia lacks research and valid and reliable tools and scales". Therefore, not only are educational programmes not fit for purpose, but it is also unclear how learning is operationalised. Moreover, the impact of the available programmes cannot be ascertained due to a lack of clarity surrounding the outcome of interventions (such as simulations and drills) incorporated into training programmes. The relevance of these programmes is doubtful, due to a lack of applicability to practical disaster preparedness and response. This review also revealed gaps in the existing education system, particularly in regard to the criterion of effectiveness, as it was observed that not only do the available curricula lack

comprehensiveness, but there is widespread paucity of research activities regarding the subject of disaster response and preparedness. Based on this, it is evident that the education provided is not informed by research, and accordingly has little impact. Concerning the criterion of relevance, it was observed that there is lack of commitment on the part of the relevant educational authorities, as described in Table 3.7. This also informs the clear observation that nurses are not adequately prepared for disaster response, thereby highlighting the importance of future research into disaster education and training. As Hammad et al. (2010) contends; "furthermore, there is a lack of attention placed on disaster management by hospital management", and as explained by Chegini et al. (2022) nursing managers need to develop improvements in the capabilities within disasters from nurses, which may be done by undertaking sessions for routine disaster scenarios and through the provision of disaster preparedness courses.

Finally, across all the articles, the requirement for further training knowledge development in disaster preparedness and response for nurses was clearly highlighted, most notably with respect to the OECD-DAC evaluation criterion of relevance, as nursing education is in dire need of reforms to make it more relevant, systematic, and knowledge-driven. Concerning the criterion of impact, there is a requirement for nurses to learn how to prioritise frontline and emerging issues during disasters in a time-sensetive manner, through improved education in disaster prevention, self-care for nurses, and to better adapt global standards to local/national needs. Regarding the criterion of relevance, as explicated in Table 3.6, identified needs include further clarification of the roles of nurses, the need for further research into nursing roles, a requirement to establish effective continuous training and on-the-job education, and there are also indications that there should be national government policy change. Seroney (2014) aptly stated that "there is a need for the establishment of a Disaster Management Committee that will ensure that the hospital is adequately prepared for disasters." Further that "Nurses should be part of the disaster management plans of the hospital as well", a contention affirmed by Hammad et al. (2010) in their study. Other areas of need identified with respect to effective preparedness include the impact of climate change on health, proper coordination of activities, as well as effective emergency planning and knowledge sharing. Further interpretations of data presented in Table 3.6 are set out in Sections 3.5.1 to 3.5.4. Additionally, a requirement to make core humanitarian principles a central theme in education programmes was also highlighted in the articles reviewed.

All the articles selected (100%, n = 59) identified a clear need to educate nurses in disaster preparedness and response. This emerged as either negative impacts, termed 'barriers', whereby a lack of education was present, or positive impacts, termed 'enablers', where preparedness and training for disaster response were given greater prominence in their education. In addition, although some of the literature sought to address issues relating to evaluations and appraisals of existing programmes, these were not identified in any instance in a sufficiently clear or quantifiable manner for impact assessment. Significantly, gaps in education were a feature of all the literature analyses conducted in this review. Nurse training emerged, in most cases, as severely under-addressed despite recognition of the need for greater fluidity and relevance to local context needs and priorities within nurse training. Furthermore, the literature analysis identified that deficiencies in the disaster preparedness of nurses among relevant government authorities is largely non-existent. Other areas constituted (including overlaps with the primary emergent themes) a smaller, yet substantial aspect of the literature reviewed, and thus revealed a need for broader discussion of these topics.

All the articles identified nurses as frontline healthcare practitioners and caregivers during disaster response. This aligns with the reality on the ground, and the experience of the researcher, which confirms nurses play a central role in disaster preparedness and response. Natural disasters featured in all the selected articles, in addition to a minority of manmade and conflict-driven disaster contexts. Interestingly, famine was not, which is striking given the extent of human and economic loss associated with this humanitarian crisis.

To address the issues which emerged in relation to the theme of lack of evaluation and appraisal, and as a measure of rigor in the analysis, the findings were also quality appraised using the new ALNAP guide (Overseas Development Institute, ODI, 2016). Although evaluation methods have become "more deeply ingrained in the humanitarian sector", issues regarding "the quality of the evaluations themselves" (ODI, 2016, p. 12) remain present. To address this, the ODI have developed "An ALNAP Guide for humanitarian agencies" to evaluate humanitarian action using the OECD-DAC criteria for the development of "better", "high-quality" evaluation methods as a means of "improving the learning, accountability and performance in the sector". This new ALNAP guide provided a framework to enable the interpretation of key OECD-DAC criteria, specifically within the humanitarian context, so as to appraise the quality of the data findings in this review. An imperative factor in the

selection and application of this evaluation tool was that its core ethos and intention was focused on real life experience, and it was designed for teams on the ground.

3.5.1 A Clear Need to Educate Nurses in Disaster Preparedness and Response

Effectiveness: The literature connects nurses' lack of confidence when responding to disaster with a widespread lack of formative education in disaster preparedness and response. For instance, the nurses in a study by Al Khalaileh et al. (2012) blamed their lack of confidence on inadequate prior training. Furthermore, Alshhri (2016) concluded that a "lack of adequate disaster training for appropriate nurse preparation affect confidence in disaster situations". Likewise, Baack and Alfred (2013) revealed that "most nurses are not confident in their abilities to respond to major disaster events." In those instances, where nurses were found to display increased confidence in this context, it was discovered that they had received more disaster related education (VanDevanter et al., 2017). This indicates that the implementation of education in disaster preparedness and response for nurses would effectively improve the confidence and care output of nurses on the ground. The literature also highlighted the importance of practice-based education, as this was also associated with nurses generally demonstrating greater confidence in their roles, and obtaining better-perceived outcomes in practice, as reported by Loke et al. (2013). This was corroborated by Al Harthi et al. (2021), who reported that Saudi nurses encounter various difficulties in disaster nursing stages, including insufficient education, preparedness, research, and levels of expertise in practical settings and in academia.

Furthermore, the study previously mentioned by Younos et al. (2021) also highlights that effective disaster preparedness and disaster education can considerably improve nurses' disaster response and recovery capacities, whereas insufficient preparedness and skills results in poor performance. As a result, it is reasonable to assert that health professionals, particularly nurses, must be well prepared with enough knowledge, skills, and training to respond successfully in a crisis. Furthermore, good disaster preparedness reduces an individual's susceptibility and limits risk of danger to life and property.

Similarly, Van Devanter et al. (2017) reported that trained nurses are more confident when responding to disasters. Furthermore, according to the findings by Baack and Alfred (2013), the majority of nurses have insufficient confidence to cope with large disasters, and thus, nurses need to gain better training and education in how to manage patients' needs, especially

in regards to individuals with special needs, including the elderly, children, and people with mobility impairments or mental health issues. Hence, nurses need to be equipped in disaster situations with essential core competencies in order respond to disasters in an effective manner (Gebbie & Qureshi, 2002). Li et al. (2015) also urged attention to be given to disasters with nurses receiving additional training, with more focus on their mental health when working in disaster zones. Further, Li et al. determined that nurses generally had minimal experience of disasters, and consequently had low levels of confidence. In accordance, Park and Kim (2017) have reiterated that disaster nursing core competencies need to be made better with education and training programmes functioning to improve emergency nurses' levels of preparedness in disasters.

Impact: The need for comprehensive evidence-based disaster training among healthcare employees of all levels, including the creation of standards and recommendations for training in the multidisciplinary health response to large disasters, has been identified as a high priority for the disaster response community, according to Seroney (2014) and other authors.

The majority of the studies included here were conducted at various times and in different countries around the world. They indicated that nurses had a low level of disaster knowledge and preparedness. The impact of such findings emphasises the requirement for globally accredited training and education programmes, in which core humanitarian principles must be prioritised. The wider effects of such an intervention would be significant at both macro (sector) and micro (household) levels relative to social, economic, technical, environmental, and individual considerations. This review has also revealed a disparity in the literature concerning training and education methods, as well as the position of core humanitarian principles as a central aspect of disaster preparedness education and output measures, a fact observed by participants in Hargreaves and Golding's (2017) study: "It is not surprising that the seven nurses who gave their time and their life stories to this study demonstrate humanitarianism to be at the heart of their identity as nurses." However, the study also raised concerns regarding the nature of humanitarian work and the role of nurses within this context. This was further demonstrated by the study's findings, requiring that a meaningful intervention be required. Preparing nurses to face disasters through training and education has become an international concern, due to the frequency with which disasters around the world, as Basnet et al. (2016) and Diab and Mabrouk (2015) both contend.

Relevance: The literature presented studies in which various core competencies were identified at both global and country levels, demonstrating the growing potential of, and need for, a more globalised rollout of competencies with humanitarian principles at their core. Such an intervention would require both an international and a more localised consensus to enable the delivery and implementation of a humanitarian educational programme for nurses. Clarity founded on consensus is a key foundational requirement identified in this paper for effective disaster preparedness and response education for nurses. Any intervention should also acknowledge the local context, although a universal application of humanitarian principles and standards should remain broadly applicable, as posited by Fung et al. (2009) who wrote that "training for disasters is vastly different from hospital to hospital, community to community, and among various organisations". Garbutt et al. (2008) likewise claimed that more research is needed to assess nurses' familiarity with emergency preparedness, as it is crucial to have a nursing workforce that is trained in how to respond to a major disaster occurrence. The nurses in this study stated that hands-on education would help them to feel better prepared, and this was expressed in their responses to an optional question posed in the survey. Furthermore, Whetzel et al. (2013) pointed out that "although a number of articles have been written with regard to nursing in general and disasters, little has been written specifically about the role of the emergency nurse in a disaster" in agreement with the aforementioned authors.

3.5.2 A Lack of Evaluation and Appraisals of Existing Educational Programmes

Effectiveness: The selected literature does not elucidate how learning is operationalised, and the minimum standards for disaster preparedness in Australian hospitals are unclear, with significant gaps in research related to disaster nursing and preparedness being reported by Hammad et al. (2010). Furthermore, one of three findings that emerged from Hammad et al.'s (2010) data states:

> *"Although the majority of nurses appear to have completed disaster education and training, questions have been raised regarding the appropriateness and relevance of this education. In addition to this, 'it remains unclear as to what exactly hospital education sessions entail, who runs them, what qualifications they have, how frequently the sessions are run, what the content is or how evidence based it is as this information was not captured by the questionnaire."*

These rather dismaying findings mirror those of Pesiridis et al. (2015) in Greece; they wrote that "although a series of training programmes, aiming to improve nurses' capability of disaster preparedness have been carried out, in many cases it remains unclear if these training programmes are effective". Accordingly, the effectiveness of current educational programmes is a matter of ambiguity at best.

Impact: This atmosphere of ambiguity complicates our capacity to measure the extent to which educational activities are achieving their purpose or intended output and their applicability in terms of timeliness. The findings reported in most, if not all cases, are typically unclear and poorly measured. The literature reveals a lack of clarity in the outcomes of simulations and drills which presents additional difficulties when measuring the impact, outputs, and the wider effect of projects, as demonstrated by Witt and Gebbie (2016).

Relevance: The lack in clarity of preparedness and response to disasters demonstrated in the literature indicated that an improved and potentially universal set of evaluation methods and standards should be provided to assess educational programmes. The results of Loke and Fung's (2014) study showed that "the awareness of disaster preparedness and competencies among Hong Kong nurses is generally weak", and that the competencies of evaluation for disasters require more attention. It is not possible to assess the relevance of programmes and humanitarian activities without measures that evaluate how effective they are in achieving their outcomes on the ground as well as how appropriate they are to local needs and priorities. In addition to this, Pesiridis et al. (2015) have pointed out that "although a series of training programmes, aiming to improve nurses' capability of disaster preparedness have been carried out, in many cases it remains unclear if these training programmes are effective". This assertion that a lack of clarity regarding the efficacy of existing programmes is further supported by Wang et al. (2008) and Thobaity et al. (2016).

3.5.3 Significant Gaps in Existing Education

Effectiveness: The selected literature identifies the lack of a comprehensive curriculum and research as among the main reasons for the failure of educational interventions for disaster preparedness to meet their stated objectives on a wide scale (Kalanlar, 2019; Xia et al., 2020; Veenema et al., 2017). Likewise, Loke and Fung (2014) indicate that the self-reported disaster nursing competencies of nurses were grossly inadequate, demonstrating a need to develop a comprehensive curriculum for public health. Disaster nursing core competencies

that are specific to general nurses were limited or not verified. Usher et al. (2015) also elaborated on this point, writing: "once again, the lack of evaluative practice in both aspects was shown to contribute to unclear and/or poorly measured results that hinder research direction and consequently curriculum development". The authors continued, explaining that "research indicates that current nursing curricula do not adequately prepare nurses to respond to disasters." Accordingly, the effectiveness of current curricula is clearly inadequate.

Impact: The lack of evidence based education proceeding from research into disaster preparedness and response for nurses presents a twofold problem. Firstly, any initial intervention proposed based on research (if present) does not necessarily reflect the context nurses are in, partly due to socioeconomic disparity within the current education process, as educators do not make productive use of funding to achieve the required outputs. Secondly, although the literature in the review identifies clear gaps, the lack of research, most notably the lack of evaluative research in particular, into the broader consequences of existing educational interventions means potential opportunities for development in this area and more efficacious applications of funds and facilities are grossly overlooked, as supported by VanDevanter et al. (2017). A study by Hammad et al. (2010) likewise indicated a dearth of literature on disaster nursing preparedness, as "there is no current research that explores emergency nurses' knowledge and perceptions of their roles in disaster response." This was confirmed by Basnet et al. (2016), who asserted that disaster education and training for nurses is inadequate in Asian nations in particular. Yan et al. (2015) and Ranse et al. (2010) both concur; observing that "in China, disaster training courses for nurses is almost non-existent" Likewise, Li et al. (2015) contended that educational research in the area of disaster competencies for nurses remains scarce. In a similar vein, Younos et al. (2021) agreed with previous studies, mentioning that almost all of their participant nurses who took part in disaster response incidences stated that they had no professional disaster management training or practical experience. The impact of this paucity of research-led education was further confirmed by Alzahrani and Kyratisis (2016), Baack and Alfred (2013), Loke and Fung (2014), and Whetzel et al. (2013). Although some may dispute this contention by pointing to work that has recently been undertaken to develop a disaster education and training framework in the Australian context (FitzGerald et al., 2010), this is in its infancy and requires further development and implementation, as mentioned by Li et al. (2015) and Usher et al. (2014).

Relevance: There is a significant lack of commitment from authorities to address the aforementioned issues, as demonstrated by Baack and Alfred (2013), who pointed out that "administrators must support and encourage disaster preparedness education for nurses in order to promote hospital readiness to provide community care delivery in the event of a disaster situation". Doing so requires research funding to assess local contextual needs and priorities on an on-going basis, and to facilitate tailored programmes that will meet these needs and priorities while also carrying out the continual and sustainable evaluative research that necessarily follows. Authorities must also contribute to, and be receptive to, greater global collaborations for the development, implementation, and evaluative consistency of universal programmes establishing preparedness for and response to disasters. Additionally, Ahayalimudin et al. (2012) concluded that it is vital that administrators working in healthcare conduct education/training for disasters for front-liner workers, including emergency and community health nurses who can then develop their knowledge and practices of disaster management. Likewise, Yan et al. (2015) carried out a study following the Shanghai earthquake, which showed that none of the responding nurses had received prior disaster nursing training to work in earthquake disasters, and they believed that knowledge and skills needed to be improved in this area. Their statements echo findings reported in Whetzel et al.'s (2013) study, which demonstrates that many emergency nurses have not effectively prepared themselves for a disaster scenario from either a personal or professional perspective, a fact that underlines the importance of disaster education designed to meet the needs of emergency nurses. This is equally evident in the findings from Loke and Fung's (2014) study, which demonstrates that hospital administrators should develop continual education in order to prepare nurses with the competencies to cope when working in disaster care.

Furthermore, the respondents in Younos et al.'s (2021) research were asked an open-ended question about what they should do to improve their capacity for disaster preparedness. The majority of nurses (59.5%) stated that further training in emergency response and disaster management was vital on a regular basis. There was also focus on disaster management-related nursing curriculum development in hospitals to develop effective disaster responses, and proposed disaster management workplace awareness schemes. However, Diab and Mabrouk (2015) noted that despite these opinions, some local academic institutions offer disaster education for undergraduate or postgraduate healthcare and nursing students, with no attempts having been made to assess the effectiveness of such courses or programmes in practice.

3.5.4 Nurses Need Further Training and Education in Disaster Preparedness and Response

Effectiveness: According to Usher et al. (2015), the initial progression for disaster preparedness is to enable frontline health workers to develop effective responses to crises of disaster. However, in reality, the wider body of literature reveals nurses have expressed a need for a greater institutional commitment to nursing education. They have also indicated their awareness that there is insufficient unambiguous evidence and measurable interventions regarding what may be required for a greater drive to take place, which further compounds the notion that nurses are generally untrained in disaster preparedness and response. It is thus necessary to systemise and increase both knowledge and education to improve preparedness. It was stated by Fung et al. (2009) that there is not enough data on disaster nursing, which has resulted in insufficient comprehension of nurses' perceptions regarding their roles and the levels of provision for both safe and effective care pre- and post-disaster. Subsequently, Li et al. (2015) also noted that invest is greatly required to prepare nurses better for work in disasters situations; while Rokkas et al. (2014) adds that there remains inconsistencies in the comprehension of the roles, requirements, and capabilities of nurses during disaster events.

To effectively prepare health personnel, suitable education and training informed by evidence based research and focused on evaluating what existing training programmes provide is required to help identify the challenges nurses face accessing applicable education and training. Currently, however, it appears that disaster education and training are routinely being provided in a haphazard manner. There is no clear system in place to provide standard education for all nurses. Despite this, a vast number of nurses have completed education programmes, the appropriateness, frequency, and substance of which remains unclear, as demonstrated by Hammad et al. (2010) and Usher et al. (2014). Moreover, Al Harthi et al. (2021) recently claimed that:

> *"The problem has been reported globally with a clear requirement to clarify the roles of nurses during disaster events with preparedness as a significant issue affecting response levels in the KSA in regard to both healthcare professionals and health organisations."*

Impact: It is evident from this review that nurses are the primary frontline caregivers when incidents occur within communities. Nurse education is therefore crucial to ensure prevention

of escalation, and response in health related disasters, which is indicated by the analysis of the study findings. Another major issue identified in the literature, explicates the distinct need for balance between considerations at the macro and micro level, and pertains to self-care for nurses, as associated interventions are ineffective and not measured overall. These considerations naturally conflict with one another. The analysis of the findings revealed emergent trends indicating a need to apply WHO global standards at national levels. This was also reflected in the writings of Tzeng et al. (2016), Baack and Alfred (2013), Loke et al. (2013), Veenema et al. (2017), and Alzahrani and Kyratisis (2016). Furthermore, Nurses in Saudi Arabia encounter numerous challenges in all phases of disaster nursing, including that the specialty is in its infancy resulting in a lack of education, training, research, and few practitioners competent in both the clinical and academic fields. Surmounting these obstacles will both benefit nurses and advance the specialty in areas such as policymaking and procedures, education, and research (Al Harthi et al., 2021).

Relevance: The need to develop the conceptual clarity of the role of nurses is another major issue highlighted here. Accordingly, there is a significant requirement for further research into the role, as well as for continuous training and education on the job to ensure practitioners can meet the varied needs and priorities of local contexts. According to Fung et al. (2009), there are still poor levels of training in mass-casualty/incident disaster events, and there are only limited studies regarding preparedness of nurses. However, as Yin et al. (2011) noted, there remains emphasis on both the skills and knowledge that nurses need when working in disaster situations, and as Yan et al. mentioned, viewpoints frequently differ concerning what knowledge and abilities are necessary. Accordingly, there is a need for scholars to reach a consensus and address this lack of clarity.

Pourvakhshoori et al. (2017) reported that nurses with higher levels of preparedness, who comprehend the distinct moral implications of care, are generally more adapt at health care delivery in disaster events. In contrast, individuals who are obligated to work in disasters are more likely to suffer from feeling that their presence is of no value. Moreover, nurses' training and preparation for disasters is vital to optimise safe functioning and minimise the emotional and psychological trauma that can result from working in such circumstances.

This point is well illustrated by Li et al. (2015), who explained how the participating nurses were forced into distressing environments of destruction, where danger and ethical dilemmas were commonly evident whilst trying to help survivors, communities and themselves. On a

macro level, there is also an urgent need for increased ownership, accountability, and cost-effectiveness, as well as shifts in national government policy surrounding disasters (Veenema et al., 2017). Likewise, Park and Kim (2017) highlighted how the nursing profession needs to participate actively when developing disaster nursing education and training programmes; and Wenji et al. (2015) focused on disaster nursing education and training countrywide, and funds to advance more cohesive plans, policies, research, and training to establish reliable disaster response training for nurses. Nurses need to be intimately involved in this process, and it would be ideal to include military nurses who have the requisite disaster knowledge and skills. This will empower nurses to feel more confident and competent, allowing them to plan for, be involved in, and then evaluate their work in future disaster response. Yan et al. (2015) and Tzeng et al. (2016) also makes this point that urgent action is required by nursing leaders, as well as other leaders in Health, Education and the Government in China to increase nurses' levels of preparedness for frontline work in disasters.

3.6 Gaps in Research and Recommendations

Given the global scale of this study's inclusion criteria, the findings of this scoping review demonstrate an international consensus denoting a severe lack of education in healthcare preparedness and response for nursing professionals (who have been identified in all sources as frontline caregivers in disaster), which prevents them from working appropriately and effectively in disaster settings. In addition, the literature offers crucial knowledge from multiple contexts with a history of disasters, such as the USA, Australia, Japan, and China, and where key experience on the ground is vital to developing effective plans for universal disaster management intervention. Further research should therefore seek to bridge this gap in developing a recognised, effective and applied curriculum for nurses in the context of humanitarian action, accounting for the invaluable experiences to be gained from particularly disaster-prone contexts. This will further ensure that global best practices are taught to nurses, who will then be able to adapt them to local contexts within the KSA. Such a curriculum should consider the perspective of nurses, as requirement for their involvement emerged from the literature presented and was analysed as a principal component of this scoping review.

Likewise, there is a need for government authorities at national level to take responsibility for deficits in disaster nursing education. This will facilitate the development of the required high-level organisational structures in healthcare, as a foundation upon which locally

effective and culturally sensitive educational strategies for disaster risk reduction can be built. These strategies must address the lack of availability and consensus regarding approaches to disaster preparedness, and the paucity of the evaluative measures identified in this scoping review to ensure effective disaster nursing education.

The need for a national curriculum, delivering teaching that aligns with international standards, but is adapted to suit local needs and contexts, is also apparent. This scoping review has indicated that although nursing practitioners are willing to implement international standards, the understanding of existing standards as well as the role of nurses in the emergency situations is poor. Uncertainty in nursing roles signifies a substantial gap in disaster management education. It arises not only because required skills are lacking, but because the application of existing skills and competencies may also be skewed due to poor knowledge. This review presents the various consequences of lack of proper disaster nursing education, including low confidence levels among nurses when assessing their own disaster preparedness, unwarranted and neglected traumas in the workforce, and wider societal impacts. Consequently, greater accountability and action is required with action at higher organisational levels.

In summary, and in addition to the four main themes identified in Table 3.5, gaps identified in this scoping review include:

1. A need for the design and delivery of a disaster nursing education that is practice-based and includes mechanisms for the proper evaluation of skills and competences of pre-practice nurses. Such education programmes must also be evidence-based/knowledge-driven.

2. A need for disaster preparedness training and education programmes that are globally recognised and teach to meet international standards, as well as being applicable to local contexts. This will teach nurses the ability to prioritise frontline and emerging issues during disasters, improve their self-care abilities, and help them to better adapt global standards to local/national needs.

3. A lack of clarity or poor understanding of the role of nurses in emergency settings. Certainly, there is a need for further research into nursing roles in emergency situations.

4. A need for the establishment of effective continuous training and on-the-job education, and a need for national government policy change in this regard.

5. A requirement for better engagement with government agencies in disaster nursing education. This will ensure the proper coordination of activities, effective emergency planning and effective knowledge sharing.

3.7 Limitations of the Review

This review was carried out as systematically as possible, with a priori inclusion criteria minimising bias present in the review process. The searches were limited to reviews published in 2009 or after. There is, however, a potential risk of selection bias based on the exclusion of non-English language publications. Moreover, despite attempts to do so, this review may have omitted some of the published and grey literature. Furthermore, it should be emphasised that the data presented is limited to nurses and does not focus on the experiences of other healthcare workers.

3.8 Conclusion

The scoping review conducted and discussed in this Chapter examined the available evidence from a variety of countries relating to the preparedness of nurses for disaster risk reduction/response. The review focused principally on analysing factors found to promote or prevent healthcare professionals from responding effectively to disasters when they occur. The review also addressed information about existing education programmes and their effectiveness in preparing nurses to respond to disasters. Following a critical review of all articles identified, it is apparent that a gap exists in the skill sets of nurses, and that the existing nursing curricula in the KSA and other countries does not adequately prepare nurses to respond effectively to disasters. The scoping review also led to the realisation that there is a clear need to upskill nurses in the region and establish a framework for the evaluation and appraisal of any new nursing training programme. In line with the overall rationale for this thesis, it revealed the current poor understanding of the Key Concepts a good nursing education needs to provide in order to prepare nurses effectively. Therefore, the studies planned and executed in the subsequent chapters of this thesis were primarily designed to identify these Key Concepts, both from the perspectives of nurses, and the understanding of those people involved in developing policies, such as the academic staff in universities

responsible for devising curricula and implementing training programmes to facilitate nursing education. The next chapter in this thesis will focus on describing the methods and methodology adopted to achieve the aims of the thesis.

Chapter Four: Methodology

4.1 Introduction

The scoping review conducted in this thesis indicated the existence of a gap in the knowledge and skills of nurses in respect to disaster preparedness and response and demonstrated that there is a need for further investigation of what nurses identify as essential ongoing educational provision and support that would ensure that they are capable of delivering effective disaster management nursing in the KSA. Based on this finding, this study focuses on the specific objectives of assessing of current levels of knowledge, skills, and the performance of emergency nurses concerning disaster preparedness and response within the KSA, as well as the identification of elements and concepts that are critical for preparing nurses to effectively respond to disasters. To achieve this aim in a way that facilitates further research, it is essential to select appropriate methods of data collection and a research design that enables the collection of relevant and high-quality data. This chapter aims to elaborate this critical aspect of the research and elucidate subsequent steps to be taken in the course of this research.

Therefore, this chapter presents details of the research methodology underpinning the successful fulfilment of the research aims and objectives while justifying the selection of the chosen research approach; thereafter, a detailed exploration of the application and value of the case study methodology will be provided. Furthermore, this chapter also provides justifications for the methods and approaches chosen for this project. Specifically, it introduces the research process adopted in this study, outlining the researcher's rationale for adopting a qualitative research design over other alternatives. It also elaborates on the means of identifying and selecting the six project sites and target population in the case study, the research methods employed, and how ethical approval was granted for the project.

4.2 Research Design

In this thesis, the concept of methodology is defined as the framework upon which the contextual understanding of the research is anchored (Kara, 2015). According to Niglas (2010), it may be understood as a logical scheme informed by the researcher's views, values, and beliefs, as well as influential choices that the researcher makes during the conduct of the

research. On the other hand, methodology may be interpreted as any strategies or techniques used by the researcher in his engagement with participants in pursuit of data that will be analysed to uncover new findings in line with the stated aims and objectives of the study (Busetto, Wick & Gumbinger, 2020).

4.2.1 Research Methodological Choice

Given that disasters often cause death and destruction on differing scales, providing quality health care is essential to increasing survival rates, decreasing mortality, and improving the condition of individuals following such incidents. In such cases, a quick and effective healthcare response is required beyond the scope of the usual emergency response (Chandra, Kawamura, Paudel & Nishigawa, 2020). The aim of this thesis is to determine what nurses identify as essential ongoing educational provisions and support necessary to ensure they are delivering effective disaster management nursing in the KSA. Therefore, the choice of research methods should be made in relation to this aim and the related research objectives. Fellows and Liu (2008) have stated that the research methodologies used are determined by the type and nature of the research problem being investigated. Accordingly, the qualitative research design employed here reflects the research aim and objectives hitherto elaborated. A qualitative research method, as pointed out by Denzin and Lincoln (1994), is appropriate because it 'focuses on the interpretation of phenomena in their natural settings to make sense in terms of the meanings people bring to these settings'. This is further elaborated in Creswell's (2015) definition, which described qualitative research as an approach aimed at exploring and understanding the meaning that individuals or groups ascribe to a problem, whether it is a social or human problem. Creswell (2015) further indicated that the process of qualitative research involves the use of questions and dedicated procedures to collect data (usually in the participant's setting). Such data is subsequently inductively analysed to build particular or general themes that the researcher interprets to make sense of the data. As a result, reports of qualitative research often have a flexible structure.

Likewise, Polkinghorne (2005) described qualitative studies as those which investigate, describe, and explain human experiences as they manifest in people's lives. Furthermore, Maxwell (2008) states that the qualitative research approach seeks to answer a research question by systematically employing predetermined protocols to collect evidence that may generate findings applicable beyond the immediate boundaries of a given study. Qualitative data can convey the complexities of reality and the meaning of actions and behaviours in a

given context, especially when interviews are designed carefully to provide insights to answer research questions (Lewis, 2015). Likewise, Becker (2017) states that direct disaster experience can be a powerful tool with which to inform future disaster preparedness.

A qualitative research design was therefore chosen for this study because it aims to utilise an analysis of people's experiences as a means of determining what nurses require in terms of continuing educational provisions and support to ensure they can deliver effective disaster management nursing within the KSA. Qualitative studies typically seek to resolve research problems by acknowledging the perspectives of stakeholders while collating relevant data pertaining to the values, social contexts, behaviours, and opinions of a study population (Hoddinott et al., 2018). As has been mentioned, the overarching aim of this study is to establish what professional nurses identify as essential ongoing educational provision and support to ensure they are delivering effective disaster management nursing in the KSA. Achieving this goal is only possible through gaining an understanding of the meanings conveyed regarding the lived experiences of participants, with their perspectives presented in their own words in a detailed manner, such that an open-minded researcher able to set aside what they think and know about the event being recounted may draw conclusions from this information. In other words, the purpose of a qualitative interview is to capture the participants' subjective points-of-view (Rubin & Rubin, 2012).

Furthermore, the researcher assumes that the meanings that research participants assign to their experiences is a product of context and is interpreted based on prior experience and biases that may emerge during the interview process (Rubin & Rubin, 2012). In other words, qualitative interviews operate on the premise that all humans learn and interpret their surroundings by drawing on what they know and have experienced in the past. The act of recalling and reconstructing what happened before sharing their experiences during the interview allows research participants to reflect on what happened and choose which aspects of the experience are important (Thelen, 1989), thereby allowing the researcher to understand another person's perspective and the context in which it happened (Schutz, 1967). This allows the study participant/interviewee to think more deeply about what happened, allowing them to clarify, justify, and rationalise their experiences in order to describe what happened in a meaningful way. Qualitative studies are underpinned by the notion that through participating in interviews, study participants are given the chance to freely explore and

validate their experiences while generating meaningful data for researchers (Brinkmann, 2007).

It is worth mentioning, however, that qualitative studies are often more expensive and time consuming than quantitative studies, as they require researchers to dedicate a longer period of time to data collection, analysis, and interpretation (Carina, 2022). However, this additional effort and expense is justified in this case, as qualitative data is critical to the researcher's primary goal of establishing essential ongoing educational provisions and support necessary to ensure nurses are delivering effective disaster management nursing within the KSA in order to save lives and reduce the impact of disasters. A qualitative study is ideal for generating quality data that may serve as the basis of an education programme intended to contribute to the provision of superior healthcare to patients, thereby saving lives and reducing the impact of disasters due to the deep and insightful information emerged from the collected data (Almeida, 2017). Moreover, the fact that quantitative studies might limit the scope of participants' responses, restricting them from expressing their circumstances, feelings, or needs freely, further justifies the selection of a qualitative approach to this research (Almeida, 2017).

4.2.2 Justification for a Qualitative Research Design

The rationale for adopting a qualitative research method for this study was based on many factors. In the first instance, researchers employing this model gain 'privileged access to people's basic experience of the lived world' when they conduct qualitative interviews to unfold the meaning of their experiences (Brinkman & Kvale, 2015, p.32). Furthermore, it is widely recognised that one of the key strengths of qualitative research is that it enables the provision of more detailed content that may prove useful for practical applications than quantitative research (Bengtsson, 2016). Therefore, it represents the best method to generate detailed information about the current experiences of nurses in the KSA in respect to their ability to respond to emergencies and the challenges associated with doing so. Also, the qualitative research approach provides ample opportunities for deeper insights regarding how their previous education has prepared them for their current roles as emergency responders.

This approach is essential to gain a better understanding of how nurses' experiences can contribute to the development of a more effective disaster preparedness and response education, which is the desired practical application in this regard. Therefore, it is evident

that a qualitative design will facilitate the desired changes within the core of nursing and give nurses the opportunity to raise their voices and actively contribute to the development of their education. It is envisaged that contributions of nurses in this way will help address observed gaps in nurses' ability to effectively response to disasters, and by extension, improve the quality of care delivered to victims of disaster events. Moreover, the choice of a qualitative research approach is also predicated on the fact that experiences of nurses cannot be effectively captured or perceived thoroughly with traditional data collection techniques, such as short-answer questionnaires designed to collect surface-level information (Polkinghorne, 2005). For this reason, many research processes rely on qualitative data, which is typically more nuanced, context-rich, and representative than quantitative data. Interviews, for instance, are a popular data collection technique because they allow for interactive exchanges between researchers and participants, while also allowing the researcher to be adaptive and flexible in order to get to the core of their research issues and explore multiple understandings and points-of-view (Aspers & Corte, 2019).

In addition, qualitative research has been described as the best approach for studies with small sample sizes (Marshall et al., 2013; Malterud et al., 2016). The fact that detailed information about the experiences of nurses (as well as nursing educators and policymakers) are required in this study presupposes that a large sample size is not feasible, and that only a small number of participants who are able to provide useful information will be recruited. This, therefore, makes the qualitative research approach the most appropriate method for this study. Moreover, other advantages of the qualitative method, such as its cost-effectiveness (compared to other methods), its flexible operational structure, the provision of opportunities to ask open-ended questions, and its ability to turn individual experiences into usable data, further justify the selection of the method for this study. The qualitative approach adopted involved a combination of a case study (comprising two aspects of the research) and a phenomenological study (comprising one aspect of the study). Details of the case study framework adopted in this study, in which one hospital in each region of the country was selected, are described in Section 4.2.2. As for aspects of the study involving the study of the experiences of policymakers and nursing educators, a phenomenological approach involving the study of the experiences of key officers from the Ministry of Health (policymakers) and nursing schools (nursing educators) in the KSA was adopted. Details of how these participants were selected will be discussed fully in Section 5.2 of this thesis.

Moreover, to benefit from the experiences of participants, it is essential to gain a better understanding of how nurses' experiences contribute to education preparation. The rationale for seeking a rich understanding of nurses' disaster responsiveness arises from the fact that nurses in areas prone to disaster will have accumulated experiences from previous disasters. Since experience cannot be perceived thoroughly with traditional data collection techniques, such as short-answer questionnaires designed to collect surface information, this study will utilise qualitative interviews (Polkinghorne, 2005) within a case study framework, as will be discussed in greater detail in Section 4.2.1.

In the first instance, the research questions posed in this study centre on establishing the current level of knowledge about disaster preparedness and response among emergency nurses in the KSA, as well as on identifying the Key Concepts needed for a nursing educational programme that will adequately prepare nurses for effective disaster preparedness and response. The material gathered would form the basis of a disaster management programme that will adequately and effectively prepare Saudi nurses to response effectively to disasters, thereby saving lives. Therefore, it is imperative that the research design is sufficiently robust and is able to effectively generate quality data about essential educational provisions that would enable nurses in the KSA to respond effectively to disasters. A qualitative research methodology represents one of the best methods for achieving this goal. In addition to this, it is also critical that the design of this research reflects the manner in which educational curricula are constructed and organised in order to achieve the intended aim, particularly as it pertains to professional development and skills acquisition in Saudi nurses.

With this under consideration, a qualitative research approach (specifically multiple case studies) may be employed as a means to investigate what nurses already know and what further knowledge/skills they require. In the context of this study, what practicing nurses already know about disaster preparedness and response can be compared with what nurses are expected to know to be able to respond effectively when emergencies or disasters occur. This comparison can then lead to the development of education programmes that are carefully targeted towards filling the gaps identified in the knowledgebase of nurses, thereby giving nurses opportunities to engage meaningfully with the research process in a way that enables them to forge connections between prior knowledge and new knowledge necessary for them to learn.

It is furthermore important to mention that the researcher is a registered nurse who has worked previously in the KSA and has personal experience responding to disasters such as those detailed in Section 1.2.2. Though it is known that there are risks associated with insider knowledge in qualitative research, Wendt (2020) has also highlighted its importance in facilitating the understanding of complex issues that may be difficult for an outsider to comprehend. In agreement with Wendt (2020), it is envisaged that the researcher's experience will facilitate deeper understanding of elements and concepts that will inform the development of an effective nursing education programme for nurses in the KSA. It is also believed that qualitative research approaches would help to lay the foundation for a veritable platform that the researcher can use to construct the knowledge arising from this research.

It is worth noting that, in addition to being registered nurses, one of the inclusion criteria for nurses (Table 4.3) recruited stipulated that they needed to have worked in a hospital's emergency department for more than two years and must have had experience in disaster response. The participants were also expected to report a misalignment between the level of responsibility they were held to as nursing students and the degree of responsibility they now hold as registered nurses. Consequently, distinguishing between gaps in knowledge and gaps in practise is anticipated to be difficult. This is a process described by Delaney as 'beginning with an ending, followed by a period of distress and confusion, and resulting in a new beginning'. While participants might have initially felt excitement and elation entering the profession, their experiences as registered nurses soon transformed their feelings into bewilderment, fear, disillusionment, doubt, and inadequacy. This phenomenon is termed 'reality shock', which arises when people are confronted by the differences between their idealistic conceptions and the actual realities of the world and contributes to a negative adjustment experience while potentially leading to disillusionment (Delaney, 2003; Woo & Newman, 2019).

4.2.3 Case Study

Case studies are an invaluable method of conducting research that allows researchers, as it were, to put themselves in the centre of the action, witnessing the lived realities of their research subjects rather than viewing them from a distance (Aspers & Corte, 2019). Case studies are founded on the assumption that particular instances may be reflective of generalities and therefore use a particular site or location as a representation of a broader

phenomenon. Furthermore, they afford a level of detail that cannot be reached with other approaches to research (Crowe et al., 2011).

Although case studies involve systematic analyses of different or related events, the main aim is to objectively describe such events (Bromley, 1990, p.302). The method of a case study is able to be utilised as a creative option in comparison to traditional approaches to description, which emphasises the perspectives of nurses as a central aspect of the process of developing disaster nursing education content. Contemporary practitioners and researchers have started to appreciate the subjective richness of nurses in recounting their experiences and the meanings implicit in them to help guide practice. However, researchers often differ in their opinions concerning the design and implementation of case studies. According to Yazan (2015), three prominent researchers who produced seminal works detailing procedures and roadmaps for the design and implementation of case studies are Yin (1981), Merriam (1998), and Stake (1995). Yin (2009, p.13) described a case as:

> *"A contemporary phenomenon within its real-life context, especially when the boundaries between a phenomenon and context are not clear and the researcher has little control over the phenomenon and context."*

Yin indicated that case studies involve the investigation of cases in an empirical manner that focuses on answering 'how' and 'why' questions regarding the phenomenon under investigation (Yin, 2009). Flyvbjerg (2006) expounds on the advantages of case studies, stating that, 'the advantage of the case study is that it can "close in" on real life situations and test views directly in relation to phenomena as they unfold in practice'. Considering case studies from another perspective, Stake described cases as bounded systems that must be perceived as objects rather than as processes (Stake, 1995, p.2). Merriam's description of a case study is similar to that of Stakes, and defines a case as 'a thing, a single entity, a unit around which there are boundaries' (Merriam, 1998, p.27). Merriam's report further indicated that a case can be a person, event, group, or policy, and that cases must be viewed as integrated systems (Yazan, 2015). Case studies, according to Stake (1978), are ideally used to supplement existing experience and enhance humanistic understanding.

However, Yin's interpretation of case studies is more applicable to this study and was therefore adopted (Yin, 1994). Several reasons informed this choice: in the first instance, Yin (1994) indicated that case studies often involve the collection of data from documents,

archival records, and methods such as interviews and direct observation. This is exactly what is intended in this study, as these methods will help to uncover essential information in relation to the research objectives. It has also been suggested that the most significant aspects of case studies relate to their scientific credibility, and the provision of evidence for the purpose of professional application (Yin, 1994). Naturally, it is essential that investigations conducted in this study are credible, as the study's findings will contribute to the development of a national programme with far reaching implications.

Five key components of a case study research design have been identified as essential to the scientific processes inherent in case studies (Yin, 1994; Hancock & Algozzine, 2017; Harrison et al., 2017). These five key elements are: a statement of appropriate research questions that informs the central focus of the study; the case study proposition, which is often derived from the research question or other data sources (existing literature) to guide the development of cases to be studied; the case's unit of analysis, which is the item of the case that is observed or measure to collect data; an establishment of the link between the case's propositions and available data; and finally, a statement of criteria for data interpretation. In respect to this study, the case proposition is that effective education can lead to an improved ability of nurses to respond effectively to disasters, and the units of analysis are elements of emergency response that need to be included or improved in the existing nursing education programme to make it more effective in preparing nurses to respond to emergencies.

According to Cunningham (1997), case studies can be of four different types: illustrative case studies, which are often centred on the description of one or two instances of a particular event to illustrate key attributes of that case; exploratory case studies, which are often condensed and frequently conducted prior to large-scale investigations; cumulative case studies that aggregate data from different sites allow for greater generalisation of findings; and finally, the critical instance case study, which also collects data from one or more sites without aiming to generalise findings (Bergen & White, 2000). In the next section, particular details about the type of case study adopted in this research project will follow, offering further explanation and rationales concerning why the researcher decided to use it.

4.2.4 Justification for Adopting Multiple Case Study Approach

According to Saunders et al. (2016), if a researcher wants to have a deep understanding of the research setting, a case study technique is advised. Likewise, according to Yin (2014), one advantage of the case study technique is that it can accommodate several methodologies in the research, such as a mix of qualitative and quantitative approaches. Furthermore, a case study approach is essential when a researcher wishes to investigate a topic that has no clear conclusions drawn about it. On a fundamental level, case studies can be useful for understanding multiple phenomena, producing comprehensive descriptions, and preserving what Yin (2014) refers to as 'the holistic and meaningful features of actual events and situations'. Direct access to key individuals in case organisation studies can yield richer contextual perspectives and interpretations from study actors. Therefore, this study adopts a cumulative case study approach that involves multiple case studies.

Several factors justify the choice of multiple case studies herein. In the first instance, disasters, whether caused by natural or human-made factors, are inherently complicated events. The relationship between the nature of the hazard, the vulnerability of the people, the adequacy of response, and the resilience of structures and systems varies from case to case (Bennett, 2004). Accordingly, examining multiple case studies helps capture the complexities of disaster situations (Bennett, 2004). The cumulative case study design supports an in-depth, multifaceted exploration of complex issues in their authentic settings (Crowe et al., 2011). Furthermore, according to Grynszpan, Murray and Llosa (2010), case studies are particularly useful for analysing processes and practises. They provide a valuable opportunity to learn from past experiences and identify evidence-based best practises. Case studies also provide an opportunity to isolate a group or event to produce a detailed and extensive study (Lewis, 2015). The popularity of case studies among education and social science researchers is also predicated on the fact that they are holistic and employ an in-depth, investigatory approach that addresses the lack of a detailed explanation for the social and behavioural dimensions of the subject being researched in the majority of qualitative studies (Zainal, 2007). Furthermore, in disaster risk reduction, having an effective technique to raise public attention to a relatively unusual incident is critical, and case studies play this role very effectively. Communities and decision-makers are unlikely to act to prevent an event that they do not feel will affect them. Even within communities directly affected by disasters, memories of the disaster and effective practises for reducing vulnerability fade over time and across

generations. Case studies present the situation in a way that aggregated data does not, and are an effective way to present the reality of disasters as well as the importance of prevention and preparedness to an audience that may not be able to relate to theoretical or statistical statements. (Grynszpan, Murray & Llosa, 2010)

To further elaborate on these advantages, Zainal (2007) has indicated that case studies enable the examination of data within a similar context to that which the research's findings will be applied. The focus of this study was the examination of data on the level of emergency preparedness from selected hospitals (cases) in relation to disaster nursing education within the context of the KSA responsible for preparing nurses working in these selected hospitals for their roles in responding to emergencies. According to Yin (2014), multiple case studies are typically used to reproduce results and establish generalisations, as well as to strengthen the validity of the research. As a result, multiple case studies are considered a suitable technique for this study for the following reasons: the use of a multi-case analysis aided the identification of gaps in the current knowledge-base and skillset of nurses that could be addressed by improving the nursing curriculum and its delivery. In line with the advantage of case studies highlighted by Zainal (2007), participants' remarks and interpretative viewpoints will significantly help the researcher address complex issues that need to be discussed in depth. Also, this approach will allow the researcher to look beyond the quantitative statistical findings (which could be marred by biases associated with the collection and analysis of quantitative data) and focus on the interpretation of behavioural circumstances, as well as the viewpoints of nurses who are directly engaged in responding to disasters, while exploring multiple understandings as well as similarities and differences in points of view (Aspers & Corte, 2019). Furthermore, a cumulative case study design will enable comparisons between the selected cases in order to support generalisations, thereby rendering a judgement as to whether the proposed education can be properly used to improve nurses' disaster preparedness and response capacities within the KSA.

Case studies often involve the use of variety of methods to collect information about the case that is being studied (Cousin, 2005). Schoch (2020) particularly emphasised that the fact that methods such as direct observations can be combined with focus group discussions and interview methods in case studies provides an opportunity for proper verification of data that leads to more reliable and valid data collected. This is particularly relevant to this study, as the collection of credible and well-validated data that can be used for the development of an

effective disaster nursing education programme is the primary focus for this study. In addition, since the nature of hazards and emergencies that hospitals are vulnerable to differ significantly, and are determined by several factors, such as geographical location and level of care, the use of research methods that do not adequately take individualistic approach to data collection will not be appropriate for this study. However, the case study approach allows each hospital to be studied based on its elements and characteristics prior to making general conclusions that may be used as a basis for comparison with other hospitals in the region. Furthermore, it allows for replication and comparison in order to support generalisations, in addition to validating whether or not the suggested education programme can be practically applied to enhance the disaster preparedness and response capabilities of nurses within the KSA.

As was mentioned, the advantages of adopting a multiple case studies approach have been extensively elucidated by Zainal (2007) in a manner that highlights the applicability of the approach to the present. One of the foremost advantages of case studies is that they enable the examination of data within a similar context to that which the research findings will be applied to (Zainal, 2007). Accordingly, as the focus of this study lies on examining data from selected cases in respect to disaster nursing education within the context of the Kingdom of Saudi Arabia, a multi-case analysis is most suitable to identify gaps that could be addressed by improving nursing curricula. Based on the participants' responses and interpretative viewpoints, the researcher could address the complex issues that need to be discussed in depth, looking beyond the quantitative statistical findings of other research techniques to interpret behavioural circumstances and the viewpoints of nurses directly engaged in disaster response. In the majority of cases, different approaches to each particular case study enable data to be analysed both qualitatively and quantitatively, thereby enhancing the robustness of the investigation. It is therefore believed that a case study approach will enable the most optimal collection of data useful to the task of furthering existing knowledge about disaster preparedness among nurses and highlight any gaps in education. For these reasons, the case study strategy is clearly the most appropriate strategy for this research and is essential to gain the depth of understanding of the Key Concepts necessary to develop training programmes to enhance the disaster preparedness and response capabilities of nurses in the KSA.

The theoretical model of the case study adopted in this study is represented in Figure 4.1. The model focuses on the phenomenon of disaster nursing and clarifies that the focus of the

researcher in selected cases is the understanding of the exact nature of nurses' experiences of disaster preparedness and response via the exploration of policies provisions and their implementation at each case hospital. However, it is known that external factors pertaining to the unique social, political, cultural, economic, and environmental dimensions of each case may interfere with the phenomena under investigation. Therefore, the interplay between these factors and emergency preparedness, as well as the response abilities of nurses that have implications for a more effective education programme, was necessary to consider through the case analyses conducted in this study. This model of investigation therefore posits that examining each case hospital in terms of policy provisions, the availability and implementation of Emergency Response Plans, the experience of nurses, and the perception of nurses towards disaster nursing education in the KSA while controlling for the impact of external factors will help in the identification of key themes that describe the current context in the KSA, providing a foundation for the development of an effective disaster preparedness and response education.

With respect to this study, the contents of an effective emergency preparedness and response education programme should be relevant to the specific context of the KSA and should take the experiences of nurses in the KSA into consideration. It is therefore important that the contents of such an education programme are arranged in a way that facilitates effective learning and that allows nurses to adapt learning into emergency situations in the KSA. According to Jolley (2015), nurses have experiences that can positively affect their perspectives regarding professional problems. Moreover, every individual has a learning history and will constantly update their experiences as they learn things, as learning is a social activity that people automatically engage in whenever they interact with one another (Shum & Ferguson, 2012). This is why focus group discussions that enable participants to interact as they reflect on their learning experiences comprise an integral part of this study. Briefly, the selected hospitals (represented in the inner core) serve as individual cases, while the data collected from the participants was selected for focus group discussions, as was information collated from the emergency plan for each hospital. The impact of the socioeconomic and political environment (outer core of the Figure 4.1) on the attributes of each selected case was also examined.
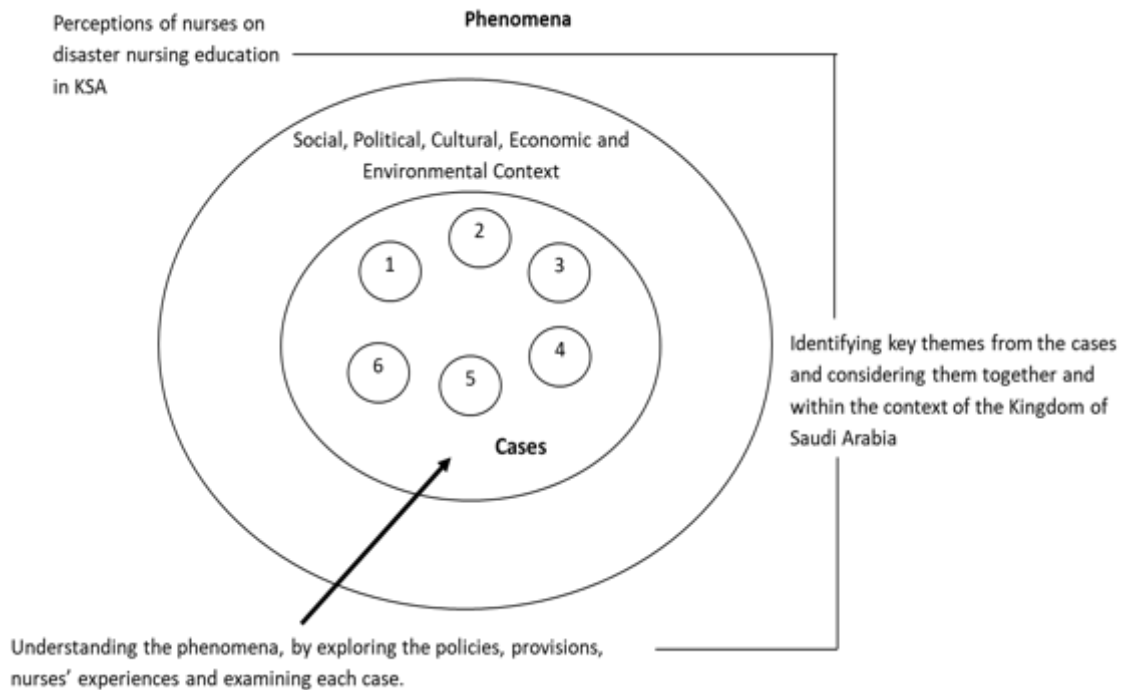
Figure 4.1: Representation of Cases used for the Current Research (Source, Author, 2021)

4.3 Selected Cases

As qualitative research aims to enrich how an experience is understood, it is important to select representative examples of that experience for investigation (Farrelly, 2013). Therefore, all selections must be purposeful, carefully planned and not at all random or arbitrary from any perspective. This purposive sampling technique often involves choosing cases that have the best characteristics of the phenomenon under investigation and provide good access to information (Sharma, 2017).

A total of six hospitals were selected as cases for this study (see Table 4.1). One hospital was selected from each of the six regions of the country, as it is more pragmatic to study one hospital from each region in detail rather than examining many hospitals that cannot be studied thoroughly. Also, the selection of case studies in six different cities allows for replication and comparison in order to support generalisations, while further validating whether or not the suggested education can be practically applied to enhance nurses' disaster preparedness and response capabilities within the KSA. The selection of these hospitals was purposively based on the diverse geography of the country, as the different regions of the KSA in which these hospitals are located are exposed to various types of disasters. More

importantly, each hospital is considered as an individual case, as each hospital has its own unique culture by which it operates in ways that are both similar to and different from other hospitals. Moreover, emergency response policies can vary from one hospital to another, as the policy at one hospital will likely be tailored to address disasters that are most common in that hospital's locality. Nurses were recruited for focus group discussions, and Emergency Response Plans (ERPs) were collected from each selected case hospital for analysis in this study.

Table 4.1: List of Organisations and Study Participants

S/No	Name of Organisation	Category of Organisation	Type and Number of Participants	Role in the Project
1	King Abdul Aziz Hospital, Mecca	Hospital	Nursing staff (6)	Focus groups
2	King Faisal Hospital, Jeddah	Hospital	Nursing staff (6)	Focus groups
3	Dahran Al Janoub Hospital, Dahran Al Janoub	Hospital	Nursing staff (6)	Focus groups
4	King Fahad Hospital, Madinah	Hospital	Nursing staff (8)	Focus groups
5	King Khaled Hospital, Tabouk	Hospital	Nursing staff (8)	Focus groups
6	Arar Hospital, Arar	Hospital	Nursing staff (7)	Focus groups
7	King Saud University, Riyadh	Nursing School	Academic staff (1)	Semi-structured interview
8	Prince Naif University, Riyadh	Disaster Management School	Academic staff (1)	Semi-structured interview
9	General Directorate of Nursing, Riyadh	Ministry of Health	Policymakers, Managers, Planners (1)	Semi-structured interview
10	General Directorate of Crisis and Emergency Directorate, Riyadh	Ministry of Health	Policymakers, Managers, Planners (1)	Semi-structured interview

(Source: Author, 2021)

Table 4.2 summarises previous disasters affecting the selected project sites.

Table 4.2: Previous Disasters at the Selected Project Sites by Type

Site	Type of disaster	Date
Jeddah	COVID-19, Flooding, Epidemic Terrorist attacks	2020, 2021 2009, 2011, 2015, 2017, 2018, 2019 1987, 1992, 2000, 2001, 2009, 2015, 2020
Mecca	COVID-19 Stampede inside pedestrian tunnel during Hajj, Fire during Hajj, Militant occupation of Holy Mosque in Mecca, Crane fall, Hostel collapse, Terrorist attacks Iranian riots during Hajj, Epidemic outbreak, Floods,	2020, 2021 1990, 1994, 2006, 2015, 1975, 1997 1979 2015 2006 2020 1988, 1989 1987, 1992, 2000, 2001, 2009, 2015 2002, 2003, 2009, 2015
Madinah	COVID-19, Earthquakes and volcanic activities, Terrorist attacks, Flooding,	 2009-2010 2015 1997, 2005, 2015, 2016
Dhahran Aljanoob	COVID-19, Conflict, Houthi insurgency in Yemen, flooding, Terrorist attacks	2020, 2021 2015 1997, 2004, 2019 2015
Tabouk	COVID-19, Earthquakes, The Egyptian ferry drowned Flooding,	2020, 2021 1995 2006 1981, 1985, 1988, 2005, 2008, 2009, 2010, 2012, 2013, 2016, 2019
Arar	COVID-19, Hazards related to Chemical Pollution, Flooding, Flight 163 crashes, Dust storms, Conflict, Gulf War,	2020, 2021 2013 1986 1982, 2009 1990
Riyadh	COVID-19, Flooding, Dust storms, terrorists attack,	2020, 2021 2005, 2009, 2010, 2015, 2018 2009, 2011 1995, 2002, 2003, 2004

(Source: International Disaster Database EM-DAT, WHO (2021); Abosuliman et al. (2013); Al-Bassam, Zaidi and Hussein (2014); Abdulrahman and Okazaki (2008); Abdelkarim et al. (2019).)
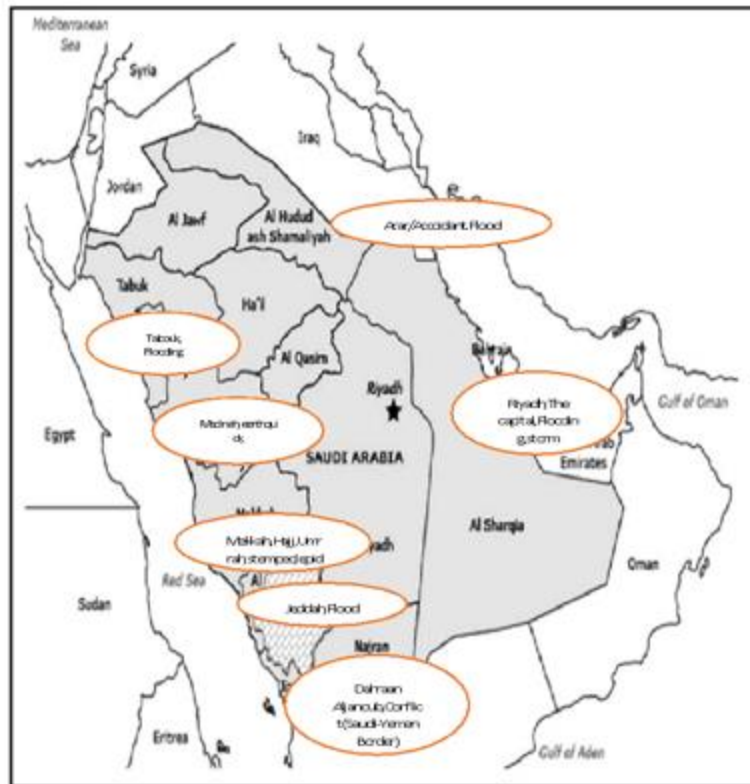
Figure 4.2: Cities Selected for the Study

(Source: Author, 2021)

Criteria were used in selecting hospitals for inclusion in this study in order to ensure that hospitals that have sufficient number of nurses with experience of disaster response were selected for this study. The selection criteria included stipulations that (1) the hospital must be located in the centre of the city and (2) the hospital must have the greatest number of staff and serve as an umbrella hospital for other hospitals in its region.

Based on these criteria, the selected hospitals have been identified as the first hospitals to respond to disasters and to receive victims in the case of any disaster within the city they are located. In addition, these hospitals will have the capacity to supply staff members to other hospitals in the region in which they are located or elsewhere when support is required in the event of an emergency. Furthermore, different hospitals were selected to provide an opportunity to recruit participants with varying views concerning the research topic, which enriched the data. These criteria also ensured that participants were the most experienced disaster response workers with the requisite experience to participate in this study. Therefore,

this provided the researcher with the opportunity to collect data spanning across a wide range of disaster response experiences.

Nursing training and education is largely provided by Universities in the KSA. Therefore, universities in which nursing education or disaster courses are taught were included in the scope of the qualitative research methods of this study. This is also because the development of nursing curriculum and its implementation in training nurses occurs within the university system. Accordingly, the opinions of academic staff members who participate in the development of nursing education curriculum and nursing training programmes are essential to identify gaps that future curriculum developers could address. Universities are repositories of scientific knowledge and provide accessible information that can be relied upon and trusted. Accordingly, integrating academic perspectives is essential to protect lives and property, as the scientific approach of peer review adds integrity to the proposed procedures and brings together healthcare professionals and academics to create a conceptual synthesis between theoretical and practical knowledge. Doing so will prevent any potential disasters and issues that might occur, or are likely to occur, as a result of failing to consider all viewpoints, and will facilitate solutions to issues through the cooperation of academics and professionals (Ahmad, 2007).

Therefore, the main centres for each university in the KSA were researched and the faculties of nursing were emailed to establish which of them would be the most appropriate to meet the current study's criteria, and which of them would be willing to participate. This search resulted in two universities being included in the study, namely King Saud University and the Prince Naif University, both of which offer nursing and disaster courses. Finally, officers involved in the development of emergency response policies were recruited from the Ministry of Health for this study. Details of the participant selection approach and criteria are presented in Section 4.5, while details of steps involved in recruiting participants will be presented in Chapter 5.

4.5 Participant Selection and Recruitment Criteria

The participant samples for the current study were recruited using a purposive sampling technique, enabling the researcher to focus on particular characteristics within the target population to ensure the selection of participants with a particular knowledge base and attributes relevant to the research question (Tongco, 2007). The main reason for choosing this

approach was to purposefully access sites or participants that would best assist the researcher in answering the research questions (Creswell, 2009). The researcher chose a non-random sampling technique that did not require access to specific theories or particular groups of participants (Acharya et al., 2013). Instead, the emphasis laid on uncovering what needed to be known and finding people who would provide information emerging from their own knowledge and/or experience. This enabled qualitative research to be undertaken, as it identified information-rich cases that were effective in the research process (Acharya et al., 2013), and, unlike random studies, did not discriminate based on age, background, or culture (Etikan et al., 2016).

The participants chosen for the current study comprised of emergency nurses, academics from universities, decision makers at the general nursing directorate, and those responsible for general disaster and crisis management in the KSA. Nurses were selected from major hospitals at each of the selected cities detailed in Table 4.1, while individuals involved in nursing education (academics) were recruited from selected universities in the KSA, and other participants were chosen from the general nursing directorate and Emergency and Crises Administrations at the Ministry of Health (see Table 4.1). Several factors informed the selection of the different categories of participants for the current study. The nurses involved in emergency services' provision were recruited as they are very active in the field and can provide information to fill the gaps in knowledge and areas where capacity building is required. Moreover, this group of participants will deliver an account of the reality of the challenges that nursing care service providers encounter during a disaster event.

The academics selected were from universities that run the existing nursing education programmes across the country. Therefore, they will be able to provide useful information about current curriculum provisions, particularly concerning training for disaster response and indicating areas in which new knowledge or capacity building is needed. Ahmad (2007) pointed out that universities play a major role in producing new knowledge through carrying out studies and research related to disaster response. They then transfer that knowledge throughout society after critiquing and analysing previous disasters, which helps the overall profession to learn essential lessons and reduce future losses via several methods, such as courses, scientific programmes, conferences, and other efforts to advance the profession. In addition to this, Jolley (2015) opined that collaboration between practitioners and academic staff members represents an effective model for developing educational paradigms, as it

draws on accounts of experience from a wide range of perspective. Through comparing these perspectives, the researcher will be able to identify common themes across sources and recognize variations in how experiences emerge, moving beyond the limitations associated with a single viewpoint.

Only nurses with experience were recruited in order to reflect the reality of professional practice and ensure that a meaningful contribution to the corpus of available information concerning disaster nursing is made. Furthermore, only Saudi nurses were recruited to participate in this study, as the KSA's healthcare workforce is essential to the transformation and shifting commercial interests in the health sector and beyond. Vision 2030, the development programme enacted by the government of Saudi Arabia, aims to expand the size and performance of the workforce to fulfil the changing requirements and health objectives of the people by increasing the proportion of nurses within healthcare workers (MOH, n.d.). The Saudisation of the health workforce, or minimising reliance on foreign personnel by increasing the number of Saudi citizens, is a major priority of Vision 2030. The health workforce accounts for a major portion of the total workforce in the KSA and moulding the health workforce in such a fashion provides an opportunity to enhance labour market participation among Saudi citizens, which is another essential objective of Vision 2030. The KSA's government has already achieved some success in its strategy to increase the total quantity, distribution, and performance of nurses throughout the country (Alsufyani et al., 2020; Alghaith et al., 2021). The decision to focus on nurses in this study was also partly explained by the fact that the Saudi Vision 2030 strategically focused on the training and education of nurses, making nurses an important target for the improvement of the healthcare system in the KSA.

Table 4.3: Inclusion and Exclusion Criteria for the Selection of Participants

No	Participant Type	Inclusion Criteria	Exclusion Criteria
1	Nurses	- Registered nurses working in emergency departments. - Have disaster preparedness and response experience. - Willing to participate and being able to provide informed consent. >2 years' experience on an emergency ward, as this will ensure they have had sufficient exposure to make a meaningful contribution to the data collection. - KSA nationals trained in the KSA	- Nurses who do not work in emergency departments. - Nurses with fewer than 2 years' experience of care provision during disasters. - Nurses with registration and qualifications, but not working in disaster response. - Non-Saudi nurses
2	A) Academic staff at Nursing Schools B) Academic staff at Disaster Management Schools	- Must be directly involved in developing nursing programmes or educational courses for nurses. - Involved in preparing plans for the characterisation and development of curricula for nursing. - Must be an expert in the field of nursing and disaster response. - Those providing specialist training courses, such as courses in disaster management, health and safety etc.	- Those not involved in the training of nurses or providing academic services in disaster response or management. - Those who do not have full scope regarding the nursing curriculum content. - Those who provide specific courses in nursing, but do not understand the entire course of training.
3	Professionals from Government Agencies and Disaster Management Organisations	- Professionals must work in Disaster Planning and Response or Training and Education sections of selected organisations. - Selected organisations will be restricted to the General Directorate of Nursing and The General Directorate of Emergency and Crisis, Ministry of Health, the KSA	Professionals working in other sections the within selected organisations.

(Source: Author, 2021).

The professionals recruited from the general directorate for disaster management and the nursing directorate were expected to provide insights into issues regarding the governance of disaster responses, health management, funding, and other policy issues. According to Lavis (2006), this will help to process the translation of knowledge into practical policies in a manner that facilitates the partnership between research institutions and stakeholders in

healthcare. Therefore, it was anticipated that the involvement of policymakers in the current study would prove beneficial and provide the required connection between public policy and educational programmes, as highlighted above.

4.6 Sample Size and Sampling Techniques

The importance of effective sample selection techniques and their contribution to the success of case studies has been highlighted by Curtis et al. (2000). Sample sizes and sampling techniques vary between the different methods of investigation used in this study. For the focus group discussions, the group size was set at a maximum number of eight participants, which reflected previous studies that have revealed that the ideal size for focus groups in a non-commercial investigation is between five and eight individuals (Marshall, 1996). Due to time and financial constraints, the qualitative research approach is frequently used with a smaller sample size; however, because of the rich and informative data, valuable conclusions can still be drawn from a smaller number of participants (Naoum, 2013). Furthermore, qualitative samples are chosen for their ability to provide richly textured information pertinent to the topic under inquiry. Purposive sampling, as opposed to the method of probability sampling used in quantitative research, picks 'information-rich' cases from which to derive findings (Vasileiou, Barnett, Thorpe & Young, 2018). Indeed, recent evidence shows that purposive sampling outperforms random sampling in qualitative studies, lending credence to related claims long advanced by qualitative methodologists (van Rijnsoever, 2017).

The transferability of qualitative research is similar to the concept of generalisability in a quantitative study, but the specific aim of transferability in qualitative research is to answer whether the study conclusion may transferable to other contexts (Miles, Huberman & Saldana, 2014). This can be achieved by choosing the participants who are representative of the population and ensuring that there is a thorough description of participant demographics and geographic characteristics of the location of research. (Tolley et al., 2016).

In this study, between six and eight nurses were selected for each focus group discussion (a total of 39 nurses), all of whom had previous disaster experiences and were willing to share their experiences with the researcher. While this number is small and cannot be said to be representative of all the nurses working in the KSA, it is an acceptable number under the present circumstances of this study, especially when considering that the hospital from each

of the country's six regions was included in the study. Moreover, by its nature, the case study approach used in this study will not allow the selection of a larger number of nurses considering the level of detail expected from qualitative research. Nevertheless, owing to the fact that participants were selected from geographically diverse environments struck by different types of disasters meriting varying responses, such a sample size may afford us with a representative idea of the current level of nursing preparedness to disasters in Saudi Arabia despite the paucity of participants. In summary, the qualitative nature of the study and the large geographical area from which participants were drawn provides a richness of data that can be relevant to a wide range of research studies.

For the semi-structured interviews, four key stakeholders, including academics from nursing schools and selected health policymakers, were recruited. When selecting participants from hospitals, consideration was given to those who work in disaster-prone areas and have experience providing healthcare services during a disaster event. This particular set of participants would then be able to provide information regarding the specific needs associated with each type of disaster. The conclusion of this research might then be transferable to studies that are conducted in different countries.

4.7 Data Collection Methods

Methods for data collection often employed in qualitative research approach include focus group discussions and interviews with participants, among other methods (Denicolo et al., 2016). In this study, a multi-method approach that included focus groups discussions, semi-structured interviews, and reviews of emergency plans was adopted. The choice of a multi-method approach was based on its reported usefulness in providing a better understanding of subject under study, as doing so allows for the collection of data on the same subject from multiple approaches (Hall, 2013). Details of how each method was adopted will be provided in Sections 4.7.1 to 4.7.3. Each of these approaches focuses on one particular aspect of the research and addresses a distinct research question. In specific, the focus group discussions and semi-structured interview address both of the research questions stated in this study, while the document analysis focuses on identifying concepts to integrate into effective disaster response training programmes for nurses. The connection between the different data collection methods and the study objectives is set out in Table 4.4, which illustrates the connection between each of the methods selected to achieve the objectives of the study, the justification for selecting the method, and the types of participants that will be targeted by

each method. As a result of following this strategy, the research objectives were achievable in using different data collection techniques.

4.7.1 Document Analysis

Every health facility is expected to have an emergency response plan that provides detailed information on the protocol and people with responsibilities for particular actions during an emergency situation (Perry & Lindell, 2003). The presence or absence of an emergency plan, the comprehensiveness of the plan, and the level of understanding of the plan by nurses, are clear indicators of the level of emergency preparedness of hospitals, and by extension, nurses within the hospital. In order to identify and assess gaps in the level of understanding of emergency response planning in each of the case hospitals, and to determine aspects of the identified gaps that could be included in an effective disaster preparedness education programme in the KSA, this study collected and reviewed emergency response plans (ERPs) from the various organisations from which the participants were selected. According to the Federal Emergency Management Agency (FEMA) in the USA, an ERP is a hospital plan that 'describes who will do what, when, with what resources, and under what authority — before, during, and after an emergency.' In other words, the plan outlines how a hospital will respond to ensure the best chances of recovery in patients afflicted by all disasters. Communicating the processes outlined in the ERP is vital, as the plan needs to be implemented within the first few minutes after an emergency. The plan includes guidelines that outline the level of preparedness required, response methods, and measures to take in the event of a minor or major incident. The actions taken in the few first minutes of an emergency are critical because they can save lives, reduce the impact of disasters, and facilitate disaster recovery. Thus, the goal of an ERP is to minimise human injury and damage to property – as well as the environment – when disaster strikes.

The lack of a hospital ERP could result in severe losses when handling numerous casualties, which may threaten to bring about the organisation's possible collapse. Disaster incidents can quickly overwhelm even the most advanced, well-equipped, and fully staffed hospital. Therefore, as nurses are the largest group in the healthcare sector, they play an essential role in implementing these types of documents in reality. With this in mind, the ERP is an essential document that guides the response operations of nurses during a disaster event. More specifically, these documents were reviewed to identify the various areas of nursing competence and gaps in these areas under the current educational curriculum. The quality of

an ERP in an organisation more often than not indicates the level of understanding among people in charge during an emergency, and by extension, the people responsible for developing and implementing the plan (largely nurses).

Table 4.4: The Link between the Study Objectives and Methods of Data Collection

No	Objectives	Data Collection Method	Participants	Justification
1	Assessment of the current level of knowledge, skills, and performance of emergency nurses in relation to disaster preparedness and response	Focus group Semi-structured interview	Nurses Academic staff	● Nurses will be able to reflect on their current knowledge during the Focus group discussions. ● Academic staff at development units at Nursing Schools will provide information about what is currently being taught in schools.
2	Determination of Key Concepts of a nursing educational programme for disaster response	Focus group Semi-structured interview	Nurses Academic Staff Policymakers	● Nurses will be able to identify themes that are essential to their duties during a disaster response. ● Academic staff will provide information on themes from existing curricula. ● Policymakers will provide insights into policy guidelines that need to be covered by the educational programme. ● Nurses will be able to reflect on gaps in their knowledge during the Focus group discussions. ● Academic staff will provide information about what is lacking, and areas that the new educational programme should address. ● Policymakers will be able to provide information on policy implementation, challenges involved and where gaps exist.
3	Identification of key practice gaps	Document analysis	Nurses	● Poorly developed emergency plan is a clear indication of lack requisite skills and competence for effective disaster response ● Review of documents will provide information about deficit available in each selected hospital ● Data on what is currently lacking can be retrieved via document analysis

(Source: Author, 2021)

Therefore, ERPs were collected from the selected hospitals for the purpose of reviewing them. The aforementioned criteria produced by the Organisation for Economic Co-operation

and Development's Development Assistance Committee (OECD-DAC) to evaluate humanitarian actions were adopted as a basis for the critical review of the plans (Beck, 2006). Two vital factors in the selection and application of the chosen evaluation tool were that, first, its central ethos and intention concentrates on lived experience, and second, it was originally designed for use by teams on the ground in a manner that mirrors the nature of the present study.

These criteria include relevance, connectedness, coherence, coverage, efficiency, effectiveness, and impact. Relevance assesses the appropriateness of a plan to meet the local needs of the target organisation; connectedness evaluates how the implementation of activities relating to a short-term emergency necessitate a consideration of responses to longer-term problems; and coherence relates to how the plan balances other relevant policies (such as human rights, security concerns, military assistance, and humanitarian aid); coverage addresses whether the plan covers all groups of people whom could potentially be affected by a disaster; efficiency measures the output of a plan according to possible outputs and alternative approaches. The final two criteria are effectiveness and impact – while effectiveness deals with the assessment of the extent to which a plan is able to fulfil its intended objectives, impact assesses the wider effects of the implementation of the ERP. As it is difficult to assess the efficiency, effectiveness, and impact of a plan by simply reading a document, these three criteria will be assessed during the focus group discussions. The attributes of ERPs in terms of their appropriateness, connectedness, coherence, and coverage for each ERP were tabulated for discussion purposes.

4.7.2 Focus Group Discussions

It is known that people respond to disasters differently (Twigg & Mosel, 2017), and accordingly, tools, strategies, resources for emergency response, individual needs expressed by participants and challenges facing them will also differ (Twigg & Mosel, 2017; Sim and Waterfield, 2019). The implication of this, particularly for nurses, is that people will have different experiences, opinions, knowledge, and skills as it pertains to disaster response. Therefore, perceptions of a disaster and its impact on a community, as well as views on education and the training of professionals, may be used to improve a community's capability to respond to and recover from different disasters, and accordingly, the focus group approach was adopted for nurses in emergency departments of selected case hospitals. The intention was to obtain as much diversity in terms of perspectives as possible, as it was anticipated that

the group members would encourage each other to reveal and recollect their experiences. A focus group discussion provides an opportunity for this type of participation for nurses. This is certainly important, as varied input provides a greater stimulus for dynamic discussions, enabling participants to reflect upon and react to the viewpoints of others, thereby yielding a more organic set of data (Nyumba et al., 2018).

In addition, studies have indicated that focus groups are extremely useful when research outcomes are unpredictable and/or when a researcher is interested in obtaining accurate responses reflective of the situation on the ground (Cyr, 2016). Unlike other data collection techniques (e.g., tests and surveys) employed in quantitative studies, focus groups allow the researcher to capture the emotions and feelings of participants (Guerrero & Xicola, 2018). Furthermore, this approach is suitable for addressing topics related to cultural or religious sensitivities (such as women being too shy to speak in public or unease among employees about speaking frankly for fear of information being passed to their bosses when interviewed alone), which is relevant to the study setting.

One of the key aspects that motivated the selection of this data collection approach was the fact that it provides opportunities for participants to provide open-ended responses, enabling them to accurately convey their thoughts and feelings compared to quantitative metrics (Cyr, 2016; Guerrero & Xicola, 2018). Moreover, focus group discussions were employed to gather information on the collective views of those who directly engaged in disaster response, as well as the meanings underlying such views. It aided in obtaining a thorough grasp of the participants' experiences (Kitzinger, 1994) while accommodating a larger target population, which afforded the researcher a cost and time-effective method for acquiring valuable data. The key advantages of the method are that it allows good demographic coverage and encourages participants to engage with the research and development processes. In addition, group dynamics can stimulate more relevant conversation as long as the facilitator or group moderator keeps the discussion on track in accordance with the purpose of the research. This approach also provides an opportunity to utilise non-verbal behaviour as research evidence.

However, there are limitations and disadvantages associated with focus groups. Most notably, discussions can be influenced by a limited number of dominant parties, which requires the discussion moderator to effectively manage the conversation. Cyr (2016) cautioned researchers that there can be a tendency for influential group members to skew discussions within the group, aligning others with their own opinions unconsciously. One topic of

considerable concern was the guarantee of confidentiality to ensure the participants are willing to share their open and honest opinions publicly, as some participants raised confidentiality issues, especially in relation to feeling uneasy about voicing their opinions/experiences relating to their colleagues – this was particularly common among female staff. However, this issue was overcome, and the participants seemed to feel more at ease voicing their opinions in the group discussion after it was confirmed that their confidentiality would be maintained. Another consideration is that the output of focus groups is less predictable, as they can produce more general opinions rather than the detailed results of quantitative studies. These drawbacks were considered and effectively managed by the researcher from the onset of research, as the researcher previously conducted group discussions while he was working in the KSA and was involved in regular meetings held every three months by the Ministry of Health and with other organisations who respond to disasters, such as the Civil Defence, Red Crescent, police, etc. to prepare for potential disasters that could happen. In these meetings, everybody needed to express his or her opinions in order to achieve the objectives, which helped the researcher realise the importance of everybody expressing their opinions and views freely without influence from other members. These experiences allowed for the successful management of discussions conducted as part of this research programme.

Furthermore, these drawbacks were overcome by the researcher's experience in delivering training courses in his country and serving in disaster areas in which he needed to listen to others to help other nurses advance the care they deliver. It is also worth mentioning that various challenges and obstacles would often present themselves in such meetings, as the disaster preparedness efforts include many organisations that have different views and opinions of the roles and structures required to manage disasters. Nevertheless, all of them share the same aim, which is to better organise effective responses to disasters in order to save lives and reduce the impact of such events, drawing on knowledge of previous challenges solved to improve the knowledgebase of the profession as a whole. Considering these difficulties, the focus group discussions were pre-empted by a reminder that it was essential to hear from everyone, with quieter members of the group being encouraged to speak up and participate in the discussion so that they could share their opinions about the topic. It was emphasised that they should speak with each other during the meeting. The researcher was also careful to reaffirm the confidentiality and anonymity of the participants,

and to state that nobody would have access to the data except the researcher. Furthermore, all privacy considerations pertaining to data recording for analysis were taken into consideration.

4.7.3 Semi-structured Interviews

Though general information collected from nurses may offer useful information regarding the gaps in knowledge and personal viewpoints of nurses about an effective educational programme for disaster response, it is expected that people who hold managerial positions in agencies related to emergency response, policymakers and nursing educators will have better knowledge of challenges associated with the effective implementation of disaster nursing education programmes (Veenema, 2018). Therefore, in addition to the aforementioned focus groups discussions, this study adopted a semi-structured interview approach to collect data on the perceptions of nursing educators in academia and those of policymakers responsible for effective disaster nursing education programme. This was a deliberate decision intended to facilitate more in-depth conversations than those obtainable through focus group discussions.

Furthermore, since individuals targeted in this aspect of the study work in different settings, organising a focus group discussion posed several practical challenges. Instead, this type of interview was used to enable a two-way conversation between an interviewer and an interviewee (Brinkmann, 2014). This interview approach differs from other forms of interview, however, as the process is guided by pre-prepared questions, while also allowing the interviewer the liberty to explore other topics that might arise (Rabionet, 2011). A key purpose of semi-structured interviews is to ensure the general focus is not lost while permitting participants freer input and allowing the interviewer greater flexibility to direct the conversation. With informed consent, it is possible to effectively build rapport with participants to guarantee high validity with semi-structured interviews, as participants are relatively free to express their views in their own terms. This methodological flexibility is a key reason for the selection of this form of interview over other alternatives in the current study. Nevertheless, as some aspects of semi-structured interviews are guided, it is relatively easy to compare the responses from different interviewees. The ability to compare the interview responses given by different interviewees is vital in the task of identifying the key aspects of education that need to be addressed in this study. In addition, the fact that interview questions can be prepared ahead of the interviews aids the researcher in preparing for the interview (Horton, Macye & Struyyen, 2004). However, this type of interview may be time consuming, extending the time required for data analysis. A further concern is that with

inexperienced interviewers, the thread of conversation can deviate from the research aims, and thus, the process of comparing information can be more complex. The smaller sample size, however, also reduces possibilities for generalisability.

In this study, the selection of academics at universities and policymakers at the General Directorate of Nursing and the General Directorate of Crisis and Emergency at the Ministry of Health, the KSA for interview was due to the small sample size of this group of respondents, which made the method relatively cost and time efficient. Another factor behind the choice of interviewees was that the relatively open framework of the semi-structured interview method allowed more detailed and specific policies to be investigated due to the nature of a two-way discussion. The flexibility of the method enables the researcher to follow topical trajectories where appropriate to yield relevant and rich details, hence offering an opportunity to get recommendations as to how to improve education. Additionally, this approach allowed the researcher to gather in-depth information relating to the current theoretical framework regarding disaster nursing and the content of effective disaster management education programmes.

4.8 Ethical Considerations

The foundation for conducting successful and meaningful research is ethics, according to (Kevin, 2019). Ethics are principles that drive conduct and decisions made during the research inquiry process, and are also regarded as the code of practice for performing any academic research, as they aid in the establishment of a context for behaviour and the nature of connections between the researcher and the object of study. Human participant protection standards ensure that researchers avoid harm, gain informed consent, and ensure privacy and confidentiality. Furthermore, as Kimmel (2007) stated, ethics in any research process protects the rights of all parties and ensures that standards are followed. Based on this understanding, this research was carried out in accordance with the University of York's research policy and local and global ethical standards. It is worth mentioning that the researcher has completed a "Becoming an Effective Researcher Tutorial" online course (BERT), which is compulsory for all postgraduate research students at the University of York and must be completed in the first year and before the first Thesis Advisory Panel (TAP) meeting. The researcher obtained ethical approval for the entirety of this study.

In the first instance, the study was approved by the Health Sciences Research Governance Committee at the University of York (Reference number: 2018/306, Date: 07/12/2018, Appendix 3). This is essential, as this PhD study is registered in the UK and the research could not be commenced without approval from the University of York. In addition, the application was submitted to the funding body, the Saudi Cultural Bureau in London (Appendix 4), so that they could issue letters to give to the targeted hospitals and universities within the KSA. In addition, ethical approval was submitted to the General Directorate for research and studies at the Saudi Ministry of Health (Reference number 2019-0133M, dated 08/01/2019, Appendix 5), in order to access King Abdul Aziz Hospital, Mecca; King Faisal Hospital, Jeddah; Dahran-Aljanoob Hospital, Dahran-Aljanoob; King Fahad Hospital, Medina; King Khaled Hospital, Tabouk; King Saud University, Riyadh; Prince Neif University, Riyadh; the General Directorate of Nursing, the Crisis and Emergency Directorate, and Ministry of Health, Riyadh.

Furthermore, after receiving ethical approval from the targeted hospitals (see Appendix 6), they were then contacted to organise a time to visit for participant recruitment. The researcher contacted the hospitals via the Saudi Ministry of Health in order to secure a web channel for the research. After receiving the approval letter, the researcher then worked with gatekeepers in the Ministry of Health in the KSA and within each particular setting to confirm the specific details and objectives of the research, while also setting up a framework for data collection and ensuring that the researcher has completed all the necessary paperwork (such as ethical approvals) and if they have additional requirements before the study could be officially approved and data collection commence. This process also entailed the application for IRB through the General Directorate of Research in the Ministry of Health, which took place through an email conversation (research@moh.gov.sa), during which the required forms that were required to be filled to complete all the requirements of the government were filled out and returned.

This process is essential for any research to be conducted in collaboration with the Ministry of Health in the KSA, and is indeed a requirement of the MOH in Saudi Arabia in order to organise the process of research, access the targeted hospitals, and recruit the participants for the study. Furthermore, these individuals helped to facilitate the recruitment of participants within their respective settings and to advertise the project to nurses, as gatekeepers typically hold managerial positions. Such gatekeepers were then used to make arrangements and

communicate with the participants. In the case of the universities, the researcher conducted internet research on target universities and contacted them before submitting applications for research via each university's website; after receiving their response, the applications were transferred to the relevant gatekeepers to facilitate participant recruitment. Thereafter, an invitation letter was issued to the gatekeeper at each of the chosen organisations to recruit these participants, describing the inclusion/exclusion criteria for participation described in Chapter Four (Table 4.3). Participation was also dependent on the availability and willingness of respondents. Potential participants who were willing to participate were contacted via email and text message before the selected day in order to confirm their participation. Similarly, they were assured that all information shared would remain confidential and utilised solely for research purposes.

In line with international standards for research involving human participants (Shrestha & Dunn, 2019), all participants were provided with an information sheet clearly explaining the purpose of the research and their expected level of involvement. It was further clarified that the participants could withdraw from the study at any stage without needing to provide a reason for doing so. Moreover, at the commencement of the study, all participating individuals needed to sign a consent form provided by the researcher before collecting data for research purposes. Participants were given the researcher's contact information so they could get further information if they needed it. Likewise, all pre-requisite risk assessments for the study were conducted prior to the study and measures to mitigate or minimise risks were implemented throughout the research. Audio recordings of each focus group discussion and semi-structured interview were produced in the course of this study. Participants were informed of this during the recruitment phase via the project information sheet, with the researcher repeating this information at the beginning of each focus group session or interview. Participants were informed through the project information sheet that their part in the study was voluntary and withdrawal could be enacted at any stage that they would desire. They were also informed that data already collected from them at the point of withdrawal might still be used in the study.

After the interviews were completed, all data was retained confidentially in line with the provisions of the UK General Data Protection Regulation 2021. Data would only be shared later with individuals specifically involved in the study process such as the researcher's supervisors. All recordings were transcribed by the researcher and stored securely on the

University of York data repository. The data was then transcribed by the researcher and transferred to a password-protected USB flash drive, with all notes safely stored so that only the researcher and his supervisors had access to them. Following the completion of the analysis and the publication of the results, the data will be safely preserved for five years before being destroyed. Furthermore, the aim of the Research Integrity Tutorial is to ensure that the researchers begin their research study with a strong foundational knowledge regarding research integrity and ethics. In addition, the researcher took advantage of further training modules and support provided by the University of York in this area. Likewise, the researcher has fulfilled training requirements set by the Ministry of Health in the KSA in human research protections through an online training course known as 'Protecting Human Research Participants (PHRP)', which covered the historical development of human subject protections and ethical issues associated with research involving human subjects, as well as current regulations and guidance for prospective researchers.

4.9 Data Analysis Methods

As the focus of this thesis is the identification of essential elements of disaster nursing education that nurses in the KSA identify as being essential to their ability to respond effectively to disasters, all data analysis in this study was principally conducted via a thematic analysis approach. Thematic data analysis techniques centre on the extraction of meanings or concepts from textual data through the recognition of patterns or themes (Terry et al., 2017; Braun & Clarke, 2020). This method of analysis has been described as one of the most effective techniques for analysing transcripts of focus group discussions and interviews, and this widely-reported efficacy of the method is one of the factors which justifies the selection of the technique in this study (Braun and Clarke, 2020). Employing a thematic analysis approach is also based on the fact that this research is intended to reveal the perceptions of nurses, and a data analysis strategy is necessary to develop an understanding of how individual respondents construct meaning.

Several other advantages are associated with thematic analysis: Terry et al. (2017), for example, noted that thematic analysis is flexible and can enable researchers to better reflect on and clarify the realities associated with a set of data. Braun & Clarke (2006) likewise indicated that thematic analysis is easy to use, even by people who are relatively new to qualitative research. Moreover, it is an extremely useful technique in that it helps researchers to highlight different strands in data as well as similarities and differences present across data

sets (Braun & Clarke, 2006). King (2004) likewise contended that thematic analysis is helpful for summarising the key features of a study involving large data sets or different categories of data, thus making it applicable to this study.

Although the flexibility of thematic analysis has been criticised for allegedly opening the door to inconsistency and a lack of coherence, the advantages associated with the technique far outweigh this criticism, and there is a clear justification for the selection of the approach for data analysis in this study. Specifically, inductive thematic analysis, which provides a strong link between themes and data collected, was adopted in this study to counter some of these criticisms (Javadi & Zarea, 2016). This approach allows the researcher to capture valuable information, particularly when participants are providing information that is not necessarily related to the question asked but is nonetheless very relevant to the study (Braun & Clarke, 2006; Vaismoradi, Turunen & Bondas, 2013). Another advantage of inductive thematic analysis, particularly in relation to the focus group discussions and interviews, is its efficacy in providing a data-driven perspective as well as perspectives based on inductive coding for data interpretation in respect to the research question. It is also known to provide a verifiable means of checking whether data collected contains sufficient information to answer a particular research question (Braun & Clarke, 2006).

In addition, the selection of a thematic analysis approach was informed by its ability to help the researcher identify patterns and themes in collected data (Braun & Clarke, 2006). This is particularly important in this study, as there is a need to identify congruence in the gaps in knowledge in disaster nursing and the content of an effective nursing education programme as identified by nurses, academics, and policymakers. According to Frith and Gleeson (2004), the identification of themes in a thematic analysis could be implemented either inductively (bottom-up) or deductively (top-down). In this study, an inductive approach was employed because it effectively supports the emergence of findings from dominant or frequent themes in the raw data (Thomas, 2003). Thomas (2003) also indicated that the inductive approach has three purposes: the condensation and summarization of large and varied raw data, the establishment of links between study objectives and findings, and the development of a model of experience, such as is evidenced in the data collected. Therefore, the approach in this study involves the summarisation of data collected from all data points (focus group discussions and interviews); it further establishes links between these summaries and the

development of a model detailing the concepts required for the development of a nursing education programme to effectively prepare nurses for emergency response.

Finally, thematic analysis is theoretically flexible and can be adapted to fit a wide range of frameworks and models to accommodate a wide range of experiences, perceptions, and views among respondents (Braun & Clarke, 2006). The use of this data analysis approach ensures a rigorous process of familiarisation with the data, data coding, thematic development, and revision. The subsequent section will serve to detail how this process was implemented in this study. Information contained in the Emergency Response Plans collected from selected hospitals, as well as transcripts of focus group discussions and semi-structured interviews, were subjected to thematic analysis. The specific focus of this analysis of emergency documents was the assessment of their relevance, connectedness, coverage, effectiveness, and efficiency – the description of these criteria used for this analysis is presented in Table 4.5. Essentially, thematic analysis was used to identify how documents retried from each case hospitals match these criteria.

For focus group discussions, the analysis focuses on the assessment of the experiences of participants, perceived gaps in knowledge, their perceptions of the current education programmes, and matters they identify as essential for them to become competent in responding to emergency situations. Likewise, for the semi-structured interviews, the focus is on challenges associated with policy development and implementation, and the deeper interpretations of issues pertaining to the ability of nurses to effectively respond to disaster.

Table 4.5 OECD-DAC Scoring Criteria

Criteria	Description
Relevance	Checks if the ERP addresses issues that are local to the environment where the hospital is located.
Coherence	Examines whether the ERP provides opportunity for working together with external agencies in relation to wider emergency response policies of the country.
Connectedness	Determines whether the procedures and protocols contained in the ERP can be applied to both short-term and long-term emergencies. Short term emergencies are defined as emergencies that can be addressed over a short period of time (such as fire outbreak). Long-term emergencies are defined as emergencies that takes a period of time to properly address (such as a disease outbreak).
Coverage	Examines whether the plan contained in the ERP covered all types of hospital users, including patients, staff, contractors, visitors etc. It checks if these different users were categorically mentioned in the plan
Efficiency	Evaluates how resources are being used during the implementation of the plans contained in the ERP. It focuses on assessing whether interventions are being delivered in an economic and timely manner.
Effectiveness	Examines if the ERP meets its stated objectives. It relates to the extent to which the stated objectives are achieved, and results are obtained across all groups.
Impact	Assesses changes associated with the implementation of plans contained in the ERP. It focuses on assessing if results are positive or negative, intended, or unintended, as well as the intervention's higher-level effects.

 (Source: Adapted from OECD-DAC Criteria for Evaluation, 2006).

4.10 Conclusion

This chapter has presented the research methodology of this study and described the methodologies selected to ensure that the qualitative case study produces actionable data. In addition, details of the research design, as well as theories underpinning the selection of a case study research methodology, have been provided. Furthermore, details of project location, procedures, criteria for the selection of participants, and sample size/sampling techniques were also discussed. This chapter has also provided justifications for the research approach taken and outlined the planned methodology and the researcher's rationale the choice of research design. Finally, it has detailed and justified the process of identifying the six case study sites and the target population, as well as the choice of focus groups, document analysis, and semi-structured interviews as the methods of research. The following chapter

will provide more information on how data collection and analysis processes were carried out.

Chapter Five: Methodology and Methods: Data Collection and Analysis Techniques

5.1 Introduction

This chapter further elaborates on the themes of the previous chapter by detailing activities carried out while recruiting participants, the data collection process for each component of the case study, and how collected data was analysed.

5.2 Recruitment of Participants

5.2.1 Recruitment of Participants for Focus Group Discussions

In order to recruit participants or focus group discussions, an invitation letter, which outlined the inclusion/exclusion criteria for participation presented in Chapter Four (Table 4.3), was sent to the gatekeeper at each of the selected organisations. The letter also provided details of participation requests for relevant staff members and the time frame during which participation would be required. The contact details of the interested participants, who were accordingly issued a letter of invitation via email, were collected prior to travelling to the hospitals. In order to ensure that a minimum number of six people were recruited for each focus group meeting conducted in this study, up to twelve invitation letters were sent for each site. Between six and eight replies were received for each of the selected hospitals, and the researcher was able to obtain a sufficient number of participants for each focus group discussion. After receiving replies to these emails from potential participants, those individuals were also contacted by telephone, text messages and/or WhatsApp in order to obtain their initial consent. Once participating nurses contacted the researcher via e-mail to express their interest in engaging in this study, and any ambiguities were clarified, interviews were planned at a time that was most suitable for the interviewees.

Thereafter, each focus group discussion was organised in a lecture room in each hospital once approval was obtained. The advantage of utilising the hospitals' lecture rooms was that it enabled easy access for all participants, as they could easily go to their place of work if required. It provided some form of comfort to the participants, as they were able to speak in an environment that was comfortable and familiar to them. Furthermore, this format enabled seating to be arranged in circles and facilitated audio recording. However, consent for audio

recording was not obtained in one focus group discussion as a result of cultural preferences and the desire to increase participant comfort and participation in the given context.

5.2.2 Recruitment of Participants for Semi-structured Interviews

The approach used for the recruitment of participants for this aspect of the study is similar to what has been described for focus group discussions (Section 5.2.1). In brief, a letter of invitation was sent to identified participants (based on their roles and affiliations as earlier highlighted in Table 4.1) to invite them to participate in the project. Letters were sent to seven policymakers and seven educators. However, only four of these invited participants accepted the invitation. Those who accepted the invitation were them contacted by email to arrange a suitable day and time for the interview.

5.3 Data Collection Procedures

The following section will serve to provide details regarding how data was collected, and the procedures used to develop questions for use in focus group discussions and semi-structured interviews. Furthermore, it will present details of observations made during these interviews and focus group discussions with reference to the overall aims of the research project. In this study, data was collected to ascertain comprehensive evidence into the topic and to better comprehend the subject. The main methods for data collection were detailed in Chapter Four, and include focus group discussions, semi-structured interviews and an analysis of Emergency Response Plans, thereby enabling the researcher to approach the research subject in a multifaceted manner.

5.3.1 Data Collection from Emergency Response Plans

Emergency Response Plans were collected from each of the selected hospitals personally by the researcher, after which data was extracted from collected ERPs in relation to the criteria of relevance, coherence, connectedness, and coverage as laid out in Table 4.5. Emergency Response Plans were collected from each of the selected hospitals personally by the researcher. Data was then extracted from collected ERPs in relation to the relevance, coherence, connectedness, and coverage criteria as indicated in Table 4.5. The researcher then made judgements based on the information contained in each ERP, determining whether each of the criteria in Table 4.5 could be scored as met, unmet, or partially met. Where

substantial information is present in the ERP relating to a particular criterion, it is judged to have been met; conversely; where attributes relating to a particular criterion are completely absent, the criterion is judged to be unmet. In cases in which a criterion is not directly addressed but there are attributes within the ERP that address the criterion (such as a mere mention of attributes relating to the criterion), the criterion is judged as partially met. A similar approach was used when analysing the data collected from the focus group discussions and semi-structured interviews in respect to the efficiency, effectiveness, and impact of the OECD-DAC criteria.

5.3.2 The Development of Questions for use in Focus Group Discussions and Interviews

As aforementioned in Section 4.7, focus group discussions and semi-structured interviews are imperative to data collection, although well-structured interview questions are vital to the overall flow of the process. Correspondingly, an interview guide/protocol was developed to align with the study's methodology and aim of the study (Castillo-Montoya, 2016). As Roberts (2020) has noted, in a process where data is ascertained from qualitative interviews, the researcher and the specific questions are the set tolls, with the value of data determined by the researcher. Hence, it was essential that the interview questions were appropriate and capable of achieving the goal of obtaining a detailed response to the study question that would present the different perspectives of the participants.

In the current study, the aim was to identify and explore knowledge gaps and conceive of the content of an effective nursing education programme based on data provided by nurses, academics, and policymakers. Considering this intention, the interview questions employed in focus group discussions and semi-structured interviews were carefully constructed to reflect the objectives of this study. The foundations for questions in this study were derived from gaps identified in the scoping review, as well as the broader thesis objectives that required clear explanations and comprehension. Contrastingly, the questionnaire only focused on a single research question, while the questions from the interview worked through all the gaps as determined by the scoping review, and covered all the objectives which contributed to generating better comprehensive data that is able to be triangulated in a precise manner (Given, 2008). Therefore, data collection during focus group discussions was conducted using a document containing carefully designed and validated guide questions. Content validation of questions was conducted by research supervisors, with changes to the initial draft being made before the final version was utilised in data collection. Generally, these

questions were designed to collect information about three major areas: the current knowledge and skills of nurses for effective emergency response, their understanding of Key Concepts in emergency preparedness and response, and their understanding of emergency response delivery methods. All questions used are present in Appendix 6.

Concerning the first area, nurses were asked to communicate their feelings about the adequacy of their skills and knowledge in disaster situations. As a follow-up question, nurses were also asked to reflect on particular problems and challenges they experienced while responding to disasters, as well as how they addressed or overcame those challenges. Having worked previously as a nurse in the KSA, the researcher is cognisant that the nature and frequency of disasters that nurses from the selected case hospitals encountered is highly variable. It was therefore essential for the researcher not to allow his previous experience of disaster to interfere with the experiences described by nurses who participated in the focus group discussions.

The second area assessed during the focus group discussions pertained to the nurses' understanding of Key Concepts concerning emergency preparedness and response. Participants were particularly asked to comment on what training they have received that qualified them to work as emergency response nurses, after which follow-up questions relating to whether the training in emergency response received by nurses occurred via a formal school-based training programme, short courses, online training or work-based practical experience were asked. Participating nurses who had not been trained on any particular matter were asked to reflect on why they might not have been trained, and to speculate on any benefits that they think a formal training might provide for them. In addition to this, all participating nurses were asked to identify knowledge and skill areas that would significantly enhance their job performance when they are called to respond to potential disasters. Due to my knowledge and working experience in the area, I was aware of some of the gaps in knowledge and general areas in which my expertise is lacking. However, it was important not to allow this prior knowledge to inform my perceptions of the focus group discussions or conclusions drawn from them, as new challenges may have arisen since the time I left the KSA to study in the United Kingdom. On this note, the COVID-19 pandemic would have certainly brought new challenges for these nurses that I am not aware of. These considerations altogether informed my handling of this aspect of the focus group discussion

and made me careful to carry out the focus group discussions in a way that ensured that my prior knowledge was separated from information provided by participating nurses.

The last part of the focus group discussions centred on methods of instructional delivery that are best suited for training nurses in emergency preparedness and response. Specifically, participating nurses were asked to identify what they consider to be the best approach for training nurses in emergency response in order to indicate their individual preferred learning methods, and to discuss how they think the identified method would help them to gain better knowledge of emergency response. These questions were asked against the background assumption that no school currently provide a stand-alone disaster nursing programme and served to assess whether the current teaching and learning approaches within nursing schools across the KSA could be considered adequate in the delivery of an effective disaster nursing programme.

Furthermore, the researcher assisted participants in articulating their thoughts by probing for more detailed answers in an effort to deepen knowledge, seek clarity, and, most importantly, determine what to ask next. This was done by making efforts to maintain their concentration throughout the interview and follow-up on their responses (Brinkman & Kvale, 2015; Seidman, 2013). This was facilitated by a well-planned interview guide with open-ended questions and ready-made probes that boosted researcher confidence and allowed the researcher to focus on what the individual has to say. (Charmaz, 2008, p.29). Furthermore, probes are useful in that they help researchers to manage the flow of the interview and keep the interviewees engaged and on topic. In addition to this, probes can be used to keep the subject talking or to clarify what has been said previously. (Rubin & Rubin, 2012). At the end of the focus group meeting, interviewees were asked if they had any other comments or questions to offer.

Considering that the official language of the KSA is Arabic, and that some of the nurses selected for the focus group discussions were not proficient in English, all focus group discussions were conducted in Arabic. As was mentioned, the audio of all focus group discussions was recorded for transcription and analysis; furthermore, the interview questions themselves are accessible in Appendix 6.

5.3.2.1 Observations during Focus Group Discussions

Six focus group discussions with nurses were conducted at six hospitals in different regions in Saudi Arabia. The focus group discussions involved 39 nurses in total, with Cases 1, 2, 3, and 6 having six nurses participating, while Case 4 had seven nurses participating and Case 5 enjoyed the largest focus group, with eight nurses participating.

The focus Group discussion lasted 60 to 90 minutes. The researcher approached participants who were in each focus group discussion and introduced himself, offering an outline of the study and providing participants with an information sheet. Those who agreed to participate in the study were asked to sign the consent form. The focus group discussions guided by focus group protocols as described in the Section 5.3.2. The focus group dissuasions were audio recorded, with handwritten notes describing the participants' non-verbal language and the interviewer's thoughts and feelings.

Following an interview, it is important for researchers to take some time to reflect on their experiences and write about them (Brinkmann & Kvale, 2015; Stake, 1995), as this allows the researcher to acknowledge and reflect on the entirety of the interview, considering the relevance of body language, notable interactions or moments, and ideas concerning themes and connections expressed by participants. Thereafter, a researcher may freely write a summary of the interview and highlight what was learnt, noting unexpected themes and feelings expressed or events that took place during the interview. Researchers are also able to write down their ideas on potential biases, first impressions, pertinent contextual information, and other factors that may have influenced the interview or its execution. It may also be useful to describe whether or not the participants seemed able to share their thoughts or connect with the researcher, as well mentioned as any challenges that arose during the interview that may provide additional insight in data collection and analysis (Brinkmann & Kvale, 2015; Stake, 1995). With this in mind, after each interview and discussion, the researcher took time and space immediately following the interview to reflect on the data he collected.

5.3.2.2 Trust, Rapport, and Engagement with Participants during Research

As the main aim of this qualitative research is to gather an in-depth understanding to establish what professional nurses identify as essential ongoing educational provisions and support that

they would require to ensure the effectiveness of nursing preparation in the KSA, it was essential to develop optimal working relationships with all participants. It was particularly important for the researcher build a rapport with participants in the study, as researchers are able to access more meaningful data when they build a strong connection and channels of communication with participants. (Denzin & Lincoln, 2000). In connection with this, Molden (2011) stated that 'the foundation of effective communication is mutual trust and understanding'. People might be sceptical and suspicious when they lack understanding and trust, and as a result, the significance of data that the researcher gathered could be imperilled should participants make up tales or withhold important knowledge. Participants who distrust researchers will not provide a clear window into their experiences, and the validity of research data can be compromised by this.

Therefore, it is essential for researchers to get along well with their participants. An important factor that must be taken into consideration, especially when a researcher conducts interviews and observations in order to provide rich data, is developing solid interpersonal relationships between the participant and the researcher (Guillemin & Heggen, 2009). Having a good relationship with participants is critical in order for researchers to generate rich data while at the same time ensuring respect is maintained between researcher and participant. Rapport is defined as the ability to connect with others in a way that fosters trust and understanding; it is also the ability to value other people's opinions, as well as understand and accept the feelings of others (Knight, 2009). Establishing a good rapport with participants will likely increase the quality of information and ease of data access for the researcher due to the trust and understanding built as a result of the good relationship between both parties (Zakaria & Musta'amal, 2014). Once rapport is built, trust and mutual respect will increase, as will the effectiveness of communication (Youell & Youell, 2011). Leach (2005) contends that rapport can be recognized by certain indicators, such as an improvement in the conversation's flow, a willingness to share sensitive material, relaxed body language, improved eye contact, and better listening skills. On the other hand, if there are indications of resistance, such as prolonged silences, sudden halts in conversation, a lack of eye contact, short responses, or protective body language, a good rapport has evidently not been established. Furthermore, according to Dwyer and Buckle (2009), empathy is an important tool for connecting with others, as it demonstrates an understanding of their feelings and past experiences. In this case, the researcher found that the shared experience of working as nurses and working in disasters provided common ground between himself and the participants.

The procedures enacted in the focus group discussions and interviews, including how participants responded to the questions posed at the beginning of each discussion, will be discussed below: after introducing the researcher himself and the study and thanking participants for taking the time to attend the focus group discussions, the researcher asked the participants to read and sign the participant sheet and consent form if they were happy to participate – this ensured that participants understood what they are agreeing to. Thereafter, the researcher commenced the discussion by engaging in light conversation to break the ice and establish familiarity with the researcher and the process of data collection. Doing so provided participants with a general idea of what to expect and mitigated possible apprehensions about the research project. The researcher took special care to avoid asking direct questions during this phase to avoid making participants feel tense or nervous, after which he asked everybody to write his or her name on a tag so would be able to remember each other's names, as remembering people names builds trust and paves the way for good communication. In Leach (2005), researchers were supposed to express certain qualities in preparation for rapport building. Researchers need to be open minded, flexible, supportive, friendly, genuine, warm, sincere, empowering, respectful, sensitive, and empathetic in encouraging rapport.

Asking follow-up questions techniques eliminated uncomfortable silences and helped the group to enter into more meaningful conversations, as when a researcher asks follow-up questions during a conversation, they demonstrate interest in the speaker's point of view – a sign that they're listening closely and want to know more. Generally, most participants expressed their gratitude during these focus group discussions because they came to believe that someone out there is still concerned about their needs and working conditions in disaster zones. Some individuals also expressed their delight to meet a researcher interested in their condition. However, there were a number of notable observations made by the researcher across the six focus group discussions conducted in this study of apprehension displayed by participants. In the first instance, it was observed that, initially, despite the fact that the researcher expected willing participants in a voluntary study to be unafraid to contribute, some participants expressed mistrust and difficulty speaking to the researcher as well as a fear of openly sharing information with their fellow participants. Upon noticing this, the researcher further reiterated that the purpose of the research is to complete a university degree and that all the data would remain confidential such that no participant will be linked with data collected in any way, which strengthened the rapport and lowered the guard of wary

participants. The researcher followed the suggestion of Hull (2007), employing effective listening skills and non-verbal cues such as eye contact, nodding, and facial gestures in order to boost rapport building between the researcher and participants.

However, in Case 1, it took about fifteen minutes for the reassurance of confidentiality to take effect and signs of trust between researcher and participants to become apparent. After this point, previously laconic participants subsequently started to provide information that was more detailed and accurate. Moreover, fear was observed in the body language of participants, some of whom held each other's hands and looked at each other's faces during the meeting. Knight (2009) advises paying attention to the other person's communication style, identifying any significant aspects of his or her actions, speech, or body language, and this technique was used during focus group discussions and interviews. After some initial awkwardness, participants soon began to establish eye contact with the researcher and unfold their arms, displaying more confidence and comfort in participating in the focus group discussions. Additionally, after 32 minutes had passed, a participant mentioned certain topics that were not previously mentioned as material to the study, which was more evidence that participants were opening up and understood that they could share their feelings and ideas without fear of judgment – a sure-fire sign of good rapport. These observations were repeated during some of the other focus group discussions, despite the fact that the aim and objectives of the study were explained to the participants prior to the commencement of each focus group discussion, and thus, to further allay apprehension among participants, the researcher ensured that all participants read the project information sheet and subsequently signed consent forms.

Prior to the commencement of all focus group discussions, the researcher sought the permission of participants to record the audio of the meeting for reference during the thematic analysis. However, at the beginning of the focus group discussions at Case 2 hospital, all of the participants refused to grant permission to have the meeting audio recorded, despite the fact that the researcher explained the aim of the study clearly to participants, reiterating that data collected would only be used for research purposes, reassuring them that the identity of participants would remain confidential, and they would not be associated in any way with the study's findings. Nevertheless, participants were still not comfortable with an audio recording of the meeting. The situation was somewhat paradoxical, as the participants wanted to participate and be involved in the study, but at the same time, they wanted their responses to

be recorded through writing rather than audio. This apprehension may have arisen out of a fear that the researcher was there for the purpose of evaluation and to assess their performance level for official purposes. Transparency regarding the ethical processes followed by the researcher also helped to build trust and rapport, allowing participants to feel secure in sharing personal and sensitive information. Moreover, thanks to the experience obtained from conducting a previous case study, the researcher was more prepared for this trip.

With this in mind, the researcher asked permission to take notes on paper and sometimes asked participants to repeat their words to ensure that the researcher captured them correctly in the exact phrasing. Furthermore, the researcher used another strategy to help him to clarify responses and get more details by repeating the responses of participants and asking them for clarification, at times directing them to write what they meant exactly on a small pace of paper. Furthermore, before the discussion, the researcher distributed sheets of papers to participants in case they want to write down any thoughts or suggestions. Also, participants were able to discuss what they wrote, and, following the discussion, were given a chance to change what they already wrote or keep it the same, with the researcher asking permission at the end of the meeting to collect all that pace of papers which, later on become important notes utilised in coding the data in conjunction with the researcher's notes taken during and after the meeting. In summary, while at the beginning of the meeting a lack of confidence and difficulty in talking to the researcher, as well as fear of providing incorrect information, was observed among most participants, steps were taken to assuage these fears and foster a spirit of openness in discussions.

Also, in Case 6, there was also nurse participant who seemed untalkative, giving short and brief answers without establishing eye contact with the researcher. Both these terse responses and non-verbal cues indicated scepticism concerning the researcher's identity. The researcher was likely either perceived as an authority attempting to gain information or a possible means of leaking information to such authorities. Such reasoning is understandable: as was mentioned earlier, the researcher had worked previously in Hospital #2 as part of the support team. This may have contributed somewhat to the level of apprehension observed among participants who may have viewed him as an agent of the institution. However, as the meeting progressed, participants slowly gained confidence as the researcher began to explain his role as a doctoral student while sharing details of the study. The researcher also explained

to the participants that he is also a nurse, and that the main objective of the study is not to critically evaluate their opinions and answers, but to benefit from their experiences and further develop the field of nursing.

After approximately eight minutes, participants began to provide more accurate information and cooperated fully with the researcher. Participants, at this point, began to freely express their opinions within the limits of the current study, demonstrating that trust and comfort had developed. According to Guillemin and Heggen (2009), the necessity to balance generating rapport and forming rich relationships with participants while maintaining distance from them out of respect for participants' privacy or sensitive concerns is paramount in qualitative research, and this was taken into consideration during these interviews.

One key observation that arose during some of the focus group discussions, such as the meeting at Case 2 hospital, was the fact that most participants remarked that the study was strange to them: they indicated that no one had ever asked them about their actual needs before. They repeated a common misperception that nursing is unimportant to those in higher positions and were indeed encouraged by the fact that hospital administrators were not involved in the focus group discussions (only nurses working in the Emergency Department were involved), as this made them more comfortable talking to the researcher. In some of the meetings, indications of anxiety and tension when expressing their opinions (particularly at the beginning of the meeting) were expressed in the hand gestures and body language of participants. Whenever this occurred, the researcher made sure to pause the meeting to reassure participants that the meeting is only for research purposes and confidentiality will be kept throughout the study and when reporting findings. This seemed to make participants more comfortable, and once they felt comfortable with the research, they start to move their hands normally in gestures that indicated greater satisfaction and trust, which then led to richer and more insightful data being shared.

At some other locations where this study was performed (such as Case 3), participants were excited in regards to the research and would provide useful information. Participants exhibited a greater desire to prosper from the study's findings after listening to the description of the study's aim and objectives, as presented by the researcher. This attitude made the interaction between the researcher and these participants exciting and fruitful. This enthusiasm was particularly common among participants who had extensive previous disaster

response experiences, some of whom expressed the shock they once experienced while responding to disaster events in their conversations.

However, the context of semi-structured interviews was different, as policymakers and academics were very friendly and ready to share their experiences. Just as was the case in focus group discussions, transparency concerning ethical processes helped to establish the quality of the data collecting process and improve the research outcome by establishing trust and rapport during fieldwork. Generally, participants were very encouraging and responded to the researcher's questions, explaining issues in more detail compared to nurses and welcoming the study as a necessary contribution to scholarship. Furthermore, they provided their personal phone numbers in case the researcher needed more clarification. It is also worth mentioning that, as the researcher is a registered nurse in the KSA and two of the participants from the General Nursing Administration in the Saudi Ministry of Health, important conversations concerning the necessity of such a study were held, with all participants concurring that the Saudi medical profession is in great need of such research. Likewise, academics displayed an incredibly positive reaction, and as they responded to the researcher's questions they explained that they were greatly interested in the aim of this study and were encouraged to make the time to meet with the researcher despite their busy timetable –one of them was even outside the country but made sure to find the right time to meet with the researcher as a result of the perceived importance of the study.

Additionally, I cannot ignore the positive effect the meeting room had on the quality of conversation: since the place was chosen according to the participants' preferences and where they felt comfortable, they were able to open up to a greater degree than a travelling scholar may have been able to. Furthermore, when they heard the introduction, they agreed with the importance of the topic and expressed the importance of participating in it, which positively reflects on the quality of collected data. Finally, the researcher left time to answer any of the participants questions at the end of each of meeting.

5.3.3 Data Collection during Semi-structured Interviews

As mentioned, semi-structured interviews were also conducted with selected educators and policymakers in the KSA. The conduct of interviews was similar in approach of the focus group discussions; however, the focus of the questions asked was markedly different. For policymakers, a document containing five major guiding questions pertaining to their roles

within the organisation they work for, details of existing programmes that are related to the training of healthcare workers in disaster response within their organisations, their opinions about the need for a new disaster nursing programme, involvement of stakeholders in policy development, their views of a good and effective good practice guidelines are, and details of their previous experience that are relevant to the development of an effective disaster nursing programme, was followed (Appendix 7). At the end, interviewees were asked if they had any other comments or questions.

For nursing educators, the guide document contained three major questions relating to the educator's familiarity and knowledge of issues confronting nurses in respect to their roles in disaster preparedness and response, their opinions of what an effective disaster nursing programme should cover, and methods that they think will be effective in delivering an effective disaster nursing programme. Follow-up questions for nursing educators centred on content relevant to disaster preparedness and response in the programme that they currently teach, their understanding of gaps in existing nursing programmes with respect to disaster preparedness and response, and methods for training current nursing students, as well as nurses who are already practicing (Appendix 8). At the end, interviewees were asked if they had any other comments or questions.

Data presented in Table 6.4 indicates that all participants interviewed in this study have more than five years' experience of working in their respective roles either within the academia or as policymakers. Specifically, one of the participants interviewed has fifteen-years working experience as a policymaker. Also, data in Table 6.4 indicates that all interviewees have senior management roles within their respective organisations. These roles include responsibilities in strategic planning, research, and learning development for policymakers, while those selected from the academic institutions also have experience in emergency planning and response implementation within the University. These observations indicate that all participants interviewed have sufficient working experience and are certainly able to give information that is relevant to this study. Notably, 75% of participants interviewed are women, and all interviews except for one were conducted face-to-face in locations selected by participants. The majority of these interviews took within the organisation where interviewees work, and were conducted in the morning, with interviews lasting between 1 hour 35 minutes and 2 hours. All interviewees gave consent for audio recording of interview sessions. The exceptional interview was conducted over the phone, as the participant was

outside the KSA during the duration of research. However, the researcher emailed the participant the information sheet and consent form to read and sign (assuming they are happy to participate), asking the participant to email it back to the researcher to confirm their approval. Additionally, the researcher asked for their approval to participate in this study verbally at the beginning of the call. As was the case in the focus groups, the researcher asked permission to write down notes and did so throughout the course of the interviews, asking the participant to repeat his words to enable the researcher to write it down. Furthermore, after ending the call, the researcher wrote his note on paper. All interviews were conducted in Arabic and were audio recorded; these audio recordings were transcribed and analysed as detailed in Section 5.4.2.

5.4 Data Analysis

5.4.1 Emergency Response Plan

The researcher made judgements based on the information contained in each ERP, evaluating whether each of the criteria in Table 4.5 could be scored as met, unmet or partially met as detailed earlier in Section 5.3.1.

5.4.2 Transcription and Analysis of Data from Focus Group Discussions and Semi-structured Interviews

Data collected from the focus group discussions and semi-structured interviews was analysed via thematic analysis according to the framework of Gibbs (2007). This involves several stages, as detailed below.

5.4.2.1 Transcription and Data Organisation

While technology is understood to make transcription and analysis easier by using software (such as NVivo and Atlas-Ti) for qualitative data analysis (Faste & Lin, 2012), whenever coding can be used on transcribed interviews, there is value in the researcher themselves engaging with the data and processing it. This helps to find out what the core ideas or findings of the research are and how they relate to one another to a greater degree than outsourcing transcription does (Kitchin & Tate, 1999). All codes were created by hand, since studies show that writing and arranging facts by hand improves memory and understanding while reinforcing connections considerably more than typing or using computer tools

(Mueller & Oppenheimer, 2014; Wiley & Rapp, 2021). Furthermore, there are audible characteristics that cannot be captured in transcription yet aid in data comprehension and analysis (Markle et al., 2011).

Prior to analysis, transcripts of audio recordings of focus group discussions and semi-structured interviews were produced in Arabic verbatim. In research, linguistic differences can be of great import: since concepts in one language may be interpreted differently in another, language variability may have implications concerning the reliability and validity of research. This is particularly significant concerning qualitative research, which explicitly focuses on verbal responses (van Nes et al., 2010). Each audio file was listened to four times prior to manual transcription by the researcher for ethical reasons. Due to research confidentiality agreements, which the particiapnts were made aware of prior to data collection, nobody besides the researcher was permitted to look at the transcriptions to protect the confidentiality of participants. As a result of enacting these confidentiality procedures, trust was built between the researcher and participants, increasing their confidence and producing more accurate information.

Transcriptions of recorded audio data was completed within 72 hours of each interview, with any information that could identity any individual being removed, and each participant being assigned a number code to ensure confidentiality. Patterns or themes noticed while transcribing the records from the focus group discussions and semi-structured interviews were noted in the transcript margins. Further, data utilisation in its initial multimedia (i.e., audio) form has been reported to ensure data accuracy, clearer descriptions, and better data reporting. The advantage of audio data transcription includes the fact that it ensures understanding of the meaning of data rather than the language and makes speech readable. In addition, it allows the researcher to highlight important details in the data, which would not otherwise be possible (Mondada, 2007). Moreover, the notes can be reviewed with reference to the audio recording to ensure their accuracy and allow the researcher to produce additional notes and points of information relevant to the thesis.

5.4.2.2 Data Familiarisation

This process involved carefully reading and blending data to answer the research question and involved careful notetaking and the recording of vital impressions. This process also allowed the researcher to cross-reference the quality of any data obtained from a transcription

(Wengraf, 2001). According to Wengraf (2001), one key advantages of this stage is that it enables the researcher to readily compare data with field notes to ensure ideas and memories from interviews are not subsequently lost later in the research process. Moreover, Wengraf (2001) states that the interview content, together with feelings present at the time of research and non-linguistic data must be included in the field notes. His study also suggested that it is important that scratch notes are promptly converted into properly written field notes while impressions can still be recalled (Barz, 1996). Crichton and Childs (2005) indicated that such processes of familiarisation reduce the impact of errors in transcription, preserving the freshness and truth of the data collected and reducing the risk of misinterpretation or loss of context. In this study, the author compared all the field notes with both the Arabic and English versions of the transcripts of the audio data to guarantee that all relevant information was accurately captured.

5.4.2.3 Coding of Focus Group Discussions and Semi-structured Interviews

The analysis of transcripts from all focus group discussions was carried out in two stages. Codes were first analysed by hand to uncover and establish codes, and to develop themes from among the collected data. At stage one, the entire transcript from each case hospital was screened for statements and comments that directly addressed each of the five areas covered in the guide question as highlighted in Section 5.3.2. The number of comments and statements were then collated in a table, which is presented as a template of in Table 5.1. In order to aid the identification of comments and statements relevant to each area, transcripts were screened for indicative codes as detailed in Table 5.1, such that the mention of previous responses to any specific internal or external disaster, or any form of indication of previous working experience with a disaster response agency would be interpreted as participants' experience with disaster response (Area 1). For Area 2, indications of knowledge regarding the existence of an Emergency Response Plan, previous participation in a response planning training, triage, the knowledge of the content of disaster response plans (such as warning codes) or other comments indicating participation in the response plan implementation were taken as evidence of participants' knowledge of Emergency Response Plans and their implementation (Area 2). For Area 3, emergency response training, comments relating to the awareness of training programmes, participation in previous programmes, or reference to contents of a disaster training programme were counted and recorded.

Table 5.1: Table of Themes and Indicative Codes for Focus Group Discussions

Areas of emergency preparedness/response	Indicative codes	Frequency of related phrases (Cases)							Summary of findings
		1	2	3	4	5	6	Total	
Participants' experience of disaster response	Response to named disaster – internal or external, indication of working previously with disaster response agency, etc.								
Participants' knowledge of Emergency response plan and participation in the development of the plan	Response plan training, triage, warning codes, Response plan implementation, etc								
Training on emergency response received by participants	Awareness of training programmes, indication of previous engagement with training, reference to contents of training programmes, etc								
Gaps in knowledge of emergency response indicated by participants	Inability to respond to disaster event, indications of lack of confidence, poor knowledge of warning codes and procedures, no knowledge of ERPs, etc								
Challenges associated with effective emergency response that could be addressed by training	Not trained as part of regular nursing degree, no on the job training, no understanding of actions during response operation etc								

Likewise, comments highlighting factors preventing nurses from responding effectively to disasters (such as a lack of confidence and poor knowledge of Emergency Response Plans or

their contents) were recorded for Area 4. Finally, comments by nurses relating to how identified problems could be solved were counted and recorded for Area 5. The total number for each area across all the six case hospitals was also computed.

A similar coding strategy was used for the transcription of semi-structured interviews conducted for policymakers and nursing educators. In their case, the area that guided the analysis of interview transcripts included the inclusion of disaster preparedness and response training in the current nursing curriculum, the availability and effectiveness of short courses/on-the-job-training pertaining to disaster preparedness and response, Key Concepts required for effective disaster preparedness and response education programme, and policies and other issues relating to emergency preparedness and response. Statements by nursing educators and policymakers relating to these areas were enumerated and recorded using a template presented in Table 5.2.

The second stage of the analysis conducted for transcripts of focus group discussions and semi-structured interviews involved a thematic analysis of responses provided by participants. Unlike the analysis at the first stage, which involved looking for specific contents, the analysis at this stage focused on identifying common themes in the responses of nurses across the six selected hospitals. This stage also involved familiarisation with the transcripts by reading each of them at least 4 times. This was accomplished by the assignment of preliminary codes, which were descriptions of what participants said in each section. These preliminary codes were then combined to form themes that offer broader meanings and interpretations of preliminary codes. Identified themes were then reviewed thoroughly prior to naming them. An example of how data was coded in this study is presented in Table 5.3.

Table 5.2: Table of Themes and Indicative Codes for Semi-structured Interviews

Areas of emergency preparedness/response	Indicative codes	Frequency of related phrases (Interviews)					Summary of findings
		1	2	3	4	Total	
Disaster preparedness and response in the current nursing curriculum	Reference to curricular contents on disaster preparedness and response, modules/subjects on disaster preparedness, etc						
Availability and effectiveness of short courses/on-the-job-training on disaster preparedness and response	Reference to named short course/training on emergency response, participation in training programme design, facilitating training programmes, etc						
Key Concepts required for effective disaster preparedness and response education programme	Identification of named concept such as communication and non-clinical skills, reference to missing concepts, etc						
Policies and other issues relating to emergency preparedness and response	Awareness of policies, references to named policies, identification of policy issues etc						

Table 5.3: Example of Coding Conducted in the Study

Excerpts from transcripts	Code	Final theme
Excerpt 1 *"What may or may not have been our feeling at that time was fear. Fear from not knowing what happened exactly. Fear of what, we don't know? What happened or what we should do about what happened? What happened? Because we did not open our phones, we did not know what was happening in the hospital or outside. So, the news started circulating from here to here and everyone said something different. But at the same time, we continued receiving patients. These patients are present, we have to serve them."* (Case 3, page 5)	Poor communication during disaster or poor communication of disaster events. Indication of lack of good training in emergency response. Indication of gaps in knowledge of appropriate response to disaster.	Awareness of roles as first responders in emergency situation. There are challenges that affected the ability of nurses to respond effectively to disasters.
Excerpt 2 *"The patients were continuing to come to the hospital, and we had to provide care for them, even though we did not know what to do. We presented what we guessed we should and continued from about 9 am. I was not sure of the time until 8:30 or 9 pm of the same day. I stood up and worked without stopping even for one minute. I don't have any background in this. I mean how to respond to such event ... I mean in reality."* (Case 5, page 7)	Awareness of roles during disaster situation. Participants have responded to disaster before. Lack of training and skills. Lack of confidence in emergency response.	Awareness of roles as first responders in emergency situation. There are challenges that affected the ability of nurses to respond effectively to disasters.
Excerpt 3 *"Our role will be in response to the event: the first team move from the hospital, which means the response to the event, is from the same health facility because each hospital has its internal plan of how to deal with events and manage."* (Case 1, page 3)	Nurses have experience of disaster response. Awareness of availability of emergency plans at the hospital level.	Participants are aware of their role as first responders during emergency situations, and have previous experience of emergency response. There is a recognizable system of emergency preparedness and response in many of the case hospitals.

5.4.2.4 Data Interpretation

This stage of the analysis involved identifying the chief characteristics, differences, typologies, and links between the data categories to establish their interrelationships. These were developed into the findings of this study and used to establish a framework for

developing further effective disaster management education for nurses in the KSA. To summarise, the process of data collection and analysis occurred as follows: first, the interviews were conducted and recorded by audio, with the exception of hospital #2 and the third semi structured interview, which necessitated collecting information in writing. During the interviews, informal notes were taken, which were then collated and transformed into formal, reflexive notes thereafter. Following the interview process, audio recordings were transcribed manually such that data could be carefully read and blended in order to answer the research questions thereafter. The transcription process was followed by a manual coding of both focus group discussions and the semi-structured interviews (based on a template devised from an interview schedule).

This level of analysis has two main stages, the first of which involved screening the entire transcript from each case hospital for statements and comments corresponding to the five areas covered in the guide question. This information was then numerically recorded in a table, and transcripts were screened for indicative codes. Thereafter, the second stage involved a thematic analysis of responses provided by participants. This analysis identified common themes in the responses of nurses across the six selected hospitals and was carried out through a process of data familiarisation in which each transcript was carefully read at least four times. The thematic analysis was accomplished by the assignment of preliminary codes, or descriptions of what each individual participant said in each section. Following this, these preliminary codes were combined to form themes that offered interpretations of the preliminary codes and expounded on their shared meanings.

The process of data interpretation was then carried out in order to identity the chief characteristics, differences, typologies, and links between each data category to establish their interrelationships. This was done in order to develop the findings of this study and establish a framework that may be used to develop more effective disaster management education for nurses in the KSA. Summaries of information provided by nurses, nursing educators, and policymakers were then generated, with themes emerging from this data being generated via comparative analysis, which involved analysing the similarities and differences between different case studies. The analysis of ERPs collected from selected hospitals and the analysis of focus group discussions/semi-structured interviews were then synthesised to present overall themes and findings pertaining to key areas of emergency preparedness and response

that must be addressed by an effective disaster nursing education programme. The findings resulting from data interpretation will be presented in the following chapter.

5.4 Validity and Reliability Testing

In order to ensure the quality of data collected in this study, the validity and reliability of instruments used in collecting data from focus group discussions as well as semi-structured interviews were tested. According to Mangoni and McKerchar (2013), testing the validity of a research instrument is done to assess the ability of the instrument to accurately collect the data it is intended to collect. Regarding the reliability test, the aim is to assess whether the instrument is able to consistently measure the parameter it is supposed to measure (Kidd & Parshall, 2000). In this study, the set of questions used for data collection during the focus group discussions and the semi-structured interviews were first subjected to face and content validity checks, which involve sending the questions to research supervisors to examine their relevance to the objectives of this research, and following their approval, to the Health Sciences Research Governance Committee at the University of York. Suggestions made following this assessment were then used to make appropriate corrections to the questions. Furthermore, a pilot study involving eight nurses selected from a hospital separate from those selected for the main study was carried out. These nurses engaged in two small-scale focus group discussions (four nurses per meeting) using the developed focus group instrument, with their responses to questions being assessed in line with the objectives of this study to evaluate the validity of the instrument. Furthermore, reports from the two focus group discussions were compared to assess the consistency of the instrument in collecting focus group data. Similarly, two pilot semi-structured interviews were conducted, with reports from these interviews also being analysed to evaluate the validity and reliability of the set of interview questions used in this study. Where necessary, changes were made before the final drafts were produced and used in the collection of data reported in this thesis.

Harding and Whitehead (2013) indicated that confidence in data collected in a qualitative study can be demonstrated in four ways including ensuring trustworthiness, credibility, dependability, transferability and confirmability. The researcher made efforts to achieve these in various ways in this thesis. In addition to efforts to ensure face validity detailed above, other strategies were employed to confirm that data collected are credible, dependable and transferable. For instance, to ensure that information provided are reliable and rich, the researcher ensured that all questions asked were relevant and related to the aim of this study.

The same was done for the semi-structured interviews. Moreover, some information provided by nurses during focus group meetings were cross-checked during the visit to each of the case hospitals in this study. Also, the researcher constantly cross-checked findings with research supervisors to ensure that errors are avoided, and the valid results are analysed in this study. Moreover, the validity of findings was constantly checked in line with available literature so as to ensure that findings have strong backing in the literature. To ensure auditability, the researcher kept adequate record of all notes made during interviews and focus group discussions. To ensure confirmability, findings of this study were derived only from data collected and information provided by participants. Findings were not based on any other external information that was not directly collected in this study.

5.5 Reflexivity and Positionality of the Researcher

When conducting a qualitative study, it is essential that the researcher constantly examines his or her feelings, reactions, and motives, focusing on how these affect the outcome of research (Dodgson, 2019). This is due to the fact it is common for the prior experiences of researchers to introduce biases into the conduct of research and the analysis of results (Dodgson, 2019). Therefore, constant reflection of prior experiences and their impact on the research process, as well as conscious queries of the researcher's values, have been indicated as ways of ensuring that a researcher's position does not affect the research itself (Haynes, 2012).

Reflexivity was implemented in this study in two major ways: in the first instance, I maintained a reflexive diary throughout this research, in which I documented actions and the rationales behind them, while also describing my feelings at the time actions were being carried out, particularly those I perceived during the focus group discussions and the semi-structured interviews. This diary later became very useful during the interpretation of results and was helpful in facilitating the isolation of my previous experience from the comments of participants, thereby increasing the trustworthiness of the findings of this research. The use of a reflective diary (as implemented in this thesis) and the associated benefits of it have been reported by Hewitt (2017). Likewise, regular self-questioning and interrogation of the researcher's background, beliefs, and prior experience during the research process have been identified as a way of maintaining reflexivity (Hewitt, 2017). This is particularly relevant to this study considering my previous working experience and knowledge of healthcare systems

in the KSA. Ensuring that I regularly engaged in this action of self-reflection during data collection and interpretation helped me to maintain an awareness of my own biases.

As mentioned earlier in Chapter 1, I am a registered nurse in the KSA with first-hand experience with nursing education and practice, as well as emergency response in the KSA. Furthermore, I understand and speak the local language of the participants and have a good understanding of the geographical location and the history of disasters in the areas selected for this study. Therefore, it was imperative to ensure that these attributes do not affect the conduct of the study and the interpretation of results.

Despite the risk of biases, my prior knowledge and working experience were in fact beneficial to the conduct of this research. In the first instance, the fact that the researcher had trained and worked as a nurse in the KSA was instrumental in having a proper understanding of the structure of nursing education and state of nursing practices in the KSA. In addition, this understanding of the national structure for nursing practice in the KSA informed the design of the research, particularly when selecting the types of hospitals to include as cases and determining where meaningful data may be collected. Also, my understanding of geographical variance within the country facilitated the selection of hospitals across the different geographical regions of the KSA. Moreover, the fact that the researcher understands the local language and culture helped ensure that ethical approval was granted by Saudi authorities. Moreover, while he led the focus group discussions, the researcher was also able to read the participants information sheet to participants and interpret some questions in the local language to facilitate effective data collection as a result of this knowledge.

However, in one of the case hospitals visited, some of the participants were initially reluctant to participate in the research as they recognised the researcher as a former senior nursing officer. The researcher had to convince these participants that the focus group discussions were for the purpose of research alone and were not a performance appraisal, after which these participants freely participated in the research. This experience, on one hand, represented one of the limitations that the positionality of the researcher caused in this study. In order to overcome this, the researcher worked with a gatekeeper who facilitated data collection in other case hospitals. Furthermore, due to in-depth understanding of the research location, it is possible for the researcher's bias to set in. To minimise bias, the researcher ensured that there were second opinions when it came to issues such as hospital selection and participant recruitment. The gatekeeper, who was less familiar with these areas, was allowed

to lead the project in areas where the researcher envisaged that a high level of his bias may interfere with data collection and/or analysis.

5.6 The Study's Limitations

The implementation of this study was not without challenges, which the researcher encountered at different stages of the research. Details of how these challenges were addressed (or otherwise) and their implications for findings reported in this study are highlighted below:

1. The official language in Saudi Arabia is Arabic, and much of the data collected in this research (such as the ERPs and interviews) were written in Arabic. Though stringent efforts were made to translate these data correctly and accurately, it is possible that some key information may have been lost during the translation to the English language.

2. The researcher noticed that some of the participants selected for focus group discussions were initially afraid to speak freely. Efforts were made to allay fears and to get these participants to participate in the study freely. However, it is possible that some of the respondents may have still held back some useful information about disaster nursing in the KSA.

3. The number of policymakers and educators interviewed in this study was quite small and it is possible that there are other policymakers and educators whose knowledge of disaster nursing and perceptions of the needs of nurses differ from those selected for this study.

4. This study only investigated hospitals from pre-selected towns for data collection. It may be possible that this study had omitted some hospitals with certain characteristics that could affect the findings of this study.

5. This study adopts a case study approach, and case studies are often criticised for lacking scientific rigour, a basis for the generalisation of results, and risking the possibility of researcher's bias affecting results and causing difficulty in replicating the study. These may have some implications on future applications on the findings of this study.

5.7 Conclusion

This chapter has presented a detailed description of the method adopted for data collection as well as data analysis techniques used in this study. In the first instance, the chapter discussed the process used for the recruitment of participants. Also, methods used for the extraction of data from Emergency Response Plans collected from each selected hospital, as well as data analysis techniques for data collected from focus group discussions and semi-structured interviews, were also described in this chapter. In addition, the approach used in assessing the validity and reliability of instruments for data collection was also described in this chapter. Finally, the positionality of researcher, as well as potential limitations of the study, have been presented in this chapter. The subsequent chapter will present findings of this study that were derived from Emergency Response Plans, the focus groups discussions with nurses, and semi-structured interviews held with academics and policymakers.

Chapter Six: Results

6.1 Introduction

This chapter presents data collected from the various data collection activities conducted as part of this study. To commence, a description of the profiles of the hospitals from which ERPs were collected and in which focus group discussions were held will be provided. Thereafter, findings from the review of the ERPs collected from these hospitals will be discussed alongside highlights of any similarities and differences between these ERPs, as well as an overview of their adequacy with respect to effective disaster response and management. This will be followed by a presentation of data collected from focus group discussions across the six hospitals, in which a brief summary of the report from each focus group discussions (together with key highlights of results) will be provided, after which reports of the two interviews conducted with university lecturers and the two interviews conducted with policymakers will be presented. This data will then be analysed in a subsequent chapter.

6.2 Hospital Profiles

Six case hospitals were included in this study: details of the capacity, location, available services, and nursing staff capacity of selected hospitals are summarised in Table 6.1. The first case is a hospital located in the city of Mecca, the KSA. The hospital occupies a floor area of 10,000 meters and is a 3-story building with a capacity for over 500 beds scattered across three campuses. It hosts several departments, including the accident and emergency department, outpatient department, haemodialysis, the operation room, the intensive care unit, male and female medical departments, male and female surgical department, radiology department, laboratory, and the blood bank. Other units within the hospital include infection control, quality management, respiratory therapy, physiotherapy, patient safety, the pharmacy, nursing, and the administrative unit. Concerning its nursing strength, this hospital has a total number of 687 nurses, 60% of whom have Saudi origins. The hospital also has robust disaster response capabilities due to the annual Hajj, which takes place in locations very close to the hospital. Available reports indicate that unique medical situations are caused in Hajj, as Emergency Departments receive increased amounts of patients.

The second case is a 100-bed hospital located in the city of Dhahran Al Janub. The hospital was founded in 2004, and departments within the hospital include the emergency department, outpatient department, kidney dialysis and departments for general specialties such as surgery, internal surgery, urology, eyes, gynaecology and paediatrics. There are approximately 400 medical staff members at this hospital, including 89 nurses, 35 nurses of whom are originally from the KSA. The majority (26) of these Saudi nurses are female. The hospital's Emergency Department provides various types of emergency care, especially for patients who are exposed to acute and sudden illnesses and victims of accidental injuries. The department has a triage room, a male observation room, a female screening room, and a 2-bed capacity cardiac resuscitation room. The department is connected to other parts of the hospital, such as the internal patient ward, surgical patients' ward, and the intensive care unit. The department also works together with the external medical services unit to make referrals and to transfer patients to other hospitals when advanced care is required. The emergency department employs nine nurses who are distributed over three shifts per day. Following the start of the Yemen war, the Emergency Department has been divided into four sections, namely the red zone (which contains three to eight beds and is used as the male treatment room), the yellow zone (which contains three to fifteen beds and is used as the female treatment room), the green zone (which is used as nurses' resting room) and the black zone (which is used as a temporary morgue). The clinical capacity in the triage room was increased from one bed to three beds due to war within the area.

The third case is a hospital located in the city of Jeddah, a central hub for pilgrims to Mecca. Jeddah is a city falling within the Mecca Region of the Western Province of the KSA. The city is located in the middle of the Eastern Red Sea coast near the Lower Hijaz Mountains, and is surrounded by Sudan, Egypt, and Eritrea. Jeddah has a total area of 74,762 square kilometres and represents approximately 3% of the total area of the KSA (2,250,000 square kilometres). Indeed, Jeddah derived its historical importance from being considered the port of Mecca, the holiest city in the world for Muslims. Therefore, the majority of Muslim pilgrims pass through Jeddah on their way to the holy cities of Mecca and Medina. Jeddah is the first stop where pilgrims from all over the world land on their way to Mecca, arriving through its international airport and seaport. Jeddah is also a major trading centre characterised by heavy traffic, popular and modern high-end shopping malls, markets, and industries. These make Jeddah one of the most attractive cities in the KSA to tourists and travellers. The hospital has a capacity of 707 beds and is a medical training centre and is the

largest hospital operating under the Ministry of Health in the region. Therefore, it is a highly regarded educational hospital that provides specialised and educational health services to all patients with highly qualified medical staff and advanced equipment. It provides many specialised services in disease diagnosis and treatment services through its internal departments, and in addition to its emergency services unit, the hospital has an intensive care unit, departments of cardiology, bariatric surgery, and many other medical services. The hospital also has a substantial number of highly qualified and well-trained technical staff members. These include 904 nurses, 51% of whom hail from the KSA. The hospital serves as a referral centre for all primary care, secondary care, and even private health care facilities within the region.

The fourth case is a hospital established in 1980 in the City of Tabuk. The hospital has a capacity of 450 beds and provides over 27 different specialty care services, making it the largest hospital in the region. The hospital is also a key referral and training centre for the Northwest region of the KSA. Key departments within the hospital include the dermatology, nephrology, urology, paediatric, and the surgical department which provides both plastic and general surgery services, in addition to a family clinic operated by the hospital. The hospital has a total number of 904 medical staff, including 596 nurses, of which 64% are of Saudi origin.

The fifth case is a hospital located in the city of Arar, located in northern Saudi Arabia near the Iraqi border. The hospital was established in 1975 with an initial capacity of 50 beds. This was subsequently increased to 300 beds when several specialty services were introduced into the hospital. The hospital serves more than 400,000 people, and it is the reference hospital for residents of the northern border region. In addition to the internal departments and the speech and speech department, as well as the kidney centre, the hospital has an outpatient department comprising of 35 clinics that serve most medical specialties, such as general surgery, neurosurgery, plastic surgery, urology, ophthalmology, and the paediatric surgery. The hospital also created a one-day surgery department, which serves the patients by performing operations and discharging patients on the same day. The hospital has a total number of 524 medical staff, including 370 nurses, of which 56% are of Saudi origin.

The last case is a general hospital in Madinah, the KSA. Established in 1980, this hospital is the first reference hospital for the Madinah region and has a 500 bed capacity. The hospital offers health services in various specialties, including neurology, general surgery,

gastrointestinal and endoscopy, nephrology, orthopaedic surgery, physical therapy, as well as other specialised medical disciplines. It also has a department that specialises in training students from colleges and health institutes. The hospital consists of five floors, and in addition to other facilities, has an intensive care unit with a capacity of 64 beds that is equipped with the latest medical technology and is supported by medical personnel qualified to deal with critical medical cases. The surgical suite developed at the hospital has a capacity of eight operating rooms, covering all surgical specialties to provide the best medical services. Furthermore, the hospital's Stroke Unit has a capacity of ten beds. Available data indicates that the hospital has provided care for 258,412 patients, with 135,803 emergencies and 132,609 outpatients. The hospital has a total of 1244 medical staff, including 832 nurses, of which 71% are of Saudi origin. Like the case hospital in Mecca, the hospital in Madinah also sees a large number of patients visiting the city for pilgrimage.

Table 6.1: Profiles of Selected Case Hospitals

Case No	Location of Hospital	Bed Capacity	Nursing Staff Capacity	Percentage of Nurses with KSA Origin	Availability of Emergency Services
1	Mecca	500	687	60%	Yes
2	Dhahran Al Janub	100	89	39.3%	Yes
3	Jeddah	707	904	51%	Yes
4	Tabuk	450	596	64%	Yes
5	Arar	300	370	56%	Yes
6	Madinah Munawarah	500	832	71%	Yes

Table 6.1 provides a summary of the aforementioned quantitative information concerning the six hospitals selected as cases for this study. Data presented in Table 6.1 indicate that the bed capacities range from 100 beds in the first case hospital located in Dhahran Al Janub to 707 beds in the third case hospital located in Jeddah. Concerning the capacity of nursing staff, the largest number (904 nurses) was found in the Jeddah hospital, contrasting with a mere 89 nurses in the Dahran Al Janub hospital. This is not surprising considering that the hospital is a relatively large hospital and is indeed one of the oldest hospitals in the region. As was mentioned, Jeddah is a city of historical and contemporary importance as a result of its status as the port of Mecca, the holiest city in the world for Muslims. By contrast, Case Hospital 2, located in Dahran Al Janub, has a small number of nurses, as after the Yemen war started, the hospital became a field hospital to treat and transfer patents from the southern border of the KSA to deferent hospitals in the KSA. Furthermore, Despite Case Hospital 1 and 6 having

the same bed capacity of 500 beds, Case Hospital 6 has a larger quantity of nurses, numbering at 832 nurses, 71% of whom are of Saudi origin, which is the largest percentage of Saudi nurses, compared with 39% of nurses in Case Hospital 2. This is likely because the hospital delivers health care for both the local population and to people visiting the second holiest mosque for Muslims – the Prophet's Mosque in Madinah – with emergency departments seeing the bulk of patients.

These hospitals are major hospitals in each region, and it is therefore not surprising that nurses with several years of experience were available for recruitment in this study. The selection of these hospitals was purposively based on this diverse geographical spread across the country, as well as the fact that the diverse regions of the KSA in which these hospitals are located are exposed to various types of disasters. More importantly, each hospital is considered as an individual case, as each has its own unique culture by which it operates, which may be either similar to or different from another hospital. Moreover, emergency response policies can vary from one hospital to another, as the policy at one hospital will likely be tailored to address disasters that are most common in that hospital's locality.

All locations and sites where data were collected in this thesis are presented in Table 4.1. The cities selected for this study, including Jeddah, Mecca, Madinah, Dhahran Al Janoob, Tabouk, and Arar, have been exposed to major disasters historically. The choice of cities was also determined by the fact that they have each previously been exposed to different types of disasters. For example, Mecca was selected, as it is one of the cities most affected by disasters that arise during the Hajj, and its hospitals have had to manage the heavy burden of treating victims engaged in religious pilgrimages. Table 4.2 summarises previous disasters affecting the selected project sites. It was also ensured that hospitals with a sufficient number of nurses with experiences with disaster response were selected for this study. The hospitals selected were located in the centre of the city, and each hospital had the greatest number of staff in the region and served as an umbrella hospital for other hospitals in its region.

Each hospital was the first hospital to respond to disasters and to receive victims in the case of any disaster that takes place in the city in which they are located. In addition, these hospitals have the capacity to supply staff members to other hospitals in the region, both in which they are located and other regions, when support is required in the event of an emergency. Furthermore, different hospitals were selected to provide an opportunity to recruit participants with varying views concerning the research topic, further enriching the

data. This also resulted in acquiring the most experienced disaster response workers who have the necessary experience to participate in this study. This, therefore, provided the researcher with the opportunity to collect data spanning across a wide range of disaster response experiences, which makes the collected data for response plan applicable to several disasters.

6.3 Emergency Services in Selected Hospitals

The objective of this study centres on the assessment of the current level of knowledge/skills and the performance of emergency nurses in relation to disaster preparedness and response in the KSA. As a first step in achieving this objective, a review of emergency services in selected hospitals was carried out to ensure that the researcher has a solid understanding of the environment in which nurses and emergency service directors recruited for this study work. This additionally enables the researcher to have a better understanding of the adequacy (or lack thereof) of ERPs collected from selected organisation and to further understand the perspectives of nurses expressed during focus group discussions. In addition, doing so prepared the researcher and facilitated deeper insights into the manner in which existing policies are being implemented, while also imparting a clearer understanding of challenges highlighted by nursing educators and policymakers during semi-structured interviews conducted in this study.

Site visits conducted in this case study indicated that all hospitals selected as cases have emergency services department, though the capacity of emergency departments as well as the scope of services provided differ from one case to the other. For instance, the Emergency Services Department at Case Hospital 1 has a capacity of 53 beds and provides a range of medical and surgical services. It was also observed that the hospital provides quality healthcare, patient safety, and customer service to the local community. This department covers emergency cases including lifesaving procedures, pain control, diagnosis, and differential diagnosis work-up. Furthermore, the hospital provides medical services for citizens, visitors, and expatriates, particularly during Hajj seasons, when about approximately two million Muslims commit to their pilgrimage, with most made up of elderly people who come from a variety of countries, have different social backgrounds, and suffer from various health issues. Hajj and its related rituals are performed over a short period, which consequently results in over-crowding and mass movement that threatens to cause crowd crush incidents and related disasters. Additionally, during this period of Hajj, the weather is

normally very hot, at times reaching 48°C. The Red Crescent or medical Hajj missions deliver the majority of emergency cases to this hospital, as do the relatives and friends of many patients. In addition to medical problems, other problems that contribute to challenges within the emergency department include language barriers, differences in cultural inclination, and overcrowding in the emergency room itself.

The nature of Emergency Services in Case Hospital 2 is likewise similar to Case 1 in many regards. However, the scale of emergency response ongoing at the hospital is not related to Hajj but due to ongoing war between the Alhawithi Militia in Yemen and the KSA. As a result, the hospital is often described as a field hospital for war. To ensure adequate response to this situation, it was observed that the hospital often receives support from other medical staff, such as nurses from other hospitals across the KSA, in order to increase the number of emergency staff to ten per shift and to increase the total number of nurses to 35 per shift. Meanwhile, in cases of major injuries, nurses are transferred from internal departments of the hospital to support the Emergency Department. Case Hospital 2 also has a chemical disinfection unit in which nurses are trained to work in a simplified manner.

The emergency services department at Case Hospital 3 is composed of eight main units, including reception, case screening, rapid detection, intensive care, and respiratory insulation. This hospital receives the highest number of people seeking emergency medical attention within the province where it is located, and like Case Hospital 1, the emergency unit at this hospital provides all necessary treatment services for pilgrims during the annual Hajj season. The hospital has an integrated plan to provide the finest healthcare and medical services to pilgrims to the Holy Mosque in Mecca. The plan focuses on strengthening the hospital's potential with special attention emergency departments and intensive care units and aims to provide quality medical and emergency services as may be required during annual Hajj seasons. The plan also includes the preparation of a medical convoy that will help the pilgrims who are in the hospital to move to Mecca to complete their pilgrimage while accompanied by a medical officer and a nursing team capable of monitoring their health. The convoy of sick pilgrims is another medical convoy that transports pilgrims whose health condition requires special care and helps them to ascend Mt. Arafat to complete their rituals. In addition, the Saudi Ministry of Health often prepares seasonal hospitals that operate in conjunction with the Case 3 hospital to provide emergency response capabilities in locations where Hajj takes places. These are supported by medical staff to ensure the health

and safety of pilgrims and to provide medical services such as general surgery and other types of treatment that may be required.

The Emergency Department at Case Hospital 4 has a total capacity of 50 beds. The department is divided into the patient reception area staffed by 2 employees and the visual triage room, which is staffed by one nurse. After registering the patients and making a visual triage, the patients are moved to the triage room, which has one doctor, one nurse, and two beds. Furthermore, there is a room that contains six male examination beds and six female examination beds. A total of 33 doctors and 60 nurses work within the emergency services department at Case Hospital 4.

At Case Hospital 5, the emergency department consists of several rooms: the triage room has one bed in which cases are sorted. The department also has a critical care room with two beds, observation rooms with 18 beds, a wound dressing and casting room, and a cardiac resuscitation room with a single bed. The department has a total staff strength of 28 nurses and 19 doctors who are divided into three working shifts. Meanwhile, Case Hospital 6 has a smaller emergency services department consisting of a triage room, the green area for examination and rapid procedure with four beds, a minor surgery room, and a plaster room. There is also an isolation area with three rooms within the green area. In the yellow area, there are 22 beds that are used for intermediate cases, examination, preparation for admission, medication administration, and observation. The red zone has 15 beds that are used for critical cases, and is also used as the recovery area, with three beds being isolated for resuscitation cases. The emergency services department at this hospital has a staff strength of 95 nurses in total.

In summary, these hospitals and their emergency departments have a number of noteworthy similarities, such as the extent to which medical services are tailored around the annual Hajj pilgrimage in Case Hospitals 1 and 3 (and to a lesser degree, 6), and the nature in which regional particularities (such as the regional conflict impacting Case Hospital 2). The emergency services offered by each hospital tend to reflect the needs of the region, with larger metropolitan hospitals tending to require larger and more diverse services to meet the needs of its patients, in contrast to the smaller hospitals exemplified by Case Hospitals 2 and 5. Naturally, these local particularities result in a number of differences in the nature of services rendered by each hospital, with Case Hospital 2 operating almost as a military hospital and Case Hospital 3 focusing on providing services that enable the Hajj pilgrimage

to function smoothly. As has been discussed, each hospital will be experienced dealing with particular types of disasters that tend to afflict their region more often than others.

6.4 Data on Emergency Response Plans (ERP) from Selected Hospitals

This section presents data on Emergency Response Plans obtained from selected hospitals. In the first instance, general description of ERPs collected from all the cases in terms of availability and the format of these ERPs will be provided. As indicated in Section 4.7.1, an Emergency Response Plan document details actions that professionals within an hospital need to take during an emergency situation. While the format of ERs can differ significantly from one organisation to another, a properly prepared ERP must cover all forms of disasters that an organisation may be exposed to, list actions that must be taken in the event that these disasters occur, provide details of people with responsibilities during emergency response operations, and identify any necessary training required for effective implementation of the plan (Borell and Eriksson, 2008). All the selected hospitals in this study had one form of ERP or another, and therefore it was possible to collect documents from all the selected hospitals.

6.4.1 ERP from Case Hospital 1

Case Hospital 1 has plans for both internal and external disasters. The analysis revealed that the hospital has a single document divided into two sections, with the first section covering contingency plans for external disasters (defined as disasters not directly affecting the hospital building, its staff, visitors, and patients). The external disaster response section covers procedures for receiving external disaster notifications and details coding systems in place for the identification of the type, severity, and consequences of various disasters. The plan stipulates Code Yellow and Green respectively for the beginning and end of external disasters. Goals of the contingency plan were clearly identified at the beginning of the document. Details of people responsible for the implementation of the plan together with the role assigned to each individual were also clearly identified in the plan. In recognition of the fact that nurses have significant roles to plan in emergency response, key roles were earmarked for nurses in the plan. The internal ERP collected from the hospital is similar in structure and organisation with the external ERP. However, key differences in both plans include the inclusion of floor plans for the different buildings within the hospital, as well as an elaborate evacuation plan in the internal ERP. Like the external ERP, the internal ERP also earmarks responsibilities for key people (especially nurses).

6.4.2 ERP from Case Hospital 2

The ERP collected from Case Hospital 2 is a detailed single plan for both internal and external emergency situations. The document initially provided a working definition of the terms 'emergency' and 'disaster' with the objective of providing readers with a good understanding of events and scenarios covered by the document. In addition, the document provides a list of all disasters that are common in the area, as well as an analysis of the likelihood of each identified risk occurring and the degree of impact and severity each risk entails. The document identified key people with roles to play at the organisational level in the event of a disaster and clearly stipulates the role of each person. External agencies which the hospital may need to work with to effectively respond to a disaster event were listed alongside their contact information, including external ambulance services, the police, the public health department, and blood banks. Tasks required for effective disaster response were identified and protocols to follow while carrying out these tasks were provided in the document. Each protocol was matched with a responsible officer who would coordinate the performance of these tasks in the event of a disaster. There were protocols for reporting protocol and passing communications between the relevant authorities, activating the emergency and disaster centre in the health sector, emergency plan activation protocol and alerts (different colour coding system is provided), safety and security within the health facilities, and patient follow-up (during transportation between health facilities).

The document also has protocols for communicating with patients, sorting, and transferring cases, medical evacuation (ground - air), supporting hospitals and border centres inside or outside the region through rapid intervention, communication between different agencies during emergency, managing clinical capacity, distributing drugs and equipment in the event of shortages, and providing advanced medical care during the event. Detailed protocols for disasters such as chemical spillage, radiation and nuclear disasters, infectious outbreaks, as well as pest and rodent infestation were also provided. Other specialist roles that may be needed during disaster response, such as the provision of psychological and social medical service, contact follow-up, cooperation with external agencies, communication with the media, planning of recovery, monitoring of ports and mortuary services were also detailed by the plan. Sample forms for reporting incidents were provided in the ERP.

6.4.3 ERP from Case Hospital 3

Case Hospital 3 has Emergency Response Plans for both internal and external disasters. This analysis showed that these plans are contained in two different documents which are clearly defined to indicate whether they relate to internal or external emergencies. The analysis of the Internal Disaster Management Plan revealed only a hospital-wide policy addressing fires within the hospital. It was observed that an all-hazard approach has not implemented in the design of the emergency response plan, and therefore, there are no provisions within the plan for other intra-hospital emergencies that may occur in Case Hospital 3. However, the plan made provisions for working in collaboration with the social services to provide support for victims of internal disasters. Also, no reference to other government emergency-related policies was highlighted in this ERP. The internal ERP made provisions for all different users of the hospital that may be affected during a fire disaster, including staff, visitors, and patients.

The relevance of the External Disaster Management Plan to the local community where the hospital is located is apparent, as it referred to Hajj, a major disaster-prone event in the area. It also highlighted other disasters that are relevant to the area based on the high commercial and industrial activities earlier highlighted for Jeddah. In contrast to the internal ERP, the external ERP in the hospital adopted an all-hazard approach to emergency preparedness by making the response plan applicable to several disasters. The plan particularly highlighted and makes plans for disasters such as floods, bioterrorism attacks, bomb threats, hostage situations, and disease outbreaks. Moreover, the plan details connections and collaborative working arrangements with social services, the police, Red Cross, and the Civil Defence. The plan also highlighted national policies which are relevant to how the hospital can work together with these aforementioned agencies in responding to disasters. Like the internal ERP, the external ERP also adequately made provisions for all categories of people that may be affected by a disaster. Both plans provide a coding system for the identification of the type and severity and the end of the disaster. These plans use the universal Codes Yellow and Green for the beginning and end of external disasters and Code Red for the most severe form of disaster. In addition, details of people responsible for the implementation of the plan together with the role assigned to each individual were clearly identified in the plan.

6.4.4 ERP from Case Hospital 4

The ERP obtained from Case Hospital 4 is provides a plan to deal with crises, disasters, and multiple injuries events. The plan provides a definition of disaster and its scope covers both internal and external disasters. The objectives of the plan were clearly stated, and it covers different stages of responding to disasters, detailing actions required before the incident, during the incident, and after the incident. The plan is designed around the disaster lifecycle model, and provided an inventory of hazards that are relevant to the hospital together with their impact analysis. Identified hazards were divided into human, technological, material, and natural hazards, and a comprehensive all-hazard vulnerability assessment is included in the plan. Details of collaboration with other health agencies and policymakers are also highlighted in the plan.

Additionally, the organisational structure of people responsible for organising responses to emergencies is provided in the ERP. Protocols and procedures provided in the plan covered all stages of the disaster life cycle, highlighting individuals responsible for particular tasks. Command and control levels for emergency response were also described in the plan, which includes protocols for activating the plan, communication during the response activities, triage and classification of patients, incident recording and documentation, case distribution, provision of medical attention, and activities to be carried out in the various departments of the hospital. Protocols concerning the patients' follow-up during transportation, the provision of medical supplies, public engagement, media handling, and post-disaster work are also provided. Procedures for responding to chemical and radiation-related disasters, providing blood, conducting epidemiological investigations, and managing foodborne diseases are also provided in the plan.

6.4.5 ERP from Case Hospital 5

Case Hospital 5 also provides a detailed ERP, which is a single document that provides an initial hazard vulnerability assessment prior to the stipulation of protocols for responding to various hazards. The document identifies all disasters that the hospital is vulnerable to and categorises them as technological, man-made, hazardous materials related, and natural disasters. An impact analysis of the most common disasters is also provided in the ERP. The document provides an organisational structure of people responsible for emergency response within the hospital, listing names and contact details of currently-employed individuals with

roles in disaster response. Roles to be played before disaster struck are assigned for members of the command-and-control team in the document, and the ERP also has role cards for members of emergency response team. A security plan to be carried out during emergencies was provided in the document, as well as protocols for several emergency response activities. These include protocols for the transportation of victims, patient information, triage procedures for the injured, medical evaluation, receiving injured people, providing medical support, event communication, clinical capacity management, the provision of drugs and medical equipment in the cases of shortage.

Moreover, the ERP has protocols for the provision of advanced medical care, chemical disinfection, caring for patients exposed to toxic gases, dealing with terrorist situations, radiation and nuclear disinfection, saving blood and its derivatives, epidemiological investigation and contact follow-up, hospital preparation and communication, and the investigation of foodborne disease outbreaks. Other activities covered in the document include the provision of mental and social services, the maintenance of ambulance services, entomological investigation and pest control, reporting, periodic updates and information exchange, collaboration with external agencies and government departments, support for disaster response inside and outside the hospital, coordination of response teams, event expiration, recovery, media communication and mortuary services management. Templates for recording data and reporting events, as well as the contact details of relevant external agencies are provided, including other hospitals in the region, the ministry of health, and the public health department. No reference to the police or other law enforcement agents or charities such as the Red Cross was made in the document.

6.4.6 ERP from Case Hospital 6

The analysis of documents collected from Case Hospital 6 indicates that the hospital has Emergency response plan for both internal and external disasters. This analysis found that these plans are contained in two different documents, both of which are clearly defined to indicate whether they relate to internal or external emergencies. The analysis of the Internal Disaster Management Plan demonstrated that the policy is a hospital-wide policy largely focusing on incidences of fire within the hospital, although some references to other forms of potential internal disasters were made within the document. Regrettably, procedures and roles allotted within the document did not address these other identified disasters. There is no indication of an all-hazard approach or hazard vulnerability assessment in the internal plan of

this hospital. Reference to other agencies, such as the Civil Defence and Red Cross, were made in the document. References to hospital policies, but not government emergency-related policies, were also highlighted in this ERP. The internal ERP made provisions for all different users of the hospital that may be affected during a fire, including staff, visitors, and patients. Lastly, there are plans for staff training and performance improvement measures within the ERP.

The External Disaster Management Plan at this hospital is more elaborate and detailed compared with the internal plan. It provided a definition of external disasters as disastrous events occurring outside the hospital but within the region, and established a Yellow Alert for activating the plan. Triage areas separated into red, yellow, green, and black areas are likewise identified. The names and contact details of responsible individuals are provided, and the plan made provisions for the creation of a disaster command centre. However, the plan limited the scope of external disasters to general surgical cases, urology cases, poisoning cases, orthopaedic cases, suffocation by toxic gases, outbreaks of infectious diseases, intensive care services for adult and children, and laboratory and diagnostic services. There is no information regarding how these were recognised as hazards and there seems to be confusion about services provided in the hospital and hazardous risks facing the hospital within the plan. The purpose of the plan is clearly stated, and relevant policies and people responsible for drafting hospital wide policies are highlighted.

In addition, the role of the hospital in national-level disaster responses was highlighted in the document, and a section on risk assessment is provided. However, the section simply listed mass casualty incidents and epidemics without a proper hazard vulnerability assessment. Plans for the backup of essential resources such as water, electricity, fuel, nitrous oxide, and other gases are provided, and the ERP has plans for community coordination and transfer of patients. Details of collaboration with the police and security forces to ensure the transportation and evacuation of victims are provided in the plan. The document contains plans for the provision of medical/non-medical supplies and stipulates a role for the media information centre. Roles for managers, department heads, ER managers, admin officers, nurses, and other positions within the hospital are highlighted in relation to their roles in emergency response. The procedure for the termination of disaster response is also highlighted, as well as plans for the review of the ERP, education of service-providers, and performance indicators were also stated in the plan. The plan stipulates task card's goals and

roles for responsible officers, and contains a programme for orientation and education as well as performance improvement measures.

6.4.7 Emerging Findings from the Analysis of ERPs

Following an analysis of all ERPs collected from all the selected hospitals, the following emerging findings were discovered:

1. All selected hospitals have ERPs in place, although the format of the ERP differs significantly from one hospital to another. Moreover, while in some cases both internal and external ERPs were developed in a single document, other hospitals have separate ERPs for internal and external emergencies

2. ERPs from all selected hospitals addressed issues that pertinent to them at varying degrees of comprehensiveness. The coverage ranged from a mere listing of probable local hazards in some hospitals to detailed plans on how to respond to local emergency situations.

3. Plans to work collaboratively with external agencies in response to disasters vary significantly across the hospitals selected for this study. While the ERP collected from some hospitals provided adequate links to external governmental and non-governmental agencies, ERPs from some other hospitals only provided links to governmental organisations and external links were completely absent.

4. ERPs collected from majority of selected hospitals lack a comprehensive response plan for all types of hospital users. The majority of these plans are generic and do not specifically identify users that are catered for.

A detailed analysis of these themes using OECD-DAC criteria is provided in Section 7.3 of this thesis.

6.5 Data from Focus Group Discussions

6.5.1 Participant Profiles

Details of how participants for the focus group discussions conducted in this study were recruited have been provided in Section 5.2. Table 6.2 provides a summary of the demographic characteristics of participants recruited for the focus group discussions held at

the six hospitals selected as cases for this study. Data presented in Table 6.2 indicates that total number of participants selected for the focus group discussions ranged from 6 (for Cases 1, 2, 3 and 6) to 8 (for Case 5). Concerning the amount of years of experience among participants, the majority (67%) of participants at the focus group discussions held in Case Hospital 1 had between 5 and 10 years of working experience. The mean year of experience for the hospital was 9.7 years, which is indicative of sufficient years of experience to meaningfully contribute to discussions during the meeting. This is not surprising considering that the hospital is a relatively large hospital and is one of the oldest hospitals in the region.

For Case Hospital 2, 50% of participants at the focus group discussions had between 0 to 5 years of working experience, while the remaining half have between 6 and 10 years of working experience. The mean year of experience for the entire group was 6.2 years, an observation similar to Case Hospital 3, which has 50% participants with 0 to 5 years working experience, 17% with 6 to 10 years' experience, and 33% with more than 10 years' experience. However, the majority of the participants at the focus group discussions held at Case 4 (43%) and Case 6 (50%) had more than 10 years of working experience. These hospitals are very old hospitals, and therefore it is not surprising that nurses with substantial years of experience were available for recruitment in this study. The mean year of experience for Case 4 and Case 6 were observed at 6.9 years and 8.8 years respectively. However, data obtained for Case 5 indicated that the number of participants with 0-5 years of experience is equal to the number of participants with more than 10 years of experience (38%). This resulted in a mean year of experience of 8.9 years for the participants at the focus group discussions held at that hospital. Across all cases, there is an equal number of participants from the three categories experience in this study (33.3%) each. This indicates a balance in terms of the years of experience brought to discussions at the six focus group discussions held in this study.

Table 6.2: Demographic Profiles of Focus Group Discussions Participants

Description	Frequency (%)						
	Case 1 (n = 6)	Case 2 (n = 6)	Case 3 (n = 6)	Case 4 (n = 7)	Case 5 (n = 8)	Case 6 (n = 6)	All cases (n = 39)
Yrs of experience							
0 – 5	0 (0%)	3 (50%)	3 (50%)	2 (29%)	3 (38%)	2 (33%)	13 (33.3%)
6- 10	4 (67%)	3 (50%)	1 (17%)	2 (29%)	2 (25%)	1 (17%)	13(33.3%)
> 10 years	2 (33%)	0 (0%)	2 (33%)	3 (43%)	3 (38%)	3 (50%)	13 (33.3%)
Qualification							
Nursing Diploma	3 (50%)	3 (50%)	2 (33%)	2 (29%)	4 (50%)	3 (50%)	17 (43.6%)
B.Sc	3 (50%)	3 (50%)	4 (67%)	4 (57%)	4 (50%)	3 (50%)	21 (53.8%)
Postgraduate	0 (0%)	0 (0%)	0 (0%)	1 (14%)	0 (0%)	0 (0%)	1 (3.6%)
Gender							
Male	3 (50%)	1(17%)	2 (33%)	3 (43%)	4 (50%)	1 (17%)	14 (35.9%)
Female	3 (50%)	5 (83%)	4 (67%)	4 (57%)	4 (50%)	5 (83%)	25 (64.1%)

In regard to the level of qualification, nurses in Case Hospitals 1 & 2 either have nursing diplomas or BSc degrees in nursing, and none of the participants from these hospitals have a postgraduate degree in nursing. A similar distribution was observed at Case Hospitals 5 & 6. However, the majority of participants from Case Hospital 3 (67%) and Case Hospital 4 (57%) hold B.Sc. degrees in nursing, and the only participant with a postgraduate degree in nursing was observed in Case 4. Overall, 53.8% of nurses selected for focus group discussions held a B.Sc degree in nursing and 43.6% had nursing diploma, with only a single nurse (3.6%) having a postgraduate degree. The distribution of participants based on gender indicated that an equal number of male and female participants was selected in Case 1 and Case 5 hospitals. However, the majority of participants at Case Hospitals 2 (83%), 3 (67%), 4 (57%) and 6 (83%) were female. Overall, female participants constituted 64.1% of respondents across all focus group discussions.

6.5.2 Analysis of Focus Group Discussions Data based on Key Areas of Emergency Preparedness and Response

Details of how data from focus group discussions was organised and coded have been provided in Section 5.3.2. The coding of the transcript of the six Focus group discussions conducted in this study was carried out manually. Based on the objectives of this study, five key areas of emergency preparedness and response were identified (as previously described in Section 5.3.2), including:

(a) Participants' experience of disaster response

(b) Participants' knowledge of an Emergency Response Plan and participation in the development of the plan

(c) Training on emergency response received by participants.

(d) Gaps in knowledge of emergency response indicated by participants.

(e) Challenges associated with effective emergency response that could be addressed by training.

Data on the number of times that comments relating to each of these key areas were made across all the six cases is presented in Table 6.2 and subsequently discussed in this section. Data presented in Table 6.2 indicated that there were 37 comments relating to participants' experience of disaster response across all the six selected cases. The analysis indicated that 21.6% of these comments were made by participants in Case 2, while related comments made in Case 5 and Case 6 accounted for 18.9% of all comments relating to this theme. This data is consistent with the fact that nurses from these hospitals have higher mean years of experience, and therefore are more likely to have witnessed more disasters than nurses with fewer years of experience. Data presented in Table 6.3 further indicated that the least number of comments across the six cases was obtained concerning the participants' knowledge of an Emergency Response Plan and participation in the development of the plan.

Table 6.3: Analysis of Comments on Key Areas of Emergency Preparedness and Response made during Focus Group Discussions Conducted across Selected Hospitals

Key areas of emergency preparedness and response	Cases (Frequency (%))						Total
	1	2	3	4	5	6	
Participants' experience of disaster response	5 (13.5)	8 (21.6)	4 (10.8)	6 (16.2)	7 (18.9)	7 (18.9)	37
Participants' knowledge of Emergency response plan and participation in the development of the plan	7 (17.1)	9 (21.9)	8 (19.5)	4 (9.7)	7 (17.1)	6 (14.6)	41
Training on emergency response received by participants	9 (15.3)	9 (15.3)	10 (16.9)	11 (18.6)	12 (20.3)	8 (13.6)	59
Gaps in knowledge of emergency response indicated by participants	7 (11.9)	10 (16.9)	7 (11.9)	11 (18.6)	15 (25.4)	9 (15.3)	59
Challenges associated with effective emergency response that could be addressed by training	8 (18.6)	6 (14.0)	8 (18.6)	8 (18.6)	7 (16.3)	6 (14.0)	43

There were a similar number of comments obtained concerning the participants' knowledge of an Emergency Response Plan and participation in the development of the plan (41) and challenges associated with effective emergency response that could be addressed by training (43). While participants in Case Hospital 2 made the most comments relating to participants' experience of disaster response (21.6%) and participant's knowledge of Emergency response plan and participation in the development of the plan (21.9%), Cases 1, 3, and 4 had the greatest number of comments (18.6%) for challenges associated with effective emergency response that could be addressed by training. An equal number of comments (59) was obtained concerning training on emergency response received by participants and gaps in knowledge of emergency response indicated by participants and the highest number of comments (20.3% and 25.4%, respectively) were made by participants in Case Hospital 5 for these codes.

The comparison of data presented in Table 6.3 across the different Case Hospitals revealed that nurses from Case Hospital 2 have the most experience with disaster response while those from Case Hospital 3 have the least. Case Hospitals 5 and 6 produced a similar number of comments while only 5 comments were observed for Case 1. This disparity may be due to differences in the age of establishment of these different healthcare facilities. A similar but slightly different trend was observed concerning knowledge of ERPs and participation in

their development. Nurses from Case Hospital 2 seem to have better engagement with the process, while those from Case Hospital 4 indicated the least number of comments in this regard. Across all the case hospitals, similarities in the frequency of comments on emergency response training received by nurses were observed. Although Case Hospital 5 produced the highest number of comments (12), the lowest number observed (8) in Case Hospital 6 was not significantly less. Concerning reports of gaps in knowledge, nurses from Case 5 made the highest number of comments. This indicates that they may have the largest gap in knowledge, and this may account for the reason the hospital has the largest number of comments related to training. Finally, similar number of comments relating to challenges associated with effective emergency response that could be addressed by training was observed across all the case hospitals. This could be interpreted to mean that nurses across all the selected hospitals are unanimous in their opinion that proper training will provide solutions to the numerous challenges they currently experience.

The analysis of focus group discussions indicates the following results:

1. Participants are aware of their role as first responders during emergency situations and have previous experience of emergency response.

2. The majority of participants are aware that the hospital they work for has an ERP but express poor knowledge of the content; they are largely of the opinion that the implementation of the plan within the hospital is poor.

3. There is a recognizable system of emergency preparedness and response in many of the case hospitals.

4. It was evident that nurses are not involved in the development of ERPs, its implementation plan, and the design of emergency training programmes.

5. The nurses' knowledge of disaster response is very basic, although they are willing to learn.

6. Nurses indicated that their previous training does not adequately prepare them for effectively responding to disasters.

7. Nurses indicated that the hospital faces enormous challenges and cannot provide effective emergency response services.

Further discussion of these results and a presentation of how they inform the overall findings of this thesis will be provided in the next chapter.

6.6 Data from Semi-structured Interviews

6.6.1 Profiles of Interviewees

In line with the aims and objectives of this study, nursing educators and policymakers were recruited and interviewed in this study. Lecturers were selected from nursing schools in the KSA, and policymakers were drawn from the KSA's Ministry of Health. Details of how these participants were recruited have been detailed in Section 5.2. Additionally, details of how these interviews were conducted and how transcripts of interviews were organised and coded have been provided in Section 5.3.2. A demographic analysis of participants interviewed in this study is presented in Table 6.4 below.

Table 6.4: Demographic Profiles of Participants Interviewed

Description	Frequency (%)
Yrs of experience	
0 – 5	0 (0%)
6- 10	3 (75%)
> 10 years	1 (25%)
Role	
Senior/management	4 (100%)
Middle level	0 (00%)
Junior	0 (0%)
Gender	
Male	1 (25%)
Female	3 (75%)

Data presented in Table 6.4 indicates that all participants interviewed in this study have more than 5 years of experience working in their respective roles, either within the academia or as policymakers. Specifically, one of the participants interviewed has 15 years of working experience as a policymaker. Additionally, data in Table 6.4 indicates that all interviewees have senior management roles within their respective organisations. These roles include

responsibilities in strategic planning, as well as research and learning development for policymakers, while those selected from academic institutions also have experience in emergency planning and response implementation within the university. These observations indicate that all participants interviewed have sufficient working experience and are most likely able to give information that is relevant to this study. Moreover, 75% of participants interviewed are women.

6.6.2 Analysis of Semi-structured Data Based on Key Areas of Emergency Preparedness and Response

Data on the number of times that comments relating to each key area of emergency preparedness and response were made across all the four interviews conducted in this study is presented in Table 6.5. Data presented in Table 6.5 indicates that there were 12 comments relating to the availability or lack thereof of disaster preparedness and response content in the existing nursing curriculum. As expected, the majority of these comments were made by nursing educators (24.0% for Interview 1 and 41.7% for Interview 2). However, with respect to comments relating to the availability and effectiveness of short courses/on-the-job-training on disaster preparedness and response, a more even spread of opinions between nursing educators (Interviews 1 and 2) and policymakers (Interviews 3 and 4) was observed. However, nursing educators (70.2% of all comments) provided more information in relation to Key Concepts required for an effective disaster preparedness and response education programme. Similarly, policymakers overwhelmingly provided information (80% of all comments) on policy issues related to training of nurses for emergency preparedness and response (Table 6.4).

Table 6.5: Coding of Themes from Semi-structured Interviews

Key areas of emergency preparedness and response	Interviews				Total
	1	**2**	**3**	**4**	
Disaster preparedness and response in the current nursing curriculum	3 (25.0)	5 (41.7)	2 (16.7)	2 (16.7)	12
Availability and effectiveness of short courses/on-the-job-training on disaster preparedness and response	4 (25.0)	3 (18.8)	5 (31.3)	4 (25.0)	16
Key Concepts required for effective disaster preparedness and response education programme	7 (41.2)	5 (29.4)	3 (17.6)	2 (11.8)	17
Policies and other issues relating to emergency preparedness and response	2 (10.0)	2 (10.0)	7 (35.0)	9 (45.0)	20

Following the analysis presented in Table 6.4 and the generation of summaries of information provided by nursing educators, the following results from the interviews were apparent:

1. Educators indicated that there are no structured disaster response education programmes within current nursing training programmes across the KSA.

2. Available training courses have shortcomings and challenges that render them inadequate to prepare nurses for effective emergency and disaster response.

3. Educators identified key components that an effective disaster training programme should include: namely, basic theoretical and extensive practical knowledge of disaster response.

4. Educators were not particularly knowledgeable regarding policies associated with the training of nurses for emergency response.

Likewise, a summary of the information provided by policymakers indicate the following results:

1. Policymakers are aware of and involved in the development of short courses for emergency training, but there seems to be no national policy for training of nurses in emergency response.

2. Policymakers identified gaps in knowledge and communication skills as a key factor militating against effectively training nurses in emergency response.

3. Policymakers believe that an effective disaster training programme must focus on basic competence in emergency situations and triage.

An analysis of these findings will be presented in the next chapter.

6.7 Conclusion

This chapter has presented a detailed description of the profiles of selected hospitals as well as data obtained from the ERPs obtained from these hospitals. Also, demographic profiles of participants at focus group discussions, observations during the meetings, and results from focus group discussions with respect to key areas of emergency preparedness and response have been provided. Similarly, results emerging from semi-structured interviews conducted with nursing educators and policymakers have been presented. The analysis of these results and how they inform the overall findings of this thesis will be presented in the next chapter.

Chapter Seven: Analysis of Results

7.1 Introduction

The focus of this chapter is to analyse the results presented in Chapter Six in line with the aims and objectives of this study. In the first instance, the analysis of ERPs based on OECD-DAC criteria in each of the selected hospitals will be presented to provide a better understanding of the adequacy (or lack thereof) of the ERPs obtained from these hospitals, as well as background information about the working environment in which nurses in the KSA respond to disasters. This will be followed by a cross-case analysis of data extracted from the ERPs using the OECD-DAC criteria previously detailed in Section 4.9. This chapter will also present the results of thematic analyses of transcripts from focus group discussions and semi-structured interviews conducted in this study. Highlights of how these themes corroborate findings highlighted in Chapter Six for key areas of emergency preparedness and response will also be provided in this chapter. Finally, this chapter will provide a summary of the key findings of this study.

The current study examines requirements for effective disaster nursing education in the KSA by establishing what nurses in the KSA identify as key concepts for educational provisions and support mechanisms that will enable them to contribute effectively to disaster management. The specific objectives of this study include the examination of the current evidence-base that underpins nursing education for emergency preparedness and response in the KSA, which has been addressed by the scoping review conducted and reported in Chapter 3 of this thesis. Specifically, the scoping review indicated a clear need to educate nurses in disaster preparedness and response, a lack of evaluations and appraisals of existing educational programmes, significant gaps present in existing education, and the need for further training of nurses. However, additional information relating to this objective emerging from focus group discussions and semi-structured interviews will be highlighted in this chapter. Another objective of this study is to assess the current level of knowledge and skills in nurses, as well as their performance in relation to disaster preparedness and response in the KSA, and to identify concepts and elements that could prepare nurses effectively to respond to disasters. Conveying how data collected from the review of ERPs, focus group discussions, and semi-structured interviews addressed these objectives is the focus of this chapter.

The analysis of ERPs using OECD-DAC guidelines is a widely used approach in evaluating disaster operation management, as well as other related national development activities (Chainca, 2008; Paciarotti & Valiakhmetova, 2021), which explains the rationale for the adoption of the OECD-DAC guideline in assessing ERPs collected in this study. The use of a thematic analysis approach for the analysis of data collected from Focus group discussions and semi-structured interviews is also a commonly used analysis technique, particularly for studies organised from a constructivist epistemological worldview (Xu & Zammit, 2020). Furthermore, Evans and Lewis (2018) have indicated that the use of thematic analysis in interpreting semi-structured interviews allows researchers to identify the meanings that respondents attach the subject under investigation based on their experiences. The decision to use these methods in this study was based on their ability to help analyse the lived experiences of nurses in regards to emergency preparedness and response.

7.2 Analysis of ERPs Based on OECD-DAC Criteria

A summary of the cross-case analysis employing the OCED-DAC criteria on the ERPs from the six cases selected for this study is presented in Table 7.1. This section provides a breakdown of how ERPs from the selected hospitals meet each of the criteria.

7.2.1 OECD-DAC Relevance Criterion

Document analysis conducted in this study indicated that ERPs from all the six cases satisfy the relevance criterion. The analysis presented in Table 7.1 shows that, even though not all the plans were based on extensive, carefully conducted hazard vulnerability assessments, all ERPs addressed local disaster needs. It was observed that some of the ERPs lacking extensive hazard vulnerability assessments were based on a history of disasters that took place in the region where the case hospitals are located.

It is evident that the ERP used in Case Hospital 1 directly addressed issues local to the hospital. However, specific disasters were not highlighted in either the internal or external ERP. A similar conclusion can be reached for the ERP collected from Case Hospital 2, as the ERP addressed issues local to the hospital and provided an analysis of the likelihood of each disaster presented occurring. For Case Hospital 3, it is clearly shown that both ERPs directly addressed issues local to the hospital and its environment. The external ERP particularly listed all relevant disasters, although the internal ERP only focuses on fires within the

hospital. Observations around Case Hospital 4 proved similar to what was observed for the first three cases, as the analysis demonstrated that the ERP addressed issues local to the hospital and its environment, as it was based on a comprehensive hazard vulnerability assessment of the hospital. For Case 5, the ERP provided protocols that were based on a carefully conducted risk vulnerability assessment of the hospital, ensuring the plan is reflective of local needs. Though no explicit division into internal or external disasters was made in the document, all relevant disasters were listed in the ERP. Also, ERPs from Case Hospital 6 directly addressed issues local to the hospital and its environment, with the external ERP covering additional disasters.

7.2.2 *OECD-DAC* Coherence Criterion

The coherence criterion relates to the analysis of how ERPs collected from selected hospitals involve working with external agencies, and how external policies informed the development of such ERPs. Observations regarding this criterion differed from what was observed for the relevance criterion across the six cases, as only 67% (4 out of the 6) of selected hospital cases fully satisfy this condition, while one other case hospital partially met this criterion. No reference to external agencies was presented in the ERP obtained from Case Hospital 1. Both plans from Case 1 provided no references to relevant external policies (though the international triage card was mentioned in the external ERP). For Case Hospital 2, the plan referred to relevant external agencies and provided their contact details. The protocol approach adopted in the plan satisfies the connectedness criterion of the OECD-DAC guideline, as the protocol can be followed for any type of disaster event, whether short- or long-term events. However, the external ERP from Case Hospital 3 provides links to different relevant external policies while the internal plan only referred to social services. The observation for the ERP from Case Hospital 4 proved similar, with links to external agencies being provided. For Case Hospital 5, limited connections to external agencies were articulated in the ERP, which only provides links to government-related health organisations. Therefore, the cohesion criteria can only be said to be partially satisfied. The criterion can be said to be fully met by the ERP from Case Hospital 6, as its external ERP provides links to different relevant external policies while the internal ERP referred to Civil Defence and Red Cross.

7.2.3 *OECD-DAC* Connectedness Criterion

The fulfilment of the connectedness criterion is similar to what was observed for the relevance criterion among all ERPs. The ERPs from all six hospitals provided procedures and protocols that could be replicated in both short-term and long-term disaster events. However, a careful analysis of the ERPs revealed that the documents from cases 2, 4 and 5 are extremely similar in terms of scope and the arrangements of the protocols. Details of how individual cases meet this criterion are summarised in Table 7.1.

7.2.4 *OECD-DAC* Coverage Criterion

Only a single set of ERPs completely satisfied the coverage criterion, with the other five case hospitals failing to meet the criterion. While the majority of the ERPs attempted to cover all possible hazards that the case may be exposed to, providing extensive protocols for disaster response, they fail to identify how the plan may serve different hospital users or highlight specific needs that various hospital users may have. Even though the ERPs from Case Hospitals 1 and 2 partially satisfy this criterion, only the ERP from Case Hospital 3 completely satisfied the condition. The ERP from Case 1 did not categorically identify individual user groups – such as patients and their families, staff members, contactors, or visitors – but procedures laid out would cater for the needs of these people during emergency. In Case 2, user groups were not directly identified in the plan, even though it does appear to be the case that needs of all categories of people involved in a disaster event were catered for. However, for Case 3, both Internal and external ERPs collected from the hospital categorically identify individual user groups that may need to be catered for during emergency.

Table 7.1: Cross-case Analysis of ERPs from Selected Hospitals

Cases	OECD-DAC Criteria			
	Relevance	**Coherence**	**Connectedness**	**Coverage**
Case 1	Case 1 hospital directly addressed issues that are local to the hospital. However, specific disasters were not highlighted in both the internal and external ERP Conclusion = Satisfied	Both internal and external plans provided no link to different relevant external policies (though the international triage card was mentioned in the external ERP) Conclusion = Not satisfied	Procedures detailed in both plans can be broadly applied to cover short-term and long-term disasters Conclusion = Satisfied	Procedures described adequately covered all hospital users, even though these users were not explicitly stated Conclusion: Partially satisfied
Case 2	The document listed and analysed the likelihood of common disasters within the locality of the hospital Conclusion = Satisfied	The plan referred to and provided contact details of relevant external agencies Conclusion = Satisfied	Protocols provided in the plan can be followed for any type of disaster event, whether short- or long-term events Conclusion = Satisfied	User groups were not identified in the plan even though it does appear that needs of all categories of people involved in a disaster event were catered for Conclusion = Partially satisfied
Case 3	It is clearly shown that both ERP at this hospital directly addressed issues that are local to the hospital and its environment Conclusion = Satisfied	The external ERP provides links to different relevant external policies while the internal plan only referred to social services Conclusion = Satisfied	The applicability of both the internal and external ERPs to short-term and long-term disasters are also visible. Conclusion = Satisfied	Both internal and external ERPs categorically identify individual user groups that may need to be catered for during emergency Conclusion = Satisfied

Case 4	The plan addresses disasters that are local to the hospital and its environment as it was based on a comprehensive hazard vulnerability assessment of the hospital	The ERP provides links to different relevant external agencies.	The plan provided protocols which can be applied to both short-term and long-term disaster events	The plan does not categorically identify individual user groups that may need to be catered for during emergency
	Conclusion = Satisfied	Conclusion = Satisfied	Conclusion = Satisfied	Conclusion = Not satisfied
Case 5	All protocols provided in document were based on a carefully conducted risk vulnerability assessment of the hospital, making the plan to respond to local needs	Limited link to external agencies were provided in the ERP. Links to only government-related health organisations were provided in the document.	The plan can be applied to both internal and external disaster events	The document did not identify individual user groups that may need to be catered for during emergency but rather focused on how to respond to different disaster scenarios
	Conclusion = Satisfied	Conclusion = Partially satisfied	Condition = Satisfied	Condition = Not satisfied
Case 6	It is clearly shown that both ERPs directly addressed issues that are local to the hospital and its environment with the external ERP covering more disasters	The external ERP provides links to different relevant external policies while the internal plan only referred to Civil Defence and Red Cross	The applicability of both the internal and external ERPs to short-term and long-term disasters can be seen as they have clearly laid-out protocols	None of the plans categorically identify individual user groups that may need to be catered for during emergency
	Conclusion = Satisfied	Conclusion = Satisfied	Conclusion = Satisfied	Condition = Not satisfied

No user groups were identified in the ERP from Cases 4 and 6; and while the Case 5 ERP did not identify individual user groups, it instead focused on how to respond to different disaster scenarios.

7.2.5 OECD-DAC Efficiency, Effectiveness, and Impact Criteria

Efficiency, effectiveness, and impact are three other criteria contained in the OECD-DAC framework. However, it is difficult to assess how ERPs collected satisfies these criteria merely by looking at the paper. Therefore, these attributes were assessed during interviews and focus group discussions conducted with staff members selected from the hospital. With respect to the efficiency of these ERPs, which measures the output in relation to outputs of alternative methods, this was difficult to adjudge in this study, as there were no alternative methods in all the cases selected in this study. However, the criterion of effectiveness can be said to be partially satisfied, as the majority of participants across all cases indicated knowledge of these ERPs and participated in its implementation to varying extents with some indications of positive results. Similarly, the impact criteria, which indicate the wider effects of the implementation of these ERPs, can be said to be partially fulfilled. This is because the majority of ERPs have standard protocols that can be implemented in the context of many disaster events afflicting society in order to respond to the needs of diverse members of society in the event of disaster.

7.3 Thematic Analysis of Focus Group Discussions

To further understand findings emerging from data collected through focus group discussions, a thematic analysis of the transcripts from all case hospitals was carried out. The discussion of responses from all six cases that contribute to each of these findings is presented in this section.

(a) Result 1: Participants are aware of their role as a first line responders during an emergency situation and have previous experience of responding to disasters. However, there is ambiguity about their role in disaster response.

Responses from participants across all six cases clearly indicated that they are aware of their role as first-line responders during both internal and external emergency situations. For instance, one of the participants from Case Hospital 1 commented that:

> *"Our role will be in responding to the event: the first team moves from the hospital, which means the response to the event, is from the same health facility because each hospital has its internal plan of how to deal with events and manage its event at all levels."* (Case 1, lines 165 – 167)

Responses during the same meeting also indicated that participants have previous experience of responding to disasters within the hospital. They made comments such as:

> *"...we know that it's not a good thing, and we need to work for long hours."*
> (Case 1, line 208)

Another participant indicated that:

> *"...the hospital becomes like a beehive, very busy all the time."* (Case 1, line 210)

Similar comments were observed from transcripts of other case hospitals, and analysis of these comments indicated that participants of focus group discussions have experience in responding to a range of emergency situations, including mass casualty events (such as stampedes), war, bus accidents, internal fires, terrorist attacks, and chemical spills.

It was also evident from the analysis of transcripts from focus group discussions that the experience of disaster had a significant impact on nurses and their preparedness for disaster response. For instance, some of the participants who responded to victims of the war between the KSA and al-Houthi militia in Yemen expressed that the number of war casualties they attended to has a significant impact on their perception of disaster.

> *"I learned through my previous participation in previous disaster of how to deal with large number of sritical cases."*

With respect to their disaster response role, responses of the participating nurses indicated that, despite knowing that nurses are first line respondent during disaster, participant reported that in most events they don't know what is required of them, they have challenges and are unprepared for their disaster role. One of the participants indicated that:

> *"We sort cases in the event area ... everything is completely new to us ... we don't know how to act."*

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Another participant responded that:

"We're not used to it ... it was scary ... dealing with wounded soldiers loaded with weapons and bombs." (Case 2, p.6)

Majority of participant reported their lack of knowledge of their exact role during disaster and all focus on clinical aspect of their work, they just believe that they should receive order from doctor or a leader of how to work and what to do:

"We wait till we receive order from doctor, or our supervisor tells us what to do, we cannot take the responsivity of work without order." (Case 6, p.8)

A good illustration of this can be found in the descriptions of how tasks were distributed during emergency response that nurses articulated. One respondent expressed that that:

"The head of nursing at the time of the catastrophe distributes us to the regions and tells us what to do." (Case 3, p.8)

These view of nurse reflect that they only a recipient of order or instructions, they are not considering themselves able to take decision or work according to the situation, they only focus on their duty in treating disaster victim, they don't see themselves as leader or decision maker during the event. This could be related to the low level of education and training of how to properly response in disaster event

(b) Result 2: The majority of participants are aware that the hospital they work for has an ERP, but indicate poor knowledge of its content and are of the opinion that implementation of the plan within the hospital is poor.

When asked to comment about their knowledge of their hospital's ERP, participants from the different case hospitals selected for this study indicated they are aware that there is an ERP in their hospital, but the majority of participants expressed a lack of knowledge about the contents of such ERPs, and that, when it comes to the implementation of the plan, they just take orders from their superiors. In one of the cases, a participant commented:

"We have an emergency plan to do that but I don't know ... we have an internal and external plan." (Case 1, line 171)

However, in a gesture that indicated that not all nurses were aware of the emergency plan, another participant said, "where is the internal or external plan of the hospital?", to which the first participant responded "in the department*" (Case 1, lines 173 -174). Another participant simply responded, "we don't know about it". In another case hospital, one participant indicated:

> *"They're working on it. As I mentioned to you at the beginning, I have, I have an emergency plan in every department...but we don't know about it."*

Another participant added that:

> *"We need to know it, implement it, and practice it in reality… especially how to evacuate."* (Case 3, p.31)

A very notable observation concerning gaps in knowledge is the indication expressed by participants that they do not have any knowledge of an emergency plan within the hospital or its contents. They particularly indicated that they do not want a plan on paper, but something that can be applied and that is actionable.

One participant directly stated, "we don't want plans on paper" (Case 5 line 310), a clear indication of a lack of adequate knowledge of the content of an effective ERP. This was confirmed by the statement of another participant indicating a lack of knowledge of emergency codes: "Activating emergency codes, we don't know what it means..." (Case 1, line 221)

Regarding the implementation of the plan, responses from participants indicate that they are of the opinion that the ERPs in their various hospitals are poorly implemented. Participants seem to hold divergent understandings concerning the process of activating alerts in the event of disaster. At one of the Case hospitals, one of the participants indicated that, "they activate the emergency codes" (Case 1, line 168)*, while another participant stated that, "no they do, but sometimes the patients come suddenly without any notifications" (Case 1, line 170), and yet another participant countered by saying, "Not always, sometimes after receiving the victims" (Case 1, line 168). However, two of the participants at that particular case hospital appeared to understand the procedure indicated in the ERP for response. One of these two participants commented that:

> *"Look, there are major lines of the plan that must be adopted, such as the method of notification and escalation of communication, hospital entrances and exits, and evacuations. Also, there is a detailed plan for each hospital that reflects the administration and the structure of the hospital and according to the building design."* (Case 1, lines 179 - 182)

This detailed response was corroborated by the second participant with good knowledge of the ERP, who said that:

> *"There is a general plan for the hospital, and there is also a plan for the region for health affairs that includes, for example, the method of reporting, handling cases and distributing them based on their severity."* (Case 1, lines 183 - 185)

Across other case hospitals, the use of colour codes for the activation of emergency plans was reported widely.

(c) Result 3: There is a recognisable system of emergency preparedness and response in many of the case hospitals.

It was evident from this study that some of the hospitals, such as Case Hospital 3, have well-developed and recognizable emergency preparedness and response systems. Discussions during some of the focus group discussions indicated that participants undergo regular drills which are meant to assess the ongoing preparedness of the hospital and its staff for emergencies. With respect to this and while discussing her experience during a previous disaster training, one of the participants responded by saying, "*we performed some training scenario of how to deal with disaster in some time during our work*".

In addition to providing evidence of regular drills, discussions during focus group discussions also indicated that a majority of the cases have well-organised response protocol, even though participants disagree in their understanding of these protocols.

Another participant confirmed this by stating that:

> *"We were taking instructions from the charge nurse to be found in the area."* (Case 3, p.8)

Participants across five focus group discussions also made 16 references to the disaster coding system, and references made to this system indicated that they understood what the coding means and the necessary actions they need to take when the coded alarm is sounded. One of the participants made statements, such as:

> *"Of course, it was the day of Eid, it was the 10th day of Eid. So they made a yellow call, ICU, which is the code yellow…"* (Case 3, p.5)

Another participant said:

> *"So we heard the yellow call and then we came down and we couldn't imagine the scale of the disaster."* (Case 3, p.5)

The coding system is also used in demarcating the Emergency Services Unit. This was made clear by the statement made by one of the participants, who stated:

> *"...who will go to the red area, who will be in the yellow, who will be in the green and who will be in the discharge…"* (Case 3, p.8)

(d) Result 4: It was evident that nurses are not involved in the development of ERPs, its implementation plan, and the design of emergency training programmes.

It was evident from focus group discussions that nurses do not play active roles in the development of ERPs or training programmes for emergency response.

One such respondent indicated that:

> *"Hospitals in general are part of the scenario, but nursing in particular does not participate in preparing plans or scenario because in every hospital we have an officer for plans and evacuations that determines the types of scenarios, injuries and others."* (Case 1, lines 327 - 329)

Responses indicated that nurses were neither consulted to take their opinions and needs into consideration while developing ERPs nor involved in the ERP drafting processes. This was observed to be a common phenomenon across different organisational settings from which respondents for the focus group discussions were selected from. The negative implications of this observation in the level of knowledge of the content of ERPs, as well as the confidence of nurses in implementing ERPs, were also observed in this study.

Responses from nurses at the focus group discussions also revealed that there is few training courses being developed by agencies external to the hospitals in the KSA – particularly the Ministry of Health, and therefore, the ministry must have been involved in the assessment of areas of emergency response where knowledge is lacking before developing these courses with predetermined contents. However, participants reported that this is not the cases and there is no assessment of their level of preparedness by ministry of health. one of the participants responded that:

> *"These are courses offered by the ministry without having any input in them, which means they are pre-determined."* (Case 1, line 265)

Another respondent confirmed the observation that the assessment of training needs and the development of emergency training programmes may be conducted by agencies outside of the hospital without any input from nurses. The participant expressed that:

> *"To be honest with you, we never interfere with it, and never define anything."* (Case 1, line 268)

Altogether, these observations, particularly the lack of involvement of nurses in the design of ERPs and a lack of assessment of training needs and the design of training programmes, may contribute significantly to the inability of available training programmes to adequately prepare nurses to effectively respond to emergency situations.

(e) Result 5: Nurses' knowledge of disaster response is very basic, yet nurses are willing to learn.

Nurses across all cases indicated obvious gaps in their knowledge of emergency response. In some of the cases, participants complained of a lack of training opportunities or education courses, while other participants indicated participation in a REDI training programme, which only provided basic knowledge of what emergency response is without adequately preparing them for real-life situations. For example, one of the participants indicated that during training, they only work with one hypothetical patient, which differs markedly from the huge number of victims that they have to deal with during real time emergency response. Moreover, other participants indicated that while they can respond to injured victims brought to the hospital during an emergency event, they are ill-equipped to respond to victims outside the hospital, particularly in the ambulance.

In another case hospital, participants indicated that they have not been properly trained. The analysis of responses from participants in this case hospital indicates inadequate knowledge of how to deal with injuries resulting from large scale disaster events, a lack of knowledge of how to profile cases, inexperience in responding to chemical disasters, and lack of knowledge of how to assess an emergency situation. One participant stated that, "We don't know how to treat injuries or the chemical…", while another stated, "We don't know how cases are distributed; we don't know how to assess the situation." (Case 5, line 234)

However, participating nurses indicated their willingness to participate in training that will adequately equip them with required knowledge to respond to disasters. They expressed a particular need for training in areas such as dealing efficiently with disaster cases, in-hospital training on disaster simulations, and theoretical and practical applications of disaster response techniques. They indicated that such training programmes should be intensive and cover how to deal with injuries, sort disaster victims, and conduct expedited diagnosis and treatment strategies. Participants also indicated there is a need for training on how to respond to other forms of disasters. For instance, one of the participants commented that:

> *"…We need extensive training and risk management training, such as screening or chemical purification. And disaster situations must focus on them…"* (Case 6, line 145)

However, current training programmes are inadequate to address these needs. In support of these observations, it was noted at one of the cases that, though participants seem to understand the general duties of care expected for a nurse attending to a disaster victim, only one of the participants at that Case hospital seemed to understand details of how to screen disaster victims as a first responder to an external disaster. The participant expressed that:

> *"…We follow the American or Canadian systems. But we rely more on the American screening system within the emergency departments because it specializes in nursing and it categorizes patients who reach the emergency in five levels – and they are urgent cases they must enter the resuscitation directly who are the first and second levels. As for the third, fourth and fifth levels, it depends on the resources and the remaining time."* (Case 1, lines 280 - 285)

even though some respondents clearly indicate gaps in their knowledge and ability, one of whom said:

> *"...to be honest with you, not always. Sometimes we face many difficulties, and we do not know how to act."* (Case 1, lines 296 -297)

This participant further provided details of these difficulties by stating that details of the content of the ERP are not known, and that majority of nurses do not know how to communicate information or escalate matters appropriately, while also expressing confusion regarding the role of nurses are when a particular disaster case is escalated. Back to the nurse who reported that '' we don't know how to assess the situation." (Case 5, line 234), this also reflect the lack of proper critical thinking and decision making skill among nurse.

(f) Result 6: Nurses indicated that their previous training and education does not adequately prepare them to effectively respond to disasters.

The majority of the participants at the focus group discussions indicated that they have received one form of training or another. One of the participants stated:

> *"I understand that there is an Incident Command System ... we understood that everyone has a role in disaster response, which we learnt from the Incident Command System."* (Case 3, pp. 22–23)

Another participant corroborated this statement by saying that, "I understood that there is something called the Incidence Command System" (Case 3, pages 22-23). Other disaster related training courses, which participants indicated that they have participated in, include disaster management and trauma team course. One of the participants said: "After our courses of management, public administration, we even got courses on disaster management", while another added "I took the trauma team course" *(Case 3, page 21)*.

Participants indicated that these courses significantly enhanced their confidence in responding to disasters. One of the participants stated that:

> *"They taught us, the time of debriefing, I mean, they are talking, they do work, mean explanation, give me, give me more confidence. See what it means, you feel right, you can control the situation if it happens again!"*
> (Case 3, p.25)

Regarding the adequacy of the training received by participants and their ability to respond effectively to disasters, participants across all cases indicated that the training they received did not provide them with the skills required for effective disaster response. Participants unanimously indicated that the training they received was short and not particularly relevant to their roles. It was also indicated that the training was only theoretical and lacked simulations of what an actual disaster scenario may look like. They also conveyed that training received was more appropriate for doctors than nurses. With respect to this training, one of the participants stated that,

> *"Studying is one thing, training is one thing, and application is another. There's nothing to do with reality. We've been taught small incidents and individual cases, but not wars at all", while another participant went as far as to say, "We do not know if we are doing the right thing or not."* (Case 5, line 263)

In another case hospitals, participants also indicated that one of the problems with the training they received was that it was delivered by a non-specialist who had difficulties in conveying information and often got angry when asked a question. One participant stated:

> *"The difficulty of communicating information. He gets angry and gets angry when asked…we have doubts about his work."* (Case 4, p.30)

Based on this confusion, participants indicated that during actual disaster responses, they often experience an overlapping of roles, which at times leads to quarrelling with doctors. One participant particularly indicated that:

> *"...everybody's role ... quarrel with doctors, large numbers of responders, we don't know how to receive or deliver cases."* (Case 6, line 423)

In one of the case hospitals, participants were asked if the formal nursing education they received adequately prepared then for disaster response. Participants were unanimous in the belief that they gained more disaster response skills on the job than during their formal nursing education. They indicate a lack of educational courses or competences in their university curriculums.

One of the participants stated that:

"...No, at the university we did not study that; I studied on the diploma stage, and I studied on the bachelor's stage", while another added that *"this knowledge comes after real practical experiences, but not at all from our studies."* (Case 3, p.27).

One participant went as far as to assert that *"what is in schools is not related to reality."* (Case 3, p.28)

They unanimously indicated that a disaster preparedness education was not covered in their formal training at all, such that one of the participants expressed that "We don't know about disaster system at all". However, one of the participants indicated that he was taught only general knowledge about emergency services but nor about disaster response. He stated that:

> *"I studied at King Abdelaziz University, they taught us emergency care, Ok? We studied emergency care in general."* (Case 3, p.27)

Furthermore, many of the participants remarked that they were surprised that, despite the importance of disaster response education, it was not considered to be an essential aspect of their formal nursing training programme. In regards to this, one of the participants stated:

> *"But you know we really need to know what to do in disaster based on the right things – I mean formal education or courses."* (Case 3, p.27)

However, while participants indicated that skills gained through some previous training programmes were helpful when responding to disaster, they opined that some training courses that include drill provide them with some skills of how to work during disaster, one participant stating "…in an emergency, based on the places, we based the drill experiences" and "in the drills, that worked a lot throughout the year. Everyone who works like this and knows how you do it. It was scheduled by the nursing department, and they tell us where to go or where to be – I mean the designated area" (Case 3, p.7).

Result 7: The nurses described their previous education and training as insufficient to give them the leadership and management skills needed to effectively respond to disasters.

During disasters nurses must carry out clinical tasks as well as maintain security and address the needs of both patients and the other members of the nursing team. This

requires nurses to be equipped with the leadership, management, and communication skills necessary to work with a team and coordinate their actions. However, some participants indicated that the nurses lacked leadership ability during disasters and emergencies:

> *"I think leadership in disaster is critical as we have seen the vital role for them.....mmm...I think ....I think....we feel such a comfortable feeling if somebody does that role perfectly."* (Case 4, line 316).

Another participant responded:

> *"You're absolutely right.... but you know ...everybody wants to be a leader....no clear guidelines...we don't know who is the leader or what they do."* (Case 4, line 319).

In addition, participants in the focus groups highlighted that communication was poor, resulting in confused and ineffective staff relationships during disasters:

> *"During disasters everything is a mess, everybody works alone and everyone tries to prove he's doing the right thing."* (Case 6, line 501).

Nurse participants expected the nursing leaders to provide guidance to other staff during disasters as they face many challenges during disasters:

> *"It's different from normal situations; we need someone to guide us."* (Case 3, p.4)

The unpredictability and speed with which events occur during disasters requires heightened attention, and rapid, well-coordinated responses. Participants found the nurse leaders to lack the cooperation and management skills required to prioritize patients, organize the team, and distribute resources efficiently:

> *"There was a supervisor, but he didn't have any experience of dealing with a crisis – he looked like he needed some guidance"*

The focus group discussions showed that nurses were seeking someone to guide them through disaster situations:

> *"We needed someone to lead us, to guide us on what we should do, as we hadn't had any experience of this before."* (Case 6, line 567).

Participants did not view themselves as leaders in disaster situations, despite the fact that they represented the majority of the staff present and were the first respondents at the scene of the disaster. This reflects the lack of leadership and management skills acquired during the nurses' education, as well as their lack of experience as nursing professionals during emergency situations.

The critical nature of disasters puts nurses' decision-making skills into sharp focus. The participants seemed to realise that disasters can require the use of methods which are different to those used in normal situations:

> *"It's different from normal situations… more work, and a greater number of patients."*

> *"On normal days, …. I have time, but that time I didn't have the time, I don't have a lot of resources in disasters. Whether…, not just out of our own resources. Patients, no, I mean I've got many patients who…, I need to save their lives in this disaster."* (Case 3, line 172).

The participants believed that the high uncertainty surrounding disasters and the need to allocate scarce resources ethically, places great demands on decision-making abilities. Nurses lack the ability to make rapid decisions during crises and to focus on what information is critical, and to filter out that which is only secondary:

> *"in a disaster event, we have a shortage of everything - staff, resources… - we need to assess cases with caution, we need to triage patients appropriately."*

Participants reported that they could not access and evaluate the scattered information present at a disaster scene quickly enough:

> *"The triage system and protocol is not efficient during crises; nurse don't have time to take the right decisions."*

Critical thinking refers to the ability to select and attend to relevant information, and apply logical reasoning to it efficiently. It requires the ability to interpret and analyses information effectively. Participants reported a lack of critical thinking during disasters:

"We're just awaiting doctor's orders, it's something new to us, I don't know which patients need the most care."

"Fear of this, it was fear of the event, … I mean, I cannot work…, or from.., - because of the large number of patients, but.. no, no, no... it's not related to work, a job, ...no, there's something missing……we don't know….why ….why we couldn't work, or decide how to work" (Case 3, line 138).

Nurses need the ability to work under pressure and overcome challenges during disasters and other crises. They must make sure basic needs are being met, stay in control of their emotions, maintain self-confidence, and seek appropriate help when needed. They also should not lose sight of the values that nursing embodies and continue to reflect on insightful experiences, always striving for excellence and compassion. The trauma of war has profound psychological effects on those involved and one nurse in particular expressed these in comments such as:

"...fear of war... the hospital is in a state of disorientation… it is scary … we don't know if we're safe or not… we have fear of being bombed and becoming martyrs of war… we work with great fear... our voice is inaudible…" (Case 3, line 214).

To build a resilient and effective nursing team demands many different skills from leaders. They must coordinate the rescue tasks effectively, allocate work schedules fairly and resources efficiently, and create enough flexibility within the team to cope with uncertainties while giving nurses sufficient rest time to recuperate. Importantly, they need also to ensure the nurses have received, and continue to receive, adequate education on disasters and the health risks involved. To facilitate this, hospital managers must provide nurses with targeted education on ethical decision making in emergencies and the management skills required to work as part of a team under pressure. Furthermore, appropriate legislation should be in place to reduce the physical, emotional, and psychological risks for primary caregivers during disasters.

(g) Result 8: Nurses indicated that the hospital faces some challenges and cannot provide effective emergency response services.

Nurses participating in focus group discussions identified several challenges that hospital face and discussed how they may be impairing the effectiveness of the disaster response services they provide. Perhaps most significantly, respondents indicated that the ongoing war represents a major challenge facing emergency preparedness and response of hospitals in affected regions. Discussions indicated that the majority of these hospitals deal with casualties of the civil war daily and that their resources are constantly over-stretched. Therefore, if any disaster should occur, they will likely have limited resources and bed spaces to accommodate victims of disaster. In relation to this challenge, one of the respondents conveyed that:

> *"We were dealing with martyrs and injured martyrs, wounded soldiers from the war, as well as civilians – in addition to the patients who are visiting the hospital civilians and those from Yemen."* (Case 6, p.1)

In addition to challenges related to the ongoing civil war, respondents also highlighted that the lack of effective leadership during emergency situation is a major problem affecting the effectiveness of their response operations. Though all ERPs collected from the different hospitals contain information about lines of command during emergency situations, it is clear from responses obtained during the focus group discussions that the scheme of leadership prescribed in these ERPs differs from what occurs during real life emergency situations. According to some of the respondents, the nature of the problem is that of inconsistent leadership rather than a complete lack of leadership. For instance, one of the respondents indicated that:

> *"There was a leader; the second time there was no leader. When was there, he was a determined and knowledgeable leader – things went well."*
> (Case 6, p.6)

Another respondent expressed concerns about the issue of leadership, stating:

> *"To be honest, no, because the head of nursing at the time of the catastrophe is distributing us to the regions and telling us what to do."*
> (Case 3, p.8)

This observation is consistent with the role prescribed in the ERPs for nurses who have leadership responsibilities during an emergency situation. However, it is unclear if the

leadership provided by these leaders is effective or not. In fact, indications from another respondent revealed that rather than giving sensible instructions, leaders during the emergency situation merely give orders without explaining to followers. One of the participants stated that:

> *"I tell you, I mean, we have a plan and we are supposed to walk on it, but at the time of the disaster, officials come and give us orders, and when we try to explain, they do not listen to us, they just say, do according to orders and follow directions from us."* (Case 5, p.2)

While it is possible that these leaders may expect that nurses responding to disasters should have adequate knowledge of their roles during emergency response such that they just need to issue directives, it is clear from the observation in this study that such directives may not produce the desired result in occasions in which nurses have poor knowledge of emergency response and lack the confidence for effective disaster response activities.

Similar to the problem of leadership, participants also identified issues related to ineffective communication between healthcare staff members during emergency situations. Nurses particularly expressed difficulties in communicating with doctors during these situations. In support of this observation, one of the respondents stated that:

> *"When asked by the doctors about any procedure, he gets angry when asked, because he considers it to be an insult, an insult, or a doubt about his work."* (Case 2, p.6)

Another respondent indicated that the problem is also in the form of miscommunication or the provision of conflicting information about processes and procedures. The respondent stated that:

> *"Because we may have heard the same information from another doctor, but it is different, and we want to inquire, but they are very upset and angry with us."* (Case 2, p.6).

However, this would not have been an issue if the nurses themselves had a solid understanding of ERPs and were equipped with the required skills, competencies, and confidence to respond effectively to disasters. In fact, if nurses are well-trained, they will not

need to ask doctors, who are themselves very busy during emergency situations, for information.

Challenges relating to the shortage of nursing staff were also highlighted. One of the respondents stated that:

> *"The lack of [a sufficient] quantity of nurses is the biggest factor for difficulties."* (Case 2, Page 6)

and unfortunately receives unusually high number of patient cases (about 70 – 80 cases per day).

7.4 Thematic Analysis of Semi-structured Interviews

7.4.1 Themes Emerging from the Analysis of Educators' Interviews

Nursing educators were interviewed in this study because of their ability to provide insights about current nursing training programmes, particularly with respect to aspects of emergency preparedness and response taught within the curriculum. Moreover, it is expected that interactions with educators will help in identifying key concepts that are relevant to many of the issues that nurses have raised during the focus group discussions. Following the analysis of data collected from interviews, nursing educators generally indicate that:

a. There are no structured disaster response education programmes within available nursing training programmes across the KSA.

b. Available training courses have shortcomings and challenges that render them inadequate to prepare nurses for effective emergency and disaster response.

c. Educators identified key components that an effective disaster training programme should include, including both basic, theoretical knowledge and extensive, practical knowledge of disaster response.

d. Educators were not particularly knowledgeable regarding policies associated with the training of nurses for emergency response.

Detailed analyses of these observations are presented in this section.

(a) Result 1: Educators indicated that there are no structured disaster response education programmes within the current nursing training programmes across the KSA

The analysis of interview data obtained from educators revealed that the current nursing programme across colleges in the KSA does not contain specific contents focused on preparing nurses for effective emergency response. One of the respondents specifically stated that:

> *"What I know about king Saudi universities college of nursing is that they have no structured [programme] teaching about medical disasters, or, any integration in the curriculum about medical disaster."*

However, educators interviewed in this study indicated that they are aware of short courses, running for only two or three days, with the aim of providing nurses with some basic knowledge of effective disaster response. One of the respondents also indicated involvement in running one such programme, and expressed that majority of these short courses are in a stage of infancy. The respondent said:

> *"These [programmes] are very few and still in their infancy, especially here in the Kingdom of Saudi Arabia. There are readiness programmes, which are held by Prince Sultan College in Riyadh, and also, there is a programme organised by myself, but [it was] stopped for lack of adequate support for it, and also, there is a pre-hospital case support program…"*

Respondents also indicated that these short courses available to nurses are often organised by specific training centres who charge a fee to trainees. The educators described them as:

> *"…short courses of two to three days, some of which have theoretical and practical side, and some purely practical, but those programs are held by specific training centres and have fees…"*

Respondents identified available training courses to include Response and Emergency Disaster Incidence (REDI), Disaster Management and emergency Preparedness (DMAP), Basic Disaster Life Support (BDLS), and Advanced Disaster Life Support (ADLS).

On the one hand, these responses and observations indicated that nursing educators (who are also involved in the development and implementation of nursing curriculum) are aware of programmes related to emergency preparedness and response. The fact that some of them are involved in implementing short courses of emergency preparedness and response also indicative of the fact that they have the required skills and knowledge to teach this material as part a regular nursing programme (as opposed to short, stand-alone courses). However, it is not yet fully understood why this is not being done. On the other hand, the short courses mentioned by educators were similar to those identified by nurses during the focus group discussions, and the inability for nurses to access these programmes may partly be due to the fact that such courses on emergency preparedness and response are taught at a fee (as indicated by one of the educators), which nurses may not be able to afford.

(b) Result 2: Available training and educational courses have shortcomings and challenges which render them inadequate to prepare nurses for effective emergency and disaster response

Educators highlighted several problems and challenges associated with training and educational programmes currently available for emergency responders within the KSA. In the first instance, it was clear from interviews with educators that available courses are not tailored for the needs of trainees and nurses at the forefront of emergency response. In fact, it is not clear whether or not the needs of nurses assessed in any capacity before training courses are developed. It was also highlighted that the majority of the courses placed greater emphasis on theoretical knowledge than practical knowledge, while in reality nurses understood practical experience to be more important. Moreover, the lack of a feedback mechanism, through which course providers can evaluate the effectiveness of their training programmes and make the necessary adjustments to ensure the relevance, adequacy and efficiency of their programmes, was also recognised as a major challenge. One of the respondents commented that:

> *"The problem in those courses is that their development was not based on the needs of the trainees, and also, there is no feedback for such courses, which they were actually successful and led to the desired goal of experience, knowledge, and efficiency. And to answer your question: we need to know what everyone needs to work, when and how. Not just theoretical knowledge, but how to use that knowledge. Experience is not enough in this area, but we*

need to relate it with the necessary knowledge. Briefly, the content of these courses should result in people knowing how to behave at the time of disasters."

Respondents also indicated that in addition to the inability of available short courses to equip nurses with basic disaster response skills, available training programmes do not address skills required for effective collaboration and multi-professional working scenarios that characterise disaster and emergency situations. An educator indicated:

"As for these programs, they are very few, and do not specify the actual needs of the participants. They also do not care about the individual differences; the level of competency [required] and the topic is difficult for participants, and does not address other parties involved in the response, such as the Red Cross or Civil Defence."

Another educator indicated that this ineffective training engenders inadequacies in the way nurses on the field work alone and communicate ineffectively during emergency situations. The respondent said:

"The problem is that everyone is working alone, and I hope that people with experience in this field and others agree on such matters, and respondents must know many things not studied in universities by the international laws like; camp refugee compatible disease or Command Incidence System, and everyone knows his role and how does it. The problem we actually face is that the existing system is a response system not an indicator; so all efforts have to come together and unite so that we can achieve the thing we want."

Another respondent indicated the inadequacy of available programmes and stated that:

"Nurses lack education. They don't know what a disaster triage is. They don't know how to categorize patients. They know, they are familiar with the colouring system ... but they're not necessarily competent, let us say, some of them are familiar, but they are not competent in terms of knowing how to, triage patients during disaster and that is something that will cause problems."

(c) Result 3: Educators identified key components that an effective disaster training programme should include, including both basic, theoretical knowledge and extensive, practical knowledge of disaster response

Having realised that the currently available nursing training programme is not effective in preparing nurses for effective disaster response, it is then essential to collect information (in line with the aim of this study) regarding key components that a nursing education should include for it to be adequate. Educators who are involved in curriculum development represent one group of stakeholders to be engaged in this regard. When asked to identify key components that an effective disaster response training programme should have, all nursing educators interviewed in this study highlighted the importance of placing emphasis on practical skills that in a manner commensurate with the busyness that characterizes a real-time emergency situation. One of the educators said:

> *"It should be related to the theoretical and practical side, involve all parties, be updated on the latest developments, include learning, workshop simulation, and role play, as we do not only want paper experience, but also connect it [knowledge] to the correct application, and also how to organise or communicate with other organisations."*

Educators also identified certain key attributes that an effective disaster response training programme should have to include incident command and response to different types of disasters. A respondent indicated that:

> *"I expect they should know [of] it from undergraduate – the basics of Incident Command, regardless of the [specific] structure of Incident Command. They need to know manmade disasters, natural disasters, and types of disasters for which are the general orientation. And then they should, sure, basically, they should know about CBRNE (chemical biological radiological nuclear explosives.) At least, they should be people who practice; they need to know about because they will respond to it, one way or the other. This is the general concept. In terms of the people on the ground, they should have structured training."*

However, respondents insisted that instead of prescribing a training programme developers think nurses may need, it is important to engage nurses to identify their knowledge gaps that

can be addressed by training courses. This is what this study has achieved by involving nurses in focus group discussions with the objective of identifying knowledge and skill gaps impeding their emergency preparedness and response. With respect to this, a respondent asserted:

> *"We must know the level of people and the degree of their awareness of such things from a basic level to the advanced, and this will be followed by sending them a questionnaire identifying those matters and allowing them to train. There is also a need for refreshment course and feedback [after] every period to determine the degree of benefit from these courses and compliance with international standards."*

The participants who were healthcare educators emphasised the need for more training in management and leadership skills. They were also clear that this was needed in education programs for general practice nursing, as well as for nursing in emergencies and disasters. In addition, the educators stressed the importance of good cooperative, teamwork, and communication skills for nursing in disasters, and that this should be provided as part of their nursing education:

> *"Disasters are never expected, nurses need to learn how to work together smoothly ... how to communicate with each other and other parties."*

During the interviews the educators expressed that they expected nurses to have the coordination and cooperative skills to work within the system, minimize risks for themselves and others, prioritize patients, and plan resource use optimally. One health educator stated:

> *"How to keep on touch with other health personales is important, they should to know how to work together in a coordinated manner, how to communicate effectively."*

One nursing educator described the importance of critical thinking during responses to disasters, as it enables nurses to take in, interpret, analyse, and explain an immediate emergency situation:

> *"Nurses should know how to make accurate decisions, assess a situation, and critically analyse what needs to be done."*

> *"Nurses know how to provide basic life support, but they should also know how to work as a team, how to lead a situation."*

One healthcare leader emphasised the importance of collaborating with other health professionals. educators also stressed the need for disaster nurses to stay calm, and concentrate on giving people the critical information they need, as well as to collaborate with other health professionals at the scene.

Other educators expressed similar views, stressing the need not to let panic take control in emergencies, but that the nurses should first act and think later. They thought nurses needed the same kind and frequency of emergency training that the ambulance, police, and fire services are given. These service personnel receive training several times a year:

> *"There was no plan. You have to decide what to do."*

> *"Certainly you always were debating with yourself about doing the right thing."* (p.14)

During disaster, relief management and leadership skills are severely tested. The ability to maintain good working relationships between staff members is crucial. These skills need to be taught so that nurses can lead other health professionals, as well as volunteers, during disasters.

(d). Result 4: Educators were not particularly knowledgeable regarding policies associated with the training of nurses for emergency response.

It is known that an effective disaster preparedness and response training programme must be based on existing disaster preparedness and response policies in the KSA. This will ensure that trained nurses have adequate knowledge and an understanding of policy frameworks underpinning their disaster response activities. Furthermore, this will also ensure that activities across different parts of the country are of implemented at a uniform quality level. For this to happen, it is then expected that nursing educators should have adequate knowledge of relevant policies and legislations. However, it was observed that there is disconnect between disaster management policies and nursing education programmes in the KSA. While several factors may be responsible for this, observations during interviews revealed that nursing educators may have very limited knowledge of existing policies and regulations on

emergency preparedness and response within the KSA. Specifically, throughout all interview sessions for educators, reference to policies and regulations guiding emergency response in the KSA was seldom made. Even when prompted, respondents did not directly address questions about policy, but instead went on to talk about other aspects of emergency response that they were knowledgeable about and comfortable with.

The importance of good knowledge of disaster preparedness and response policies is also underscored by the fact that effective disaster response is often implemented by several agencies and professionals (not just nurses). Therefore, for the process to be effective, it is essential that all members of such multi-agency and multi-professional teams have a good understanding of policy frameworks stipulating the role of each agency, rules of engagement, and each stakeholder's responsibilities during disaster response. Therefore, it is essential that this is included in disaster training programmes for nurses.

Moreover, as an indication of the possible lack of adequate knowledge of regulatory frameworks and policies, it was apparent that educators interviewed were unsure of who is responsible for training nurses and funding such training programmes. In fact, one of the respondents recommended that the Ministry of Health should assume the role of ensuring that nurses are properly trained and are properly funded to do so. A respondent suggested that:

> *"...the Ministry of Health invests in the teaching of the incident command system at the regional level."*

While funding arrangements may be a responsibility of the Ministry of Health, nursing educators certainly have an essential role to play in the development and implementation disaster preparedness and response. Therefore, the full responsibility for training nurses should not be left to the Ministry of Health.

7.4.2 Themes Emerging from the Analysis of Interviews with Policymakers

Having recognised the critically important role of policies and regulatory frameworks in the effective disaster preparedness and response, policymakers were interviewed in this study. The focus of this interaction with policymakers was to assess the level of their involvement in the planning and implementation of disaster training programmes for nurses, understand gaps and challenges associated with the development of policies that facilitate the effective training of nurses for disaster response, and identify essential components of an effective

training programme. Based on the data collected from interviews with policymakers, it can be concluded that:

a. Policymakers are aware of and involved in the development of short courses for emergency training, but there seems to be no national policy for training nurses in emergency response.

b. Policymakers identified gaps in knowledge and poor communication skills as key factors militating against effective training in emergency response for nurses.

c. Policymakers believe that an effective disaster training programme must focus on basic competence in emergency situations and triage.

Details of these observations are presented in this section.

(a) Result 1: Policymakers are aware of and involved in the development of short courses for emergency training, but there seems to be no national policy for training nurses in emergency response.

The interview with policymakers in this study indicated that they are conversant with short training courses on emergency preparedness and response within the KSA. It was also indicated that the Ministry of Health itself has a department that is involved in training health officials in emergency response. Respondents indicated their awareness of short training programmes such as REDI, the ICS programme – which is targeted at leaders who play key roles in emergency response – as well as a course that is specially developed for people who respond to Hajj-related emergencies. One of the respondents stated that, "We have instructors who develop training programmes." However, it is unclear if these training programmes merely address the needs of leaders of emergency departments or if they are relevant to all hospital users, including nurses. Moreover, indications of how instructors within the ministry develop training programmes, as well as procedures for identifying training needs, were unclear from discussions with policymakers.

In addition, respondents indicated some involvement of the Ministry in assisting hospitals in developing emergency plans. One respondent said, "Our planning departments are responsible for hospital emergency plans, public emergency plans – they are involved in it." However, the extent of the support provided to hospitals in developing Emergency Response Plans was not clarified. Juxtaposing this statement with the observation made during the

focus group discussions with nurses that indicated that nurses are not consulted in the development of ERPs, it may as well be the case that the Ministry of Health has a template of ERPs, which hospitals across the country simply adopt without modification. If this is the case, it would explain why no internal inputs (particularly from nurses) are taken into consideration while developing ERPs. The fact that the policymaker's statement indicates that the Ministry assumes a level of responsibility for the development of hospital ERPs also further support the assertion that hospitals in the KSA may be adopting plans developed by the Ministry verbatim. It would therefore not be surprising that the implementation of such plans is poor, and that these plans are poorly understood by people at the grass-root level who implement such plans.

In addition, policymakers also highlighted the presence of a training department involved in running training workshops on emergency response. Finally, the involvement of the Ministry in developing a disaster response framework for the entire region was also highlighted. However, when asked about policies underpinning these activities, respondents seemed unaware of any policies providing support for these activities. When asked about this, one of the respondents answered, "What do you mean by our policy?"

This absence of clear policies may also partly contribute to the poor knowledge of policy frameworks and regulatory guidelines by nursing educators with an attendant effect on existing nursing training programme. These observations point to the fact that the problem of disaster nursing education in the KSA may be a more serious matter than what can be fixed by a simple curriculum development approach, necessitating a carefully planned and executed health systems strengthening programme involving policy development, the writing of national guidelines, the establishment of a needs assessment process, capacity building for several stakeholders, and the development of an effective disaster nursing curriculum.

(b) Result 2: Policymakers identified gaps in knowledge and poor communication skills as key factors militating against effective training in emergency response for nurses.

In this study, policymakers were also asked to identify level of knowledge of nurses for disaster response. This was done with the understanding that if these policymakers are awar for the need for programmes for disaster preparedness and response,. In response to this, one of the respondents specifically said:

"Honestly, we dealt with people, who did not have any knowledge or any experience."

This statement provides insights into the issues facing programmes training nurses for emergency response at many levels. In the first instance, it further underscored the already highlighted finding that the knowledge level of nurses within the KSA about emergency preparedness and response is poor. Secondly, it provides indications that training courses provided by the Ministry will be basic at best.

In addition, respondents indicated that the impact of communication barriers in facilitating effective working relationships between the many agencies that often work together in disaster response situations. It was highlighted that nurses within the hospitals often need to engage with agencies such as the Red Cross and the Civil Defence when responding to emergencies, and effective communication is critical to the success of these engagements in facilitating effective responses to disaster.

(c) Result 3: Policymakers believe that an effective disaster training programme must focus on basic competence in emergency situations and triage.

When asked about components of an effective disaster nursing programmes, policymakers interviewed were of the opinion that it is essential for nurses to receive adequate training in basic skills that are required for critical care during emergency situations ' *basic clinical support for victim is important for nurse to learn and practice to response better in disaster'*. However, indications of what such basic skills training programme should contain were not highlighted. Moreover, comparing this observation with the gaps identified during the focus group discussions with nurses, it appears that there is disconnect between the expectations of nurses and that of policymakers who develop training programmes. For instance, it is clear that nurses have competence in basic nursing routines and activities during an emergency situation. However, gaps in skills for leadership, critical thinking, decision making, a lack of understanding of frameworks and policies, and other related issues seem to be what nurses interviewed are lacking.

According to policymakers interviewed, nurses need to acquire competence in triage procedure and incident commands, although the evidence from which the identification of these areas is based is not understood. Policymakers went further to recommend courses such as the BLS, which cover aspects of these identified skills and competence. Issues

relating to the duration of training programmes were also flagged during the interviews with policymakers. Most of the available short courses last between half a day or one day, and it has been highlighted that these durations are grossly inadequate to provide nurses with the type of knowledge and competence required for effective disaster response. One of the respondents expressed that, "they need more training about incident command, 1 day, nor half a day is not enough", while another policymaker corroborated this statement by saying that "one hour of training on decontamination is not enough".

These observations largely provide the justification for why strategies for effectively training nurses for disaster response must be based on the incorporation of core concepts in emergency preparedness and response within existing nursing programmes. Some advantages of this approach include the fact that such training programmes will directly target nurses and their needs, in a manner that markedly improves on the indirect training approach (training of leaders who then train team members) that is currently used for available short courses. Also, since nursing training programmes last for a period of three years, there will be a sufficient time period for proper theoretical and practical training in different aspects of emergency preparedness and response.

Chapter Eight: Cross Analysis of the Finding

8.1 Introduction

This study investigated requirements for effective disaster nursing education in the KSA with a view to establishing what nurses in the KSA identify as key concepts for educational provisions and support mechanisms that will enable them to contribute effectively to disaster management. A qualitative case study approach was used together with a scoping review of available evidence on disaster preparedness and the response of nurses. Six hospitals across KSA were selected as cases and ERPs were collected from all selected hospitals for review. Also, six focus group discussions were undertaken for nurses recruited from selected hospitals, and four semi-structured interviews were conducted for nursing educators and policymakers from the KSA. Thematic analysis of transcripts of the focus group discussions and interviews was conducted and presented in the previous chapter.

In this chapter, the cross-analysis of evidence across the various forms of investigation conducted and how this informs the identification of key concepts needed in a new nursing curriculum will be presented. In the first instance, details of key findings with respect to what existing gaps are will be provided. Furthermore, key components of an effective training programme for disaster nursing, which addresses these gaps (as informed by research findings), will be provided.

8.2 Synthesis of Findings across Invetsigations conducted in this Study

The focus of this chapter is the presentation of key findings arising from the cross-analysis of results obtained from the different investigations conducted in this thesis. Details of findings from each investigation conducted and how they contribute to overall findings of this thesis have been synthesised in Table 8.1 below, where the Key Concepts extracted from the data will inform the key components required for an effective dsaster nursing training programme:

Table 8.1: Cross Analysis of Findings

Overall finding	Evidence from ERP analysis	Evidence from focus group discussion with nurses	Evidence from semi-structured interview with nursing educators and policy makers	Emerging key concept and implications for a new disaster nursing curriculum
There is a gap in the knowledge of nurses with respect to emergency planning and the implementation of ERPs.	ERPs are available in all hospitals studied. The structure of ERPs and scope of coverage differ from one hospital to another.	Nurses are aware that ERPs are available but have poor knowledge of contents. Nurses indicated that they do not partake in ERP development and have not been trained in proper implementation of ERPs. Nurses indicated that challenges associated with ERP implementation are largely around soft skills (such as leadership, teamworking and communication) that are required for ERP implementation.	Nursing educators confirmed that available nursing training programmes lack contents on emergency planning and the implementation of ERPs.	Curricular contents relating to emergency response planning and ERP implementation. Training in leadership, effective communication, inter-agency collaboration and teamwork, critical thinking.
Nurses lack important non-clinical skills and competence that are needed for effective disaster response.	Not applicable.	Nurses indicated that they were not condifent in responding when faced with disaster events They indicated that the	Nursing educators indicated that the current training programmes do not cover soft skills but covered basic nursing skills theoretically.	Training in non-clinical soft skills which builds confidence and resilience. Emergency drills and practical training in

		emergency response process is not properly led. They were aware of their roles and are capable of providing medical care. However, poor knowledge of emergency response protocol and lack of skills required to take initiatives when facing emergency situations affected their ability to respond effectively. They indicated that lack of practical knowledge was partially responsible for their lack of confidence.	They further indicated that there is a need for the inclusion of more practical experience and coverage of more non-clinical skills for emergency response in pre-registration nursing curriculum.	emergency response . Disaster response leadership and management.
There are significant challenges facing the development and deployment of effective disaster training programmes in KSA.	Not applicable.	Nurses indicated that their initial nursing training lacked disaster response contents. They are aware of short courses on disaster response, but such trainings are not available to all nurses as they are	Policy makers indicated that they are aware of and involved in the development of short courses for emergency training, but there seems to be no national policy for training of nurses in emergency response.	The need for post-registration training courses for the development and deployment of effective disaster training for nurses in KSA to be better prepared for disaster response..

		not free and not regularly run. Nurses who have attended the training indicated that it is theoretical and have several shortcomings which makes them inadequate. For example, duration of training is often too short for nurses to be able to gain the required level of competence. Nurses indicated that hospitals have challenges which prevented them from regular drills and sponsoring of short courses on emergency response.	Policymakers identified gaps in knowledge and communication skills as a key factor militating against effectively training nurses in emergency response. Policymakers believe that an effective disaster training programme must focus on basic competence in emergency situations and triage. Nursing educators indicated that training courses have shortcomings and challenges that render them inadequate to prepare nurses for effective emergency and disaster response. Nursing educators lack knowledge of available policies and regulatory frameworks.	Courses should be accessible and affordable to nurses. Issues relating to policies, national strategies and regulatory frameworks.

(a) There is a gap in the knowledge of nurses about emergency response planning

Evidence from the different investigations conducted in this study indicated gaps in the knowledge of nurses with respect to emergency planning. From the analysis of ERPs conducted in this study, well-developed Emergency Response Plans are available in the majority of the selected case hospitals. The analysis also revealed that to a large extent, these ERPs covered many of the disasters that hospitals within the region could face, even though significant differences in the format of these ERPs from the different hospitals were observed (Section 6.4). It was also observed that the scope of the ERPs differs significantly across the hospitals.

However, findings arising from the focus group discussions (Section 6.5.2) held with nurses revealed that there are problems associated with the implementation of these plans by nurses. Responses from these nurses (as detailed in Section 6.5.2) indicated that challenges associated with the implementation of ERPs stems from many factors including the fact that nurses are often not involved and/or consulted in the development of ERPs. Therefore, their knowledge of the content of ERPs is not adequate during the development or when it is available as there is no education on the plans. It is therefore not surprising that they encounter challenges in the implementation of ERPs. Moreover, nurses indicated that the training they have received did not prepare them sufficiently for emergency planning or the implementation of ERPs. Their responses particularly indicated that their initial nursing training programmes lack elements of emergency preparedness and response to disaster with the skills both clinical and non-clinical that they felt they needed. Responses obtained from nursing educators also confirmed these findings, as detailed in Section 6.5.2, nursing educators clearly indicated that there are no structured disaster response education contents within the current pre-registration nursing training programme in the KSA and that whilst there were some post-qualifcation training available it was not freely available or adequate They recognised that there was little in relation to the skills associated with policy making and planning for nurses and that this maybe a barrier to engagement.

Altogether, these findings indicate that there is a need for an education programme which provides adequate content relating to the development of ERPs. During the focus group discussions, problems highlighted by nurses in this regard include the lack of skills in communication, in the leadership of the emergency response process and in critical thinking which is often essential during the emergency response scenarios when there is often little or

no opportunity for supervision. These, therefore, represent part of the key concepts that an effective disaster nursing programme must address. Details of how these could be addressed in a nursing training programme will be highlighted subsequently in this thesis.

(b) Nurses lack training in important non-clinical skills that are needed for effective disaster response

Evidence relating to this finding were largely derived from the focus group discussions held with nurses as well as interviews conducted with nursing educators. As expected, it is difficult to deduce nursing skills from contents of ERPs. Therefore, the analysis of this finding will be largely based on data obtained from nurses and nursing educators. Data obtained from nurses during the focus group discussions (presented in detail in Section 6.5) revealed that whilst nurses are confident in the deployment of clinical skills required for effective emergency response in a general setting, these skills and the confidence required to deploy them are countered by a lack of non-clinical skills in actual disaster response settings. Their responses indicated significant lack of non-clinical skills required for effective disaster response. Non-clinical skills highlighted by nurses in this regard are similar to those highlighted earlier as part of challenges associated with the implememtation of ERPs. Specifically, these relates to leadership skills, issues around ethics and values, negotiation, and working collaboratively as part of a team. It was evident that though nurses engage in activities which require the use of these skills as part of their clinical work (such as team working), the fact that emergency situations are completely different from the usual clinical routines makes the deployment of these skills very hard for nurses. Altogether, these affect the confidence of nurses when facing disaster situations. These, coupled with the fact that the emergency situation is often poorly led and managed, further contribute to the nurses reporting feeling inadequately prepared to effectively respond to disasters.

Responses obtained during the interview conducted for nursing educators further highlighted problems around the lack of these essential non-clinical skills identified by nurses. Educators interviewed confirmed that the current nursing training programmes lack contents relating to these non-clinical skills, and where contents exist, they are not taught within the context of emergency/disaster response. Nursing educators however iterated that available nursing training programmes provide adequate basic training in clinical skills, even though it is more theoretical than practical. This reinforces findings that indicate the need for a disaster preparedness curriculum that focuses on addressing the gaps in non-clinical skills, and the

practical application of clinical skills which the data would indicate is acceptably covered in undergraduate nurse training.

Together with the responses obtained from nurses, theses findings clearly identify concepts around these skills as Key Concepts required in an effective nursing curriculum. Specifically, these observations highlight the importance of training of nurses in leadership, team work, personal resilience and confidence.

In addition, responses of nurses and nursing educators also highlights the importance of regular emergency drills and practical training in disaster response to simulate and allow for learning and practicing of the practical, on the ground skills. These are also recognised as Key Concepts that underpin an effective training programme in the UK competency Framework presented on p.235. This key finding informs the vital inclusion of practical simaulations and drills presented and discussed in more detail in the proposed curriculum model (pp. 233-34) and developed framework (pp. 235-37).

Finally, the importance of effective disaster response leadership and management was evident in the responses of nurses engaged in the focus group meetings. The lack of direction that some of these nurses indicated stems from the fact that the process of disaster preparedness and response has not been effectively managed and led. Therefore, due to the important role of nurses in the disaster response process, it is important that they are also taught on how to effectively lead and manage the disaster response process.

(c) There are significant challenges facing the development and deployment of effective disaster training programmes in KSA

Responses obtained from nurses engaged in the focus group discussions organised in this thesis indicated that their initial nursing training lacked an inclusion of disaster response contents (both theoretic and practical) and this, to a large extent, is an indication of several challenges that are associated with the development and deployment of effective disaster training programnmes in KSA at the pre-registration level. The Key Concepts indentified from table 9.1 would be vital in bridging these knowledge and skill gaps, which include but are not exhaustive of teamwork, development of resilience and leadership and management skills in a disaster response context. Where these are currently unavailable in pre-reg curriculum, it is important that any course designed to bridge these gaps is applicable as a CPD stan alone course, where nurses can build on their clinical-skills and apply them,

fortified by the non-clinical skills in the proposed curriculum, to apply their existing clinical skills accordingly.

However, their responses also indicated that there are challenges in accessing post-registration short courses on disaster response. These nurses indicated that they are aware of short courses on disaster response, but such courses are not available to all nurses as they are not free and not regularly run. Nurses who have attended the training indicated that it is theoretical and has several shortcomings which makes it inadequate. For example, duration of training is often too short for nurses to be able to gain the required level of competence required to be effective in the field. Despite these challenges, responses obtained from nurses indicated that whilst they are often willing and want to undertake such courses, they are often unable to. Responses obtained from nurses further indicated that hospitals have challenges which prevented them from regular drills and sponsoring of short courses on emergency response (Focus group discussions, result 8).

Responses obtained through interviews conducted with policymakers provided further clarifications of challenges highlighted by responses obtained from nurses. For instance, policy makers indicated that they are aware of and involved in the development of short courses for emergency training, but there seems to be no national policy for training of nurses in emergency response. Perhaps this lack of national policy is why hospitals do not fully and actively engage in sponsoring their nursing staff members for available courses. Policymakers also identified gaps in knowledge and communication skills as a key obstacle in effectively training nurses in emergency response. Furthermore, policymakers believe that an effective disaster training programme must focus on basic competence in emergency situations and triage of patients and the situation.

Responses obtained from nursing educators also confirmed many of the observations made from the responses of nurses and policymakers. For example, nursing educators confirmed that available training courses have shortcomings and challenges that render them inadequate to prepare nurses for effective emergency and disaster response. However, it was also observed that nursing educators lack knowledge of available policies and regulatory frameworks, and this will have implications for the type of training they provide at the pre-registration level. This would be an useful point to explore further in conjunction with future post-doctoral development of the curriculum as discussed in Chapter 10, to ensure all gaps in

the network are adequately covered to provide effective disaster nurse preparedness and response training with the inclusion of all necessary stakeholders involved in that process.

It is therefore evident that both educators and policymakers are aware of challenges facing the effective training of nurses for disaster response, but there is a great disconnect between all parties. There is no evidence of feedback from nurses in the field to educators that may lead to constant curriculum development to make services effective. There is lack of feedback between policymakers who are involved in the development and delivery of disaster training programmes and those being trained. Moreover, nursing educators themselves have limited knowledge of existing (albeit inadequate) policies and frameworks underpinning any current disaster response training in the country.

Interactions with nurses, educators and policymakers indicated that, though the Saudi 2030 Vision document was recently developed, the implementation of strategies highlighted in the document with respect to improved nursing education is yet to take place. Also, the fact that there is no national association such as a national nursing council may partially contribute to the lack of vision, structure, and guidelines for the scope of nursing. This may be the reason why no significant effort is made to develop effective disaster nursing training programmes. It is possible that everybody involved in macro-level development may be unsure about what to do. Altogether, key concepts emerging from these observations with respect to challenges associated with available courses include the need for post-registration training courses which are accessible and affordable to nurses. Moreover, the need to ensure that issues relating to policies, national strategies and regulatory frameworks are adequately addressed in the curriculum of such courses is also prominent.

8.3 Conclusion

This chapter has presented a cross analysis of findings obtained from the individual investigations conducted in this thesis to highlight how they inform the overall findings of the thesis. Moreover, highlights of key concepts that should be included (or covered) by an effective disaster nursing programme, based on responses obtained from the different categories of participants involved in this study, have been provided. In the next chapter, a brief discussion of each of the identified key concepts (in relation to disaster nursing) and how challenges associated with these concepts could be addressed in an improved disaster nursing curriculum will be discussed in the next chapter.

Chapter Nine: Discussion

9.1 Introduction

Disasters have always been a common human experience, causing substantial loss of life, reducing the quality of life, displacing people, and negatively impacting entire populations (Veenema, 2018, p.2). Globally, the rate at which disasters are occurring is increasing, as are the number of deaths, the degree of morbidity and suffering, economic losses, and environmental damage (Usher & Mayner, 2011).

Like many other countries worldwide, the KSA is prone to disasters. Indeed, the KSA has a history of, and continues to experience, various types of disasters, each necessitating a unique response. The situation is especially complicated due to the fact that each province is prone to different types of disasters: for instance, flooding is predominant in the central and western regions, earthquakes and volcanic eruptions occur in the north-west, dust storms strike the central and eastern areas, and landslides threaten the south-west (Al-Bassam et al., 2014). In addition, religious practices can also contribute to health hazards in the KSA, as discussed earlier.

This emphasizes the need to manage the current and future situation, by planning for emergencies and ensuring disaster preparedness (Veneema, 2015). While there is often no way to predict or prevent disasters, it is certainly possible to prevent, or mitigate, their deleterious effects, especially the number of human casualties and the negative economic impacts. Since healthcare is an important aspect of disaster management, and disasters impact individual, communal, and societal health directly, it is crucial that healthcare professionals, especially nurses, are prepared for any disaster that might occur. Nurses constitute the largest group of healthcare professionals in the KSA, and are frontline responders in emergency situations (WHO, 2020). Moreover, they play a critical role in the disaster response, as demonstrated by the fact that the demand for nurses during a disaster eclipse that of other healthcare professionals (Fung et al., 2009; Lavin, 2006). Crucially, the clinical outcomes of the victims of disasters are largely dependent on the skills and competencies of the responding nurses (WHO, 2009). Accordingly, there is a need for adequate levels of

preparedness for any event that might adversely affect the health of a large number of people within the general population (Alraga, 2017).

Recent disasters have demonstrated that a lack of knowledge of disaster response and management can result in confusion among responders, thereby reducing the effectiveness of the response (Pradhananga & ElZomor, 2021). Disasters involve unique circumstances that require healthcare professionals to adapt to changing environments and working conditions. As nurses comprise the largest segment of the healthcare workforce, excluding them from disaster planning and educating them inadequately about disasters, entails substantial risk for the population (Park & Kim, 2017; Karnjuš et al., 2021). The main aim of this study was to establish what professional nurses identify as essential ongoing educational provisions and support that they require to ensure the effectiveness of disaster nursing preparation in the KSA.

The connection and relationships between the views and perceptions of nurses, academic lecturers, and policymakers, alongside associated key concepts, have been provided in the previous chapter. This chapter will provide a brief discussion of each of the key findings. This will be followed by the description of key concepts identified as well as how gaps relating to these concepts could be addressed through an improved nursing curriculum that could be implemented in KSA.

9.2 Discussion of Findings

To facilitate the discussion, it will be framed using the research questions stated at the beginning of this thesis which in turn will demonstrate how they have been achieved.

9.2.1 *Research question 1: What is the current evidence base that underpins nursing education for emergency preparedness and disaster responses in the KSA?*

The scoping review conducted in this thesis revealed that nurses faced significant obstacles in responding to disasters due to their lack of prior disaster experience, training, and education. All studies reviwed indicated the need for quality preparedness training to boost nurses' confidence and competence. This observation is consistent with the data collected from focus group discussions conducted for nurses (and will be discussed subsequently in this chapter). In addition, this outcome of the scoping review is also consistent with the previous report by

Chegini et al. (2022) which indicated that there are still unaddressed deficiencies in disaster preparedness and fundamental competencies for emergency nurses. It also further highlighted that addressing the lack of confidence in nurses is a key concept that the new curriculum that this study aims at proposing must focus on.

In addition to the lack of confidence among nurses, the scoping review further identified several other challenges which face the effective training of nurses in KSA for disaster response. These include the lack of evaluation and assessment of extant educational programmes (Seroney, 2014; Al Harthi et al., 2021) further confirmed this finding by indicating that there is a lack of research as well as valid and reliable tools/scales for evaluating currently available education programmes.

As presented in Chapter 3, the scoping review conducted further indicated that incorporating concepts of disaster preparedness and response into the nursing curriculum is an approach widely adopted internationally, but not in the KSA. The nursing programme in the KSA does not make any reference to disaster preparedness or response and is currently grossly inadequate at preparing nurses for effective disaster response. The scoping review conducted revealed the importance of incorporating effective emergency response preparedness education in nurse training programmes. Several studies reviewed recognised that the goal of emergency response preparedness training and education is to equip nurses with the knowledge and skills required to perform effectively in emergencies. It was highlighted that hospitals should also be both sufficiently resourced and have effective operating structures to handle emergencies/disasters Ilo et al., 2020). Evidence across studies reviewed also emphasized the importance of effective emergency planning in minimising the impact of disasters (Davidson & McFarlane, 2006; Hosseini et al., 2019; Perry & Lindell, 2003; Ramisetty-Mikler et al., 2015), However, it was evident from the scoping review that the communication of the processes and procedures for emergency response among nurses is poor (Cole et al., 2017). This therefore identifies effective communication as a key concept that must be addressed in the curriculum that is proposed in the final chapter of this study.The scoping review conducted also revealed that there is a knowledge gap with respect to the relationship between disaster response, leadership, and management skills among nurses. This also set the scene for the need to consider issues relating to leadership and management as key concepts required for effective disaster nursing training in KSA.

In addition to the scoping review, a review of the ERPs in selected hospitals was conducted in this study. This is against the rationale that the quality of ERPs in an hospital may provide an indication of the level of disaster preparedness of the hospital, and by extension provide an indicator of the level at which nurses within the hospital are operating because they are key players in disaster response and also because nurses are often involved in the development of ERPs. Moreover, the review is also important as it may help in the identification of key concepts that needs to be addressed in the curriculum that this study seeks to propose.

Adequate preparedness for emergencies helps minimize their impact, and where people are exposed to specific risks (such as flooding or earthquakes), specific impact reduction measures (such as floodproofing and structural reinforcement) can be undertaken in advance (Billa et al., 2006; Cole et al., 2017). Within the healthcare sector itself, ERPs are essential as hospitals and healthcare staff are at the forefront of the disaster response and they need proper guidance on how to conduct their activities under such conditions (Persoff et al., 2018). While all the hospitals included in the current study had one form of ERP or the other, there are significant variations both in the procedures detailed in these ERPs and the scope of disaster covered, which is by extension indicating difference in the level of emergency preparedness of these hospitals. There is no universal ERP standard for hospitals to follow and this may be responsible for the inconsistencies in the style and format of ERPs that are present in these hospitals. Some ERPs provided just a little more than the listing of likely scenarios while others contain detailed procedures and protocols to be followed during emergency situations. ERPs collected from these hospitals also differ significantly in the extent of plans they had in place for collaboration with external agencies during disasters while some of the ERPs do not have comprehensive response plans for all potential users of their services (as such, very generic in nature).

Overall, the main finding from the review of ERPs in selected hospitals in KSA is that the observed lack consistency, comprehensiveness, and clarity of guidance in their ERPs are indicators of either poor knowledge of nurses involved in the development of these plans or indications that nurses were not involved ab initio in the development of these plans. The exact nature of the problem in this case was investigated during the focus group discussion held for nurses. Details of the implications of findings arising from the investigation will be provided in the next section. Irrespective of what the nature of the problem is, it is evident

that the provision of adequate knowledge of ERP development and implementation is a key concept that the disaster nursing curriculum that is to be proposed should cover.

The review of ERPs conducted also showed that there are challenges associated with coordination of different agencies involved in disaster responses. Moreover, the demarcation of roles and responsibilities assigned to nurses in many of the ERPs is unclear. According to Harris et al. (2021), this lack of clarity has the ability to significantly affect the establishment of effective management structures within and between organisations in a negative manner. These observations therefore highlight the importance of inter-agency collaboration and teamwork as key concepts that are essential for effective disaster response, and as such, should be covered by a good disaster nursing training programme.

9.2.2 *Research Question 2: What is the current level of knowledge in terms of disaster preparedness/response among emergency nurses in the KSA?*

To answer this research question, focus group discussions were organised for nurses and nursing educators and relevant policy makers were interviewed. The rationale behind the investigation of the current level of knowledge of nurses in disaster preparedness/response in this study is anchored on the fact that it is important to gather information directlyfrom nurses' perspective about challenges that they are currently facing in the field vis-à-vis the adequacy of any training and or education that they have received. Moreover, policy makers and nursing educators were interviewed because they are important stakeholders in nursing education within the context of KSA,therefore, interacting with these stakeholders has the potential to help in the identification of existing gaps as well as key concepts that should be considered in the development of a new curriculum. The cross analysis of findings presented in Chapter 8 has provided an indication of how observations made from interacting with these participants helped in the identification of some key concepts.

As der Heide (2006) points out, the rapidity of responses by the emergency teams is crucial for reducing disasters' impacts, and this is enhanced by early and accurate detection of their occurrence. While having a good ERP is good, it is essential that health professionals have adequate knowledge of the content of these ERPs and are competent in implementing strategies, protocols and procedures details in these ERPs. The provision of other resources, such as equipment, transport and medical supplies, are also essential for effective implementation of ERPs (der Heidi, 2006). It is against these backgrounds that nurses

selected from hospitals from where ERPs were collected were asked to reflect on their experience of disaster response as well as their knowledge of ERP and its implementation.

As detailed in Chapter 8, most hospitals examined had reasonable ERPs in place. However, the majority of nurses drawn from these hospitals were only vaguely aware that the hospitals had an ERP in place, and without adequate knowledge of the content of these plans. This lack of knowledge was also coupled with participants expressing views that their ability to implement (as well as the current level of implementation of) these plans was poor. Typically, nurses engaged in the focus group discussions indicated that they simply followed orders when emergencies occurred and at times, such orders may be confusing. These observations are consistent with the previous report by Ibrahim (2014) which indicated that nurses in KSA have both a low level of awareness about disaster plans and little engagement with the policies and procedures they contain.

Other previous studies have reported that most hospitals in KSA have well written documentation that was in accordance with the standards set by JCAHO and the Saudi Central Board for Accreditation Healthcare Institution (SBAHI) (Alruwaili et al., 2023; Alyami et al., 2020). However, consistent with the present study, these previous reports indicated that nurses either found the texts too difficult to follow or had insufficient time to read them (Alruwaili et al., 2023; Alyami et al., 2020). Alshahrani (2021) suggested that the fault lay with administration and the absence of a standardized disaster plan across KSA. These observvations are also consistent with some of the outcomes of the scoping review which indicates that communication problems may play a significant role in the inability of nurses to respond effectively to disasters. This could be problems associated with how contents of ERPs are communicated as well as how communications during ERP implementation are passed.

Responses obtained during the focus group discussions organized in this study revealed that nurses are aware of their roles during an emergency or disaster situation. Therefore, this study has uniquely discovered that nurses' inability to respond effectively to disaster events is not due to the fact that they are unaware of their roles. However, the problem may likely be resulting from their lack of knowledge, skills and subsequent confidence required to deliver on these roles. This is particularly important because it is known that skills required during emergency response are not just clinical but also involve non-clinical skills, many of which

the scoping review conducted has identified as Key Concepts required for a disaster nursing preparedness curriculum and has indicated as lacking among nurses.

The above observation is also consistent with the response of nurses which indicated that they are often not included in the development of ERPs. Nurses particularly indicated that they felt unable to increase their performance in disasters for want of direct involvement in the setting up and maintenance of hospital ERPs. The evidence from the nurses shows they are not included in the development of ERPs or the training programs for disaster relief. The development of ERPs is done entirely without nurses' input and without consulting them about the needs they have or even overseeing the draft ERP proposals. This finding of the present research is consistent with what other studies have reported. For example, Whetzel et al., (2013) indicated that most nurses tended to be aware that hospitals had ERPs with written documentation, but few knew where they were kept or their contents. According to Whetzel et al., (2013), some nurses are not even aware of its existence. The study therefore remarked that the purpose of ERPs is more than knowing where a hospital plan is, but knowing the instructions it contains and the roles assigned to nurses, should disasters occur. A useful point to consider here is the potential for nurses to feel a lack of importance and power or agency, in light of this, which could be a contributing factor in low nurse confidence identified in the data in these respects.

Nurses' knowledge and skills are increased by understanding disaster plans, thereby improving their preparedness (Jagim, 2007). In a study based on Hurricane Floyd by French et al., (2002), nurses found hospital ERPs inadequate at addressing their concerns, but were unable to determine what deficiencies they had – only that further research was required. As suggested by Fass et al., (2010) a first step in solving any as yet poorly understood failings in ERPs would be to make sure they were clear and easy to comprehend. The general consensus from the research into the subject is that more research is required on ERPs: what makes them effective and what makes them confusing.

Data obtained following the interview conducted with nursing educators and policymakers provided some explanations for the observed poor knowledge of nurses in KSA. Nursing educators confirmed that available pre-registration courses in KSA lack contents on emergency preparedness/response, while policymakers who are involved in the development

of post-registration short course also highlighted certain limitations of available short courses. As highlighted in Chapter 8, the fact that available short courses are not accessible to nurses is a major limitation in this regard. . So, if nurses are not exposed to and develop the required skills or at least foundational elements during their initial nursing training programmes and they do not have access to available short courses, it is expected that their knowledge, skills and competence in disaster response will be poor.

In line with these observations, Shalhoub et al. (2017) indicated that nurses usually make up the largest number of the first responders during disasters often have documentation that met JCAHO and SBAHI standards. According to Shalhoub et al. (2017), even though some of these nurses claimed to be ready for disasters, their disaster education and training levels were observed to be quite poor. Like nurses who participated in the present studies, nurses recruited for the study by Shalhoub et al. (2017) were unaware of both policies and procedures, and no hospitals involved in that study conducted disaster training or simulations without advance warning. The study further iterated that nurses in KSA are not given the opportunity to voice their own perceptions of the education and training they feel they need (Shalhoub et al., 2017). This observation further highlights the importance of the present study which seeks the opinion of nurses about key concepts that should be in an effective disaster nursing training programme.

Consistently, all participants recruited for this present study are of the opinion that there are far too few opportunities for training of nurses in emergency preparedness/response. Nurses who have participated in the available short training courses also indicated that those trainings only provided very basic education and skills about emergency responding, and fall short of preparing them for a disaster in real life. This clearly highlights some of the limitations that both nursing educators and policy makers talked about in this study. Altogether, these observations point to the fact that the current provision of disaster training for nurses is inadequate and does not equip them with the necessary knowledge and capability to act effectively during disasters.

Like this study, many previous studies have reported the poor knowledge of nurses in emergency response in KSA over the last decade (Ibrahim, 2014; Al Thobaity et al., 2015; Alshehri, 2017; et al., 2017; Baker et al., 2019; Brinjee et al., 2021a). However, unlike this study, many of these studies did not investigate the adequacy of current training programmes or the level of coverage of available training programmes. For example, the study by Ibrahim

(2014) examined KSA student nurses' knowledge, attitudes, practices, and familiarity in relation to disasters and reported poor levels of performance in all of these categories except practices. Together with these previous reports, the report of our present study strongly motivates the includion of disaster response education into the nursing curriculum. Al Thobaity et al. (2015) compared KSA military and civilian nurses' knowledge levels on disaster responding and found moderate and poor levels respectively. The same findings for civilian nurses were observed by Alshehri (2017). This was inconsistent with the assumption earlier made in this study that military nurses may have better knowledge of emergency preparedness and response.

In addition to factors that have already been identified in the present study, Brinjee et al. (2021a) implicated other factors in the poor knowledge and skill levels required for effective disaster responses in KSA. These additional factors include the lack of practice (e.g. simulations and drills), poor national guidelines or use of existing ones, and a general lack of teaching resources for disaster-related education. To address these deficiencies Brinjee et al. (2021b) recommended re-designing the nursing programs to include better content about disasters and provide simulations/drills. This suggestion is consistent with the overall aim of this study. However, as this study has identified that certain non-clinical skills are essential for effective disaster response, such a revised curriculum should cover non-clinical skills (many of which have been highlighted in Chapter 8 (management, leadership, ethical decision-making, communication, and collaboration). Details of how this could be implemented will be discussed subsequently in this chapter.

The lack of disaster training in the current nursing school curricula indicated by participants in this study is also consistent with previous reports and the consistent call for continually revision and updating of available curricula. The need to develop national strategies and healthcare systems to have content for specific types of disasters has also been highlighted (Labrague et al., 2018; Rivera-Rodriguez, 2017). Only by improving the undergraduate nursing education programs can corresponding improvements be made in the knowledge and skill levels of the nurses who will bear the brunt of disaster relief, and this requires sufficient high quality resources to be available to nurses and put into their education (Loke & Fung, 2014; Yin et al., 2011).

Consistent with the findings of this study, Bajow and Alkhalil (2014) reported that nurses were not trained sufficiently for effective disaster responding, despite the hospital having

quality assurance tools in place. The study therefore recommended that the current nursing programs be revised to include comprehensive disaster education and training in the areas in which nurses lacked knowledge. There continues to be a consistent call among similar studies (Abosuliman et al., 2014; Alraga, 2017; Alshehri, 2016; Al-Thobaity et al., 2015; Bin Shalhoub et al., 2017; Ibrahim, 2014). In the present study, nurses considered their practical training through drills as inadequate for the number of staff present and should be standardized and made more frequent. However, unlike previous studies, this study has discovered that whilst the focus of a new training programme must look beyond practical skills, it must also include non-clinical skills that have been highlighted in Chapter 8. The call for training in non-clinical skills is based on the fact that nurses play a crucial role in guiding and coordinating the response tasks and this responsibility requires nurses to develop effective leadership, management and overall interpersonal skills, among other skills. Also, the nursing role during disaster may include working with teams in an inter-agency working environment, and this requires that nurses are training to be able to collaborate effectively. Also, responses obtained from nurses in this study revealed that the disaster response could be associated with increased stress levels, information overload, chaotic situations, potential disruption of services, and surge in casualties. These require that nurses should be able to make crucial, time-sensitive judgements regarding what must be done. However, many of the nurses recruited for the focus group discussion in this study indicated that they lack the capacity for this type of critical decision making.

9.2.3 Research question 3: What key concepts comprise the essential components of a nursing educational programme that would adequately instruct nurses in effective disaster preparedness/response?

This questin has been answered by both the scoping review and the empirical stages of this study. Whilst much of what has been discussed is not new, it has not previously been drawn together in a way which addresses the specific needs of nurses in a meaningful way that encourages co-design of a programme. Through in-depth investigation this study has highlighted the nurses voice, engaging them in a listening exercize designed to empower them in the development of their own competence.

The educators made the point that any improvements to the disaster preparedness training for nurses has to be built on the existing provision in KSA (result 4, educators' interview). This requires making sure nurses have good knowledge of the national frameworks within which

they operate. This would also address the variability issue in disaster response training, bringing all training up to a common national standard. This demands that educators have comprehensive knowledge of existing policy and legal frameworks.

The poor knowledge of policy and the legal frameworks governing disaster relief held by nursing educators, may reflect a more serious problem in KSA which this study has created new insights into, and be a result of poor or confused policy making itself. This would imply that it is the policy making process, rather than solely the nursing curriculum, that needs to be addressed. Improvements would have to involve the policy development for disaster responding, incorporating clear standard national guidelines, a system to assess needs and inadequacies in provisions, and capacity increases and safety nets established for all stakeholders in disaster relief. The nursing programs could then be modified to include the revised policies and would be more effective as a result. This research contributes towards this aim with the proposal of a new curriculum, informed by the Key Concepts derived from the findings of this study from a multi-participatory approach.

The educators stressed the importance of including both theoretical and practical knowledge in any updated curricula (educator, result 3). Additionally, one of the participants involved in policy making commented that the current nursing education does not equip nurses for real-life disasters, but only explains what disasters are (policy maker, result 3). Thus, the interview data as a whole implies that the current nursing institutions do not give nurses enough training on how to respond to real-life disasters.

This theme was frequent in the literature covered in the scoping review, with inadequate content on disaster response skills in the curricula being pointed out as the underlying reason behind education programs for disasters not meeting their objectives across the country (Kalanlar, 2019; Xia et al., 2020; Veenema et al., 2017). Self-reports of nurses' competencies, particularly those for general nurses, were found to be seriously insufficient and in need of much improved public health education curricula. The poor development of curricula that result in inadequately prepared nurses is largely the result of poor use of evidence-based research, making the information that is available of poor quality and of limited value (Usher et al., 2015). The end result is that curricula fail the students and, when nurses, they are ill-equipped to cope with real disasters.

The inability to use evidence from research to develop appropriate training programmes for disaster nursing has been recognised as a problem in many countries (Basnet et al., 2016; Yan et al., 2015; Ranse et al., 2010; Li et al., 2015). This is particularly evident from the scoping review conducted in this study. The serious inadequacies have been reported by many other researchers, with Younos et al. (2021) indicating a complete lack of disaster management training for health professionals and totally inexperienced nursing teams. There is no shortage of related studies highlighting the scarcity of research-led education policy development (see e.g., Alzahrani & Kyratisis, 2016; Baack & Alfred, 2013; Loke & Fung, 2014; Whetzel et al., 2013). While some progress had been made in the development of coherent research-informed disaster education and training programs in countries such as Australia (FitzGerald et al., 2010), this remains underdeveloped despite the time elapsed since its initiation (Li et al., 2015; Usher et al., 2014).

Both the interview and focus group data indicated that KSA's current education for nursing fails to deliver specific and detailed disaster response training. The educators were aware of some programs on disaster responding, but these have short durations (lasting only a few days) and only equipped nurses with basic knowledge, as well as being still under development (result 2, educators' interview). Of the 39 participants, 31 agreed that the best training for real emergencies was obtained through practice drills (result 5 and 6, focus group). Suggestions included the Canadian Triage Acute Scale (CTAS), simulation, and the psychological aspects of disaster relief. The participants remarked on the poor quality of the current provision in KSA and that it often depended on information delivered via mobile phone apps and lecture videos, with no practical training or simulation (Bajow et al., 2022). Those courses that do exist were commented on as being mostly theoretical and containing little of the practical training the nurses knew from experience to be the most useful in real life.

From the experience of nursing students in close proximity to earthquake sites (Istanbul, Turkey and Miyazaki, Japan), Oztekin et al. (2014) found that undergraduate student nurses learned more about disaster relief through practical training than through lectures and video instruction. Aside from the importance of simulation discussed earlier (and which is gradually being more widely adopted), Loke and Fung (2014) recommend the provision of additional elements in nurses' training such as advanced cardiovascular life support, first aid, infection control, advanced trauma care nursing, and post-traumatic psychological care. Returning to

disaster simulation, Morrison and Catano (2010) found it to be an important means for nurses to learn how to apply their knowledge, and that those with hands-on experience of disasters did this more effectively than inexperienced nurses. A similar point is made by Setywati and Lue (2020), again recommending the inclusion of continual disaster rehearsal, professional development, and dedicated disaster training in nursing curricula.

While the policymakers in this study all agreed on the need for training in basic skills for disaster responding, they were not forthcoming about what those skills should comprise (result 3, policymakers). More importantly, in the focus group discussions, the nurses themselves were aware of gaps in their knowledge about disaster relief but this was not well understood by the policymakers responsible for nursing course provision. This mismatch seemed most acute regarding the non-clinical skills the nurses felt they needed more training in, such as leadership, decision making, and critical thinking, as well as on the policy framework within which they have to work (educators, result 2).

Nurses represent one of, if not the, largest component of most countries' health workforce (Edmonson et al., 2017). Much research highlights the importance of leadership skills in nurses during crises (e.g., White et al., 2016). However, the nurse participants felt they lacked these skills, particularly because of their uncertainty over their roles during emergencies, leading them to focus only on the clinical aspect of their work (result 1, focus group).

It was clear from the nurse's responses in this study that the leadership needed to coordinate disaster relief teams through crises were absent during real-life disasters, and that this was seen as a major reason for the ineffectiveness of the response (result 5 and 6, focus group). While the ERPs obtained from the hospitals did contain allocations of roles and responsibilities, the focus group discussions highlighted that these were not evident in actual disasters, with one nurse commenting:

> *"I follow the leader and I just wait for orders. How – I mean, in the hospital we know how to work and from whom we take orders, but there it was a totally new thing for us to deal with. I learned from that experience that leaders must give orders."* (Case 6, p.8)

However, it is unclear if the leadership provided by these leaders is effective or not.In fact, indications from another respondent revealed that rather than giving sensible instructions,

leaders during emergencies merely give orders without explaining their role to followers. One of the participants stated that:

> *"I tell you; I mean, we have a plan and we are supposed to work to it, but at the time of the disaster, officials come and give us orders, and when we try to explain, they don't listen to us, they just say, do according to orders and follow directions from us"* (Case 5, p.2)

Nurse leadership during a disaster involves many aspects critical to the quality of care delivered. These include a range of management and organisational skills as well as both supervisory and motivational roles in regard to other nurses (Knebel et al., 2012). The focus group discussions emphasized the need for such skills in nurse leaders during disasters – skills which are over and above their normal responsibilities (result 7 and 8, focus group). That nurses also account for by far the largest component of the response force during disasters, makes the need for nurse leaders to possess the requisite leadership and management skills all the more important (Knebel et al., 2012; Veenema et al., 2016). Planning is particularly important during disasters, which makes it important for nurse leaders to have a comprehensive knowledge of the current disaster management plans in effect.

The nurses in direct contact with disaster victims, including those with supervisory or leadership positions, often have not been involved with the preparation of disaster plans (result 4, focus group), despite it being well-known that this lack of involvement has negative effects on the quality of care patients receive in emergencies as well as under normal conditions (Christensen et al., 2012; Hyer et al., 2009; Laditka et al., 2009; Saliba et al., 2004). Nurses also need to have negotiation and communication skills at a high level to fulfil leadership roles (Murphy, 2014). It is therefore critical that they have these skills and make decisionmakers aware of their vital role in healthcare during crises. Decisionmakers awareness of nurses' importance would also be improved by wider public recognition of their services (Almalki et al., 2011).

The ability to process information rapidly under pressure and think critically is vital during disasters (Chegini et al., 2022). Nurses need to solve pressing problems during emergencies, and both assign responsibilities to others and work with them smoothly, all of which requires extensive knowledge and flexibility (Powers & Daily, 2010). Despite this need for rapid and

independent critical thinking and decision making (Bulson & Bulson, 2011), the nurse participants in the current study reported that they tended only to follow orders from superiors during disasters (Result 7, focus group).

Critical thinking in disasters involves finding solutions to problems rapidly given the resources available at the crisis time (Bulson & Bulson, 2011). With this ability, expert care can be delivered that is both safe and effective (Fletcher et al., 2022). To do this under pressure requires extensive practice of employing critical thinking and problem-solving skills. These skills are required of nurses often on a daily basis, in the allocation of beds and other hospital resources in limited supply. It is in part a learned skill that requires time and practice to develop (Aliakbari et al., 2022).

Decision-making ability in disasters directly affects the efficacy of the disaster response (Zhou et al., 2018) and requires an excellent knowledge base from which to make those decisions (Azizpour et al., 2022). The current study's focus group discussions also highlighted the importance of decision-making and its stressful nature under crisis conditions – in line with other research (Kapucu & Garayev, 2011).The focus groups also emphasised the uniqueness and insecurity of disaster situations during which conditions are both life-threatening and urgent (result 5, focus group). The difficulty of such decision-making is compounded by incomplete information, the speed of response required, and the possibility of competing and conflicting objectives. This is exacerbated if there are ethical or human rights conflicts or political tensions involved. Thus, while the ability to make rapid decisions with limited information is a fundamental ability required in disasters, leaders also need to have the skills necessary to prioritize the health, safety, ethical, and political factors involved (Clarke, 2013).

Communication problems were frequently brought up by the nurses (result 7 and 8, focus group), (result 3, education interview), (result 2 policy makers). These were apparent, between staff during emergencies, within health organisations, and with the MOH. In particular, nurses found it difficult to communicate with the doctors, and some highlighted that poor communication led to, or arose from, conflicting information. These problems would have been avoided if the nurses both had the skills necessary to cope with disasters effectively, and a comprehensive knowledge about the ERPs. Quite simply, had they acquired the necessary skills during their training they would have been able to work independently and not depend on seeking advice from time-pressured doctors.

Poor communication was a problem between nurses, health educators, and policymakers, and it was frequently pointed out that no overarching organisation existed that had the responsibility to communicate policy to healthcare workers at all levels – including the continuing educational programme (CPD) providers. Educators were among the key stakeholders who also expressed not having any, or only very little, knowledge of the policy frameworks governing their work, or of the specific policies that operated in emergencies. This concords with the finding that the educational institutions' curricula lacked policy documentation and protocols for disaster preparedness. One of the reasons why nurses show poor understanding of ERPs, and fail to implement them properly, is that communication between them and policy makers is poor and made worse by no operative mechanism existing for providing feedback and thereby improving training for disasters.

Commitment to work and ethics are other personal attributes that are important in nurses, with nurse leaders needing the ability to make ethical decisions in both disasters and routine daily care (Aliakbari et al., 2015). Observations from the focus group meetings indicate that nurses are dedicated to their duties, even though they may lack the ability to make quick critical decisions. Nurse during disaster also require high levels of emotional intelligence, as they are confronted by highly emotional situations in disasters as well as in normal care and must be able to understand and respect others' feelings – especially of fear, anxiety, and panic. Good emotional intelligence enables nurses to keep those around them calm and to remain capable of effective leadership and decision making under pressure and without being hindered by their own emotional reactions (Codier & Codier, 2015; Spano-Szekely et al., 2016).

Finding of this study showed that nurses are often exposed to extreme psychological pressures in disasters because of the severity of the situation. These are exacerbated if there are also frictions present between team members, or if the nurses have had earlier negative experiences (Lee et al., 2017). According to the scoping review of this study, most nurses are not yet psychologically or educationally prepared to respond appropriately to disasters. Working under high levels of psychological stress results in performance deterioration and poor cognitive functioning. The inevitability of such stress levels makes training and practice vital, as this both minimizes the effects of uncertainty and reduces the cognitive load required to execute tasks. However, there are also longer-term psychological impacts on nurses from disasters – especially trauma. This can lead to psychological/emotional problems long after

the disaster itself (Corcoran, 2020). The study participants were aware of such risks and knew that they might develop symptoms of psychological trauma in the period after an emergency event. This makes it crucial for psychological help to be available to nurses following disasters, as without intervention they could go on to develop full-scale post-traumatic stress disorder (PTSD), a condition which can last for years, even a person's lifetime without treatment. This is not only a concern for the nurses' mental health, but also has carry-over effects on their subsequent ability to work effectively in future disaster relief.

Therefore, developing resilience should be a part of nurses' training for disasters and emergencies, but it also involves psychological variables that should be reinforced in their routine work. These include developing and maintaining self-esteem, establishing and maintaining a supportive social network, strengthening flexibility, understanding and meeting their own needs, problem solving, positive thinking, and appropriate goal setting (Davies, 2019). The list is not exhaustive, but representative of the qualities needed for nurses to protect themselves and others in disasters, and to work effectively under pressure. Developing resilience also contributes greatly to the other characteristics demanded of nurse during times of crisis, including the ability to work with and communicate with team members and the self-confidence to make decisions independently in critical situations.

In summary, based on the findings of this study and previous literature, there are some Key Concepts that must be included in the curriculum of Saudi nurses for proper disaster response. These Key Concepts comprise of Nurse Understanding of ERP, Nursing Role During Disaster, Practical Disaster Response Drills, Leadership and Management Skills, Communication, Negotiation, Collaboration and Teamwork, Resources for Coping, Critical Thinking and Decision Making, Building Resilience and are summarized in Table 9.1 below.

Table 9.1: Key components needed for inclusion in an effective disaster curriculum

Key concept	Example from focus group discussion	Example from semi structure interview	Scoping review
Nurse understating of ERP	*"... we don't want plans on paper."* (Case 5, page 6) *"We have an emergency plan to do that but I don't know ... we have an internal and external plan."* (Case 1, page18) *"There was no plan... You have to decide what to do.*" (Case 1, page 4)	*"Nurses don't participate in developing the plans ..."* (Policymakers Interview 1, page 3)	Across all the articles, the requirement for further training knowledge development in disaster preparedness and response for nurses was clearly highlighted. Further to that Nurses should be part of the disaster management plans of the hospital as well.
Nursing role during disaster	*"... we wait till we receive order from doctor, or our supervisor tell us what to do, we cannot take the responsivity of work without order."* (Case 6, page 8) *"The head of nursing at the time of the catastrophe distributes us to the regions and tells us what to do."* (Case 3, page 8)	*"...and respondents must know many things not studied in universities ..."* (Academic interview 1, page 9)	The need to develop the conceptual clarity of the role of nurses is another major issue highlighted in scoping review. However, scoping review concludes that there is a significant requirement for further research into the role, as well as for continuous training and education on the job to ensure practitioners can meet the varied needs and priorities of local contexts.
Practical disaster response drills	*"We don't know how cases are distributed; we don't know how to assess the situation.*" (Case 5, page 24) *"We need extensive training and risk management training, such as screening or chemical purification. And disaster situations must focus on them ..."* (Case 6, page 31)	*"...short courses of two to three days, some of which have theoretical and practical side, and some purely practical, but those programs are held by specific training centres and have fees..."* (Policymaker interview 1, page 8)	The literature reveals a lack of proper practical training among nurses and highlighted the importance of including simulation and drills for nurses.
Leadership and management skills	*"It's different from normal situations; we need someone to guide us."* (Case 3, page 4) *"There was a supervisor, but he didn't have any experience of dealing with a crisis – he looked like he needed some guidance ..."* (Case 2, page 15) *"We needed someone to lead us, to guide us on what we should do, as we hadn't had any experience of this before."* (Case 6, page 10) *"To be honest, no, because the head of nursing at the time of the catastrophe is distributing us to the regions and telling us what to do."* (Case 3, page 8)	*"Disasters are never expected, nurses need to learn how to work together smoothly ... how to communicate with each other and other parties."* (Academic interview 2, page 2)	

Communication, negotiation collaboration and team work	*"You're absolutely right ... but you know ..everybody wants to be a leader….no clear guidelines…we don't know who is the leader or what they do."* (Case 4, page 14) *"Because we may have heard the same information from another doctor, but it is different, and we want to inquire, but they are very upset and angry with us."* (Case 2, page 6). *"Certainly you always were debating with yourself about doing the right thing."* (Case 1, page 14)	*"How to keep on touch with other health personales is important, they should to know how to work together in a coordinated manner, how to communicate effectively."* (Policymaker interview 2, page 7) *"Honestly, we dealt with people, who did not have any knowledge or any experience."* (Policymaker interview 2, page 6) *" ... and how to organize or communicate with other organisations ..."* (Academic interview, page 13)	
Resources for coping	*"It's different from normal situations… more work, and a greater number of patients."* (Case 6, page 31) *"... in a disaster event, we have a shortage of everything - staff, resources… - we need to assess cases with caution, we need to triage patients appropriately."* (Case 2, page 21)	*"And to answer your question: we need to know what everyone needs to work, when and how. Not just theoretical knowledge, but how to use that knowledge. Experience is not enough in this area, but we need to relate it with the necessary knowledge. Briefly, the content of these courses should result in people knowing how to behave at the time of disasters."* (Academic interview 1, page6)	
Critical thinking and decision making	*"We're just awaiting doctor's orders, it's something new to us, I don't know which patients need the most care.* (Case 2, page 37) *...we don't know... why ... why we couldn't work, or decide how to work."* (Case 3, page 17).	*"Nurses should know how to make accurate decisions, assess a situation, and critically analyse what needs to be done."* (Academic interview 1, page 11)	
Build a resilient	*"... fear of war... the hospital is in a state of disorientation... it is scary ... we don't know if we're safe or not ... we have fear of being bombed and becoming martyrs of war ... we work with great fear ... our voice is inaudible..."* (Case 3, page 5)	*"... and do not specify the actual needs of the participants. They also do not care about the individual differences; the level of competency [required] and the topic is difficult for participant ..."* (Academic interview 2, page 5)	

The Key Concepts outlined above, derived from the data extrapolated in this research, would form the basis of a proposed programme designed to educate nurses in disaster response. This is discussed later.

9.3 Key Components of Nursing Curriculum Required for an Effective Disaster Nursing Programme in the KSA

Both the WHO and ICN have recommended that all nursing education programs should encompass disaster nursing preperadness (Veenema et al., 2017). However, such recommendations do not negate the variation competencies of disaster nursing and there is no universal agreement upon the nurses' mastery level when completing a bachelor's degree. Furthermore, there are gaps in the nurses' capability when deployed on various phases of disasters (Redwood-Campbell & Abrahams, 2011). A nation will be more prepared in public health emergencies when the nursing students are equipped with the necessary knowledge in dealing with disaster (Siemon et al., 2019).

Kalankar (2019) conducted a study to assess the training effectiveness of disaster response among the undergraduate students in Türkiye based upon their knowledge. The study has concluded that the students have shown significant promise in terms of knowledge, thus have a higher tendency to effectively respond during disaster. Furthermore, a study by Yan et al. (2015) has focused upon nurses' knowledge and performance when responding to an earthquake with no given training.

Achora and Kamanyire (2016) recommend a continuous professional development (CPD) method for nurses that have completed their bachelor's degree. It was further added that CPD implementation could involve external agencies and academic institutions to elevate response during disaster, thus streamlining the training to undergraduate level. Other studies also recommend integrating the nursing education with various aspects of disaster nursing such as response and preparedness, which are already implemented in the majority of developed countries (Loke & Fung, 2014; Wilkinson & Matzo, 2015). A study by Xia et al. (2020) has shown that such approach has enhanced the nurses' knowledge and skills in terms of disaster responsiveness and preparation.

Many studies all over the world have revealed challenges when deciding on the core content related to disaster response within nursing related courses (Loke et al., 2021). One such challenge is the variation of cultures and expertise in the respected countries. The United

Kingdom as an example has ensured competencies transparency from emergency nurses. In response, the Royal College of Nursing (2017) has established the National Curriculum and Competency Framework for Emergency Nursing. Figure 9.1 summarises the framework, which contains three sections namely, good nursing practice being the core, cross-cutting themes and clinical domains in the nurse's respective role when responding in an emergency.

According to the Royal College of Nursing, a quality nursing practice should encompass core principles related to behaving professionally, teamwork, continuous education and professional development, effective communication, management and leadership, evidence-based practice, nursing ethics and development, decision making skills and service evaluation. The cross-cutting skills should cover the enhancement of patient assessment competency, management of medicines, pain assessment and management, handling and moving of patients, preventing, and controlling infections, excellent document and records archiving, safeguarding adults and children, and negating and managing violence and aggression.

Core emergency skills related to care should encompass any skills and expertise in providing efficient care to victims of disaster. This is different to the daily nursing routines and practice. It should also encompass the competency of caring for ill adults, adults that necessitate resuscitation, adults with minor illness and injury, elderly, children and younger adults, individuals with mental health issues and skills in responding to disaster and emergencies. Usher and Mayner (2011) conducted a survey in Australia focusing on disaster within nursing curriculum at undergraduate level. It revealed that the key components related to disaster and the domain have close resemblances to the curriculum that exists in the UK.

A working model of this proposed curriculum is provided below, where the proposed level of study is in the final year of undergraduate nursing degrees and/or as a standalone post graduate CPD course. The rationale behind this is based on the assumption that nurses who have completed 3 years of undergraduate study, along with qualified burses, should already be competent in the nursing practice' and 'clinical domain'sections outlined in the uk model framework outlined in figure 9.2 and utilised in the Developed Framework Chart on page 233-244. This programme would be rolled out and incorporated into all undergraduate nursing degrees in KSA to increase preparedness in disaster nursing roles, but with standalone option also allows for postgraduate development to fill the gaps currently identified in this study for the current qualified workforce. A working duration is 1 semester

to emcompass all the Key Concepts required for disaster nursing competency to allow for time to learn and consolidate knowledge and experience, Learning resources during the course would require a combination of lectures and simulations/drills, where simulations are imperitive to fulfilling the Key Concepts identified in the findings of this thesis and the success of the course. The overall learning objectives would be informed by the key concepts derived from the data of this study. This could be broken down into topics to cover these, ranging between lectures, simulation/drill elements.

Course Title: Disaster Nursing Preparedness in KSA

Course Description: This course is designed for both pre-reg nurses in their final year of undergraduate study and/or qualified nurses with the prospect of obtaining the necessary skills, knowledge and principles required to manage preparedness and response to disaster situations in the KSA. This course includes a manadatory hands-on focus, with practical applications of current and obtained knowledge across the course through simulations and drills.

Prerequisites: completion of year 3 nursing / relevant modules

Year of study: year 4 and/or post graduate CPD

Duration: 1 Semester

Learning Resource: Combination of Lectures, Simulations/Drills

Objectives and Expected Learning Outcomes (to address Key Concepts, outlined below):

1.   Nurse Understanding of ERP

2.   Understanding of Nursing Role During Disaster

3.   Practical Disaster Response Drills

4.   Leadership and Management Skills

5.   Communication, Negotiation, Collaboration and Teamwork

6.   Resources for Coping – Theoretical & Practical

7.   Critical Thinking and Decision Making – Theoretical and Practical

8.   Building Resilience

This curriculum will be developed further by the author of this thesis as a post doctorate topic, the development of which is beyond scope of study. During this development, each Key Concept (or learning outcome) will be broken down into their respective lecture/drill sections, and the more intricate skills involved in these Key overarching skills will be defined and delivered across the course. The main aim of this study was to develop Key Concepts for an improved disaster nursing curriculum in KSA, to propose the curriculum and the framework within which it sits, which has been met. The finer development of the module will be discussed further with experts in the field in the spirit of the participatory approach adopted in this study, then implemented for nurses – it will be a post-doctoral topic of development for the author of this study.

A key and ethically sensitive consideration that must be applied in the future development of the curriculum and to effectively teach these components in the KSA, certain requirements must be met. For instance, there is a need for aspects of professional behaviour to be taught in the curriculum, to be developed in line with the Code of Ethics for Healthcare Practitioners developed by the Saudi Commission for Health Specialities (2014) and the Nursing Code of Ethics developed by the Saudi Nurses Association (SNA). As the KSA has a predominantly Islamic culture, this code of ethics reflects the tenets of Islam. For instance, Section A of Chapter 1 of the Code of Ethics for Healthcare Professionals clearly indicated that these professionals are expected to demonstrate devotion and perceive their work as worship of Allah (Saudi Commission for Health Specialities, 2014). This indicates that respect for religious and cultural practices must be carefully considered in the delivery of the proposed curriculum. Even though it is beyond the scope of this study to expound on these cultural requirements, the researcher of this study intends to pursue a postdoctoral study after completing his Ph.D., in order to implement and develop the findings further in his home country of the KSA. This recommendation will be discussed with the policy makers and educators in the field which will bridge the gaps and disconnections between stakeholders identified in this thesis.

With this, a key aim was achieved by bringing together the policy makers, educators and nurses on the ground to identify the gaps which will enable them to respond effectively to

disasters – again this proposed curriculum will be discussed further with policy makers and educators and nurses on the ground to make the most benefit of this curriculum in order to save lives and communities and reduce the impact of disasters and make better disaster response.

Figure 9.1: Competency Framework for Emergency Nursing in the UK (Source: RCN, 2017).

With the three afore mentioned sections of the above Competency Framework for Emergency Nursing in the UK in mind, the following chart outlines the Developed Framework for disaster nursing derived from the findings of this study, with nurses' input at the forefront of the collaborative and informative process. The Developed Framework Chart presents the three overarching sections extrapolated from the Competency Framework for Emergency Nursing in the UK model, with (core) 'good nursing practice' and 'clinical domains' deemed as covered in the nurses' foundational education and normal practice. This thesis and the Key Concepts it proposes fall under, focus on and therefore constitute this particular study's 'cross-cutting themes' with respect to the outline provided by the *Competency Framework for Emergency Nursing in the UK* in figure 9.1 (see Developed Framework Chart below).

These cross-cutting themes have been informed by the evidence extrapolated though this research and are fulfilled in the proposed curriculum by namely, leadership skills, components relating to clinical skills, focus on hands-on experience in real situations for nurses and training in multi-agency collaboration and co-ordination, all of which are

discussed in more detail through Chapter 9.2.1—9.2.4. The Developed Framework Chart (pp. 234-7) also demonstrates how these cross-cutting themes are vitally informed and fulfilled by the evidence-based Key Concepts outlined in table 9.1, which draws on evidence from this study's participatory approach and focus on nurses' inclusion in building the proposed curriculum. The Chart also demonstrates how and where the Key Concepts overlap interms of the Cross-cutting Themes, which will ultimately promote repetition and reinforcement of Key Concepts delivered in the proposed curriculum.

Developed Framework Chart

From Figure 9.1: Competency Framework for Emergency Nursing in the UK **Model (Source: RCN, 2017)**: 3 sections

(core) good nursing practice

cross-cutting themes

clinical domains

From 9.4, Developed Framework

9.4.1 Leadership Skills

9.4.2 Components Relating to Clinical Skills

9.4.3 Focus on Hands-on Experience in Real Situations for Nurses

9.4.4 Training in Multi-agency Collaboration & Co-Ordination

Nurse Understanding of ERP

Understanding of Nursing Role During Disaster

Practical Disaster Response Drills

Leadership and Management Skills

Communication, Negotiation, Collaboration and Teamwork

Resources for Coping

Critical Thinking and Decision Making

Building Resilience

KEY CONCEPTS: Derived from Table 9.1: Key components needed for inclusion in an effective disaster curriculum.

Figure 9.2: Developed Framework Chart

9.4 Developing a Disaster Nursing Framework for the KSA

Recently, Saudi Arabia has experienced several natural disasters at increased frequency. However, little focus has been paid towards providing appropriate training and planning related to disaster within the country's hospitals and universities (Abosuliman et al., 2013a, 2013b). There are presently no data related to Saudi Arabia's undergraduate nursing programmes that centred upon disaster preparation. There are also no documents relevant to disaster preparation at the diploma or bachelor level. This shows that Saudi Arabia may not have an effective disaster response planning and therefore increased probability of insufficient training for nurses that may need to respond during disaster.

Research has shown that such trends of lacking disaster training at academic level is also found in other countries including Jordan (Al Khalaileh, Bond, & Alasad, 2012). Such situations necessitate increased research focusing on disaster nursing in the nursing academy, to be part of the curriculum. In accordance with this study's findings, suggestions were made where nursing curriculum should encompass disaster nursing. According to the focus group discussion and interviews, there are two areas of disaster nursing competencies, which are medical/clinical competencies and management competencies. The recommendations are to include these two areas at undergraduate level but could also extend towards practicing nurses that are already qualified in their respective CPD training.

9.4.1 Leadership and Management Competencies for Proper Nursing Practice during Disaster

Studies have shown that good nursing practices are the foundation in providing effective care (Alsadaan et al., 2021; Woo et al., 2017). Prevoius studies have revealed that nurses that do not have sufficient skills in management and leadership may not respond effectively during emergencies (Paquin et al., 2018; Veenema et al., 2016). Additionally, such skills are part of the essential elements in the Competency Framework for Emergency Nurses in the UK and are not sufficiently incorporated to the nurses working in Saudi Arabia (RCN, 2017). This means that there is a need for KSA to include training related to leadership and management to implement effective disaster nursing.

The framework proposed by this study focused upon training on non-clinical skills and leaderships, which are the core componencies of coordinating emergency services. Nurses should be required to equipped with such skills as they are an important component in an

emergency. Leadership is necessary in terms of ensuring everyone reaches an agreement and shared understanding regarding the required steps to be taken, and the subsequent approaches. In addition, it is vital in terms of influencing individuals to unify and act as a team to achieve a collaborative goal (Mutch, 2015; Veenema et al., 2016). Therefore, leadership is an essential component in terms of optimized efficiency and to achieve the objectives of the organization (Sun & Henderson, 2017).

Effective disaster nurse leadership is perceived as an essential component within a clinical setting for the purpose of delivering quality care and setting healthy work environments. It is becoming increasingly evident that leadership is becoming ever more important within the healthcare industry (Loke et al., 2021). As there is no universal consensus on the studies related to the core components in disaster nursing leadership and management, the findings of this study as well as the findings of scoping review could be used to identify the skills, characteristics and abilities that a nurse should posses to be capable of responding to the given disaster. The findings have revealed **seven categories** that are critical to becoming a nurse leader, including (a) planning, (b) coordination, co-operation and teamwork, (c) communication, (d) decision-making skills, (e) critical thinking, (f) vision, ethics, values and commitment, and (g) emotional intelligence.

(a) Planning

An essential component to emergency management is the establishment of plans preparation and response strategies (Cronstedt, 2002). This means that one of the nurse leader's attributes is the capability of establishing disaster management plans and maintain disaster preparedness. It is also essential for them to be able to communicate this plan to the entire organization, which may involve delegating to immediate-response groups, provision of training to patients and staff, budgeting and ensuring nursing staff are supported during care delivery. Students should be exposed to such competency in terms of variety of preparedness plans and they need to have the knowledge of national disaster plans and the necessary responses. Additionally, they will also need to have knowledge in establishing guidance related to policies and ethics, identifying risks, and be involved in the entirety of the disaster as well as plans on health preparedness.

Nurses that are at post-graduate level could receive training through CPD to be equipped with specific skillsets to address the local conditions, updated procedures and regulations, ethnical work practices, understanding of the local municipal disaster plan, be involved in community drills and exercises as well as constantly evaluating the said drills and exercises.

(b) Coordination, co-operation and working in a team

It is known that a nurse leader responding to disasters must have the following skills, co-operation, team player and coordination (Walsh et al., 2012). The nurse's basic skills should incorporate communication skills in responding to a crisis (Edmonson et al., 2016). The credibility and truthfulness of a nurse leader are measured with timely communication and with the correct information (Yan et al., 2015). Timely communication negates any untruthful information during uncertain times (Dhami & Mandel, 2022). Nursing students could be equipped with such competencies through training in many types of co-operational and coordination skills such as working within the system, risk mitigation to all parties, prioritizing patients and resource budgeting.

A nurse with such ability could coordinate and co-operate with all the stakeholders involved, which are part of their job scope. During disaster, such nurses must be able to build and maintain rapport and lead all the parties involved such as professionals and volunteers at all types of levels including operation and strategic. Additionally, students should taught co-operation with other professionals working with various organisations as well as able to allocate resource effectively and provide support in accordance with the management structure.

(c) Communication

The main responsibilities of a nurses are to ensure safety is maintained and all the basic necessities are present for both the healthcare staff and patients during a disaster. Successful disaster nurses that are capable of delivering safety to patients require good communication and team player skills (Samuel et al., 2018). Nurses attending to disasters require communication skills to effectively deliver information to the victims and other professionals. Various studies have revealed that a nurse leader's core component is communication skills (Knebel et al., 2012). Therefore, nurses must be fully aware of the facts and deliver the information effectively to ensure all the parties understand them.

Nursing students could be exposed to the methodologies and strategies employed by the stakeholders involved in disaster, pertaining to the magnitude, nature, significance, and risk control. Students should be taught to understand the competency of building trusts and be equipped to break down complex information to communicate with other individuals during emergencies accordingly. Additionally, undergraduate nursing students could be educated to be familiarised with the terminologies used during disasters, in order to be able to convey accurate and precise information to the professionals and responders during disaster. Postgraduate nurses should be trained to increase their role in relaying information to other professionals such as with the journalists and media. Additionally, they should be establishing plans and communication channels during any emergencies or disaster as well as able to collaborate with other leaders that are responding to the event.

(d) Decision-making skills

One of the most essential skill for nurses during disaster is decision making, where they must be able to quickly assess and make quick and precise decisions in order to save lives during disasters (Zhou et al., 2018). Working during disaster necessitates specific skillsets that are not part of the normal nursing routine and is critical in life saving and health (Hugelius & Adolfsson, 2019). The decision-making skills are highly sought after due to the unpredictable nature of disaster that necessitate ethical and proper budgeting of the scarce resources available in that context (Veenema et al., 2016). Student nurses should be equiped with assessment skills when information is not complete. This could be achieved through practical training and simulations of a disaster event.

Nursing students should also learn to perform triage while under pressure, working under harsh weather conditions and capable of addressing psychological needs and treating trauma. Postgraduate students are expected to have high competencies in using the equipment, improvisation, and deal with the mental state of the impacted victims and healthcare staff.

(e) Critical thinking

A nurse leader responding to disaster must be able to think critically (Albanese & Paturas, 2018). Therfore, nursing students must be able to critically interpret, observe, analyse and

elucidate the situation. Morever, nursing students should be taught to be able to piece together information and clarify accordingly (Edmonson et al., 2016). An effective nurse responding to crisis must be able to think in a macro way and understand the intricacies of large and complex structures and systems (Samuel et al., 2018). Such skillset allows nursing students to learn about information flow between various parties while under strict time availability as well as able to work within demanding guidelines and procedures.

(f) Vision, ethics, values and commitment

Nurse leaders must have a clear job scope (Cowden et al., 2011); (Cole Edmonson, 2010). Additionally, they must be able to make ethical and value-based decisions during disasters. Therefore, nursing students should be exposed to making optimal ethical decisions and perform as humanitarian aids in ethical manners to the disaster victims. A nurse leader is expected to have experience in establishing order during the chaos that occurs during a disaster (Edmonson et al., 2016). Nurses should be taught to make ethical and value-based decisions during disasters. During disasters, nurses are expected to uphold ethical values and determine whether a particular action is ethical.

(g) Emotional intelligence

During disaster situations, nurses must demonstrate emotional intelligence and humanity. These components are critical in the management and assessment of the situations. Leaders with emotional intelligence are able to plan and evaluate effectively at times of disaster (Mayer & Salovey, 2001). Nursing students should be taught that a critical value during disasters is their emotional and humanitarian intelligence. They should be capable of handling the disaster events in an ethical way, incorporating and maintaining a human dimension during and throughout disaster. Therfore, they should be taught interpersonal skills to be able to consistently demonstrate empathy with disaster victims (and other staff) with loss, uncertainty and challenges as well as displaying stability and strength within the anxiety-inducing nature of a disaster. A nurse that responds to disaster must have emotional intelligence. This means they are capable of planning, making informed decisions and successfully executing the strategies accordingly, without compromising ethical and empathetic requirements.

9.4.2 Components relating to Nurse Clinical Skills

Nurses must be capable of addressing patients with any types of issues during an emergency regardless of their present condition (Baack & Alfred, 2013). As such, the skills recommended as part of the curriculum could equip the nurse with the necessary skill to work effectively and ensure that they could support patients regardless of the nature of the emergency. The UK's Competency Framework for Emergency Nurses recognized such skills as cross-cutting themes with the competencies based upon assessment of the patient, assessment and management of pain, management of medicines, skills pertaining to patients' handling and moving, infection control and mitigation, safeguarding adults and children, archiving of documents and records, and mitigation and management of both violence and aggression. There is a high probability that existing KSA nursing curriculum is already encompassing the aforementioned skills. As such, it is possible to deliver such skills to the nurse using the existing training platform in the KSA.

Disaster victims often have various clinical needs as disaster impacts all individuals within a society such as younger adults, children, adults, people with mental health issues and individuals with underlying medical conditions. Additionally, these victims may also suffer from injuries of various magnitude from moderate to life-threatening injuries that necessitate immediate healthcare and medical attention. Nurses that tend to these victims necessitate different skillsets compared to nurses that are operating in the normal medical wards.

Therefore, nurses that respond to disaster must go through curriculum to prepare them to provide the necessary healthcare to the victims effectively and quickly. The curriculum needs to encompass specific skillsets for the nurses to be able to attend to individuals that require resuscitation, adults with minor injury and illness, young adults and children, individuals with mental health issues, the elderly in addition to planning and management during a disaster event.

Morever, studies have revealed that training nurses must be familiar with all the hazard's related terms as well as able to identify illness or injuries as a result of the hazards (Veenema et al., 2017). In addition, the participants in this study have revealed that they need to be familiar with diffrent type of disaster. Therfore, training related to all-hazards should be included in the training because they are the fundamentals for nursing students to be able to identify how to respond to different type of disasters. As per the study by Veenema et al.

(2017), nursing students must be capable of identifing whether a disaster is natural or manmade, understand the importance of using resources that are trustworthy and understand the category of bioterrorism agents (Category A, B and C).

Morever, Saudi nursing students should be taught to be aware that their role as a healthcare provider is critical when responding to disaster particularly within the ERPs. Such understanding of the role including the nurses service scope, understanding resources and supplies availability as well as legal and ethical implication when responding during a disaster is imperitive in bolstering nurse's confidence and agency in application of wider clinical skills.

9.4.3 Focus on Hands-on Experience in Real Situations for Nurses

Using experiential learning is a critical element in preparation and response to a disaster (Hoffmann & Muttarak, 2017). Such integrated learning of different styles in an undergraduate nursing programme is beneficial in terms of developing the students' critical thinking, (Alim et al., 2015). Experiential learning necessitates that a student learns through experiment which develops newer paths of thought. It also allows the students to gain experience through practical learning, high-fidelity simulation, case studies through the use of tutorials found on computers and interactive scenarios, collaboration between community and agency, and full or mock disaster simulation (Jose et al., 2017).

Andresen et al. (2020) state that students need to undergo alternate learning modes because disasters occur infrequently; thus, students require alternate approches of learning this content. As the role of the nurse is to provide care to the injured victims, the entire healthcare system may be affected if both the training is inconsistent and there is a lack of integration of courses related to emergency disaster response (Stanley & Bennecoff Wolanski, 2015).

Training exercises, especially in the form of simulations, should be incorporated into the nursing curriculum in order to prepare the nurses and provide them with actual experiences in responding to disasters. Countries that have a lack of disaster education should be particularly concerned with this, as training simulation could create a real situation of the progress of a disaster, thus the nurse could have first-hand experience of the systems and protocols being deployed if a real disaster is to occur (Hammad et al., 2011) and practice the application of their required competencies in this respect. Farra et al. (2015) states that nurses without prior experience in responding to a real disaster or simulation training will have limited skills

pertaining to emergency responses. Therfore, simulation should be a critical component in Saudi nursing curriculum and has proven to be effective as a teaching approach within the nursing academic programme (Aebersold & Tschannen, 2013). The definition of simulation is to recreate a mock scenario using props, such as mannequins, to replace actual individuals, to provide actual experience for the students (Basavarajegowda et al., 2023). Simulation paves the way for students to experience a disaster that they will not encounter in a normal hospital setting.

Gunawan et al. (2019) posited that mannequins are used in high fidelity simulation along with the aid of technology and computers to recreate a disaster event, which serves as a different learning mode for the students. Students could experience the different stages of the disaster development due to the presence of the computerized mannequins under the control of software (Stanley & Wolanski, 2015). The trainer can control the mannequin remotely through hand-held devices. Off the shelf's simulation software are available or trainers could customize the disaster that they wish to simulate (Stanley & Wolanski, 2015). Therfore, Saudi nursing students could learn through simulation in order to develop their critical thinking and be able to practice in a near actual environment to gain the necessary experiences. Simulation paves the way for student to develop critical thinking due to the practical experience that they encounter.

9.4.4 Training in Multiagency Collaboration and Coordination

Establish collaboration between nurses, policymakers, and nursing educators enabling the implementation and delivery of the proposed curriculum in an evidence-based and culturally sensitive manner. As highlighted earlier, the involvement of other agencies (such as Saudi Nursing Association, the police, Red Crescent, the Civil Defence, and the Army) in the establishment of benchmarks and professional competency frameworks for emergency nurses in the KSA should also be given strong consideration. This collaboration will help bridge the gap between these stakeholders and provide opportunities for the various parties to become aware of each other's challenges and potential, while enhancing the quality of training provided for emergency nurses in the KSA. It would also strengthen and make more accessible the support systems available to nurses, whilst consequently informing those systems of the appropriate support required by nurses, to provide better accessibility to and resources for coping and building resilience.

Based on the findings of this study and the scoping review, there is inadequate co-operation between various agencies when responding to a disaster. This means there is a need for a suitable framework to improve the co-operation between the aforementioned agencies, as well as increase the quality of preparedness. Therefore, nursing student learning should be inclusive of the agencies such as police, civil defence, ambulances, the Ministry of Educations, hospitals, SMD, private sector, volunteers, and the Ministry of the Interior.

Such training should be the hospital policy in order to get all the relevant parties to be involved in disaster preparedness. Development of such competency necessitates ground testing to ensure effectiveness. This means clarifying and identifying the scopes of the respective parties that will respond during disaster as part of knowledge management.

9.5. General Implications of New Curriculum with Respect to Collaboration between Stakeholders

The focus of this study is to identify key concepts necessary for an effective disaster response education programme for nurses. However, it is known that input from several stakeholders, including nurses, nursing educators, and policymakers, is essential to the development and implementation of an effective disaster nursing training programme – hence the recruitment of these categories of participants for this study. The focus of this section is to highlight the importance of collaboration between these stakeholders in the delivery of different aspects of the proposed curriculum in a way that ensures patient safety.

The analysis conducted in this thesis indicated certain similarities in the perception of nurses, academic lecturers, and policymakers with respect to level of preparedness for effective emergency response among nurses in the KSA, as well as how adequately the current nursing training programme prepares nurses for emergency response. This implies that a collaboration between these parties is necessary to ensure the effective delivery of the proposed curriculum. Figure 8.2 presents a diagrammatic representation of connections between the perceptions of these stakeholders in nursing education based on the results obtained from the analysis of data collected in this study, and indicates that all stakeholders recruited as participants in this study agree that the level of preparedness for emergency response is generally poor among nurses employed in the KSA. Nurses recruited for the study are particularly clear in indicating gaps in their knowledge and what their current level of experience with respect to emergency response is. As highlighted in Chapter Seven, the key

issue for nurses was not about recognising their roles as first respondents during an emergency situation, but rather pertained to their capacity to deliver roles prescribed for them in ERPs developed for their specific hospitals.

It has been observed that several factors may contribute to this: first, the absence of emergency preparedness and response in the curriculum used in training these nurses may largely be responsible for the lack of non-clinical skills required for providing an effective response to disasters. The indication by educators that key components of an effective disaster training programme must include basic theoretical and extensive practical knowledge of disaster response clearly supports this observation. Similarly, policymakers alluded to the same fact by indicating that an effective disaster training programme must focus on basic competence in emergency situations and triage. These observations therefore indicate that all participants agree that an effective nursing education must equip nurses with non-clinical skills such as leadership, ethics and values, critical thinking, and communication skills, as well as improved understanding of policies and regulatory frameworks for effective disaster response.

Moreover, nurses indicated that they do not often participate in the development of ERPs, which could result from their lack of understanding of what it is required to do so. This notwithstanding, it is evident from the analysis presented in Chapter Seven and from Figure 8.2 that the current nursing curriculum is not altogether ineffective in equipping students with nursing skills. As a matter of fact, it is evident from nurses' responses that they are competent in basic nursing procedures such as dressing wounds, staunching blood flow, and other routine nursing processes. This relates to the cross-cutting skills suggested in the proposed curriculum.
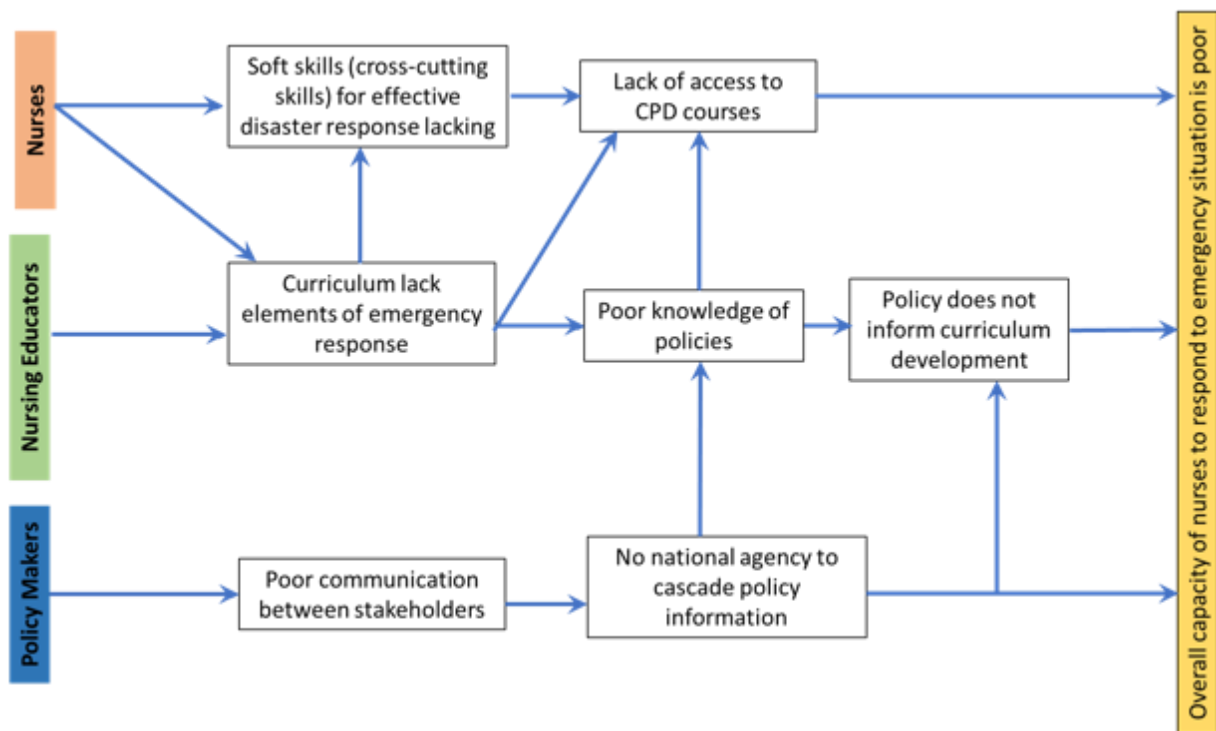
Figure 9.3: A Model of the Interaction between the Perceptions of Participants on the Level of Emergency Preparedness of Nurses

Evidence of poor communication between nurses, nursing educators, and policymakers was also observed. It was particularly observed that there is no national platform or agencies facilitating the communication of policies to nurses, nursing educators, and continuing educational programme (CPD) providers. A clear disconnect in the understanding of policy frameworks was also observed among stakeholders. For instance, it was clearly indicated in the responses obtained from educators that they have very little knowledge of policies related to emergency preparedness and response. It is therefore not surprising that their educational programmes and curricular activities in the various institutions where these educators were selected from do not necessarily feature content related to emergency preparedness and response. Similarly, there seems to be no strategy to communicate feedback through which practicing nurses can provide useful information that could be used to revise educational curricula. An ineffective communication link, particularly in relation to policies on emergency preparedness and response, was also observed between nurses and policymakers. This may also partly account for why it is difficult for nurses to understand ERPs or implement them effectively.

Altogether, these observations indicate that addressing gaps identified in this study and the effective delivery of the proposed curriculum cannot be achieved without the collaboration of all stakeholders, as well as other relevant agencies involved in the planning and implementation of emergency response plans. Often, curriculum development is usually carried out by educators who often rely on their own knowledge and expertise to develop programmes that prepare students with skills and competences which reflect societal needs. However, in this study, an approach that starts from the nurses but utilises a participatory curriculum development approach by obtaining the views of policymakers and educators, was adopted. It is expected that this participatory approach to curriculum development will facilitate the effective implementation, governance, and monitoring/evaluation of the nursing education programme. While concepts highlighted in this section may significantly benefit the development and implementation of an effective disaster nursing education within the KSA, it is envisaged that they are also applicable to effective disaster nursing education within the Asian region and globally, thereby achieving the aim of this research.

Based on the aforementioned considerations, and to ensure the effective delivery of the proposed curriculum, it is essential to identify key areas that collaboration between stakeholders will help in the facilitation of effective disaster nursing education in the KSA. According to the findings of this study, the focus of such collaborative efforts should lie on three major elements to ensure that the current challenges to effective disaster response are managed, namely:

1. Measures to improve knowledge of disaster management and designing disaster response interventions;

2. Policymaking, communication, and negotiation;

3. Critical thinking, ethics, leadership, and coordination of disaster response.

The focus on measures to improve knowledge of disaster management, response planning, and intervention development will represent a direct response to the findings of this study as they relate to the lack of knowledge and capacity to effectively respond to disasters among nurses. Specifically, focus group discussions organised in this study indicated that problems associated with the implementation of ERPs by nurses arise due to poor knowledge of disaster preparedness and response, the lack of engagement of nurses with the ERP design process, and the lack of a proper educational curriculum able to increase their capacity in this

regard. With these issues under consideration, collaborative efforts to addresses skills gap and capacity deficit will serve to tackle the problem at its root.

Nurses have proven capable of adjusting quickly to the chaotic environment of emergency departments, and their first concern in a disaster context is their patients and providing them with the highest level of care at all times (Alsharari et al., 2021). The reality of a disaster situation means that nurses are required to respond to it, despite the risks involved – if they are unprepared for such a situation, they will face a number of ethical dilemmas. This study found that those in charge of developing emergency procedures and training programmes often fail to take such ethical considerations into account. As Schultz et al. (2012) noted the safety of nurses and other frontline healthcare workers should be a top priority considering the significant and poorly understood risks to their health that they face at work. Therefore, national guidelines should be established to help nurses make appropriate decisions in disaster response situations, and courses should be developed to teach nurses how to apply an ethical code during various disaster scenarios, particularly as it pertains to triage, during which they might face difficult decisions.

In some situations, such as disasters, nurses are obligated to choose one patient over another, as they are responsible for providing care to many individuals, saving as many lives as possible using the resources and time available. Due to the high patient flow common during disasters, an increase in the nurse-to-patient ratio, and a lack of resources, nurses must seek to do the greatest good for the greatest number of people and to mitigate the amount of harm. The weight of this responsibility can cause nurses a high amount of stress. Attending the death of a patient affected by a disaster is also likely to have a negative impact on a nurse's psychological state. The resulting stress can have a negative impact on the health of nurses, causing sleep disruption, respiratory and cardiovascular problems, post-traumatic syndromes, drug abuse, or even suicidal thoughts. In a disaster context, nurses are required to work under extreme stress and in uncomfortable conditions. Nevertheless, there are currently no national guidelines backed by a clear statement of the law, regarding how nurses should handle such situations (Sandifer & Walker, 2018). It is therefore essential that nurses are involved at the healthcare policy-making level, particularly concerning policies surrounding disaster situations, in order that policy-makers are aware of the challenges they face.

According to the nurses who participated in this study (Focus group discussion, Case 3), historically their fear of disaster situations held them back and caused their current

compromised, submissive, and dependent position. Moreover, they felt that Saudi gender norms contributed to their inability to lead effectively, causing them to feel undervalued and therefore defer to authority without insisting on their representation, instead engaging in self-deprecation – a strategy that undermined their self-esteem and confidence. Many of the nurses feared speaking out or participating in decision-making due to the current labour-hostile climate that particularly prevented nurses from expressing their needs and conveying the trauma they experienced when engaged in disaster response. Nurses' and other healthcare professionals' levels of safety on the front line is a major concern from an ethical standpoint, as these individuals need to work under severely demanding pressure, and they often fail to comprehend the risks posed to their health and well-being.

If nurses are to be effective as first responders, they must overcome their fears by valuing and believing in themselves. Moreover, they must be regarded as valuable assets by other healthcare professionals. Many of the nurses in this study were afraid of losing their job if they spoke out, yet if they do not, patient safety and lives may be jeopardized. These findings demonstrated that although policymakers believe nursing to be a highly trustworthy profession, they also permit nurses little influence over healthcare reforms, particularly regarding crisis situations. Indeed, the wider public does not view nurses as significant decision-makers.

These findings were consistent with those of previous similar studies reporting that the general public perceives nurses to be simply carrying out the orders of doctors and other higher-status players, rather than making informed decisions using their education, evidence, and experience, as well as perceiving them as unable to be deliberate, thoughtful, and strategic in their actions (Mboineki et al., 2019). There is therefore a need to convey the reality of their role to the wider public, and to demonstrate that healthcare does not solely concern medicine and physicians. Such a holistic approach to nursing care is essential in enhancing a patient's journey from illness to wellness, and the present study found that misconceptions of their role are entirely preventable and must be eradicated via the proposed framework, which seeks to equip nurses with the skills necessary to communicate and negotiate their needs, as well as to become active leaders within a healthcare setting. The skills of effective negotiation and self-expression as a nurse are vital to this, and to realise a nurse's enhanced role as a leader. When the wider public understands the role of nurses, their influence will increase. Therefore, disaster nursing education must equip nurses with the

skills of leadership, negotiation, and the ability to articulate the value of their profession to decision makers. This study therefore sought to promote legislation that would protect nurses who might face inappropriate legal challenges after treating patients in disasters in good faith, and under circumstances beyond their control. Moreover, it sought to promote awareness that the increased involvement of nurses improves the quality of the service provided.

The success of a leadership role in a disaster planning situation depends on the correct professional being involved in the initial planning phase, and requires specialist knowledge in selecting appropriate, safe, and purpose-fit emergency shelters, as well as in predicting the adequate quantity of supplies and resources. Currently, however, nurses who are involved directly in the care of patients during a disaster, and even some in leadership positions, are frequently excluded from the initial planning stage, as evidenced by the findings of this study and previous studies in which nurses described how their lack of input had a direct impact on staff and patient safety and privacy and acted as a barrier to care (Christensen et al., 2012; Hyer et al., 2009; Laditka et al., 2009; Saliba et al., 2004).

Incorporating lessons learned from past disasters into disaster plans increases a facility's level of preparedness and improves communication and collaboration with local emergency management authorities. Therefore, nurses should argue for legislation that requires all hospitals to provide emergency responders with appropriate training based on scientific evidence. Fear and apathy are the greatest threats to public health in the context of nursing care, and without suitable legislation, there is nothing to hold interested parties accountable for public health and safety. This is particularly important for Saudi nurses, as the provision of appropriate legislation will improve their decision-making skills in times of crisis, and increase the amount of ethical and legal information included in nursing programmes. In addition, nurses should be aware of their rights and responsibilities under national and international law, in order to provide safe care for patients in emergency situations. For nurses to respond appropriately in disaster situations, standardized ethical laws that are tailored to the nursing practice are therefore required. According to Al Harthi et al. (2021), who echoed the findings of previous studies, disaster planning must involve nurses at every level, and take their concerns in to consideration.

Moreover, the present study found that both nursing educators and the nurses that they educate have a poor knowledge of policy issues concerning disaster preparedness and response. Specifically, the findings of semi-structured interviews conducted for the study

indicated that there is currently disconnection between policymakers and those involved in training nurses for disaster response. Therefore, a focus incorporated into nursing education on policymaking, effective communication between all of the parties involved, and an awareness of how to negotiate policy provision among many stakeholders would improve the quality of the disaster preparedness of nurses significantly, while also enhancing their ability to respond to disasters effectively.

In terms of current emergency planning legislation in the KSA, as Alyami et al. (2021) explained, none of the country's government-operated websites provide information regarding the KSA's national plan for disaster management and relief. However, the Ministry of the Interior (MOI) recently proposed a national arrangement, with the cooperation of various resources and services, in which organisations will be empowered to create their own disaster plan (Alrazeeni, 2015). For example, the Saudi Red Crescent Authority (SRCA) and the Ministry of Health collaborated to develop a health plan that was then submitted to the MOI, which is responsible for reviewing all such plans and allocating the appropriate responsibilities to relevant departments or offices (Alrazeeni, 2015). The goal of this agreement was for these organisations to collaborate at both local and the regional levels in various parts of the country, as each of them has different specialties and resources for improving and overseeing disaster response. However, there is concern that these regional and local organisations do not currently receive sufficient attention regarding the implementation of these policies and frameworks (Alrazeeni, 2015). Even within the public sector, there is currently no national Human Resources team for a health plan, or comprehensive and cross-sectoral planning that includes the nursing profession. Instead, each component of the healthcare system is responsible for its own planning and management. Furthermore, because there is little formal interaction between the health and education sectors, nursing schools do not meet the needs of the healthcare sector. Subsequently, there have been calls for nursing legislation and policies to be updated (Bagadood, 2016); accordingly, a major reason for the delay in implementing advanced nursing practices in the KSA is the current lack of adequate legislation (Alluhidan et al., 2020).

Moreover, disaster management is generally inadequate within healthcare facilities, despite the fact that disasters can have a severe negative impact on public health resources. The study conducted by Alshehri (2017) asked 72 participants from two major hospitals in the KSA's capital city, Riyadh, if their hospital had any disaster management policies in place. The

participants stated that while the hospitals had disaster plans or policies in place, the majority of their employees were unaware of their role in disaster response. Furthermore, participants who had no prior experience of dealing with disasters expressed less confidence in their abilities than those who did, a fact that could be attributed to the low rate of attendance from hospital staff at disaster management sessions, and the insufficient implementation of disaster management policies. These findings reflected the current lack of best practice guidance in the KSA's healthcare system, a fact highlighted by research participants in the semi-structured interviews conducted for the present study, who were experts in their field and would be aware if such guidance existed. These findings also underscored the fact that when nurses are not involved in the development of legislation and emergency policies, the advancement of the knowledge base within the profession and the country's disaster response is hampered. This further highlights the necessity for appropriate training and education.

All policy recommendations associated with this study must be based on a better understanding of the needs of nurses in disaster response situations, and likewise emergency plans should be implemented as part of the development of a national health workforce plan or strategy that spans across all sectors, a critical requirement for the KSA. Moreover, nursing leaders should collaborate with the leaders of other professions to design and implement a process for reaching a consensus on the future vision and plans for the healthcare workforce to collectively respond to disasters in an effective manner. This plan should include participation from all major sectors and stakeholders.

The nursing sector of each country is responsible for defining nursing and the legitimacy of the roles of nurses in a manner consistent with internationally accepted definitions in a manner relevant to the healthcare needs of its population (Aldossary, 2013). The roles associated with such a definition include promoting health; preventing disease; caring for the sick, disabled, and dying; advocating for health; and contributing to health policies, all of which fall under the purview of a registered nurse. This is also the case for disaster nursing in the KSA. As discussed previously, the role of nurses in disaster situations and the knowledge and skills necessary to fulfil them, are currently not well defined, because there is no nationally mandated scope of nursing practice for responding to disasters. In order to better facilitate the delivery of high-quality care, and to embrace the wide range of knowledge and expertise of nurses in caring for patients, it is essential that their role be defined by an oversight body (Abu-Znadah, 2005). This claim supports the argument that, in order to

advance disaster nursing practice within the KSA, healthcare policymakers must consider empowering nurses with decision-making authority. This highlights the importance of the present study and the framework it proposes, which seeks to equip nurses with these skills.

The ability to communicate effectively is a crucial part of any disaster plan. In the wake of a disaster, nurses are required to act quickly and professionally, providing a variety of services to victims while simultaneously resolving complex clinical and operational problems, communicating clearly, and making the most of limited resources. These skill requirements should be incorporated into disaster nursing education in order to improve the flow of information between nurses and other healthcare professionals, both within the hospital setting and outside it (Couig et al., 2017). The scale of a disaster often necessitates a coordinated effort from numerous government departments and organisations, including the Civil Defence, police, ambulance services and hospitals, the Ministry of Education, the Ministry of Volunteers, private sector, and the Ministry of the Interior. However, this study found that there is currently a lack of engagement and consensus between these partners in the KSA, as a result of poor communication, coordination, and onsite collaboration with other emergency organisations and the communities affected.

In order to build the capacity required, it is necessary to establish effective means of communication between these bodies. While this is the first step in meeting the requirements for responding effectively to disasters, and is part of the capacity development process, it cannot be accomplished without careful planning and expert decision-making across local agencies prior to a disaster event, and should be reflected in an organisation's disaster plan (Hyer et al., 2009; Laditka et al., 2008; Manley et al., 2006). The relationship between multiple agencies and organisations, including well-coordinated and direct lines of communication with emergency management organisations, the local community, and other healthcare facilities in the region, is necessary for attaining a positive outcome in disaster events. Nevertheless, the current integrated disaster management procedures are often deficient or inadequate, and numerous previous studies reported the need for improved communications between emergency management and state regulatory agencies (Castro et al., 2008; Laditka et al., 2009; Laditka et al., 2008; Saliba et al., 2004). The lack of effective communication highlighted by these studies, as well as the present study, underscored the need for the proposed framework to be utilised.

Nurses work in a high-pressure environment where decisions must be made quickly, and where critical thinking is a vital nursing skill that can save lives. According to Scriven and Paul (2010), critical thinking that focuses on set observations, experiences, reflections, reasonings, or communication and develops a mental process that includes subtle perceptions, analyses, syntheses, and evaluation of information gathered to produce the possibility of action to be taken. While some of the decisions required of nurses in high-pressure circumstances may be mundane and routine, many are critical and can affect a patient's medical outcomes. When nurses are faced with a life-or-death situation, and are required to make important decisions in the absence of a complete data set, is critical for nurses to quickly make the right decisions. When required to solve a specific problem in uncertain conditions, a bad decision is often as bad as no decision, and both are equally significant indicators of a need for systemic reform (Kanbara & Katada, 2022). The ability to think critically is key for disaster nurses, as it enables them to take charge of a situation by making the most of what they have, to determine innovative solutions to problems engendered by new information, to work in tandem with their colleagues, and to delegate responsibility when necessary, but not when doing so would hinder their ability to remain flexible and adaptable (Powers & Daily, 2010). In emergencies, nurses may have only a few seconds to make a decision, and the ability to think critically is essential in this situation. However, the nature of the work of nurses means that they are frequently responsible for patients' lives, which can constrain their ability to take risks on matters about which they are uncertain. Nurses must therefore be equipped with the skills to utilise critical thinking to increase the efficacy of their patient care by generating novel solutions to problems and making novel decisions. This is a crucial step in delivering care that is secure, effective, and executed expertly. Therefore, nurses should experience situations that encourage critical thinking and hone their critical reasoning abilities in order for them to be able to make informed assessments of the information they are given and to make decisions regarding hospitalisation and the allocation of scarce resources on a daily basis. These skills are not necessarily innate, rather they must be often developed and learned in order to cultivate and hone critical thinking and decision-making abilities.

The ability to think critically is also relevant to nurses because they possess a diverse, multifaceted body of knowledge used to handle numerous situations encountered during their shifts, face constant changes in an environment that includes ever-present stress, and make important decisions regarding the collection and interpretation of information that is essential

for making wider decisions. In a disaster situation, many different people, groups, agencies, and organisations are involved in making decisions; this typically involves a group of people, each with their own level of expertise and familiarity with the situation at hand, as well as their own set of institutional norms and practices. In his work, Schneeweiss (2003) referred to this method of making decisions, in which multiple people collaborate on a single issue or problem, as distributed decision making (Schneeweiss, 2003). Therefore, as a large group within the larger healthcare community responsible for responding to disasters, nurses must improve their leadership skills and learn how to communicate effectively within the healthcare sector as a whole, as all of the individuals involved share the same aims and likewise face uncertainty and stress. The framework proposed by the present study addresses this core issue.

The ever-changing nature of disasters, the range of possible damage caused, and the uncertain availability of resources for providing nursing care all contribute to an already high degree of uncertainty in disaster situations. As Yin et al. (2011) explained, teams of nurses sent to the scene of disaster in these situations often face challenges and dangers merely reaching the disaster area; once there, they frequently encounter an environment devoid of any form of infrastructure. When they are able to think critically in such situations, nurses are able to identify specific solutions to particular problems for which traditional interventions are ineffective. Even under pressure, such nurses can generate new ideas quickly, be flexible, generate original problem-solving strategies, act independently and with confidence, demonstrate originality, and meet the challenges that a disaster can present.

As discussed previously, the nurses involved in the focus group discussions conducted for the present study explained that in most cases, what they lack in such circumstances is not knowledge of the basic operations required during an emergency situation, but rather leadership and coordination skills. Therefore, the framework proposed by this study includes a focus on leadership training and training in non-clinical skills required for the effective coordination of emergency services – all of which are skills that nurses must develop, as they play a central role in emergency response. Correspondingly, effective clinical leadership is essential, as it enables high-quality systems of healthcare that consistently provide safe and efficient care (Siriwardena, 2014). Leadership involves influencing others to achieve a mutual understanding and reach agreements regarding necessary action required and ways to undertake it, as well as how to facilitate individual and collective action to achieve

collaborative goals (Schyve, 2009). Leadership is therefore an essential management function that helps to maximize efficiency and achieve organisational objectives. Effective clinical leadership is consistently identified as a crucial element in clinical settings for ensuring quality care and healthy workplaces. Indeed, within the healthcare sector, the significance of effective leadership is becoming increasingly apparent (Jie et al., 2017).

However, the definition of leadership must also consider the context in which a particular action occurs; accordingly, disaster leadership requires its own definition. Disasters place leaders in unique circumstances involving life-threatening risks necessitating swift responses in low-security environments. Insufficient information, situations that change quickly, and tension that exist between operation objectives, political relationships, and human rights issues are also often evident, where the most beneficial leadership approaches are ones that can be adapted to make rapid decisions in pressure situations with only minimal information. Moreover, during events of disaster, these decisions are frequently prioritised alongside practical, political, and ethical imperatives, and require a leader with specialized knowledge and skills suited to navigate these considerations (Clarke, 2013). As Roberta et al. (2017) explained, because disasters can occur anywhere, nurses with disaster management skills are a universal necessity. The leadership role of nurses in such situations includes planning and preparing for large-scale disasters, while also managing the clinical challenges that disasters present. Nurses must therefore possess adequate knowledge and a sound comprehension of such events, as their knowledge and experience means that they can fulfil their responsibility of planning, supervising, and coordinating patient care. Moreover, leadership and management roles are viewed as an intrinsic part of nursing competencies. They therefore play a key role in disaster leadership. As Veenema et al. (2016) argued, nurses must be prepared for disasters as a core part of their professional identity. All nurses who directly or indirectly participate in patient care should be considered to be disaster leaders, as they provide a wide range of leadership skills to disaster settings (Veenema et al., 2017b). It is evident that, as Thobaity et al. (2016) has argued that nurses need to have base competencies that present their skills, knowledge, leadership, and their capabilities to provide holistic care to people who have been affected, and likewise, they must possess management and supervision skills.

The leadership roles of nurses should also be extended to their engagement and participation in decision making and policy development at all levels of the healthcare profession,

including the local levels within the hospital where they work, the community level, and national level. However, this study has found that there is lack of stakeholder engagement in disaster policy making in the KSA. Data collected and analysed in this study particularly indicated that nurses are often not contacted or involved in disaster response decision making and/or policy development, despite the wealth of benefits that they could bring to these processes.

Due their role as carers, nurses are held in high regard during disasters; indeed, Pourvakshoori et al. (2017) claimed that their role inspires community trust, and as such, they are expected to participate in a disaster response. According to Veenema et al. (2016), nurses are consistently ranked as a reliable source of health information. During disasters, they wield considerable influence, due to the widespread trust communities have in them. As discussed previously, owing to the unique demands of disaster settings, nurses require special leadership competencies, such as the ability to act decisively in highly uncertain situations, to ethically allocate scarce resources, and make decisions in health system event management situations such as evacuation. However, Veenema et al. (2017b) noted that no previous studies addressed crisis nursing leadership competencies adequately, and that since disaster nursing leadership is a relatively new field of study, there is an urgent need to develop these competencies.

Direct effects on the population can be achieved by elevating nurses to positions of leadership within the command and control structure of disaster response, coordination, and decision making regarding healthcare and patients in such situations (Veenema et al., 2016). According to Parks (2013), leadership skills can be taught. Education in such skills commences with fundamental nursing programmes, in which students should be encouraged to make mistakes without fear of retaliation in order to develop risk-taking behaviours and self-confidence. The ability to think critically and reflect are essential to this process; however, the majority of newly graduated nurses are not prepared to assume a leadership position, and therefore require opportunities for self-discovery, self-reflection, and critical thinking in a professional context in order to comprehend their strengths and develop their abilities. Expertise can be developed via on-the-job training and mentoring (Tran & Says, 2020). However, as demonstrated by the findings of the present study, nurses are currently not involved in the process of developing Emergency Response Plans, and consequently lack the skills necessary to address this challenge.

The provision of training and education in this area would represent a significant first step in expanding the role of nurses in disaster preparedness and response as leaders, educators, responders, policymakers, and researchers. Nurses, and the organisations that employ them in the health and human services sectors, are encouraged to initiate a broad-scale national conversation regarding how to implement this vision and the related recommendations. The benefits offered by such training entail that, when disaster situations deteriorate suddenly, nurses will be able to respond, communicate, and manage the situation using the knowledge and skills they have learned, which will save lives and reduce the impact of disasters. Achieving these key elements will require the implementation of certain, carefully identified features, as proposed in the framework posited by this study – specifically the integration of disaster preparedness and response content into the current nursing training courses in the KSA.

The current absence or limited presence of these key concepts for addressing effective disaster response emphasises the need for suitable measures to address them. Significant challenges remain in this area, a situation made more difficult by the lack of engagement between relevant partners necessary for developing an appropriate educational programme for nurses to enable them to respond effectively to disasters and promote their resilience and capacity development. This study therefore sought to translate the gaps identified into appropriate measures, strategies, and steps that can be implemented as part of the KSA's recommendations for the improvement of the country's disaster nursing education. The incorporation of the proposed framework into the nursing knowledge and skills taught in Saudi universities, along with the introduction of CPD courses, has the potential to enable nurses to respond to disasters effectively, and to significantly reduce the number of lives lost and the amount of property destroyed during a disaster. Achieving these key elements will require the implementation of certain carefully identified features. Therefore, this study proposes collaborative efforts to bring about the following changes in agreement with the objectives of this study:

9.5 Conclusion

This chapter presents the discussion of the literature that were found and identify the similarity of the aspects made in the studies. The more important aspect of this chapter is the approach in addressing the study's objectives, which were achieved through identifying the key components for nurse's education that is related to disaster response. The correlations of

the participants from different roles such as nurse, educator and policymaker are identified, and it is essential for them to cooperate together in order to be able to provide an effective response during an emergency from the KSA's standpoint. This chapter has also provided recommendations for the scope of the nursing practices and concepts during disaster. Chapter Ten will entail the study's contribution towards the current knowledge and recommendations for future studies.

Therefore, this study proposes collaborative efforts to bring about the following changes in agreement with the objectives of this study:

1. The integration of disaster preparedness and response content into the current undergraduate and diploma nursing training courses in the KSA. Such integration should feature the essential components of nursing education identified in this study.

2. Establish collaboration between nurses, policymakers, and nursing educators enabling the implementation and delivery of the proposed curriculum in an evidence-based and culturally sensitive manner.

3. Employ concerted efforts to engage in multiple effective methods to promote awareness of the importance of nursing in general and disaster nursing in particular for both genders (but particularly women) in the KSA. This will help to address negative cultural views about nursing.

4. The promotion of a deeper engagement between the Saudi Nursing Association (SNA) and the Ministry of Health of the KSA to formulate policies that will enhance disaster nursing education, the delivery of quality care to disaster victims, and the regulation of Disaster Nursing Programmes in the KSA. The SNA could also be given the responsibilities of overseeing the licensure of nurses who will be able to work effectively during disaster events. In addition, the SNA will be able to take some responsibilities away from the Ministry of Health. Other roles that the SNA could play include delineating the scope of nursing, establishing a code of conduct, clarifying ethics and values, and running Continuous Professional Development courses to facilitate training on many of the cross-cutting skills highlighted in the proposed curriculum in this study.

5. Develop and implement more effective and accessible CPD training programmes on disaster preparedness and response for nurses in the KSA, while also introducing a

platform for feedback between different stakeholders involved in the training programmes. Such courses should also cover content aimed at developing a deep sense of compassion and empathy among disaster response nurses in the KSA. This will equip trained nurses with the skills required for treating patients with dignity and respect and will in turn help engender a more positive image of nurses in the country.

6. Involve nurses in the development of ERPs and provide opportunities for training nurses in ERP development. It is hoped that this will equip them with the knowledge and skills to provide safe and effective care during emergency events.

7. The development of evidenced-based local and national guidelines for disaster preparedness and response to be used by nurses is recommended.

8. The development of measures to address negative societal views of nursing in the KSA (which particularly disproportionately affect women) through a system of material and moral incentives is recommended for nurses in the KSA. This will help to preserve the value and respect of the profession in society and by patients. This process could include scientific rehabilitation and educating the community in relation to the importance of nurses in culture.

9. It is observed that, due to poor societal perceptions of the profession, enrolment in nursing schools in the KSA is poor. Therefore, the framework should articulate a programme of community awareness regarding the importance of the nursing profession (particularly disaster nursing). The possibility of using religion as one of the means of promoting the profession could be considered, as it is a puissant force in Saudi culture.

10. Implement aspects of the KSA's Vision 2030 related to the nursing profession without delay. This will also improve the societal perception of the profession and its perception in community service.

Chapter Ten: Conclusion

10.1 Introduction

Following the presentation of the major findings of this research, the subsequent discussion of these findings, and the articulation of the conceptual framework developed for the study, this chapter concludes this thesis. The chapter summarises findings related to each objective and the research question, while providing further details of how the results were obtained. Section 9.3 presents recommendations for future research that may complement the roadmap outlined in the previous chapter. The chapter also presents the study's specific contributions to existing body of knowledge in the fieldhighlighting the unique contribution made by this study to the development of nurse education in KSA. Finally, the chapter provides document recommendations for further research on this subject and presents the researcher's personal reflections over the journey of this PhD study.

10.2 Main Research Findings

This study investigated the issues necessary for providing quality ongoing educational provisions and support for professional nurses tasked with the delivery of effective disaster nursing in the KSA in a manner reflective of nurses' lived experiences with such events. The study was justified by two key facts: the increasing incidence of disasters in the KSA and the observation that there are currently deficiencies in the ability of nurses in the KSA to effectively respond to such events. The study explored the views of relevant stakeholders to obtain an in-depth understanding of challenges nurses face in disaster management and the matters they believe should be addressed in order to better prepare them to respond to these events. Therefore, this study used a qualitative case study approach paired with a scoping review of the current state of disaster preparedness and nursing response on a national and international scale. In total, six hospitals across the KSA were selected as cases for this study, with ERPs being collected for review from all of them. In addition, six focus group discussions were organised with nurses from these hospitals who held a degree in nursing, were licenced to practice nursing by the Saudi Health Specialties Authority, and had previously experienced work in the context of disaster. This ensured that the participants possessed the relevant skills and practical experience of disaster response scenarios, and were

able to evaluate their effectiveness, such that they could make informed recommendations for their future development. Likewise, four semi-structured interviews were conducted with nursing educators and policymakers from the KSA. A thematic analysis of the transcripts from the focus group discussions and semi-structured interviews was then conducted. The scoping review of emergency plan documents was used in tandem with the analysis of the focus group discussions and semi-structured interviews as a basis for developing a framework for training nurses in disaster response throughout the KSA.

The study had three objectives, the first of which was to examine the current state of nursing education as it pertains to emergency preparedness and response in the KSA. A scoping review of available literature concerning disaster preparedness and response training was conducted, with a focus on how well nursing education prepares nurses to respond effectively in disaster events. This included a survey of the current state of this matter on a global level. As discussed in Chapter Three, the review found that the incorporation of concepts of disaster preparedness and response into the nursing curriculum is an approach that is widely used, although not in the KSA. The current nursing programme in the KSA does not make any reference to disaster preparedness or response, and was deemed to be insufficient to effectively prepare nurses for effective disaster response. This observation highlighted the need for an effective disaster nursing curriculum in the country, paired with effective leadership, ethics, and communication during such events.

The second objective of this study was to assess the current level of knowledge and skills of emergency nurses in the KSA, and to evaluate their performance in terms of their disaster preparedness and response. Several approaches were used to address this objective, the first of which was to review the emergency services procedures of hospitals selected as cases for the study in order to obtain an understanding of the environment in which nurses work. In addition, the ERPs of these hospitals were reviewed in order to assess their adequacy, and to determine how the activities within the plans aligned with requisite skills and competences of nurses. Finally, focus group discussions were conducted with nurses from these hospitals in order to collect their views on the matter and to gather information regarding their skills and competences. These activities indicated that all of the hospitals selected had fairly good working environments, along with ERPs in one form or another. However, the ERPs largely failed to consider the development and implementation of nursing skills, which meant that the ERPs' development and implementation was, in part, ineffective. The failure to involve

nursing staff in the development of these policies meant that nurses had gaps in their knowledge, as well as a lack of 'soft' ERP implementation skills, such as critical thinking and leadership.

Finally, the third aim of this study was to identify elements necessary for preparing nurses to respond to disasters effectively, namely those that should be included in an effective disaster nursing education programme. The analysis of the data collected from focus group discussions with nurses and semi-structured interviews with nursing educators and policymakers identified certain key concepts necessary for the effective education of nurses in disaster preparedness, such as promoting greater understanding of emergency plan development and implementation, knowledge of relevant policies – both national and international – and guidelines for emergency response, knowledge of emerging policy frameworks, and improved understanding of non-clinical skills concepts such as critical thinking, leadership, negoation , and communication.

The analysis of the data collected identified the following key findings of this research, which have been discussed in detail in the previous chapter:

1. Effective emergency response planning and implications for training of nurses for effective disaster response.

Well-developed Emergency Response Plans are available in the majority of the selected case hospitals. However, there are problems associated with the implementation of these plans by nurses, which partly results from the fact that nurses are seldom involved in the development of these plans, and that their initial nursing training programme lacks elements of emergency preparedness and response. Therefore, nurses only have basic knowledge, which proves inadequate for effective disaster response, though they are willing to learn. In light of the aim of this study, this indicates that the **knowledge of emergency plan development and implementation is a core concept that must be taught to nurses in order to prepare them for effective disaster response**.

2. Knowledge, skills, and competence of nurses for effective disaster response

Current training provides good skill development for general nursing, but this is not the case regarding emergency response. This clearly supports the rationale for this study and further

supports **the need for a nursing curriculum that includes both concepts of general nursing and those of disaster preparedness and response**.

3. Disaster nursing education

Both educators and policymakers are aware of challenges impeding the effective training of nurses for disaster response, but there is a great disconnect between all parties. There is no evidence that feedback from nurses on the field is being taken into consideration by educators, although it could lead to constant curriculum development that would render services more effective. Moreover, there is lack of feedback between policymakers who are involved in the development and delivery of disaster training programmes and those being trained. As a result of this disconnect, nursing educators have limited knowledge of policies and frameworks underpinning disaster response training in the country. With respect to the aim of this study, it is evident that **knowledge of policies (national and international) and guidelines for emergency response should be included in an effective disaster training programme for nurses. Also, such training programmes must include frameworks for multi-stakeholder feedback (for nurses, educators, and policymakers).**

4. Engagement of nurses in disaster response decision-making and policy development

It is observed that nurses represent a group of important stakeholders in disaster response and planning. However, evidence obtained through this study indicates that nurses do not often participate in disaster response planning, decision making, or policy development. This could be due to them lacking the prerequisite skills needed for effective decision making and policy formulation. Therefore, **there is a need for this to be addressed in a new curriculum and/or training programme for disaster nursing so that nurses may make meaningful contributions.**

5. Policy framework and the role of ministry of health in disaster training

The nation generally lacks policy guidance with respect to nursing – particularly emergency response. Though the Saudi Vision 2030 document was recently developed, the implementation of the strategy in the document with respect to improved nursing education has yet to take place. Also, the fact that there is no national association such as a national nursing council may partly contribute to the lack of vision, structure, and guidelines for the

scope of nursing. This may be the reason why no significant effort is on disaster nursing – all the people involved may be clueless about what to do. In line with aim of this study, this finding further highlights why **knowledge of emerging policy framework should be a key component of an effective disaster nursing programme.**

6. Improved nursing curriculum

This study has shown that an improved curriculum for nursing should take the existing structure – which provides adequate training for general nursing – but add critical components (such recognising hazards, risk planning, mitigation strategies, response, and recovery) that are currently absent. Additionally, **non-technical skills such as critical thinking, leadership, ethics and communication should be included in the curriculum for an effective disaster nursing programme.**

10.3 Summary of the Discussion and Framework Development

The review of previous studies in the field of disaster training conducted for this study highlighted the need for such training for nurses in the KSA. This supported the objective of this study, and the Key Concepts identified as a result of the research have been discussed in the previous chapters. These were based on the responses regarding the elements required for an effective disaster nursing education produced by nurses and other participants involved in the study. The subsequent framework provided a summary of these concepts, along with the ways in which they can be addressed and implemented. The related discussion compared the findings of the present study with those of previous research conducted and presented new perspectives concerning nursing and disaster management. Connections between the views of all categories of participants involved in this study – namely nurses, nursing educators, and policymakers – highlighted the key concepts necessary for the resulting framework proposed for disaster nursing education, and included leadership and communication, along with an improved awareness of policy, practice, and governance relevant to the development and implementation of an effective disaster nursing programme. The core recommendations for promoting effective disaster nursing practices, together with the key concepts required for developing an effective disaster nursing education are summarized above. The specific contributions of this study to the current knowledge base within the field, along with recommendations for future research, are addressed in the next section.

10.4 Recommendations

This study contributed to various areas of understanding in the field of disaster response nursing, as discussed below. The recommendations of the study were based on the gaps in the knowledge and abilities of nurses identified and sought to improve the preparedness of nurses to respond effectively to disasters in the KSA in particular. Recommendations for future areas of academic research in this field are also offered below, after which the limitations of the study will be discussed:

1. The integration of disaster preparedness and response content into the current undergraduate and diploma nursing training courses in the KSA. Such integration should feature essential components that have been identified in this study.

2. Establish collaboration between nurses, policymakers, and nursing educators in the implementation and delivery of the proposed curriculum in an evidence-based and culturally sensitive manner. As highlighted earlier, the involvement of other agencies (such as the Saudi Nursing Association, the police, the Red Crescent, the Civil Defence, and the Army) in establishing benchmarks and professional competency frameworks for emergency nurses in the KSA should also be given strong consideration. This collaboration will help bridge the gap between these stakeholders and provide opportunities for the various parties to be aware of each other's challenges and potential while enhancing the quality of training provided for emergency nurses in the KSA.

3. Employ concerted efforts to employ multiple effective methods to promote heightened awareness of the importance of nursing in general and disaster nursing in particular, for both genders (particularly women) in the KSA. This will help to address negative cultural views about nursing.

4. The lack of stakeholder engagement in disaster policy development is one of the key findings of this study. Therefore, the promotion of deeper engagements between the Saudi Nursing Association (SNA) and the Ministry of Health in the KSA to formulate policies that will enhance disaster nursing education, disaster response policy development and implementation, the delivery of quality care to disaster victims, and for the regulation of Disaster Nursing Programmes in the KSA is recommended. The

SNA could also be given the responsibility of overseeing the licensure of nurses who will be able to work effectively during disaster events. In addition, the SNA will be able to take some responsibilities away from the Ministry of Health. Other roles that the SNA could play include helping to delineate the scope of nursing, establish a code of conduct, clarify ethics and values, and facilitate Continuous Professional Development courses training nurses many of the cross-cutting skills highlighted in the proposed curriculum in this study.

5. Develop and implement more effective and accessible CPD training programmes on disaster preparedness and response for nurses in the KSA and introduce a platform for feedback between the different stakeholders involved in the training programmes. Such courses should also include content aimed at developing a deep sense of compassion and empathy in Saudi disaster response nurses. This will equip trained nurses with the skills required for treating patients with dignity and respect and will in turn help in engendering a more positive image of nurses in the country.

6. Involve nurses in the development of ERPs while also providing opportunities for nurses to be trained in ERP development. It is hoped that this will equip them with the knowledge and skills to provide safe and effective care during emergency events.

7. The development of local and national evidence-based guidelines for disaster preparedness and response to be used by nurses is recommended.

8. The development of measures to address negative societal perceptions of nursing in the KSA (which disproportionately affects women) through a system of material and moral incentives is recommended to improve the state of the nursing profession in the KSA. This will help to ensure the profession is valued and respected in society and by patients. This process could include scientific rehabilitation and educating the community in relation to the importance of nurses in culture.

9. It is observed that due to poor societal image, enrolment in nursing schools in the KSA is poor. Therefore, the framework should employ measures to raise community awareness of the importance of nursing profession (particularly disaster nursing). The possibility of using religion as one of the means of promoting the profession should be considered considering its puissant role in Saudi culture.

10. Implement aspects of the KSA's Vision 2030 related to the nursing profession without delay. This will also improve the perception of the profession in community service.

11. Development and implementation of proposed Disaster Nursing Preparedness course – for future development and implementation (postdoctoral project by the author of this study).

10.5 Contribution to Knowledge

10.5.1 Contributions to Knowledge of the Multi-disciplinary Approach to the Study of Disaster Response

A major contribution of this study to the extant body of knowledge was its unique bringing together of two parallel fields of study: disaster management and nursing. Although numerous previous studies addressed the matter of disaster nursing, this study examined the matter in the context of disaster management, exploring how nurses should govern their own education in disaster response. The pedagogical approach adopted in this study offers a unique contribution to current understanding of disaster nursing in both the KSA and globally. Often, the subjects of disaster management and nursing are considered separately; thus, this study is significant for having adopted an approach that evaluates both concepts together.

Moreover, unlike previous studies that assessed the knowledge and capabilities of nurses in the KSA regarding effective disaster response, this study combined the assessment of the capabilities of nurses with the examination of institutional readiness for emergency response, employing the ERPs of particular hospitals to do so. It also investigated the views and knowledge of educators and policymakers regarding disaster response in order to identify the current gaps in disaster nursing education in the KSA along with elements that the nurses involved in the study considered to be gaps in the current education curriculum in this regard. Therefore, this study constituted a more comprehensive survey of this matter in the context of the KSA than previous research. For instance, Alzahrani and Kyratsis (2017) focused only on the level of preparedness of nurses for mass casualty events, and Shalhoub et al. (2017) focused only on nurses working in private hospitals. The present study was therefore more

comprehensive in nature due to its examination of the skills and knowledge of nurses of disaster events more widely.

In addition, the important role of concepts such as leadership, communication and negotiation are frequently overlooked in disaster management, despite being key concepts in nursing. This study has also highlighted the importance of effective leadership and communication in developing the capacity of nurses to provide effective disaster response. Specifically, many of the gaps identified via the scoping review, the focus group discussions, and semi-structured interviews can be addressed adequately by effective leadership. For examples, nurses indicated a weak understanding of the process through which ERPs are developed, as well as their limited access to effective training regarding how to act in emergency situations. Certainly, effective leadership, local and national programmes addressing these issues could easily be implemented in the KSA.

Consequently, The Key Concepts derived from this research constitute the core themes of this study and a critical original contribution to knowledge in the field. The Key Concepts, as outlined previously, are Nurse Understanding of ERP, Understanding of Nursing Role During Disaster, Practical Disaster Response Drills, Leadership and Management Skills, Communication, Negotiation, Collaboration and Teamwork, Resources for Coping, Critical Thinking and Decision Making and Building Resilience. These would inform the proposed curriculum set out as recommendations from this study.

The involvement of policymakers and nursing educators in this research provided an important opportunity to examine the incorporation of policy into practice. Therefore, the research also highlighted the important roles played by governance and diplomacy in developing programmes anticipated to have sector-wide implications. The approach adopted in this study further provided an opportunity for nurses to negotiate and communicate their needs in a manner that can inform strategy development and policy formulation (and this is the ultimate impact that this project hopes to achieve).

10.5.2 Contributions Relating to the Geographical Scope of the Study

This study was the first to explore the knowledge of nurses regarding disaster response in different regions of the KSA, a wider geographical coverage than previous research in this field. Existing studies focused on either one hospital setting, groups of hospitals in a

particular city (Alzahrani & Kyratsis, 2017), or hospitals in only one region of the KSA, such as the study conducted by Nofal et al. (2018), which covered only hospitals in the central region of the KSA, the study of Alruwaili et al. (2021), which covered only hospitals in the eastern region of the country, and the study by Khan et al. (2021), which concerned only hospitals in the western region of the KSA. As demonstrated in Figure 3.2, the case hospitals for the present study were selected from multiple regions of the KSA, and therefore the study's findings were more representative of the level of preparedness of nurses in the KSA in general than previous studies.

10.5.3 Contribution to Investigations of the Impact of Policy in Disaster Nursing Training

In addition to the wider geographical scope and nursing context of this study, another unique contribution was the collection of data from policymakers conducted in order to explore means of developing a more effective nursing curriculum in the KSA. Previous studies in this field often addressed curriculum development primarily by collecting data from the population targeted by such education, and/or on education providers. For example, Brinjee et al, (2021a) and Mansour et al. (2020) focused on university students. One of the key shortcomings of such studies was the fact that the students selected as participants did not have field experience and were therefore unable to provide useful field-experience-based information that could be used for curriculum development. In contrast, the present study involved practicing nurses, particularly selecting those with disaster response experience, as they were able to discuss the gaps in current knowledge, and their skills, or lack therefore, preventing them from performing effectively in real-life disaster events. In addition, the involvement of policymakers as participants in this study represented the first attempt by any disaster nursing curriculum development research to include the views of policymakers.

Additionally, this study presents the key finding that policymakers responsible for nursing course provision were found to be ill informed about nurses' (self aware) knowledge gaps about disaster relief. The disparity was most acute in relation to non-clinical skills that the nurses required more training in, including leadership, decision making, critical thinking and the policy framework within which they work.

A key finding and contribution to knowledge from this study, that may reflect a more serious issue in KSA and further indicate poor or confused policy making itself, was that of

inadequate knowledge of policy and the legal frameworks governing disaster releif held by nursing educators. The wider implication of this leads to the assertion that the policy making process needs to be addressed, in tandem or possibly ahead of the nursing curriculum.

A further contribution to knowledge is the Developed Framework based on the findings of this study for the generation of approapraite disaster nursing education module in KSA.

A working model for a Disaster Nursing Preparedness course has also been developed and presented, based on the findings of this study.

The approach adopted by this study also provided an opportunity for participating nurses to negotiate and communicate their needs in a way that would inform strategy development and policy formulation, as this was the ultimate result this project hoped to achieve. Meanwhile, the involvement of policymakers and nursing educators in this study provided an opportunity for the incorporation of policy into practice, highlighting the importance of the roles of governance and diplomacy in developing programmes that are expected to have sector-wide implications. A key contribution of this study was the fact that its findings could be used uniquely as evidence to support new actions to be added to the Saudi Vision 2030 programme, and factors that could be used to drive its implementation.

10.5.4 Implications of the Contribution to Knowledge

The conclusions drawn by this study were novel in the context of research concerning disaster nursing in the KSA. The current study is the first to report the vital contributions of non-clinical skills, including leadership, critical thinking, communication, and ethics, in facilitating effective disaster responses for nurses in the country. Nevertheless, the critical role of nurses as leaders within the healthcare setting in the KSA was previously reported by a number of studies (El Dahshan et al., 2017; Al-Yami, Galdas & Watson, 2018; Al Moosa et al., 2020); although no previous studies identified the core role of leadership and the other non-clinical skills identified in the context of disaster nursing in the KSA. Subsequently, the implications of these unique contributions to the knowledge of disaster nursing in the KSA are as follows:

1. Curricular development efforts based on the findings of this study will be relevant nationally, as the data collected covered many regions of the KSA;

2. The involvement of many categories of stakeholders in the study meant that the curriculum developed that is based on the findings of the study will benefit from the input of various stakeholders, and therefore have the potential to address the current gaps in disaster response preparedness and include the related knowledge and skills necessary for nurses in the KSA.

While many previous studies recommended integrating disaster nursing into the undergraduate curriculum, the key concepts identified in the current study, many of which can only be taught effectively via a 'hidden' curriculum, entail that future curriculum development efforts that employ the findings of this study will be more comprehensive than previously stated. The key concepts of disaster nursing education identified by the current study should be used as guidelines to implement the proposed framework in the KSA. Moreover, this study contributes to the corpus of knowledge in multiple ways by providing information on gaps in knowledge and professional practice among nurses in the KSA with regard to disaster response.

Furthermore, information regarding the level of preparedness of nurses to respond to disasters and emergencies was provided at the end of this study. These findings help to assist policymakers and practitioners who seek to expand upon and augment nursing training programmes for new nurses in the KSA. Additionally, it provided useful information to advance the development of Continuous Development Programmes (CPDs) or short courses for nurses who are currently practising. Information on nurses' levels of understanding of existing policies with respect to Emergency/Disaster Response are clarified at the end of this study. This will allow policymakers to propose effective methods for propagating policy information to nurses and other relevant professionals based on evidence.

In addition, practitioners in the fields of health, disaster preparedness, and response are considered to be engaged in applied sciences or fields of practice. This is because these fields deal with issues that people encounter throughout the course of their lives. When one has an interest in learning more in regards to one's practices and, moreover, in making improvements to them, this naturally leads to the generation of researchable questions, some of which are most effectively tackled using a qualitative research design. I contend that research focused on discovery, insight, actual needs, and understanding from the perspectives of those who are being studied offers the greatest potential in terms of making a difference

and saving people's lives, especially in the context of disaster zones, where communities desperately need nurses' services and the knowledge and skills they have.

10.6 Recommendations for Future Studies

This section provides recommendations for future areas of research in the field of disaster nursing management and education that will aid in addressing the current limitations identified previously, along with recommendations for future studies that will provide additional information to aid in the development of an effective disaster nursing programme in the KSA. These recommendations are as follows:

1. This present study addressed only certain regions of the KSA. Since the nature of disasters differs in the various regions of the country, it is possible that the experience of nurses differs from one location to another. Therefore, there is a need to replicate this study in other regions of the KSA not covered by this study. This will help to generate additional data to inform the development of an effective curriculum for disaster nursing, and potentially identify additional salient, geography-related factors.

2. The KSA's Vision 2030 includes certain recommendations that seek to improve the country's nursing services, including disaster nursing. There is a need for research that investigates the feasibility of implementing these recommendations. In addition, future studies might assess the impact of the recommendations of the Vision 2030.

3. The majority of the hospitals selected as cases for this study were located in urban areas, and thus future studies might include hospitals based in rural settings across the KSA in order to understand the current gaps in the knowledge and competence of nurses in emergency preparedness and response in a wider geographic area.

4. The sample size employed for this study was relatively small, and it is therefore recommended that future studies employ an approach that facilitates the recruitment of larger samples sizes.

5. This study proposed a framework for a revised nursing curriculum; future studies that explore the views of key stakeholders in nursing education across the KSA regarding this framework are therefore required. Moreover, long-term studies that adopt the proposed

curriculum as an intervention and examine its effectiveness in preparing nurses for effective disaster response would be valuable.

6. Future research might assess the nursing capacity required for all phases of disaster response, namely mitigation, preparedness, response, and recovery. Since this study addressed only the preparedness and response of nurses to disasters, it may be beneficial for future studies in this field to adopt a more holistic approach to assessing nurses' disaster management capacity.

7. Due to the potentially severe impact of disasters, it would be advantageous to examine the key concepts of the framework proposed by this research further, exploring their application in other countries, thereby promoting knowledge sharing and best practice, as described in Chapter Eight of this study. This has the potential to contribute to the academic field of disaster management both within the KSA and globally.

10.7 Personal Reflection of the PhD Journey

10.7.1 Reflection on the Problem Identification based on Previous Professional Experience

This is a critical reflection of my PhD journey into the world of disaster nursing practice. I will write using the first-person pronoun to convey my personal experiences through the process of conducting this study. The current study charts an effort to combine knowledge from contemporary literature on the topic of nurses' preparedness and responses to disaster, along with personal skillsets and experiences acquired during my sixteen years of practice as an advanced nursing practitioner in the KSA. Subsequently, recommendations are provided from this information to improve disaster nursing education systems in the KSA and potentially, on a global scale. My additional expertise in management and academics also provides useful insights and experience for the current study, and these combined perspectives have informed and validated one another in order to identify and present certain gaps in this area of training and practice. Ultimately, this has provided the platform from which informed and considered recommendations have been made in order to address some of these gaps, which is the focus of the first objective.

It is worth noting that during my professional post as a general nurse in Tabouk, the KSA, I was shifted to Emergency Administration as a paramedic nurse. This provided insights through dealing with patients at the scene of different incidents, which were unfamiliar scenarios to me, as well as exposing me to experiences of colleagues who had only been trained to work internally within hospital settings facing disasters. In a hospital setting, nurses are trained through a structured system to conduct triage and the initial patient assessments. Emergency Administration, however, required an entirely different set of triage and initial assessment knowledge and skills for which we were not formally trained. In addition to caring for, assessing, and treating patients at the scene of road incidents in the KSA, I was responsible for transporting patients to hospitals. Separately, when working on the nursing Hajj programme, where a large population of people meet within a very small setting at one specified time of year, the care needs within this context often put excessive pressure on the resources available. This event involves people from all over the world and from all walks of life, elderly members of the community or those suffering with chronic diseases – all of whom are increasingly prone to accidents or increased illness in particular settings that require rapid assessment skills and treatment of medical/surgical injuries, for example.

Through working in areas where flooding has led to the loss of homes and lives at such magnitude, it has become intrinsically evident that disasters must be considered under the notion of ecological health. In the city of Aleise, the KSA, I worked to provide care during an earthquake situation, which was an extremely difficult context to work within, again demonstrating a need for greater preparedness for such possibilities and working environments. I also worked during the conflict in the south of Saudi Arabia treating soldiers and citizens simultaneously, where the work settings ranged from public hospitals, field hospitals and army hospitals – the extent and range of injuries were extensive.

I felt that nurses, despite their large numbers in the health sector, were not listened to, a fact that was clear for me from my personal experience and the questions and challenges that my fellow colleagues faced with disasters in the KSA. This is particularly indicated by the fact that nurses are often not involved in disaster planning, decision making, and policy development. Accordingly, the current study was created not based on an aim of accomplishment, but on what the participants would view as an achievement. This would help to produce content that flows from the core of nursing identity in situations where a nurse has responded to disasters. Moreover, as a nurse, I felt the responsibility and duty of

care that I had towards patients to provide and promote care, as well as towards my nursing colleagues when I would work closely with them in a team and with other professionals. It was important to understand how care is delivered in an open and responsive manner to individuals and communities, and especially in disasters responses. Therefore, in order to achieve this, I applied to receive a scholarship, which would help me to address these issues and better explain the matter to authoritative bodies in the KSA.

Subsequently, I received scholarship to study a PhD in October 2017. The first concern to me was to comprehend what had been accomplished in the field and what evidence was available, not only in the KSA, but globally, as this could help to improve disaster nursing practice. However, the evidence available failed to answer not only my questions, but also the nurses' questions underpinning this study. Additionally, through my experience in disasters it has been possible to determine that nurses feel unprepared at the point of a rapid surge in disaster impact; for example, when transition is required from normal hospital practice, where most initial assessments are doctor led. At certain points of disaster, nurses need additional training in quick responses to improve patients' assessments and triage. There is a lack of evidence in the identification process of the most important competencies for nurses at a disaster site. There are also gaps in terms of research into nurses who have worked during disasters, which demonstrates that further training would be beneficial.

I sought to choose a method to develop and implement an appropriate programme for these individuals, which would enable nurses to gain the opportunity to be proactive in helping the development of the care they deliver in times of disasters. The nurses would also have the opportunity to express their feelings regarding their responses to disasters and to express their actual needs and roles in disaster cycles. This is why qualitative research was used, as nurses could use their experience to reflect upon their practice and develop as professionals. They would be able to learn from their experiences to face different challenges to adapt to new situations, which would develop their skills, particularly in relation to disaster response, and subsequently, help to deliver better health care in these situations. This was a key objective of the scientific discussion through the current research, as colleagues on the ground were able to analyse aspects of behaviour, attitude and approach that underpin effective disaster nursing responses and good nursing care. Consequently, this will lead to saving lives or at least reducing the level of damage that is often present in disaster healthcare settings.

10.7.2 Reflection on the Motivation for this Study

As a nurse, it was evident to me that the main driving force behind this research, aside from the evident gaps sourced from the scoping review, is that I have a moral obligation to provide the best healthcare to my patients and save lives. This PhD research has been an important opportunity to develop nursing practice in the field of disasters, and therefore, it was necessary to understand what had been analysed and concluded prior to this study. Indeed, I intended to take advantage of all of the ideas, evidence, and interpretations that had been gathered in previous and present literature. This was challenging, however, as my research is multifaceted, which requires substantial inquiries into a broader subject, which includes many different areas of relevance, such as disaster management, nursing sciences, and educational development. In addition to my moral obligation to save lives as a nurse, my moral obligations as a PhD graduate are farther reaching, as by listening to my colleagues, drawing from my own experiences and conducting this current research, it is possible to elevate the work that fellow nurses and I already have conducted in the field, to save lives and reduce the impact of disasters on a larger scale. Moreover, as a PhD student, I now have the responsibility to develop health care practices towards the aim of saving lives on a wider scale beyond my individual practice.

It is also necessary to improve the morale of Practice Health Nurses (PHNs) and their connections to management to promote teamwork and the inclusion of PHN participants in the effort towards improved disaster preparedness, response, and management, leading towards the development and implementation of a relevant training programme for PHN preparedness and response to disasters. Primary data collection to identify PHNs' requirements needed to relate to disaster preparedness and responses to improve training; however, the literature shows a lack of available evidence informing the preparation of such courses. Correspondingly, I found that the best way to achieve this was by listening to my colleagues and drawing from their experiences.

It is from these first-hand professional experiences that this study is rooted, with a primary focus on education within the nursing system, and specifically, with an aim to answer and address these questions that have remained with me throughout my professional career. Accordingly, this study hopes to offer recommendations which will bridge the gaps in nursing preparedness for disasters in an educational setting as directed through my own

experiences and validated by evidence-based studies and research. Additionally, it is the intention of this study to contribute to saving lives, as each moment for each patient in a disaster is critical. If it is possible to eliminate the gaps in the knowledge and skills of nurses who hold the lives of those patients in their hands, it will surely be a significant step towards disaster preparedness and response.

I have a clear responsibility regarding disaster response, and it is hoped that these results will help in developing a vital educational programme in line with nurses' aspirations. Accordingly, after completing this study, I hope to work further and develop a training education programme for nurses to better prepare them for disasters, as a training programme is required for nurses to understand quick responses to disasters based on their experiences and relevant practice. This is why data is required to assess the needs for this training programme and to identify the nurses' actual requirements, which are the bases of Objectives 1 and 2. These objectives were met with post-disaster primary research via qualitative data to correlate with the available knowledge from the literature through a scoping review, and to then assess the nurses' levels of knowledge, skills and performance in disaster response, and subsequently, to identify the most important competencies for nursing at a disaster site and to determine what further training would be beneficial from the experiences of nurses who have worked in disasters.

As nurses, when we respond to disasters our primary concern is to focus on people's health and security. When we work with patients, we hold their lives in our hands, and it is our responsibility to protect them; in times of disasters we often need to decide who to be treated initially, and thus, be prepared to make challenging decisions. Working in nursing has taught me the value of life and the value of being a human being that the Creator endowed with life, and that nursing is a human profession before it is professional, as it is an essential pillar of health care. People, however, often still do not recognise the true value of nursing, and the reality is that society often fails to acknowledge these important health professionals. Therefore, healthcare will not advance until nursing is promoted through expending human capital to improve perceptions and implement evidence-based practices in order to achieve better health outcomes. This is relevant globally, not just in the KSA, which is the central focus of the current study.

In regard to this PhD research, whenever I finished a specific portion of the study, I thought that it was the most challenging stage until I began the data analysis. This was the most difficult stage for me, not only in analysing the data, but also in defining what all the statements actually meant and at times reading between the lines to try to determine the real reasons that cause nurses to struggle to be prepared for disaster response. Nonetheless, after meeting with my academic supervisors and engaging in detailed discussions, my horizons were opened to search in the right direction and to think deeply about these problems. This made me analyse the history of nursing, not only in Saudi Arabia, but globally, to determine the real reasons behind these problems and why these questions have remained unanswered. Accordingly, I hope that this study finds solutions to deeper problems and not only to the problems that appear on the surface.

10.7.3 Reflections on Nursing Profession and this Study

Nursing is a great humanitarian profession, and in disasters and in the midst of devastation and trauma, the exceptional professional and humanitarian ethos of nursing is evident. However, during the COVID-19 pandemic, the role and importance of nursing in response to disasters became far clearer. It became evident that governments and organisations need to invest in nursing, as nurses are imperative to safety and are directly related to the quality of services provided through nursing to patients and communities for the health of nations and peoples. Nurses played a major role in addressing the COVID-19 pandemic, as they provided curative and/or preventive care to patients and society. Nurses function as the first line of defence to defend patients' health, which is why governments and organisations need to improve nursing in disaster response through set training programmes, as this study has recommended.

Nursing is a multi-skilled profession that includes several specialties, and it is critical for nurses to always be ready to serve their country at all times and places. Accordingly, I wanted the current research to enable nurses to gain a further level of respect within society through their own professional development, thus preventing health systems from collapsing when disasters occur, particularly in relation to Saudi Arabia. This can only be achieved by providing appropriate ongoing training for nurses to prepare them for disaster response based on scientific evidence. Therefore, this study has provided recommendations to contribute to the development of disaster nursing programmes in the KSA, as well as to be the basis for

future research. As the Saudi Minister of Health has stated, the importance of nursing revolves around the nature of the work that requires providing quality health services and promoting disease safety, which makes the intensive care of nursing providers as an essential element in the development of health services.

In addition, the suffering of nurses not only relates to the duration of work required, but also the psychological effects at a personal and family level. There is no greater feeling in the world than to relieve a patient of suffering, and this is the role of the nursing profession, as they are the closest individuals to the patients in many circumstances, especially during disasters, which is why a failure to relieve nurses can result in them suffering emotionally. The COVID-19 pandemic has proven that nurses are the basis for responding to crises, and that there is a critical need for nurses to develop a deeper understanding of issues regarding disaster nursing, which is why the provision of relevant and actionable key concepts for learning will improve the preparedness and responses of nurses in Saudi Arabia, and by extension, the world.

Therefore, there is a need to work towards better educated nurses who are equipped to respond in times of disasters and contribute significantly to the scientific research and the aspirations of nurses working in the field. Indeed, this PhD has been formulated not only as an attempt to educate other healthcare professionals and those involved in disaster preparedness and response, but to educate myself as a means of disseminating that education. All experiences have been included as a means of presenting a first-hand view of these matters. During my experience as an advanced nursing practitioner and through experience of management roles, I have noted a need for greater cohesion and the inclusion of the nursing community within management decisions relating to preparedness. Nurses are key care providers at the point of recognition both during disasters and after them, and have internal and external connections to the wider community when a disaster occurs, while also dealing with and understanding resources and patients' needs. Unfortunately, many managerial professionals in this area lack healthcare experience, and thus, it is vital that they corroborate with healthcare professionals, ideally nurses, who form the largest group of healthcare professionals and primary caregivers during disaster scenarios.

The basis of the recommended training process stems from the importance of saving lives during disasters. I realised that it is not an easy job to work as a nurse in disaster response,

and this PhD research has enabled me to meet with nurses from the KSA, who shared their experiences, hopes, and challenges in this area of healthcare, as well as their feelings of being restricted by a negative image and poor general perception of nursing in the KSA. Personally, upon reflection, I realised which areas of my practice I performed well in and which I did not, and I intend to improve on them when I return to the KSA. I aim to use the knowledge and experience I learned through this PhD programme to develop policies that will improve disaster preparedness and service delivery to patients during disasters, thereby enhancing disaster nursing care provided to them.

10.7.4 Reflection on Future Activities

In the future, I hope to pursue a post-PhD programme and form a partnership with the Saudi Ministry of Health to establish an autonomous body that will be in charge of accrediting disaster nursing programmes in the KSA. Nursing has been my passion since I was ten years old and initially developed when I volunteered to work in the Medical Corps of the Army in my area during the first Gulf War. Working as a nurse has enabled me to develop an acute sense of compassion and empathy for all humankind, which helps in ensuring my care delivered is always directed with respect. I am a proud nurse who has continually worked hard to improve nursing in my country of Saudi Arabia. This also helps me to provide justification to my parents who supported me from my initial days in nursing, as well as by my government to undertake this PhD, particularly from the Ministry of Health, and the trust given to me by my patients during disasters and my friends in nursing to advance our work together.

10.8 Conclusion

This chapter has provided concluding thoughts and recommendations based on the finding of the research reported in this thesis. In the first instance, this chapter presents a concise description of the contributions of the study to knowledge as well as the implications of findings for nursing education and practice in the KSA. In addition, the limitations of the study were highlighted, as well as recommendations for future studies. Content that could be included in an effective nursing curriculum was also proposed. The chapter also provided highlights of the researcher's reflection on the PhD journey. Moreover, this chapter addressed the study's research questions and the way in which the objective of the study was achieved

by highlighting the key concepts identified in the responses of the nurses and other participants that were relevant to the development of effective disaster nursing education. The framework proposed provided a summary of these concepts and the ways in which they are able to be implemented.

Overall, this study not only offered benefits for practical disaster nursing management, but also for the related academic field. Despite the limitations encountered, this research made significant contributions to the knowledge-base and body of practices regarding disaster nursing management, particularly in the KSA. Firstly, it combined two parallel fields of study: disaster management and nursing. Even though many previous studies of disaster nursing exist, this was the first to examine nursing in the field of disaster management, and the ways in which nurses can take ownership of their own education in disaster response, in order to improve the effectiveness of their response. Correspondingly, the implementation of the Key Concepts of the framework developed by this study has the potential to mitigate the consequences of future disasters in the KSA, if applied appropriately.

The case studies conducted for this study generated useful data that enhanced the conclusions drawn from the analysis of the data collected via the review of particular ERPs, focus group discussions, and semi-structured interviews. The resulting findings contributed to the extant body of knowledge concerning the need for a capacity assessment of nurses in the KSA. The framework developed by the study provided a robust methodology for addressing the existing knowledge gap in Saudi nurses' disaster response education. Meanwhile, the case studies conducted enhanced the qualitative data collected.

The findings of this study were not reported by any of the previous studies that addressed disaster nursing in the KSA. In particular, previous authors did not expound on the important role of non-clinical skills, such as leadership, critical thinking, communication, and ethics, in order to enhance the effectiveness of nurses' disaster responses in the KSA. If the framework developed by the study to improve nurses' disaster responses in the KSA is implemented effectively, it is hoped that it will help to mitigate the impact of such events and promote improved disaster response nursing education. It is also hoped that this study will inspire future research in the areas identified and encourage continuous improvement in disaster nursing management in the KSA.

In addition, the serious impacts of disaster events necessitate research concerning the ways in which emergency responses to such events can be improved and how mitigation measures that can be best implemented. The actions, structures, and systems necessary require a multiagency approach to disasters and public health emergencies that must be harmonised in order to avoid unnecessary time- and resource-consuming discussions and shortcomings (Boin & Hart 2010). The current nursing curriculum in the KSA is insufficient in preparing Saudi nurses to respond to disasters that can cause widespread, cascading impacts. Current nursing education programmes in the country are often conducted by educators who rely on their knowledge and expertise to develop a programme that prepare students with suitable skills and competences that reflect societal needs.

This study employed an approach that started with nurses' views, and utilised a participatory curriculum development approach to also obtain the views of policymakers and educators. It is proposed that such an approach to curriculum development will facilitate the effective implementation and governance, as well as the effective monitoring and evaluation, of future nursing education programmes. This participatory approach enabled the finding that policymakers for nursing course provision would greatly benefit from a participatory curriculum development approach, as would educators, to mitigate or minimise gaps in their knowledge and subsequenct policy and educational processes in this regard. The key concepts identified by this study will benefit the development and implementation of an effective disaster nursing education in the KSA, and are also applicable to effective disaster nursing education within the broader Asian context and beyond.

Furthermore, there is a need for comprehensive planning that ensures that nurses in the KSA, as well as all other members of the medical and civil services in the country, are prepared for disaster events. This should include the development of a national curriculum that educates participants at all levels, and implements planning that includes frequent drills so that emergency procedures are practiced and understood, and to ensure that all participants, including nurses, share the same vision and goals. If the planning, education, and training of these individuals are cohesive, this will promote the effective management of disasters at all levels. Specifically, clear communication and flexible instructions/guidelines are required in order that nurses and other individuals involved are aware of their role and their importance in disaster responses. Without such training and appropriate education, the current levels of self-confidence and self-efficacy among nursing staff will not improve and may ultimately

have a negative impact on their response to disasters, and on the success of the way in which they are handled.

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Appendices

Appendix 1: Methodological Details of Included Studies

S/No	Author (Year)	Title	Setting and country context	Aim of the research	Research design and data collection method	Sample type and size	Key finding and implication for disaster nursing	Conclusion
1	VanDevanter et al (2017)	Challenges and resources for nurses participating in a hurricane sandy hospital evacuation	New York University Langone Medical Center, USA	To explore nurses' perspectives of challenges and resources that they need to carrying out their responsibilities, and the implications for nursing education and disaster preparedness	Mixed methods involving qualitative interviewers and online survey	Nurses; interview with n = 20, survey with n = 1668	The study indicated limited literature on disaster nursing preparedness. It reported that nurses play critical roles and trained nurses are more confident in responding to disasters	Disaster preparedness education in schools of nursing and practice settings should include more hands-on disaster preparation exercises, more "low-tech" options to address power loss, and specific policies on nurses' disaster roles
2	Baack and Alfred (2013)	Nurses' preparedness and perceived competence In managing disasters	2 major hospitals and 2 small rural hospitals, Panhandle, North and Central Texas, USA	A descriptive analysis of rural nurses' perceived readiness to manage disaster situations	Quantitative study involving the administration of the 58-item Disaster Readiness Questionnaire	620 nurses	Nurses are not confident in their abilities to respond to major disaster events. The nurses who were confident were more likely to have had actual prior experience in disasters or shelters. Self-regulation of behaviour (motivation) was a significant predictor of perceived nurse competence to manage disasters. Healthcare climate (job satisfaction) was not a determinant of disaster	Administrators must support and encourage disaster preparedness education of nurses to promote hospital readiness to provide community care delivery in the event of a disaster situation

								preparedness
3	Worall (2012)	Are emergency care staff prepared for disaster	2 nurse led minor injury units (MIUs) in Wilshire, UK	To establish whether an assessment tool based on the ePIQ can be adapted to support emergency preparedness training for healthcare staff in the UK	Pilot quantitative study involving the administration of the Emergency Preparedness Information Questionnaire (EPIQ)	41 nurses	The study reported that the principle of EPIQ is sound but should be adapted for different disaster situations and needs of individual nurses	That findings will inform the development of emergency preparedness training for MIU nurses locally and will prompt nurses in a range of clinical settings to review their perception of, and familiarity with, emergency preparedness
4	Seroney (2014)	The role of a nurse in disaster management at Kapsabet District Hospital: A global health concern	District hospital, Nandi, Kenya	To investigate the role of nurses in disaster management at Kapsabet District Hospital	Cross-sectional survey involving the distribution of structured questionnaires	35 nurses	KDH management needs focus its attention on disaster management and training of nurses. Majority of the nurses at the hospital are not prepared for emergency response. Effective training programme is missing and ongoing training platform needs to be established.	An evaluation of nursing training institutions programs on disaster management and preparedness is needed. There is a need for the establishment of Disaster management committee that will ensure that the hospital is adequately prepared for disasters. Nurses should be part of disaster management plan of the hospital and the disaster plan should be regularly updated. Nurses ought to have ongoing training on disaster management and the disaster drills need to be done regularly. Nursing Council of Kenya should ensure that all nursing training institutions and hospitals emphasize disaster

								nursing and preparedness in their programs.
5	Basnet et al (2016)	Disaster nursing knowledge in earthquake response and relief among nepalese nurses working in Government and non-government sector	14 public and private hospitals in Nepal	To describe and compare the level of knowledge in an earthquake disaster among Nepalese nurses working in government and non-government hospitals	A descriptive comparative study involving the use of self-reported questionnaire	300 registered nurses	Nurses' knowledge on earthquake disasters was at a moderate level. nurses working in government hospitals had higher knowledge scores than those working in non-government hospitals	A disaster nursing training course should be provided for nurses particularly in non-governmental hospitals who had never received disaster training to improve their knowledge in order to respond to future disasters
6	Hargreaves and Golding (2017)	Humanitarian nursing with Médecins Sans Frontières: The dream job	Médecins Sans Frontières, UK	To explore the motivation for, and experience of, humanitarian nursing	Qualitative study involving the recording of oral histories	7 nurses	The histories of these nurses locate their extraordinary experiences within their life and identity as nurses. Once on a mission, their narrative captures the contrast between the ordinary and the extraordinary; familiar routine experiences side by side with mortal danger. Returning to normal life required resilience and a reappraisal of their life story in order to locate their experiences, finding meaning and peace in their post-mission world.	At a time of debate and challenge regarding the role and identity of nursing within society, this research records and analyses the oral histories of nurses working with Médecins Sans Frontières at this time
7	Witt and Gebbie (2016)	Tailoring curricula to fit health professionals needs in a disaster: A Proposal for Brazilian nurses	Brazil	This paper presents a proposal to be applied in nursing curricula in Brazil, based on the National Curriculum Guidelines and the recommendations for integrating skills and competencies into	Comparison of competencies sets was conducted to indicate the specific competencies to be included as essential for Brazilian nurses.	-	Inclusion of disaster nursing in the curriculum is more than identifying an interested faculty member who will give a lecture or two whenever it can be squeezed into the available time. It requires the thoughtful consideration by faculty of the desired level of demonstrable skill, and the decision about the	Organisational and academic challenged – need for more considered undergraduate training and education for disaster nursing

				undergraduate curricula proposed by the World Health Organisation.			amount of time to be devoted to acquisition of those skills.	
8	Hammad et al (2010)	Emergency nurses and disaster response: an exploration of South Australian emergency nurses' knowledge and perceptions of their roles in disaster response	8 Hopsitals in Adelaide, Australia	Aimed at enhancing the current body of knowledge regarding emergency nurses and disaster response. Explores South Australian (SA) emergency nurses' knowledge and preparedness for disaster response in the acute setting	Mixed method, administration of self-reported questionnaire	588nurses	South Australian emergency nurses are not adequately prepared for disaster response. Highlights the importance of future research regarding disaster education and training.	It is time the Australian government gave more commitment to the preparedness of frontline health care professionals. Minimum standards for disaster preparedness of Australian hospitals need to be determined
9	Loke and Fung (2014)	Nurses' competencies in disaster nursing: implications for curriculum development and public health	Selected hospitals in Hong Kong	To explore Hong Kong nurses" perceptions of competencies required for disaster nursing.	Focus group interviews and written inquiry	15 nurses	The most mentioned required competencies were related to disaster response; with the ethical and legal competencies for disaster nursing were mostly neglected by nurses in Hong Kong. With the complexity nature of disasters, special competencies are required if nurses are to deal with adverse happenings in their serving community.	Nurses' perceived disaster nursing competencies reported by nurses were grossly inadequate, demonstrating the needs to develop a comprehensive curriculum for public health
10	Ahayalimudin et al (2012)	Disaster management: a study on knowledge, attitude and practice of emergency nurse	Emergency Departments and Health clinics in Selangor,	To determine knowledge, attitude and practice of emergency nurse and	Cross-sectional study involving the administration of a research questionnaire	468 nurses	Adequacy of knowledge and practice, and portraying positive attitude is driven by being involved in disaster response and attending disaster-	Paramount for health administrators to conduct disaster-related education/training for front-liners such as emergency

		and community health nurse	Malaysia	community health nurse towards disaster management			related education	and community health nurses to improve their knowledge and practice towards disaster management
11	Usher et al (2015)	Cross-sectional survey/ questionnaire of the disaster preparedness of nurses across the Asia–pacific region	Selected hospitals across Bangladesh, Bhutan, Cambodia, China, Laos, Nepal, and the Solomon Islands	To assess Asia–Pacific nurses' perceptions about their level of disaster knowledge, skills, and preparedness	A cross-sectional survey	757 nurses	Low-to moderate levels of disaster knowledge, skills and preparedness, wherein important gaps were identified. Majority of the variance in disaster preparedness scores was located at the level of the individual respondent not linked to countries or institutions. Multilevel random effects modelling identified disaster experience and education as significant factors of positive perceptions of disaster knowledge, skills, and management. The first step toward disaster preparedness is to ensure frontline health workers are able to respond effectively to disaster events	The outcomes of this study have important policy and education implications. It is important that disaster preparedness is included in all preregistration nursing education in the future. It is imperative that policies are developed to ensure that this occurs. Potentially useful survey tool for disaster nurse preparedness evaluation
12	Yan et al (2015)	Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education	38 Hospitals in 13 provinces across China	This study explored the skills, knowledge and attitudes required by registered nurses from across China who worked in the aftermath of three large earthquakes to try to determine future disaster nursing education requirements.	A descriptive study using a questionnaire survey that collected quantitative and qualitative data	139 registered nurses	No respondent had ever received disaster nursing training prior to engagement at the earthquake disaster sites. All believed that there were important gaps in their knowledge and skills, and supported disaster nursing courses in the future	China urgently needs to develop disaster nursing courses, with the support of nurse leaders, educationalists and government, to implement training using an all hazards approach in accordance with international best practice and trainees' background clinical experience and knowledge

13	Ranse et al (2010)	Black Saturday and the Victorian Bushfires of February 2009: A descriptive survey of nurses who assisted in the pre-hospital setting	Australia	To describe the clinical background, disaster training and education, and roles nurses undertook when participating in a health response to events such as bushfires	A retrospective descriptive postal survey design	53 nurses	Participants had more experience in the medical and surgical environment in comparison to other areas of nursing. Most participants had pre-hospital clinical experience in bushfires response. This research has highlighted that whilst nurses trained for scenarios such as airport disasters, in practice, these very rarely occur. Instead, nurses were more likely to participate in an emergency relating to bushfires	There is a need to explore the various roles undertaken by nurses during response to health care emergencies, particularly exploring the value of nurses undertaking administrative roles. This study presents a greater level of nurse preparedness (in specific bushfire context – limited) based on: real-time experience, simulated/ mock disaster training, disaster education.
14	Mitchell et al (2012)	Are emergency care nurses prepared for chemical, biological, radiological, nuclear or explosive incidents?	Emergency Departments, Northern Ireland	To identify areas where nurses require training in order to improve preparedness for a CBRNe incident	Descriptive analysis was used for the quantitative data along with content analysis for the qualitative Questions	50 nurses	Six key areas were identified for training; waste management (including clinical waste, contaminated clothing, contaminated water and the management of the contaminated deceased), Triage, Chain of command, PODs, awareness of the range of Personal Protective Equipment and its appropriate use and the decontamination of people and equipment	There is a need for a standardised 'blueprint' of role-specific competency criteria for a CBRNe incident for all emergency healthcare staff. The assessment tool used in this study can help to assess levels of preparedness amongst nursing staff and, if adapted accordingly, help gauge preparedness of other key healthcare professionals
15	Diab and Mabrouk (2015)	The effect of guidance booklet on knowledge and attitudes of nurses regarding disaster	University Hospital, in Menoufia Governorate, Egypt	To evaluate the effect of the guidance booklet on knowledge and attitude about disaster preparedness among	A quasi experimental research design with pre-test post-test time series and follow up	280 nurses	Guidance booklet was successful in achieving significant improvement in nurses' knowledge regarding disaster preparedness which was reflected in improvement and changing	Continued nursing education should be open to all hospital staff according to their needs to increase their awareness about

		preparedness at hospitals		nurses.	assessment. Used interview questionnaire and attitude scale		their attitude towards disaster	disaster preparedness.
16	McMullan et al (2016)	Preparing to respond: Irish nurses' perceptions of preparedness for an influenza pandemic	Acute General Hospitals, Dublin, Ireland	The aim of this research was to garner opinion on: the concerns of nurses in respect of the key issues that they may face in the event of an influenza pandemic	Cross sectional study involving structured, self-administered questionnaire	127 nurses	This study provides a brief insight into these fears and concerns. It also provides insight into nurses' erception of preparedness.	By considering the points raised by those in the front line of health care provision, emergency managers shall be better placed to manage these fears, improve the working environment for these staff and provide a more effective level of care to the community.
17	Whetzel et al (2013)	Emergency nurse perceptions of individual and facility emergency preparedness	New Jersey ENA Emergency Care Conference, USA	To assess nurses' perception of their role in a disaster and their perceived susceptibility to a disaster. In addition, basic knowledge and role preparation was reviewed	Descriptive survey using survey methodology - 56-question survey, including 16 demographic Questions	177 nurses	The results reflect that many emergency nurses have not taken basic actions to prepare themselves for a disaster, either personally or professionally highlights the importance of disaster education geared to the needs of the emergency nurse.	As emergency nurses, we likely will be at the forefront of a disaster. We need to model good emergency preparedness, not only in our professional lives but in our personal lives as well. We encourage everyone to prepare a personal emergency preparedness plan and stock supplies to care for yourself and your family.
18	Adlong and Dietsch (2015)	Nursing and climate change: an emerging connection	Australia	A paper to assist nurses to recognise the health consequences of climate change	qualitative	Unclear	There are calls for nurses to take a role in relation to climate change. On current trajectories, climate change is likely to have major impacts on health through	This paper has demonstrated that climate change is already and will become an increasing major health issue that nurses need

							more extreme weather events, increased transmission of disease, destruction of infrastructure, food and water shortages and other effects.	Development of policies to limit climate change and its public health impacts may depend, in part, on the advocacy of nurses who must be prepared to meet the challenged to consider.
19	Pesiridis et al (2015)	Development, implementation and evaluation of a disaster training programme for nurses	2 tertiary public hospitals in Athens and Thessaloniki metropolitan areas in Greece	The purpose of the study was the development, implementation and evaluation of an educational programme for nurses regarding the provision of health care during disasters	A randomized controlled trial using Switching Replications design for the evaluation of a programme	207 nurses	The intervention improved nurses' knowledge and self-confidence levels while no significant changes were detected in behavioural intentions. A significant increase in the mean knowledge score was observed in both groups	The training programme was feasible and effective in improving nurses' knowledge concerning disaster response
20	Husna et al (2011)	Do knowledge and clinical experience have specific roles in perceived clinical skills for tsunami care among nurses in Banda Aceh, Indonesia?	Provincial hospital in Banda Aceh, Indonesia	The study aimed at describing the level of perceived clinical skills for tsunami care among nurses, examining the relationship between knowledge, clinical experience and perceived clinical skills for tsunami care among nurses in Banda Aceh, Indonesia. P	Descriptive correlational study involving administration of questionnaires	78 nurses	The nurses' perceived clinical skills in triage, acute respiratory care, spiritual care, mental health care, wound care, patient referral, and psychosocial care for tsunami care were at a moderate level. Nurses' perceived clinical skills for tsunami care had statistically significant low positive correlations with knowledge and clinical experience. Demographic data might have contributed to nurses' perceived clinical skills for tsunami care including educational evel, age, and clinical experience of nurses to emergency and disaster response.	This study is recommended that clinical practitioners should encourage nurses to increase their knowledge and skills in caring for tsunami patients in acute response phase. The findings of this study could serve as evidence for stakeholders in the hospital to prepare nursing staff about nurses' knowledge and skills for tsunami care by providing disaster and emergency trainings regularly to response to disaster in the future. Further study is needed to develop practical guidelines of clinical skills of nurses for tsunami care in acute

								response phase in the hospital setting.
21	Pourvakhshoori et al (2017)	Nurses in limbo: A qualitative study of nursing in disasters in Iranian context	Iran	To explore the experiences and perceptions of disaster nurses regarding their provision of disaster health care services	Qualitative study. Inductive qualitative content analysis	15 nurses	Nurses who feel better prepared, and had some understanding of moral implications of working under different standards of care, may be better suited for health care delivery in disasters. Those who had no choice about going to the disaster area or had less choice are more likely to have feelings such as lack of usefulness. In addition, the nurses' training and preparation for disasters is essential to optimize the safe functioning and minimize the emotional and psychological trauma.	To explore the process of nursing preparedness further qualitative research, using a grounded theory, is recommended
22	Hammad et al (2017)	Moments of disaster response in the Emergency Department (ED)	Australia, Indonesia, Israel, Japan, Kenya, Palestine, Saudi Arabia and the United States of America	Description of five distinct moments of nursing in the emergency department (ED) during a disaster response	A Hermeneutic Phenomenological approach -underpinned by Max van Manen's method	13 nurses	5 themes emerged: - Notification (as a nurse finds out that the ED will be receiving casualties), - Waiting (waiting for the patients to arrive to the ED), - Patient Arrival (the arrival of the first patients to the ED), - Caring for patients (caring for people affected by the disaster) - Reflection (the moment the disaster response comes to an end).	This paper provides an in-depth insight into the experience of nursing in the ED during a disaster response, which can help generate awareness and inform future disaster preparedness of emergency nurses.
23	Li et al (2015)	A grounded theory study of 'turning into a strong nurse':	Hospitals in Jiangxi Province,	To explore the earthquake disaster experiences of Chinese nurses and	Qualitative data collected in 2012–2013 in digitally-recorded, semi-	15 registered nurses	Participants were unprepared educationally and psychologically for their disaster work. Supporting the emergent	Attention must be paid to disaster education and training for nurses, as well as the mental health of

| | | earthquake

experiences and perspectives on disaster nursing education | China | develop a substantive theory of earthquake disaster nursing that will help inform future development of disaster nursing education | structured, in-depth interviews and reflective field notes, and analyzed using Glaser's grounded theory method. | | theory of "working in that terrible environment", was the core category of "turning into a strong nurse", a process of three stages: "going to the disaster"; "immersing in the disaster"; and "trying to let disaster experiences fade away".

The participants found themselves thrust in "terrible" scenes of destruction, experienced personal dangers and ethical dilemmas, and tried the best they could to help survivors, communities and themselves, with limited resources and confronting professional work | nurses who work in disaster areas.

Emergent theory helps to inform nurse educators, researchers, leaders and policymakers in China, and elsewhere in developing strategies to better prepare nurses for future disasters, and assist communities to prepare for and recover after earthquake disasters.

Limitation – study expresses reflective views of a small number of nurses attending an earthquake zone in one province of China |
|---|---|---|---|---|---|---|---|
| 24 | Tzeng et al (2016) | Readiness of hospital nurses for disaster responses in Taiwan | Taiwan | This paper analyses the perceived readiness of hospital nurses for a disaster response and the factors

influencing their report for work outside the hospital environment | Cross-sectional study | 311 nurses | The majority of hospital nurses demonstrated poor readiness for disaster responses. Scores on the four domains were most associated with nurses' disaster-related training, experience in disaster response and emergency/intensive care experience. | Disaster-related training should be included in undergraduate

programmes and continuing education courses to help hospital nurses recognise and improve their own readiness for disaster responses outside the hospital environment. Future research is needed to improve hospital nurses' disaster-response readiness in Taiwan and other |

							countries
25	Park and Kim (2017)	Factors influencing disaster nursing core competencies of emergency nurses	12 hospitals in South Korea	To identify factors influencing the disaster nursing core competencies of emergency nurses.	Survey data were collected on disaster-related experience, attitude, knowledge, and disaster nursing core competencies by means of a questionnaire	231 nurses	In multiple regression analysis, disaster-related experience exerted the strongest influence on disaster nursing core competencies, followed by disaster-related knowledge. The explanatory power of these factors was 25.6%, which was statistically significant (F= 12.189, p b 0.001).	Disaster nursing core competencies of emergency nurses could be improved through education and training programs that enhance their disaster preparedness. The nursing profession needs to participate actively in the development of disaster nursing education and training programs
26	Wenji et al (2015)	Chinese nurses' relief experiences following two earthquakes: implications for disaster education and policy development	Hubei Province, China	Describe the experiences of Chinese nurses who worked in disaster relief after the Wenchuan and Yushu earthquakes, and their views about future disaster nursing education/training programs.	Qualitative study involving in-depth interviews. Riessman's narrative inquiry method was used to develop individual stories and themes, and socio-cultural theories.	12 nurses	Highlights the urgent need for disaster nursing education and training across the country. a lack of cultural competence. lack of knowledge and skills in mental health care. little attention has been paid to the ethical preparedness of those on the frontline of public health emergencies and disasters	It is critical that Chinese authorities reflect on the skills explicated above to develop and fund more effective plans, policies, research and education about disaster responses for nurses across the country. Nurses need to be intimately involved in this process, including military nurses who have the requisite disaster knowledge and skills. This will empower nurses to feel more confident and competent to plan for, be involved in and evaluate their work in future disaster responses. Acknowledgment

								Appreciation
27	Thobaity et al (2016)	A new scale for disaster nursing core competencies: development and psychometric testing	Emergency depts. In two hospitals in Kingdom of Saudi Arabia	To develop a valid, reliable scale that identifies and explores core competencies of disaster nursing, nurses' roles in disaster management and barriers to developing disaster nursing in the KSA.	This study developed a new scale testing its validity and reliability. A principal component analysis (PCA) was used to develop and test psychometric properties of the new scale	132 emergency nurses	Provides a validated, reliable scale for exploring nurses' core competencies, nurses' roles and barriers to developing disaster nursing in the KSA. The new scale has various implications, such as for improving education, planning and curricula	It is hoped that this instrument can support disaster-nursing education in the KSA and can help evaluate nurses in terms of their preparedness for and competencies regarding disasters. Furthermore, the scale can serve as the basis for a curriculum designed for nursing schools in the KSA. It establishes 3 core constructs of disaster nursing: core, competencies, barriers and roles various barriers outlined
28	Abdelghany (2014)	Nurses knowledge attitudes, practices and familiarity regarding disaster and emergency preparedness – Saudi Arabia	Saudi Arabia	To examine nurses' knowledge, attitudes, practices and familiarity regarding disaster and emergency preparedness-Saudi Arabia.	Cross-sectional descriptive study conducted using five tools to obtain data	252 nurses	The lack of knowledge and practices with acceptable level of attitude regarding disaster preparedness and neutral familiarity with emergency preparedness were concluded. An integration of clearly titled theory and practice teaching courses about disaster and emergency preparedness into nursing curricula are crucial needed and provided in respect to their learning/training preferences.	Follow up research necessary for maximizing nursing education and nursing quality in these critical areas applied to healthcare and community setting
29	Kanbara et al (2017)	Information and response shortfall in shelters after the	Japan	This paper addresses and illustrates shortfalls in information sharing	Article drawn from situation reports published by the Japanese	Unclear	When providing care to a community, many nurses provide not only direct care, but	Health response management tended to overlook the problems that existed outside of shelters.

		earthquake in Kumamoto: The nursing perspective		and responses for public health issues in shelters and the affected areas after the Kumamoto Earthquake of April 16, 2016	Cabinet Office and major newspaper companies		they also coordinate volunteer care. What is in urgent need is an inclusive, analytical, and rapid system that is practical for timely and efficient response.	What is needed is more efficient information-sharing methods and a system that enables reasonably rapid responses to health problems and population care during the acute phase and issues requiring long-term care
30	Putra et al (2014)	Perceived ability to practice in disaster management among public health nurses in Aceh, Indonesia	27 public health centres in Aceh, Indonesia	To examine the level of perceived ability to practice of nurses in Aceh to deal with disaster-related nursing situations.	Mixed-method study	252 nurses	The result of this study found that PHNs' perceived ability to practice regarding disaster management was at a moderate level. The highest PHNs' perceived ability to practice was in the recovery phase, followed by response phase, and preparedness phase. Some factors from PHNs might contribute to the finding in this study, included subjects' working area, working experience, experience in assisting disaster victim, nursing education, and attending to training and education that related to disaster	To improve the knowledge and skills regarding disaster management by actively reading book, searching on the Internet, and attending seminars and conferences related to disaster. While, the public health centres and health policymakers are responsible to develop appropriate disaster training and education for PHNs and other health care providers in the PHC as the primary responders for disaster event. This study would also be valuable to evaluate the disaster preparedness plan, adequate personnel, and appropriate disaster training and education for disaster response in the community setting.
31	Al Khalaileh et al (2012)	Jordanian nurses' perceptions of their preparedness for disaster	Three randomly selected Ministry of Health	To assess Jordanian RNs' perceptions regarding their knowledge, skills,	Cross-sectional survey	474 nurses	- Gaps in nursing education in disaster preparedness, disaster plans,	- Knowledge, skills, and disaster preparedness need continual reinforcement to Improve self-efficacy for disaster management.

		MANAGEMENT	hospitals and two university hospitals, Jordan	and preparedness for disaster management			disaster training, and education. - Uniform integration of disaster management courses into undergraduate nursing curricula is recommended to prepare the next generation of RNs. - Development of graduate disaster management courses and programs will help in preparing RNs - 65% of RNs described current disaster preparedness as 'weak' - 430 RNs wanted to learn more about RNs role in disaster, including knowledge and skills	Further research is needed to better understand the barriers faced by RNs in preparing for potential disasters. - Issues with higher HC structural level implementation of role clarity, knowledge and skills training - Issues with disaster nursing education re knowledge and skills
32	Alzahrani and Kyratsis (2016)	Emergency nurse disaster preparedness during mass gatherings: A cross-sectional survey of emergency nurses' perceptions in hospitals in Mecca, Saudi Arabia	4 Public Hopsitals in Mecca, KSA	To assess hospital emergency nurses' self-reported knowledge, role awareness and skills in disaster response with respect to the Hajj mass gathering in Mecca	Cross-sectional online survey primary data collection and non-probabilistic purposive sample conducted in late 2014	106 nurses	Nurses reported limited knowledge and awareness of the wider emergency and disaster preparedness plans, Respondents identified 3 key training initiatives as opportunities to further develop their professional skills in this area: (1) hospital education sessions, (2) the Emergency Management Saudi Course, (3) bespoke short courses in disaster Management.	Recommendations are suggested to help enhance clinical and educational efforts in disaster Preparedness.
33	Alshehri (2016)	Emergency nurses' preparedness for	Two government hospitals in	The aim of the study was attempts to determine the disaster	Qualitative study	72 nurses	The study revealed that most nurses understood their roles after reading the disaster plan.	Response rate was 31.7%. The study found that

		disaster in the Kingdom of Saudi Arabia	Riyadh	preparedness of emergency nurses in Saudi Arabia.			And no significant difference was found between the confidence of those who had attended a real disaster or mass casualties event and that of those who had not	respondents had minimal and limited disaster experience, as reflected in their low levels of confidence after being involved in real disaster events. This highlights the need for continued efforts to expand disaster training and ensure that nurses are appropriately prepared
35	Öztekin et al (2016)	Japanese nurses' perception of their preparedness for disasters: Quantitative survey research on one prefecture in Japan	3 prefectural hospitals and 3 private hospitals in Japan	To explore nurses' perceptions regarding their knowledge, skills, and preparedness for disasters and how they acquired their knowledge about disaster preparation using a quantitative approach	A descriptive cross-sectional survey using the Disaster Preparedness Evaluation Tool was distributed to nurses	902 nurses	Nurses felt they were not able to respond in a variety of disaster situations, were aware of their workplace emergency disaster plan, but did not think they could execute them, and were not aware of the level of preparedness of the healthcare systems in their communities.	The amount of information nurses need to know on the knowledge, skills, and preparation of disasters are in great need. Such skills are understood but lacking for various reasons. In-house programs for nurses to learn more about disaster nursing are needed. Furthermore, a curriculum for disaster preparedness for undergraduate and graduate nursing programs would also help these future nurses gain more information earlier on to better prepare them for possible disaster situations in their future careers
36	Geum (2017)	Perception and core competencies of disaster nursing in South Korea	Tertiary hospitals in Seoul, Korea	To investigate the disaster-related experience, perception, and core competency of nurses in South Korea.	Self-administered questionnaire	163 nurses	Level of disaster awareness was high for the group with higher total work experience, and the level of core competencies on disaster nursing remained in the average range. In the case of the perceived awareness of disasters	The results support that the level of awareness of a disaster is a factor affecting the importance of education in disaster nursing. Thus, educational programs focusing on practical topics

						and the perceived importance of education on disaster nursing, the more serious feeling towards disaster, there was higher level of need for disaster nursing education	in disaster nursing should be developed for continuous training to increase the core competency and the understanding of disaster
37	Labrague and McEnroe-Petitte (2015)	Disaster preparedness in Philippine nurses	Central Philippines	This study examined the perceived level of disaster preparedness in Philippine nurses	A descriptive, cross-sectional research design/ interviews using a standardized instrument, the Disaster Preparedness Questionnaire	170 nurses	Three fourths of the respondents (n = 136, 80%) indicated that they were not fully prepared to respond to disasters, while only 20% (n = 34) acknowledged that they felt they were adequately prepared. Respondents believed that they could function in the primary roles of educator (n = 107, 62.94%), caregiver (n = 104, 61.17%), and counselor (n = 82, 48.24%). More than half of the respondents (n = 98, 57.7%) were not aware of existing protocols of disaster management in the workplace. Courses taken in such areas as first aid (n = 79, 46.4%), field triage (n = 43, 25.29%), and basic cardiac life support (n = 57, 33.53%) were cited as important in preparing for disasters	Nurses in the study revealed that they were not sufficiently prepared for disasters nor were they aware of disaster management protocols in the workplace.
38	Veenema et al (2016)	Nurses as leaders in disaster preparedness and response – A call to action	USA	To develop a vision for the future of disaster nursing, identify barriers and facilitators to achieving the vision, and develop recommendations for nursing practice, education, policy,	Semi-structured interview	14 nurses	The group developed a vision for the future of disaster nursing, and identified current barriers and opportunities to advance professional disaster nursing. A broad array of recommendations for nursing practice, education, policy, and research, as well as implementation challenges, are summarized in this article.	This project represents an important step toward enhancing nurses' roles as leaders, educators, responders, policymakers, and researchers in disaster preparedness and response. Nurses and the health and human

								service organisations that employ them are enc expansive national dialogue regarding how to best incorporate the vision and recommendations into their individual lives and the organisations for which, they work.
39	Conlon et al (2011)	Preparing nurses for future disasters——The Sichuan Experience	China	The purpose of this article is to describe a 'train the trainers' Emergency and Disaster Nursing course conducted in Chengdu, Sichuan Province, the People's Republic of China, in June 2008; 6 weeks after the Sichuan earthquake	Pilot test	50 senior nurses	Education to provide the necessary knowledge and skills is a key strategy but effective education relies on planning that ensures relevance of the content, teaching and learning strategies that effectively deliver that content, and evaluation of the participants	The lessons learned from this course will add to the growing literature on the preparation of nurses for emergency or disaster situations which is essential to ensure quality care for future disaster victims -relevance of training -on going training -train-the-trainer model -balance of pre disaster training and post disaster support
40	Achora and Kamanyire (2015)	Preparedness need for inclusion in undergraduate nursing education	Oman	To highlight the current state of nursing education and training in disaster management, both generally and in Oman	Qualitative	-	Many health professionals still lack the necessary knowledge and skills. There is therefore an urgent need to include disaster preparedness content in undergraduate nursing curricula, both globally and within Oman	The WHO and ICN Framework of Disaster Nursing Competencies is recommended for inclusion within nursing education. As part of their CPD process, practicing nurses in Oman should also undergo regular evidence-based simulated training and skill updates

41	Veenema et al (2017)	Call to action: the case for advancing disaster nursing education in the United States	USA	To articulate a compelling mandate for the advancement of disaster nursing education within the United States with clear action steps in order to contribute to the achievement of this vision	A national panel of invited disaster nursing experts was convened through a series of monthly semi-structured conference	14 nurses	National nursing education experts have developed consensus recommendations for the advancement of disaster nursing education in the United States. This article proposes next steps and action items to achieve the desired vision of national nurse readiness	Novel action steps for expanding disaster educational opportunities across the continuum of nursing are proposed in response to the current compelling need to prepare for, respond to, and mitigate the impact of disasters on human health. U.S. educational institutions and health and human service organisations that employ nurses must commit to increasing access to a variety of quality disaster-related educational programs for nurses and nurse leaders
42	Aliakbari et al (2015)	Ethical and legal challenges associated with disaster nursing	Iran	Exploration of Iranian nurses' experience of disaster response and their perception of the competencies required by nurses in such an environment.	Descriptive study conducted in Iran in 2012	35 nurses	5 themes emerged as areas that nurses require competence in to work effectively in the disaster setting. This article focuses on one theme: the ethical and legal issues that arise during disaster response. Within this theme, two sub-themes emerged. (1) Professional ethics explores professional responsibility of nurses as well as sense of ethical obligation. (2) Adherence to law refers to nurses' familiarity with and observation of legal requirements	Emphasize the need for nurses working in the disaster setting to be aware of professional responsibilities and familiar with legal requirements and the challenges related to observing ethical responsibilities. In highlighting these issues, this article may provide a useful starting point for the development of an educational framework for preparing nurses and other health professionals to work in the

| 43 | Xiao et al (2016) | Nurses' knowledge and attitudes regarding potential impacts of climate change on public health in Central China | Hospitals in Central China | To determine the knowledge and attitudes of nurses concerning

climate change and their role in addressing health-related impacts of climate change in

Central China | Cross-sectional study | 330 nurses | Nurses in China need to fully recognize and understand climate change and its related healthcare issues. Education on climate change in the nursing program of colleges or universities in China is still not given enough importance and needs to be emphasized

Results: Majority of nurses (76%) knew about the climate change would affect public health.

But more than half of the nurses did not know their work could also affect the development of climate change; 83e96% of the nurses thought it were necessary and would like to learn the knowledge about climate change. | The adaptive ability of healthcare service to climate change could be improved in the future by integrating knowledge on climate change through the nursing education system, resulting in more knowledgeable nurses on climate change in China. |
| 44 | Alzahrani and Kyratisis (2016) | Investigation the role of emergency nurses and disaster preparedness during mass gathering in Saudi Arabia | All 4 public hospitals in Mecca, KSA | To address the gap in skills the emergency nurses have or required in order to respond effectively to a disaster by conducting an empirical study on emergency nurses' preparedness at the mass-gathering event of Hajj in Mecca in 2014 | Cross sectional study | 106 nurses | Emergency nurses' clinical role awareness in disaster response – reported to be high, however nurses report limited knowledge and awareness of the wider emergency and disaster preparedness plans, incl. key elements of their hospital strategies for managing a mass gathering disaster. 50%+ did not thoroughly read the plan and 1 in 10 unaware of its existence

Emergency nurses' responses to | Lack of awareness in nurse perception of plan existence. Disparity between nurse role understanding and role requirements outlined in hospital emergency response plan. Significant knowledge deficits. Respondents identified 3 key training initiatives as opportunities to further develop their professional skills in this area: (1) |

							topics where there are often misconceptions on appropriate disaster management indicated a significant knowledge deficit ithonly1in3nursesatbestor1in6at worst giving correct answers. Respondents identified 3 key training initiatives as opportunities to further develop their professional skills in this area: (1) hospital education sessions, (2) the Emergency Management Saudi Course, (3) bespoke short courses in disaster management.	hospital education sessions, (2) the Emergency Management Saudi Course, (3) bespoke short courses in disaster management.
45	Yin et al (2011)	Optimal qualifications, staffing and scope of practice for first responder nurses in disaster	China	To explore: the selection criteria for first responder nurses during disaster; scope of practice for disaster relief nurses; appropriate nurse – medical practitioner ratio at the disaster site.	Qualitative and quantitative data were collected via survey using self-developed questionnaires	89 nurses	At the scene of disaster, the preferred first responder nurses were nurses: with emergency rescue training; experienced in the emergency department; with at least three years clinical experience. The scope of practice for first responder nurses needs to be extended. Appropriate nurse – medical practitioner ratios in responding medical teams is dependant on the specific medical requirements of the disaster	The recommendations made by this study provide a guide to ensure that nurses can contribute effectively as essential members of first responder emergency disaster relief teams
46	Usher et al (2014)	Strengthening and preparing: enhancing nursing research for disaster management	Australia	The aims of the course were to: Up-skill nurses from APEDNN member countries at a three- week skills workshop and prepare them to	An evaluative study of a tailored research capacity building course for nurse delegates from the Asia Pacific Emergency and Disaster Nursing	23 nurses	An outcome of the course was the collaborative design of a study now being implemented in a number of countries with the aim of investigating nurses' preparedness for disaster response. Formal mentoring relationships have also been established between more and	Recommendations from this study include funding a mix of face-to-face and distance mentoring and writing for publication workshops to ensure the sustainability of outcomes from a research capacity building course such as the one described.

| | | | | conduct research into emergency and disaster preparedness, response and management; Enhance the

ability of APEDNN members to critique research related to emergencies and disasters and make decisions about its usefulness for inclusion in disaster preparedness, response, management and workforce policy | Network (APEDNN) | | less experienced peers and facilitators to provide support in implementing this collaborative study. Overall, participant delegates rated the planning, implementation and content of the course highly | |
|---|---|---|---|---|---|---|---|---|
| 47 | Rizqillah and Sunaa (2018) | Indonesian emergency nurses' preparedness to respond to disaster | Four hospitals in Central Java, Indonesia | To explore Indonesian nurses' disaster preparedness in order to identify the education and training needs of Indonesian nurses to save lives and reduce potential disabilities in future mass-casualty emergency events | A descriptive survey | 120 nurses | Indonesian emergency nurses have a moderate level of disaster preparedness. Previous disaster experience and disaster training or education was positively associated with disaster preparedness. Additional years' experience nursing was not correlated with disaster preparedness. | The findings can be used as a basis to develop education programmes aimed at improving

preparedness for disaster among Indonesian emergency nurses |
| 48 | Goniewicz et al (2021) | Cohort research analysis of disaster

experience, preparedness, and competencybased

training among | Lublin, Poland | To identify the factors influencing the basic competences

of nurses in disasters | Quantitative research | 468 nurses | It was found that work experience, workplace preparedness, as well as training and experience in disaster response are important predictors

of preparedness | The study revealed gaps and training needs in terms of preparing nurses for disasters. Nurses are among the most important groups of healthcare professionals facing a disaster and should be involved in all phases of |

		nurses						disaster management, such as risk assessment and pre-disaster planning, response during crisis situations and risks' mitigation throughout the reconstruction period.
49	Mao et al (2020)	An illumination of the ICN's core competencies in disaster nursing version 2.0: Advanced nursing response to COVID-19 outbreak in China	Sichuan Provincial People's Hospital	To describe the actions and incident management of the APN of a disaster operation team from a hospital in Sichuan who were deployed in response to the COVID-19 outbreak, and explore how it related to the International Council of Nurses Core Competencies in Disaster Nursing Version 2.0 (ICN CCDN V2.0)	Descriptive study	92 nurses	The response approach of advanced nurses to COVID-19 encompassed six of the eight domains of the competencies outlined in ICN CCDN V2.0, namely on preparation and planning, communication, incident management systems, safety and security, assessment and intervention.	The response teams of advanced practice nurses in this study clearly demonstrated their competencies in disaster rescue, which fulfilled most of the core competencies set forth by the ICN
50	Taskiran and Baykal (2019)	Nurses' disaster preparedness and core competencies in Turkey: a descriptive correlational design	University Hospital, Aegean Region, Turkey	To identify nurses' perceptions of their own disaster preparedness and core competencies	Descriptive correlational study	1236 nurses	Technical Skills' scored highest across the subscales of the scale, and 'Critical Thinking Skills' scored lowest. When the total and subscale scores were compared by age group, professional experience, working position and prior disaster experience, there were statistically significant differences	The Turkish nurses had different levels of disaster core competencies and considered themselves as more competent in some areas of disaster preparedness than in others. There are clearly gaps to be filled in disaster preparedness and core competencies in Turkish nurses.
51	Setyawati,et al	Disaster knowledge, skills, and	2	To identify the	Descriptive correlational	130 nurses	RNs perceived themselves	Periodic disaster drills training, participation in

	(2020)	preparedness among nurses in Bengkulu, Indonesia	governmental hospitals in Bengkulu, Indonesia	factors influencing registered nurses' disaster preparedness in Bengkulu, Indonesia	study		moderately prepared for disaster management. RNs' education level, work experience, and disaster knowledge and skills are identified as significant predictors of disaster preparedness	real disasters and development of a disaster education program for the nursing curriculum are recommended as the most effective methods for successful disaster preparedness and management.
52	Basal and Ahmed (2018)	Perception of Nurses' Regarding Role, Preparedness and Management Skills during Hospital Disasters	Tanta University Emergency Hospital,	To assess the nurses' perception regarding their role, preparedness and management skills during hospital disasters.	Descriptive research design	424 nurses	About two thirds (60.14 %) of nurses had high perception level regarding disaster emergency nursing skills. There was positive correlation between ages, years of experience and nurses' perception regarding their role, preparedness, management and emergency nursing skills during hospital disasters	The study revealed that there was a high level of nurses' perception regarding their role, preparedness, management and emergency nursing skills during disaster situations. Recommendations: This study should be utilised broadly to create awareness to all nurses and nursing educators by enhancing their profession's capability and competency through training and educational program about disaster management
53	Sultan et al (2020)	Nurses' Readiness for Emergencies and Public Health Challenges—The Case of Saudi Arabia	10 Ministry of Health's (MOH) hospitals in the Najran, KSA	To assess the theoretical and practical MID readiness of emergency nurses in the southern KSA,	Quantitative research	200 nurses	The study revealed perceived weaknesses in practical dimensions of emergency management and difficulties in assessing their own efforts. There was a significant correlation between qualification and the dimensions of emergency preparedness, epidemiology and surveillance, isolation and	The study indicates a need for strengthening their practical contribution as well as their theoretical knowledge. Educational initiatives combining theoretical and practical aspects of emergency management may provide an opportunity to examine nurses' knowledge, skills,

								and abilities continuously in an environment with no harm to patients.
54	Mirzaei et al (2019)	The Effect of Disaster Management Training Program on Knowledge, Attitude, and Practice of Hospital Staffs in Natural Disasters	Shahid Rahnemoon Hospital, Yazd, Iran	To investigate the effect of a disaster management training program on the level of knowledge, attitude, and practice of nursing staffs	Pre-test post-test design	40 nurses	This study showed the positive effect of education on knowledge, attitude, and practice of nurses. Changes in knowledge and attitude levels will lead to change in performance	The educational program increased the nurses' preparedness containing their knowledge, attitude, and practice in responding to disasters. Consequently, continuous education courses on crisis and disaster management are necessary. The nurses are also recommended to participate in these courses to increase their readiness.
55	Al Harthi et al (2021)	Improving Disaster Readiness and the Response of Nurses in Saudi Arabia	Saudi Arabia	to explore strategies for improving disaster nursing in Saudi Arabia	A cross-sectional study with a principal component analysis (PCA)	From 800 distributed questionnaires, 569 completed questionnaires were returned, for a response rate of 71%	The findings of the PCA revealed two components that can be extracted from the data. The first is preparedness, which involves 13 items related to the actions that must be taken before a disaster occurs, with a loading range of 0.82 to 0.70. The second factor is the action taken after a disaster occurs, and there are seven items with a loading range of 0.83 to 0.73.	it is essential to develop evaluation tools, create specific nursing legislation for disaster situations, provide personal protective equipment to nurses to minimize the risk of infection, and encourage nurses by appreciating their efforts to minimize their stress level during a disaster. It is also important to make sufficient supplies and equipment available to nurses during a disaster and provide them with psychological support while acknowledging the importance of contact with their families and friends.
56	Younos et al.,	Are nurses ready? Bangladeshi nurses'	Bangladesh	to assess Bangladeshi nurses' preparedness	A mixed-methods	The survey data were	The nurses demonstrated moderate preparedness for	Adequate disaster education, including

	(2021)	perceived preparedness for disasters: A mixed-methods approach		for disasters, as well as examine the factors associated with the nurses' disaster management.	approach	collected from 405 nurses of six hospitals in three disaster-prone districts: Sirajganj, Patuakhali, and Sylhet of Bangladesh. -Qualitative data were collected from 6 focus group discussions and 22 interviews	disasters, but lack of knowledge, skills, and education on disaster management was identified. Nursing academic qualifications, hospitals (public/private), nurses' working areas (cyclone-prone, flood-prone, and earthquake-prone areas) were significant predictors of the nurses' disaster response and recovery preparedness.	training, exercises, and drills, is needed to increase disaster management capacity. The findings of the study would be beneficial for providing the importance of nursing education and policy implications. Future investigations should focus on nurses' disaster preparedness and readiness in actual settings.
57	Chegini et al, (2022)	Disaster preparedness and core competencies among emergency nurses: A cross-sectional study	Iran	to evaluate the levels of disaster core competencies and preparedness of nurses in the emergency department.	A cross-sectional survey	271 nurses in the emergency departments of six hospitals in Qazvin, Iran.	There are still gaps in disaster preparedness and core competencies for emergency nurses that need to be addressed.	Nursing managers must support an improvement in disaster nursing core competencies. This may be done by conducting sessions for routine disaster scenarios and providing formal disaster preparedness training.
58	Azizpour,(2022)	Disaster preparedness knowledge and its relationship with triage decision-making among hospital and	Iran	to determine the level of "disaster preparedness knowledge" and its relationship with "triage	A descriptive cross-sectional study	472 hospital and pre-hospital emergency nurses in Ardabil	Multiple linear regression analysis showed; triage decision-making, age, city of residence, training in disaster preparedness, Working on duty during a disaster, and	It is suggested that the managers of educational and medical centres and professional organisations provide conditions for training and

		prehospital emergency nurses- Ardabil, Iran		decision-making" among hospital and pre-hospital emergency nurses in Ardabil province.		Province in the northwest of Iran,	training organisation variables as predictors of disaster preparedness knowledge in hospital and pre-hospital emergency nurses (p<0.05).	increasing disaster preparedness of Hospital and pre-hospital emergency nurses according to their age and place of residence.
59	Wang et al., (2021)	Disaster Preparedness and Associated Factors Among Emergency Nurses in Guangdong Province, China: A Descriptive Cross-Sectional Study	China	to examine the prevalence of disaster preparedness and to explore associated factors among emergency nurses in Guangdong Province, China.	descriptive, cross-sectional study	633 nurses working in 26 emergency departments,	emergency nurses have a moderate level of disaster preparedness, and disaster management needs to be improved most urgently among the 5 dimensions. Interdisciplinary and multidisciplinary cooperation could effectively improve disaster management ability of emergency nurses. Age, gender, educational level, disaster relief training experience, disaster relief drill experience, and willingness of emergency nurses were found to closely correlate with perceived levels of disaster preparedness in this sample, especially disaster relief training and drill experience. Disaster nursing education, training, and drills could promote emergency nurses' disaster preparedness.	Hospitals and nurse managers should carry out interdisciplinary and multidisciplinary cooperation to improve emergency nurses' disaster preparedness, especially disaster management. Organizing disaster simulation exercises, providing psychological support and safety considerations, and formulating disaster nursing training programs may be beneficial for emergency nurses' disaster preparedness.

Appendix 2: Findings Related to Barriers and Enablers to HCP's (with attention to nurse's) Capacity to Work Appropriately and Effectively when a Disaster Happens

S/No	Author (Year)	Title	Setting and country context	Barriers to HCP disaster risk reduction	Enablers of HCP disaster risk reduction
1	VanDevanter et al (2017)	Challenges and resources for nurses participating in a hurricane sandy hospital evacuation	New York University Langone Medical Center, USA	NA	Nurses with experience and training report feeling more confident in their ability to respond
2	Baack and Alfred (2013)	Nurses' preparedness and perceived competence In managing disasters	2 major hospitals and 2 small rural hospitals, Panhandle, North and Central Texas, USA	Nurses should encourage their facilities to host disaster training, especially mass casualty, mass evacuation, mass immunization, mass triage, and mass fatality training, on a regular basis involving community partners when possible	Actual participation in disaster events may improve nurses' perceived competence in disaster preparedness response
3	Worall (2012)	Are emergency care staff prepared for disaster	2 nurse led minor injury units (MIUs) in Wilshire, UK	EPIC principle is sound but required adaptation to cater for different disaster situations and individual nurse needs	NA
4	Seroney (2014)	The role of a nurse in disaster management at Kapsabet District Hospital: A global health concern	District hospital, Nandi, Kenya	Nurse practices in terms of the frequency of ongoing and the frequency of regularly updating the plans was inadequate Lack of attention from management on disaster management - nurses need ongoing training on disaster management, performance of drills and there is a need for regular updating of the plans	Good knowledge and awareness of disaster and susceptibility forms adequate foundation for practice based learning and training
5	Basnet et al (2016)	Disaster nursing knowledge in earthquake response and relief among nepalese nurses working in Government and non-government sector	14 public and private hospitals in Nepal	Nurses working in non-government hospitals display wider knowledge gaps than those in government hospitals	Nurse training and education replicated on government hospital practice could improve knowledge and preparedness for disaster in non-government hospitals
6	Hargreaves and Golding (2017)	Humanitarian nursing with Médecins Sans Frontières:	Médecins Sans Frontières, UK	NA	Humanitarianism at the heart of nurse identity in sample – in line with willingness to

		The dream job			adequately prepare for given role
7	Witt and Gebbie (2016)	Tailoring curricula to fit health professionals needs in a disaster: A Proposal for Brazilian nurses	Brazil	Lack of considered undergraduate training for disaster nursing	NA
8	Hammad et al (2010)	Emergency nurses and disaster response: an exploration of South Australian emergency nurses' knowledge and perceptions of their roles in disaster response	8 Hopsitals in Adelaide, Australia	Lack of clarity around minimum standards for disaster preparedness of Australian hospitals Significant gaps in research related to disaster nursing and preparedness Evident lack of commitment for Australian government related to preparedness of frontline health care professionals	NA
9	Loke and Fung (2014)	Nurses' competencies in disaster nursing: implications for curriculum development and public health	Selected hospitals in Hong Kong	Gross lack of adequate understanding of perceived disaster nursing competencies as reported by nurses Lack of comprehensive curriculum for public health related to above knowledge gaps	NA
10	Ahayalimudin et al (2012)	Disaster management: a study on knowledge, attitude and practice of emergency nurse and community health nurse	Emergency Departments and Health clinics in Selangor, Malaysia	Lack of knowledge for both emergency and community health nurses related to disaster management Limited practice particularly for community health nurses	Increased opportunity for practice and positive attitude towards disaster management driven by involvement in disaster response and attending disaster education
11	Usher et al (2015)	Cross-sectional survey/ questionnaire of the disaster	Selected hospitals across Bangladesh,	Lack of opportunity for training and development related to disaster preparedness for nurses in	It is important that disaster preparedness is included in all preregistration nursing education useful survey tool for disaster nurse

		preparedness of nurses across the Asia–pacific region	Bhutan, Cambodia, China, Laos, Nepal, and the Solomon Islands	included countries	preparedness evaluation
12	Yan et al (2015)	Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education	38 Hospitals in 13 provinces across China	Lack of disaster nursing courses in China	NA
13	Ranse et al (2010)	Black Saturday and the Victorian Bushfires of February 2009: A descriptive survey of nurses who assisted in the pre-hospital setting	Australia	Need to refine and clarify disaster nursing roles	Nurses having greater experience in the medical and surgical environment may be better equipped for the event of a bushfire emergency

Mock or simulated disaster exercises |
| 14 | Mitchell et al (2012) | Are emergency care nurses prepared for chemical, biological, radiological, nuclear or explosive incidents? | Emergency Departments, Northern Ireland | Lack of clarity of role-specific competency criteria for a CBRNe incident for all emergency healthcare staff | Assessment tools to gauge levels of nurse preparedness |
| 15 | Diab and Mabrouk (2015) | The effect of guidance booklet on knowledge and attitudes of nurses regarding disaster preparedness at Hospitals | University Hospital, in Menoufia Governorate, Egypt | Lack of access to training | Significant statistical improvement in nurses post intervention (application of guidance booklet) |
| 16 | McMullan et al (2016) | Preparing to respond: Irish nurses' perceptions of preparedness for an influenza pandemic | Acute General Hospitals, Dublin, Ireland | Limited provisions made by hospital communications to provide information regarding the resources that will be put in place to support the nurses (and their families) during a pandemic to alleviate concerns regarding pandemic | Majority of nurses received in work training re influenza pandemic

Clear understandings of who to turn to if |

					unaware/unclear on prev. training content
				Increased pressure and work rate increase stress and conflict levels in the work place Paradoxical relationship between personal nurse / nurses' family care and duty of care for patients	
17	Whetzel et al (2013)	Emergency nurse perceptions of individual and facility emergency preparedness	New Jersey ENA Emergency Care Conference, USA	Lack of disaster education geared to the needs of the emergency nurse	Future directions for research in this arena with focus on determining the appropriate content for disaster education for emergency nursing and the most appropriate vehicle for such education
18	Adlong and Dietsch (2015)	Nursing and climate change: an emerging connection	Australia	Lack of developed education and policies for nurses to limit climate change and it's public health impacts	Growing awareness of climate change in public health
19	Pesiridis et al (2015)	Development, implementation and evaluation of a disaster training programme for nurses	2 tertiary public hospitals in Athens and Thessaloniki metropolitan areas in Greece	NA	Training programme produced significant improvement in knowledge related to disaster preparedness
20	Husna et al (2011)	Do knowledge and clinical experience have specific roles in perceived clinical skills for tsunami care among nurses in Banda Aceh, Indonesia?	Provincial hospital in Banda Aceh, Indonesia	Lack of systematic employment of education and training for disaster response in nurses by hospital stakeholders Increased need for nurse awareness for personal pursuit of skills and knowledge in disaster response	NA
21	Pourvakhshoori et al (2017)	Nurses in limbo: A qualitative study of nursing in disasters in Iranian context	Iran	Nurses who feel better prepared, and had some understanding of moral implications of working under different standards of care, may be better suited for health care delivery in disasters	Those who had no choice about going to the disaster area or had less choice are more likely to have feelings such as lack of usefulness
22	Hammad et al	Moments of disaster response in the Emergency Department	Australia, Indonesia, Israel, Japan, Kenya,	Lack of awareness among nurses of the likelihood of a disaster occur- ring and of the realities of	Potential / partial address of trauma may come in the form of exposure of nurses to education

	(2017)	(ED)	Palestine, Saudi Arabia and the United States of America	disaster response No clear guideline to dealing with healthcare staff's trauma as a result of disaster response	that addresses what a disaster may be like and how providing disaster health care may affect nurses and disaster nursing preparedness
23	Li et al (2015)	A grounded theory study of 'turning into a strong nurse': earthquake experiences and perspectives on disaster nursing education	Hospitals in Jiangxi Province, China	No disaster nursing education prior to dispatch Lack of professional psychological support for disaster trauma Lack of mental preparation and choice prior to dispatch to disaster Lack of practical training such as survival skills prior to dispatch and lack of resources Lack of disaster nursing skills and knowledge incorporated into undergraduate education Lack of critical thinking abilities and problem-solving skills incorporation into disaster nursing curricula for real time decision making	Benefits of 'comfort from others' – informal debriefing with co-workers and building strong team bonds Nurses noted potential to better 'work better' by being prepared in advance by 1) acquiring necessary knowledge and skills, 2) undergoing advanced preparation
24	Tzeng et al (2016)	Readiness of hospital nurses for disaster responses in Taiwan	Taiwan	No undergraduate disaster related training present to assist registered nurses in improving and recognising their own readiness for disaster responses outside the hospital setting	Relevant undergraduate training Relevant ongoing training Further research

25	Park and Kim (2017)	Factors influencing disaster nursing core competencies of emergency nurses	12 hospitals in South Korea	Need for developed education and training programs to enhance emergency nurse disaster preparedness and improve core competencies	NA
26	Wenji et al (2015)	Chinese nurses' relief experiences following two earthquakes: implications for disaster education and policy development	Hubei Province, China	Lack of nurse involvement in planning, policy development, research and education about disaster responses for nurses across the country

Limited governmental funding for the effective implementation of above | Military nurses provide requisite disaster knowledge and skills |
| 27 | Thobaity et al (2016) | A new scale for disaster nursing core competencies: development and psychometric testing | Emergency depts. In two hospitals in Kingdom of Saudi Arabia | Restricted roles of nurses and unclear roles in disaster nursing early on

Lack of proper education, training, expertise and research and evaluation tools | Untested in terms of being used to identify specific barriers and develop disaster nursing capabilities |
28	Abdelghany (2014)	Nurses knowledge attitudes, practices and familiarity regarding disaster and emergency preparedness – Saudi Arabia	Saudi Arabia	Integration of clearly titled theory and practice teaching courses about disaster and emergency preparedness into nursing curricula are crucial to addressing present knowledge and practice gaps	NA
29	Kanbara et al (2017)	Information and response shortfall in shelters after the earthquake in Kumamoto: The nursing perspective	Japan	Lack of efficient information-sharing methods and a system that enables reasonably rapid responses to health problems and population care during the acute phase and issues requiring long-term care	NA
30	Putra et al (2014)	Perceived ability to practice in disaster management among public health nurses in Aceh, Indonesia	27 public health centres in Aceh, Indonesia	Lack of facilitation by local government of Aceh province to further prepare PHNs to increase their ability in disaster management	Benefits of independent research for PHNs for maintaining practice and improving clinical skill related to disaster management
31	Al Khalaileh et al (2012)	Jordanian nurses' perceptions of their preparedness for disaster	Three randomly selected Ministry of Health hospitals	Gaps in nursing education in disaster preparedness, disaster plans, disaster training, and education	Primary nurse perception and involvement with disaster nurse preparedness

		MANAGEMENT	and two university hospitals, Jordan	Lack of uniform integration of disaster management courses into undergraduate nursing curricula	
				Lack of graduate disaster management courses and programs	
				Lack of RNs self confidence in current disaster preparedness	
				Lack of higher HC structural organisation and implementation of education where RNs wanted to learn more about RNs role in disaster, including knowledge and skills	
				Unclear disaster nursing roles – higher HC structure	
32	Alzahrani and Kyratsis (2016)	Emergency nurse disaster preparedness during mass gatherings: A cross-sectional survey of emergency nurses' perceptions in hospitals in Mecca, Saudi Arabia	4 Public Hopsitals in Mecca, KSA	Limited knowledge and awareness of the wider emergency and disaster preparedness plans	3 key training initiatives as opportunities to further develop their professional skills in this area: (1) hospital education sessions, (2) the Emergency Management Saudi Course, (3) bespoke short courses in disaster management
33	Alshehri (2016)	Emergency nurses' preparedness for disaster in the Kingdom of Saudi Arabia	Two government hospitals in Riyadh	Lack of adequate disaster training for appropriate nurse preparation and confidence in disaster situations	NA

35	Öztekin et al (2016)	Japanese nurses' perception of their preparedness for disasters: Quantitative survey research on one prefecture in Japan	3 prefectural hospitals and 3 private hospitals in Japan	No national curriculum for schools of nursing with competences for disaster preparedness exists in Japan Socio/economic factors may contribute to personal nurses' capacity for proactive progression and development in this area	An educational curriculum with the major focus of disaster nursing being mandatory in all schools of nursing would assist in nurse preparedness for disaster
36	Geum (2017)	Perception and core competencies of disaster nursing in South Korea	Tertiary hospitals in Seoul, Korea	Training and education deficiencies relating to nurse core competency and the understanding of disaster Education related to disaster preparedness (if present) is not on-going nor systematic presenting gaps in skills and knowledge the needs of which change across time/context	NA
37	Labrague and McEnroe-Petitte (2015)	Disaster preparedness in Philippine nurses	Central Philippines	Nurses perceived that they are not fully prepared for disasters and were not aware of disaster management protocols in the workplace Both the areas of nursing academia and hospital administration play a major role in the above and do not provide the necessary /means by which nurses can acquire necessary skills and knowledge Nursing academia do not provide adequate disaster planning and mock drills in order to enhance nurse competence in disaster situations and be oriented with disaster preparedness This critical deficit is also influenced by lack of incorporation of basic principles of disaster management into nursing courses as a framework for addressing these issues	development and formulation of disaster management protocols and provide appropriate disaster nursing education and training
38	Veenema et al	Nurses as leaders in disaster	USA		The project represents an important step toward

	(2016)	preparedness and response – A call to action			enhancing nurses' roles as leaders, educators, responders, policymakers, and researchers in disaster preparedness and response
39	Conlon et al (2011)	Preparing nurses for future disasters——The Sichuan Experience	China	Lack of on-going education and relevance of training to specific context	Train-the-trainer' model is effective mode of training
40	Achora and Kamanyire (2015)	Preparedness need for inclusion in undergraduate nursing education	Oman	Lack of integrated disaster management courses in nursing curricula offering CPD courses in disaster management which would prepare nurses for emergency situations	NA
41	Veenema et al (2017)	Call to action: the case for advancing disaster nursing education in the United States	USA	US educational institutions and health and human service organisations are lacking in and must commit to increasing access to a variety of quality disaster-related educational programs for nurses and nurse leaders and to enhancing collaboration across schools	Nurse inclusion in recommendations in the advancing disaster preparedness education provides clear and realistic action steps towards achieving desired vision of national nurse readiness
42	Aliakbari et al (2015)	Ethical and legal challenges associated with disaster nursing	Iran	Disaster challenges and legislation not clearly incorporated into nursing education and role/responsibility awareness in this context	NA
43	Xiao et al (2016)	Nurses' knowledge and attitudes regarding potential impacts of climate change on public health in Central China	Hospitals in Central China	The education program about this issue in Chinese colleges or universities is still very weak nursing courses and needs to be emphasized in the future	NA
44	Alzahrani and Kyratisis (2016)	Investigation the role of emergency nurses and disaster preparedness during mass gathering in Saudi Arabia	All 4 public hospitals in Mecca, KSA	Lack of awareness in nurse perception of plan existence Disparity between nurse role understanding and role requirements outlined in hospital emergency response plans Significant knowledge deficits	Respondents identified 3 key training initiatives as opportunities to further develop their professional skills in this area: (1) Hospital education sessions (2) The Emergency Management Saudi Course (3) Bespoke short courses in disaster management

45	Yin et al (2011)	Optimal qualifications, staffing and scope of practice for first responder nurses in disaster	China	Scope of practice of the first responding nurses needs to be extended	
46	Usher et al (2014)	Strengthening and preparing: enhancing nursing research for disaster management	Australia		Sustained capacity building mentoring of participants / nurses yields reports of better preparedness for disaster – as combined in-house and long-distance mentoring Inclusion of front line care givers in research, development and potential policy making re disaster response – improved morale and willingness
47	Rizqillah and Sunaa (2018)	Indonesian emergency nurses' preparedness to respond to disaster	Four hospitals in Central Java, Indonesia	The lack of participation in designing emergency plans for disaster response contributed to low levels of familiarity of local, regional, and national disaster agencies' roles in disaster response. previous disaster response experience as a statistically significant predictor of preparedness among emergency nurses.	the clinical learning process needs to be triggered by an experience Encouraging nurses to participate in planning for emergency and disaster response
48	Goniewicz et al (2021)	Cohort research analysis of disaster experience, preparedness, and competencybased training among nurses	Lublin, Poland	the lack of knowledge in medical preparation, especially in regards to advanced resuscitation activities (ALS, ACLS), as well as the low self-assessment of nurses concerning preparedness for disasters	Disaster response plans should be available before a disaster occurs. Additional resources and training are needed to cope with the challenges posed by disasters. Disaster education and training is one key element. Exercises, as well as training and post-graduate studies focusing on disaster response,
49	Mao et al (2020)	An illumination of the ICN's core competencies in disaster nursing version 2.0: Advanced nursing response to COVID-19 outbreak in China	Sichuan Provincial People's Hospital	Competencies for Disaster Nursing ,communication, incident management systems, safety and security, assessment and intervention,. ontext-specific preparation strategies and the vulnerability of COVID-9 or other types of infectious outbreak should be evaluated	

50	Taskiran and Baykal (2019)	Nurses' disaster preparedness and core competencies in Turkey: a descriptive correlational design	University Hospital, Aegean Region, Turkey	Nurses had a lower awareness of their roles in the predisaster stage, nurses need disaster training to gain basic knowledge, attitudes and skills before and after graduation. did not have sufficient educational opportunities to achieve preparedness.	Nurse managers should advocate for increasing disaster preparedness for all nurses. offering formal training in disaster preparedness. evaluate nurses' disaster core competencies
51	Setyawati,et al (2020)	Disaster knowledge, skills, and preparedness among nurses in Bengkulu, Indonesia	2 governmental hospitals in Bengkulu, Indonesia	Three significant factors associated with disaster preparedness were identified in this study: educational level, disaster knowledge, and disaster skills	Continuing disaster drills training and implementing a formal disaster educational program into nursing curriculum and professional development
52	Basal and Ahmed (2018)	Perception of Nurses' Regarding Role, Preparedness and Management Skills during Hospital Disasters	Tanta University Emergency Hospital,	The transition from the daily activities of nursing practice to a disaster operation. working in an unfamiliar community hospital, and managing the health needs of a large population in a shelter under less than-ideal conditions	include triage, coordination of the first aid response team, and direct hands-on care to victims of the emergency. Systematic procedures are necessarily followed to avoid overlapping of functions and responsibilities.
53	Sultan et al (2020)	Nurses' Readiness for Emergencies and Public Health Challenges—The Case of Saudi Arabia	10 Ministry of Health's (MOH) hospitals in the Najran, KSA	familiarity with their organisation's emergency operations plan Nurses' knowledge of the ethical, legal, cultural, psychological, and safety dimensions of emergency response. lacked adequate knowledge concerning the community quarantine process	Planning to address the needs of special populations is a strategic dimension of emergency response and recovery initiatives. Effective communication during an emergency
54	Mirzaei et al (2019)	The Effect of Disaster Management Training Program on Knowledge, Attitude, and Practice of Hospital Staffs in Natural Disasters	Shahid Rahnemoon Hospital, Yazd, Iran	education structure of hospitals with regard to disaster management is still unclear. Published posters and educational brochures about disasters does not seem to be adequate. There are no guidelines for preparing hospitals during crisis and disasters	educational program increased the nurses' preparedness containing their knowledge, attitude, and practice in responding to disasters. continuous education courses on crisis and disaster management

Appendix 3: Ethics Committee Approval for the Study, University of York

UNIVERSITY of York

DEPARTMENT OF HEALTH SCIENCES

c/o Department of Philosophy
Heslington
York YO10 5DD

Telephone   (01904) 323253
Fax   (01904) 321383
E-mail   smh12@york.ac.uk

Prof. Stephen Holland
Chair, Health Sciences Research
Governance Committee

www.york.ac.uk/healthsciences

17 October 2019

Mufleh Alomrani
Department of Health Sciences
Seebohm Rowntree Building
University of York, YO10 5DD

Dear Mufleh

***HSRGC 2018/306* Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)**

Your study was reviewed at the meeting of the HSRGC on Tuesday 4 December 2018. I wrote to you on 7 December 2018 with the HSRGC's decision, and you responded to the HSRGC feedback in a letter of 19 December 2018. I then wrote again on 21 December 2018 confirming HSRGC approval of your project subject to your submitting study documents, namely, the interview questions and interview schedules, to be considered by Chair's Action.

Thank you for your email of 9 October 2019, including these study documents.

I am writing to approve the study documents by Chair's Action, with the following feedback:

1. I noticed a typo on the Consent Forms under 'I understand my participation in the study is voluntary and that I am free to withdraw from the study': 'At any time/up to 2 number of weeks post-interview'.

2. Also, please could you confirm that Saudi Arabia's National Committee for Medical and Bioethics has approved the study (HSRGC approval is conditional on this in-country approval).

If you have any queries regarding this Chair's Action or make any substantial amendments to the study, please contact me.

Yours sincerely

S. Holland

Stephen Holland
Chair: HSRGC

Cc: *Dr Janaka Jayawickrama; Professor Tracy Lightfoot*

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Appendix 4: Study Approval by the Saudi Cultural Bureau in London

ROYAL EMBASSY OF SAUDI ARABIA

CULTURAL BUREAU

LONDON

سفارة المملكة العربية السعودية
الملحقية الثقافية
لندن

رقم الملف: A1582

إفـــــــادة

تفيد الملحقية الثقافية بسفارة المملكة العربية السعودية لدى المملكة المتحدة بأن المبتعث/
مفلح عبيد حماد العمراني (سجل مدني رقم 1001365673) مبتعث من وزارة الصحة للحصول
على درجة الدكتوراة من جامعة (University of York) وفي مجال (Health Sciences).
بداية البعثة الحالية في 04-10-2017 ونهايتها في 03-10-2020م.

وقد منح هذه الإفادة بناءً على طلبه لتقديمها الى من يهمه الأمر لتسهيل الموافقة على إستضافته
لغرض جمع بيانات بحث رسالة الدكتوراة.

الملحق الثقافي بسفارة
المملكة العربية السعودية لدى المملكة المتحدة

د. عبدالعزيز بن علي المقوشي

2019/02/26 م

الرقم:............... التاريخ:............... الموافق:............... المرفقات:...............

630 Chiswick High Road, London W4 5RY Tel: +44 (0) 20 3249 7000 Fax: +44 (0) 20 3249 7001 E-mail: sacbuk@uksacb.org
www.uksacb.org

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Appendix 5: Study Approval by the Saudi Ministry of Health

وزارة الصحة
Ministry of Health

موافقة على مهمة علمية

سعادة / الملحق الثقافي السعودي – المملكة المتحدة   المحترم

السلام عليكم ورحمة الله وبركاته،،،،،

إشارة إلى موضوع الطالب/ مفلح عييد حماد العمراني، أخصائي أول تمريض والمبتعث من قبل صحة تبوك لدراسة درجة الدكتوراة بكلية العلوم الصحية بجامعة يورك بالمملكة المتحدة، رقم السجل المدني (١٠٠١٣٦٥٦٧٣)، والرقم الأكاديمي (٢٠٢٠٥٦٤٩٨) وعنوان البحث: " الطرق الفعالة لتطوير منهج تمريضي مناسب للإستعداد لمواجهة الكوارث والإستجابة لها في المملكة العربية السعودية ".

نحيط سعادتكم علماً بأن الطالب قد إستوفى كافة المستندات المطلوبة وتمت مراجعتها من قبل اللجان المعنية بالإدارة العامة للبحوث والدراسات واللجنة المركزية لأخلاقيات البحوث بوزارة الصحة، وتمت الموافقة على تسهيل مهمة إجراء هذا البحث وجمع المعلومات والبيانات اللازمة من الإدارة العامة للتمريض والإدارة العامة للطوارئ والكوارث والنقل الإسعافي وبعض مستشفيات وزارة الصحة على أن تبدأ من تاريخ (١ نوفمبر ٢٠١٩م) وحتى تاريخ (٣٠ يناير ٢٠٢٠م) ولمدة ثلاثة شهور.

قد أعطى هذا الخطاب بناءً على طلبه لتقديمه للملحقية الثقافية السعودية في المملكة المتحدة.

وتفضلوا بقبول أطيب التحيات ،،،

مدير عام الإدارة العامة للبحوث والدراسات

د. عذاري بنت فيصل العتيبي

Kingdom of Saudi Arabia
Ministry of Health
General Directorate for Research and Studies
(GDRS)

Approval Letter   _Date: 09/10/2019_

To whom it may concern

University of York
School of health Science
_UK_

Subject: To facilitate the mission of Mr. Mufleh Alomrani
                    Academic No.: 203056498

Dear Sir/Madam,

This is to inform you that, this is an approval letter to **Mr. Mufleh Ohaid Alomrani** who submitted an application to The General Directorate for Researches and Studies, Ministry of Health, Kingdom of Saudi Arabia (**GDRS-MoH**) to collect data for his research project titled "The effective methods for developing a relevant nursing syllabus for disaster preparedness and response in Saudi Arabia " as a part of his Ph.D degree thesis at MOH facilities, KSA to be started from (01/11/2019) till (30/01/2020).

Please note that, his proposal was reviewed and approved scientifically and ethically and he is ready to commence data collection.

Yours Faithfully,,,,,

Director General
General Directorate for Research and Studies

Athari F. Alotaibi

Approval Letter

Date: 08/10/2019
Central IRB log No: 2019-0133M
Category of Approval: Exempt
Affiliation: MOH

Dear Mufleh Alomrani

The Central IRB-MoH pleased to inform you that submission dated 24/02/2019 for the study mentioned below was reviewed and approved.

Protocol Title	The effective methods for developing a relevant nursing syllabus for disaster preparedness and response in Saudi Arabia
Principal Investigator	*Mufleh Alomrani*
Affiliation	MOH-Tabouk
Documents Reviewed	Study proposal, CV, Request for exempt status, PI statement, signed consent form, MOH data base information, signed Data Share Agreement, Questionnaire E, NIH certificate, cultural attache letter, supervisor statement.

Decision:

The Central IRB was approved the protocol according to ICH-GCP. Approval is given for **one year** from the date of this letter.

Approval Conditions:

- Abide by the rules and regulations of the Government of Saudi Arabia, NCBE, Central IRB and the IHC-GCP guidelines.
- To conduct research as per the approved documents.
- Research participant confidentiality should be protected at all times.
- All researchers are required to have current and valid certificate on Protecting Human Research Participants (NIH or NCBE certificate).
- Amendment to the approved documents, the Principal Investigator is required to advise the Central IRB for its approval before implementation.
- You are required to submit a Progress Report every **6 month.**
- If PI is unable to complete your research within the validation period, he will be required an extension letter from the Central IRB one month before the expiry of the approval.

e-mail: GDRS-IRB@moh.gov.sa

Kingdom of Saudi Arabia
Ministry of Health
Central IRB
GDRS

المملكة العربية السعودية
وزارة الصحة
اللجنة المركزية لأخلاقيات البحوث
الإدارة العامة للبحوث والدراسات

- Document Retention: all study documents should be kept by the Principal Investigator for a period of **5 years** from study completion.
- This letter gives you an ethical clearance to implement your study according to the approved documents and you still need to obtain administrative approval from the site/s where the study will be conducted.
- **At the end of the study**, please submit Final Report including the results or copy of the manuscript intended for publication to MOH data base: www.marifah.gov.sa

We thank you for submitting your study for review by the Central IRB-MoH and wish you all the best with this study.

If you have any further questions, feel free to contact me.

Sincerely Yours,

Dr. Hisham M. Aziz - M.D
Consultant
Central IRB-MOH Chairman-KSA
Phone: + 966 11 2125555 Ext. 4337
e-Mail: haziz@moh.gov.sa

Appendix 6: Ethical Approval from Selected Hospitals: Case 1

المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشؤون الصحية
بصحة منطقة مكة المكرمة
إدارة التخطيط والبحوث
رقم : ....
تاريخ ..٢.../.....٨.../......١٤٤٠هـ
مشفوع/.............................

سعادة مدير الشئون الصحية بمحافظة جدة   المحترم
السلام عليكم ورحمة الله وبركاته

إشارة إلى طلب الباحث / مفلح عبيد حماد العمراني، والذي يرغب في القيام بدراسة بحثية لديكم بمستشفيات جدة اقسام الطوارئ.
بعنوان:
(الطرق الفعالة لتطوير منهج تمريضي مناسب للاستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية)

والذي من المتوقع أن يتم تنفيذه خلال عامنا الحالي الى نهاية ١٤٤٠ هـ .

لذا نأمل من سعادتكم تسهيل مهمة الباحث في إجراء الدراسة ، حيث صدر للباحث قرار من اللجنة المحلية لأخلاقيات البحوث بصحة مكة المكرمة رقم : (088-0219-K076-02-H) . على ان يلتزم الباحث باللوائح والانظمة الصادرة من قبل وزارة الصحة ومدينة الملك عبدالعزيز للعلوم والتقنية فيما يخصة .

وتقبلوا فائق تحياتي,,,,

مدير عام الشئون الصحية بمنطقة مكة المكرمة
الدكتور/
وائل بن حمزة مطير

Ministry of Health

Institutional Review Board Opinion Letter

Date of Issue	07-04-2019
Research Title	The effective methods for developing a relevant nursing syllabus for disaster preparedness and response in Saudi Arabia
Primary Investigator	Mufleh Obaid Alomrani
IRB Number:	H-02-K-076-0219-088
Category of Approval	Approved

Dear Ms./ Mufleh Obaid Alomrani

This is to inform you that the above-mentioned proposal has been reviewed and discussed by IRB Committee and was approved according to ICH GCP guidelines. Please note that this letter is from research perspective only. You will still need to get permission from the head of research department in the Directorate of health affairs, Makkah Region to commence data collection and start your project.

We wish you all the best in your project and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown in this letter.

Please be advised that regulations require that you submit a progress report on your research every 6 months. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

As a researcher, you are required to have a valid certification on protecting human research subject.

If you have further questions, feel free to contact me(research-makkah@moh.gov.sa).

DR.Nadir Hamza Motair

Chairman, Institutional Review Board (IRB), Makkah

Case 2

مستشفى الملك فيصل بمكة
KING FAISAL HOSPITAL-MAKKAH

الرقم / بدون   التاريخ / ١٤٤٠/١٠/٢٠ هـ   المشفوعات / بدون

الجنسية	رقم الهوية	الاسم
سعودي	1001365673	مفلح عبيد حماد العمراني

إلى من يهمه الامر

السلام عليكم ورحمة الله وبركاته،،،

نفيدكم أنه لا مانع لدينا من تطبيق دراســة المبتعث المحرر اســمه وبياناته اعلاه لغرض الحصـــول على درجة الدكتوراة والذي حصـل على موافقة لجنة أخلاقيات البحوث بحصـة مكة المكرمة برقم 088-0219-076-K-02-H والذي يرغب في القيام بدراسه بحثية عن (الطرق الفعالة لتطوير منهج تمريضي مناسب للأستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية).

وتقبلوا أطيب تحيـاتـي،،،

مدير إدارة الشؤون الاكاديمية والتدريب

أ/ مرام عبدالله المقاطي

منسق الابحاث بمستشفى الملك فيصل

أ/ رامي سعود المطرفي

إدارة الشؤون الاكاديمية وتدريب ﬁ kfhmsaudi1 ⊙ kfhmsaudi ✉ | 937 ☏ | 2505-2504(0125566411) ☏ | mkh-kfh-training@moh.gov.sa

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وزارة الصحة

المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشؤون الصحية بمنطقة مكة المكرمة
مستشفى الملك عبدالعزيز
إدارة الخدمات التمريضية

المشفوعات:	التاريخ:	الرقم :

مفلح عبيد حماد العمراني   /   سجل مدني   رقم:1001365673

الى من يهمه الامر

السلام عليكم ورحمة الله وبركاته

نفيدكم أنه لامانع لدينا من تطبيق دراسة المبتعث المحرره هويته بعاليه لغرض الحصول على الدكتوراة والذي حصل على موافقة لجنة أخلاقيات البحوث بصحة مكة المكرمة برقم 088-0219-076-K-02-H والذي يرغب الباحث الموضح اسمه اعلاه في القيام بدراسة بحثية عن (الطرق الفعالة لتطوير منهج تمريضي مناسب للأستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية)وذالك بعد أن أستكمل كافة أوراقة الإدارية لدينا.

مع أطيب تحياتي.

مدير ادارة الشنون الأكاديمية والتدريب
أ / نجوى علي حسن الحريصيّ

منسقة الأبحاث بمستشفى الملك عبدالعزيز
أ/مديحه صالح عمر الملايو

Case 3

المملكة العربية السعودية
وزارة الصحة
المديرية العامة للشؤون الصحية بمنطقة عسير

سعادة الملحق الثقافي بسفارة خادم الحرمين بلندن حفظه الله

السلام عليكم ورحمة الله وبركاته...وبعد

بناءً على ما تقدم به الباحث مفلح عبيد العمراني والذي يدرس بجامعة يورك البريطانية ومبتعث من وزارة الصحة رغبته في عمل دراسة عن الاستعدادات لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية والتي سوف تساعده في أتمام رسالة الدكتوراة في موضوع (الطرق الفعالة لتطوير منهج مناسب للاستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية) فأن مستشفى ظهران الجنوب يرحب به للحصول على المعلومات المتوفرة لدينا والتي سوف تثري عملية البحث ودون أدنى مسؤولية على المستشفى ومنسوبيه وذلك لتقديم هذا الخطاب للملحقية الثقافية السعودية ببريطانيا .

وتقبلو أطيب تحياتي وتقديري ،،،

مدير القطاع الصحي
والمشرف على مستشفى ظهران الجنوب

أ / محمد علي آل فـرح

المديرية العامة للشؤون الصحية بمنطقة تبوك

إدارة الطوارئ والكوارث والنقل الاسعافية

إلى الباحث / مفلح عبيد العمراني (جامعة يورك البريطانية)   المحترم

السلام عليكم ورحمة الله وبركاته

إشــــارةً إلـــى خطـــابكم والمفيــد بــانكم مـــن مـــوظفي وزارة الصـــحة والعـــاملين بـــإدارة الطـــوارئ والكـــوارث بصـــحة تبـــوك و حاليـــا مبتعثـــين لدرجـــة الـــدكتوراه فـــي العلـــوم الصـــحية فـــي جامعـــة يـــورك البريطانيـــة وأعمـــل علـــى دراســة بعنـــوان (الطـــرق الفعالـــة لتطـــوير مـــنهج مناســب للاســتعداد لمواجهـــة الكـــوارث و الاســـتجابة لهـــا فـــي المملكـــة العربيـــة الســـعودية) ولغـــرض مـــن هـــذه الدراســة هـــو البحـــث عـــن طـــرق لتطـــوير برنـــامج تعليمـــي فعـــال وملائــــم لتــــدريب المماســـين الصـــحيين علـــى الاســـتعداد لمواجهـــة الكـــوارث والاســـتجابة لهـــا فـــي المملكـــة العربيـــة الســـعودية . و طلـــبكم الســماح لكـــم بجمـــع عينـــات الدراســة مـــن العـــاملين بـــالمركز لـــدينا وذلـــك للخبـــرة الكبيـــرة للعـــاملين فـــي هـــذا المجـــال والتخصـــص والتـــي بلـــى شـــك ســوف تثـــري هـــذا الدراسة ومخرجاتها .

عليه... نفيدكم بانه لا مانع لدينا من ذلك .

وتمنى لكم دوام التوفيق والنجاح٠٠٠

مدير
إدارة الطوارئ و الكوارث و النقل الاسعافي بصحة تبوك
زياد فريح آمان

Case 5

H-03-M-084

Institutional Review Board, General Directorate of Health Affairs in Madinah

To *MUFLEH ALOMRANI*

This is to certify that Institutional Review Board (IRB), General Directorate of Health Affairsin Madinahhas reviewed all the submitted updated and amended Documents from the ethical pointview and has approved your study titled: " *EFFECTIVE METHODS FOR DEVELOPING A RELEVANT NURSING SYLLABUS FOR DISASTER PREPAREDNESS AND RESPONSE: THE CASE OF SAUDI ARABIA* "

The committee is fully compliant with the conditions and principles of good clinical practice. The committee is constituted in accordance with the WHO and ICH-GCP guidelines and works according to written Standard operating Procedures.

The IRB recommended granting permission of approval to conduct the project along the following terms:
1. If there are any further amendments, they must be approved prior to implementation unless they are intended to reduce risk.
2. Monitoring: the project may be subject to an audit or any other form of monitoring by the REC.
3. All unanticipated or serious adverse events must be reported to the REC within 5 days or according to the protocol
4. Inform the IRB prior to making prospective changes to the study procedure
5. Upon the study completion, The PI is expected to submit a final report at the end of the study

Please note that this approval is valid for one year commencing from the date of this letter.

Head OF IRB Committee

Dr.AbdulhameedAlsubhi

IRB 310

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378

H-03-M-084

Institutional Review Board, General Directorate of Health Affairs in Madinah

To *MUFLEH ALOMRANI*

This is to certify that Institutional Review Board (IRB), General Directorate of Health Affairsin Madinahhas reviewed all the submitted updated and amended Documents from the ethical pointview and has approved your study titled: " *EFFECTIVE METHODS FOR DEVELOPING A RELEVANT NURSING SYLLABUS FOR DISASTER PREPAREDNESS AND RESPONSE: THE CASE OF SAUDI ARABIA* "

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4. Inform the IRB prior to making prospective changes to the study procedure
5. Upon the study completion, The PI is expected to submit a final report at the end of the study

Please note that this approval is valid for one year commencing from the date of this letter.

Head OF IRB Committee
Dr.AbdulhameedAlsobhi

IRB 310

152. /9/ 10

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السجل المدني	التخصص	الدرجة	جهة الإبتعاث	الاســـــم
1001365673	العلوم الصحية	دكتوراه	وزارة الصحة	مفلح عبيد حماد العمراني

عنوان البحث
الطرق الفعالة لتطوير منهج تمريضي مناسب للاستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية

سعادة / مدير عام مستشفى الملك فهد بالمدينة المنورة   المحترم

السلام عليكم ورحمة الله وبركاته

نحيط سعادتكم علما بأن الموضح هويته بعاليه قد استوفى كافة المستندات المطلوبة لإجراء البحث الخاص به وقد تمت مراجعتها من قبل إدارة البحوث والدراسات ولجنة أخلاقيات البحث العلمي بمنطقة المدينة المنورة برقم (IRB 310 وتاريخ 15-9-1440 هـ) وعلى ذلك تمت الموافقة على تسهيل إجراء البحث في المنشئات الصحية التابعة لمديرية الشئون الصحية بمنطقة المدينة المنورة لذا:

نأمل من سعادتكم بعد الاطلاع التكرم بتوجيه المختصين حيال تسهيل مهمته لجمع البيانات اللازمة بما يضمن ان لا يكون هناك أي تأثير على خدمة المراجعين خلال قيامه بمهام بحثه مع العلم بأن وزارة الصحة تضمن حقوقها في نتائج البحث من خلال اتفاقية المشاركة في البيانات والتي تم توقيعها بين الباحث وإدارة البحوث والدراسات بمنطقة المدينة المنورة.

ولسعادتكم فائق تحياتي وتقديري.......

مدير إدارة البحوث والدراسات
بالشئون الصحية بمنطقة المدينة المنورة
الدكتورة/ ياسمين طلال الجهني

Case 6

وزارة الصحة
Ministry of Health
صحة الحدود الشمالية

Date: 25 - April - 2019

Re: Data collection

TO WHOM IT MAY CONCERN

Mr. Mufleh Obaid H Alomrani , Passport No. (R177384), a PhD researcher – Health Sciences - at The University of York (UK) , has requested to conduct his study at the Northern Borders Hospitals _ ArAr in Saudi Arabia. Mr. Alomrani has fully informed us about the nature of his study and the steps he will take for data collection including semi-structured interviews.

Based on the above information, we would like to inform you that we are granting Mr. Alomrani full approval to conduct his study from 01 – 30 / November / 2019 .

Sincerely,

General Director for the General Directorate of Health
Affairs in the Northern Border Region

Abedullah Welman Al A'azemy

الرقم : _____ التاريخ : _____ المشفوعات : _____

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General Directorate of Emergency
Disasters and Ambulances Services

الإدارة العامة للطوارئ والكوارث والنقل الإسعافي

الرقم:

التاريخ:

مطلق عبيد حماد العمراني   اخصائي اول تمريض   ٢٢-٠٢٩٨٧   ٩١٩/٨١   ١٠٠١٣٦٥١٧٢

سعادة مدير إدارة الطوارئ والكوارث والنقل الإسعافي بصحة تبوك   المحترم

السلام عليكم ورحمة الله وبركاته،،

إشارة إلى خطاب سعادتكم رقم ١٩٢٦٩٩٦ وتاريخ ١٤٤٠/٩/١٥هـ بشان الموظف الموضحة بياناته أعلاه والمبتعث من قبل وزارة الصحة لإكمال درجة الدكتوراه في تخصص العلوم الصحية بجامعة (يورك- بريطانيا) ويعمل على دراسة بعنوان " الطرق الفعالة لتطوير منهج مناسب للاستعداد لمواجهة الكوارث والاستجابة لها في المملكة العربية السعودية " ويرغب في السماح له بجمع عينات الدراسة عن الاستعدادات بالنسبة لوزارة الصحة في مواجهة الكوارث من الإدارة العامة للطوارئ والكوارث والنقل الإسعافي . ونتضمن طلبكم موافقة الإدارة على ذلك.

أود إحاطة سعادتكم بانه لا مانع لدينا من إجراء جمع عينات الدراسة من الإدارة العامة للطوارئ والكوارث والنقل الإسعافي . على أن يتم تحديد مواعيد إجراء الاستبيان وإبلاغ الإدارة بها مسبقاً.

أمل تفضل سعادتكم بالاطلاع .

ولكم خالص التحية والتقدير

المشرف العام على الإدارة العامة للطوارئ
والكوارث والنقل الإسعافي

د. جلال بن محمد العويسي

Appendix 7: Focus Group Discussion Protocol for Nurses in the KSA

UNIVERSITY *of York*
The Department of Health Sciences

Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)

Mufleh Alomrani

Focus Group Discussion Protocol

Case Number: ....

The Case site			
The Researcher	Mufleh Alomrani, PHD student The University of York, UK		
Day:		City, Country	
Date:		Place:	
Start time:		Finish time:	
How many interviewees:		Position of interviewees:	
Participants	Qualifications	Experience/Year	Gender

Note transcription key.

Moderator = 0, Participant 1=1, Participant, 2=2 Participant 3=3 Participant 4=4, Participant 5=5, Participant 6=6.

1

Welcome

Thank you for agreeing to be part of this focus group discussion; I appreciate your willingness to participate. I am the moderator for this Focus Group Discussion.

Introduction

My name is Mufleh Alomrani, and I am a PhD student at the University of York in the UK. I also work as a paramedic-nurse in the Crisis and Emergency Administration of the Ministry of Health, Tabouk, Saudi Arabia.

The purpose of this focus group discussion is to determine your experience and opinions regarding key concepts for an effective education-training programme for Emergency nurses. This PhD project seeks to investigate approaches to ensure that nurses are better prepared for and have the requisite skills/competence for effective responses to and prepare for disasters. It is my expectation that your opinions and experiences will help to develop further understanding of current nursing practices, knowledge and performance in the event of a disaster. I also hope that your responses will provide information in relation to actual training needs of nurses and how this can be met by an education programme.

This focus group discussion will last between one hour and one hour and a half. Information provided in this discussion is completely confidential, and your name will not be associated with anything you say in the focus group. Your personal information will not be connected to the results of this focus group discussion. At the end of the focus group discussion, information collected will be categorised into themes and topics before being shared anonymously with the researcher's supervisors at the University of York.

Please check the consent form and sign to show you agree to participate in this focus group discussion. By signing this form, you agree to participate in the focus group and to keep the entire discussion confidential. If you feel uncomfortable for any reason after signing this form, you are free to leave at any time. Please take a moment to read them over.

I would like to record this focus groups discussion so that I can adequately capture thoughts, opinions, and ideas shared during our discussion. Before we begin, it is necessary to detail a few ground rules for the focus group discussion. These are in place to ensure that you feel comfortable sharing your experiences and opinions. Furthermore, I am happy to answer any questions or provide clarification if anybody requires it.

Ground Rules

1. It is beneficial that everyone talks, as I would like everyone to participate. I may call on you if you have not participated in the discussion.

2. One speaker at a time – only one person should speak at a time in order to make sure that we can all hear what everyone is saying.

3. There are no right or wrong answers. Everyone's experience and opinions are important. Speak up whether you agree or disagree. I would like to hear a wide range of opinions.

4. Use respectful language and respect each other so as to facilitate an open discussion. Please avoid any statements or words that may be offensive to other members of the group.

5. For confidentiality, whatever is said in this room stays within the group. I want the participants to feel comfortable sharing when sensitive issues are raised.

6. The discussion will be audio recorded because I want to capture everything you have to say. I do not identify anyone by name in my PhD study; you will remain anonymous.

7. Open discussion – this is a time for everyone to feel free to express their opinions and viewpoints.

2

8. Participation is important. It is important that everyone's voice is shared and heard in order to make this the most productive focus group possible. Please speak up if you have something to add to the conversation.

Does anyone have any questions?

Ok, let's begin.

Background

Saudi Arabia is frequently prone to disasters; therefore, nurses in the country need to have the ability to assist in disaster situations, as they are considered an important element of the workforce in disaster preparedness and response. However, the review of available research evidence indicated the lack of an appropriate education programme for the training of nurses in disaster response in Saudi Arabia. Moreover, the current nursing education in Saudi Arabia does not adequately prepare nurses to respond in events of disasters. It is, therefore, imperative that research, of this nature, focuses on identifying various elements, as well as appropriate methods for developing effective and culturally appropriate training of nurses in disaster preparedness and response in the Saudi Arabia.

Geographical location

....
....
....
....

Hospital Profile

....
....
....
....

Emergency Department at the Hospital

....
....
....
....

Some of the researcher's notes

....
....
....
....

3

Warm-up Introductions

- Firstly, I would like everyone to introduce himself or herself (by the first name). Also, can you say how long have you been registered as a disaster response nurse?

Introductory Question

I am just going to give you a couple of minutes to think about your experience of response during disaster time.

Is anyone happy to share his or her experience of disasters while working as a nurse?

Guiding Questions

I. *Current knowledge and skills*

1. Could you tell me what is your experience when you responded to a disaster; in relation to your knowledge, skills, and performance?

Follow up question

a. Do you remember any problem or challenge you experienced while responding to the disaster?

b. Can you tell me about the specific situation and how you overcame or coped with it?

II. *Key concepts*

2. Can you tell me about your training and/or education to become a disaster response nurse?

Follow-up question

a. Was your training programme a formal study, short course, online course, Continuing Professional Development (CPD) or work experience? Can you highlight the content of your training or the major themes covered?

b. If you have not been trained, why and how you could benefit from a training course to help you respond effectively to disasters?

3. Can you identify knowledge and skills, which are essential for your performance as a disaster response nurse, which were not covered during your training or previous study?

III. *Delivery methods*

4. What do you think is the best approach for teaching and learning concepts in effective disaster nursing education?

Follow up questions

a. Why do you prefer that kind of teaching method?

b. How will it help you to gain the essential information?

Concluding Question

- Do you have any other additional comments or concerns you want to add regarding the discussion?

Conclusion

To thank the participants for participating in the focus group discussion and assure them of the confidentiality of their responses.

Materials and supplies for focus groups discussion

- Sign-in sheet;

4

- Consent forms (2 copies per person in each group, participants keep one copy and sign and return one copy to researcher);
- Name tags;
- Pads & pencils for each participant;
- Focus group discussion guide for moderator (the researcher);
- 1 recording device;
- Batteries for recording device;
- Notebook for notetaking and pens;
- Flip chart and markers (may be used if generating ideas/lists);
- Clock/watch.

5

Appendix 8: Semi-structure Interview Protocol for Policymakers in the KSA

UNIVERSITY *of York*

The Department of Health Sciences

Mufleh Alomrani

Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)

Semi-structured interview protocol-Policy makers

Day:................   Date:..../....../.........

Start time of the interview:............   Finish time: ....

Place:...........................

Interviewer: Mufleh Alomrani, Health Sciences Department, University of York, UK

Name of person interviewed:..

Gender,   Male............   Female................

Position of interviewees ----------------------------------

Organization: -----------------------

Recording Number: ----------------------------

Welcome

Hello, thank you for agreeing to take part in this interview. My name is Mufleh Alomrani, and I am a PhD student at the University of York, in the UK. I also work for the Ministry of Health in Saudi Arabia in the Crisis and Emergency Administration in Tabouk as a paramedic-nurse.

Purpose of the interview

The purpose of this interview is to determine your experience and opinions regarding key concepts for an effective education-training programme for nurses. This PhD project seeks to investigate approaches to ensure that nurses are better prepared for and have the requisite skills/competence for effective response to disasters. It is my expectation that your opinions and experiences will help to develop a better understanding about current nursing practices, knowledge and performance in the event of a disaster. I also hope that your responses will provide information in relation to actual training needs of nurses and how this can be met by an education programme

Information provided in this meeting is completely confidential and I will not associate your name with anything you say in the interview. Your personal information will not be connected to the results of this interview.

Procedures

- The interview will take about 60–90 minutes. There are no right or wrong answers to our questions. What I really want, and need is to know your opinions and experiences because they matter to this study.

1

- The information you provide will be kept secure to the extent provided by the ethics committee of the University of York, the UK. We will not include your name in any quotes or comments. Only the people involved with this project will hear these recordings (i.e. the researcher and his supervisors at the University of York). Data will be anonymised in this study. The approach will include coding names for each interviewee. I do not identify anyone by name in my PhD study. You will remain anonymous.

- At the end of the interview, information collected will be categorized into themes and topics before being shared anonymously with the researcher's supervisors at the University of York.

Obtain Informed Consent

- IN PERSON: To hand the interviewees the consent form and give them time to read it; to go over the form; ask if they have any questions; and obtain the signed form.

- If you feel uncomfortable for any reason signing these forms, you are free to withdraw at any time. Please take a moment to read them over.

Obtain Permission to Record Audio

I would like to record the interview so that I can adequately capture your thoughts, opinions, and ideas. Therefore, do you give permission for me to record this interview and use the transcript for my PhD thesis in Health Sciences at the University of York?

Do we have your permission to record?

[IF YES]: PROCEED AND BEGIN THE INTERVIEW.

[IF NO]: SAY, "That's OK, we can continue without recording the interview" AND PROCEED.

Then I am happy to answer any questions or provide clarification if you need it.

Interview Questions

A) Semi-structured interview guideline questions for policy makers at the Ministry of Health

1. Could you tell me about your organisation's role in disaster preparedness and response?
   Follow up question:
   - What type of disaster do you respond to?
   - From a policy perspective, what are the salient issues and concerns for healthcare preparedness and response in Saudi Arabia?
   - What policies exist in relation to disaster preparedness and response by health care workers in Saudi Arabia?
   - How have the policies regarding disaster response changed over time and how have nurses' roles developed along with these changes?

2. What existing activities, organisations, partners, or education are you familiar with that work on issues related to disaster preparedness and response in Saudi Arabia? Do you have any preparation programme for healthcare professionals in responding to disasters?

Follow up questions:

- Tell us about the training that the responders receive

- What do you think are the training priorities for responders?

- Do you see any challenges to providing further training in disaster preparedness and response in Saudi Arabia?

- What kind of resources, knowledge, capacity, or skills do you, as a policymaker, think nurses require in order to respond to disasters?

- What would be included in the ideal education programme to prepare and to respond to disasters in a better way?

- How can this type of education become sustainable in your organisation?

3. How important do you think it is to develop a new disaster nursing education programme in Saudi Arabia as one of the interventions to aid the advancement and improvement of the preparedness and response for nurses in the Saudi Arabia?

4. From your experience, what do you think are the good practice guidelines?

5. Could you tell me about previous practices; what lessons have been learnt from them; and how they can be addressed in new education programmes?

Concluding Question

1. Do you have any other additional comments or concerns you would like to add regarding the discussion?

2. Is there any policy-specific perspective, relating to nurses' disaster preparedness and response, that you want to offer?

Conclusion

To thank the interviewees for participating in the interview and to assure them of the confidentiality of their responses.

Supplies

- Informed consent forms (one copy to participant; one copy to be completed by interviewer);
- Protocol for interviewer;
- Audio recording equipment and batteries;
- Interviewer clock;
- Notebook for notetaking and pens.

Appendix 9: Semi-structure Interview Protocol for Academics in the KSA

UNIVERSITY *of York*

The Department of Health Sciences

Mufleh Alomrani

Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)

Semi-structured interview protocol-Academics

Day:................ Date:..../....../.........

Start time of the interview:............. Finish time: ....

Place:...........................

Interviewer: Mufleh Alomrani, Health Sciences Department, University of York, UK

Name of person interviewed:...

Gender, Male............ Female.................

Position of interviewees:-----------------------------------

Organization: -----------------------

Recording Number: ----------------------------

Welcome

Hello, thank you for agreeing to take part in this interview. My name is Mufleh Alomrani, and I am a PhD student at the University of York, in the UK. I also work for the Ministry of Health in Saudi Arabia in the Crisis and Emergency Administration in Tabouk as a paramedic-nurse.

Purpose of the interview

The purpose of this interview is to determine your experience and opinions regarding key concepts for an effective education-training programme for nurses. This PhD project seeks to investigate approaches to ensure that nurses are better prepared for and have the requisite skills/competence for effective response to disasters. It is my expectation that your opinions and experiences will help to develop a better understanding about current nursing practices, knowledge and performance in the event of a disaster. I also hope that your responses will provide information in relation to actual training needs of nurses and how this can be met by an education programme

Information provided in this meeting is completely confidential and I will not associate your name with anything you say in the interview. Your personal information will not be connected to the results of this interview.

Procedures

- The interview will take about 60–90 minutes. There are no right or wrong answers to our questions. What I really want, and need is to know your opinions and experiences because they matter to this study.

1

- The information you provide will be kept secure to the extent provided by the ethics committee of the University of York, the UK. We will not include your name in any quotes or comments. Only the people involved with this project will hear these recordings (i.e. the researcher and his supervisors at the University of York). Data will be anonymised in this study. The approach will include coding names for each interviewee. I do not identify anyone by name in my PhD study. You will remain anonymous.

- At the end of the interview, information collected will be categorized into themes and topics before being shared anonymously with the researcher's supervisors at the University of York.

Obtain Informed Consent

- IN PERSON: To hand the interviewees the consent form and give them time to read it; to go over the form; ask if they have any questions; and obtain the signed form.

- If you feel uncomfortable for any reason signing these forms, you are free to withdraw at any time. Please take a moment to read them over.

Obtain Permission to Record Audio

I would like to record the interview so that I can adequately capture your thoughts, opinions, and ideas. Therefore, do you give permission for me to record this interview and use the transcript for my PhD thesis in Health Sciences at the University of York?

Do we have your permission to record?

[IF YES]: PROCEED AND BEGIN THE INTERVIEW.

[IF NO]: SAY, "That's OK, we can continue without recording the interview" AND PROCEED.

Then I am happy to answer any questions or provide clarification if you need it.

Interview Questions

A) Semi-structured interview guidelines for academics at Saudi universities

I would like to start the interview with these questions:

1. What existing Education and / or training programmes are you familiar with that work on issues related to disaster preparedness and response in Saudi Arabia?

- What kind of education relating to disaster education exists at Universities across Saudi Arabia?
- Follow up - **If there are any**, could you tell me more about it

  - What are they, what kind of education programmes?

  - What is the content of such programmes?

  - Where and how are they delivered?

2

- **If not, why do we not have any?** What are the reasons from your experience?
  - What are the problems and challenges in developing disaster preparedness and response education that needs to be included in any education and training programme for nurses?

  - In your experience, what solutions /interventions have already been tried to resolve these problems?

  - How important do you think it is to develop new disaster nursing education in Saudi Arabia?

2. What do you think effective disaster/emergency response education should cover?

- **Follow up question** - what are the gaps in the existing education?

3. Based on your experience, what teaching methods can be adopted to best prepare qualified and/or future nurses for emergencies and disasters?

- **Follow up question--** And why do you think it is the best teaching method for both qualified and student nurses?

Concluding Question

1. Do you have any other additional comments or concerns you would like to add regarding the discussion?

Conclusion

To thank the interviewees for participating in the interview and to assure them of the confidentiality of their responses.

Supplies

- Informed consent forms (one copy to participant; one copy to be completed by interviewer);
- Protocol for interviewer;
- Audio recording equipment and batteries;
- Interviewer clock;
- Notebook for notetaking and pens.

3

Appendix 10: Participant Information Sheet

UNIVERSITY *of York*

The Department of Health Sciences

Mufleh Alomrani

Disaster Nursing Education for Disaster Preparedness and Response

Participant information sheet

Title of study: Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)

I would like to invite you to take part in the above-named study, but before you confirm, please read the following information.

What is the purpose of this study?

Disasters now occur more frequently in many places across the globe, including in Saudi Arabia. This often results in high levels of death, injury and suffering, along with economic loss and environmental damage. Over the past 50 years, over 10,000 disasters of various sizes have been reported. These have affected more than twelve billion people and resulted in twelve million deaths. A review of the available research evidence indicates a lack of an appropriate education programme for the training of nurses in disaster response in Saudi Arabia. It is, therefore, imperative that research, of this nature, focuses on identifying various elements of an effective disaster training programme, as well as appropriate methods for the development of such an effective and culturally appropriate disaster preparedness and response education programme for nurses in Saudi Arabia.

The main aim of this study is to investigate key concepts of an effective disaster preparedness and response education programme for emergency nurses in the KSA. The study will also investigate and identify methods for delivering an effective education programme for nurses in disaster preparedness and response in Saudi Arabia.

Who is conducting the study?

This study is being conducted by Mufleh Alomrani for a PhD study in the Department of Health Sciences at the University of York, under the supervision of Dr. Janaka Jayawickrama and Professor Tracy Lightfoot. The study is funded by the Saudi Cultural Bureau-London.

Why have I been asked to participate?

Due to the specialist nature of this study and the fact that it focuses on nursing education for emergency preparedness and response, I am recruiting nurses, people who are involved in the administration or development of nursing training programmes, health policy makers with roles relating to emergency services as well as emergency services directors from the Ministry of Health for this study.

Do I have to take part?

Participation in this study is entirely voluntary. You can withdraw at any time and there are no consequences of withdrawing from the study.

4

What will be involved if I take part in this study?

This semi structured interview will last between 60 to 90 minutes and will be held in the nearest research centre to you. Audio proceedings of each semi structure interviews session will be recorded for the purposes of this study. No participant will be exposed to danger or harm of any sort. No personal or embarrassing issue will be discussed during interviews session.

What are the advantages/benefits and disadvantages/risks of taking part?

No incentive or reimbursement will be provided to participants in this study. However, participants will have the opportunity to contribute to the development of a programme that will be of immense benefit to the public and help in shaping nursing responses in Saudi Arabia. Moreover, through participation in the semi structure interviews sessions, participants will have the opportunity to learn more about the field, as well as engage in meaningful discussions that may positively impact their practice.

Can I withdraw from the study at any time?

Participants are free to withdraw from the study at any time without giving any explanation, up until two weeks after interview sessions. Please e-mail me at any time if you wish to withdraw from this study.

How will the information and personal data I give be handled?

Interview sessions will be recorded. Moreover, the researcher will take notes from semi-structured interviews directly by hand. Handwritten notes and memos will be typed as soon as possible in order to ensure accuracy of information. This will then be kept on the researcher's dedicated and password protected official laptop and the study's back-up disk drive in password secured folders. Data will be anonymised in this study; the approach will include coding names for each interviewee, which will be used when taking notes. The key that links real participant names with code names will be stored as a pass coded document in a pass coded file on the researcher's dedicated official laptop only. The study's primary supervisor, Dr Janaka Jayawickrama, and the researcher, are the only individuals to have access to data collected from this study. Data will be kept for 5 years, after which it will be destroyed. Data will be stored on the secure research data storage at the University of York facility.

What will happen to the results of the study?

Results generated from this study will be presented in a PhD thesis. In addition, results will be presented at appropriate conferences and submitted for publication in peer-reviewed journals.

Who has reviewed and approved this study?

This study has been approved by the University of York's Department of Health Sciences Research Governance Committee as well as the National Committee for Medical and Bioethics of Saudi Arabia.

Who do I contact for more information about the study?

For more information about this study, please contact Mufleh Alomrani, via moa520@york.ac.uk

Who do I contact in the event of a complaint?

For general complaints, please contact, Dr Janaka Jayawickrama, via janaka.jayawickrama@york.ac.uk. Additionally, participants who are unhappy with the way their personal data has been handled have a right to complain to the university's data protection officer at dataprotection@york.ac.uk. If they are still dissatisfied, they have a right to report concerns to the Information Commissioner's Office at www.ico.org.uk/concerns.

Thank you for taking the time to read this information sheet.

Appendix 11: Participant Consent Form

UNIVERSITY *of York*

The Department of Health Sciences
Mufleh Alomrani

Participant consent form

Title of study: Disaster Nursing Education: A qualitative study to determine the key concepts for education in the Kingdom of Saudi Arabia (KSA)

	Please confirm agreement to each statement by putting your initials in the boxes below
I have read and understood the participant information sheet	
I have had the opportunity to ask questions and discuss this study	
I have received satisfactory answers to all of my questions	
I have received enough information about the study	
I understand my participation in the study is voluntary and that I am free to withdraw from the study: 1. At any time/up to 2 number of weeks post-interview 2. Without having to give a reason for withdrawing 3. Data already collected at the point of withdrawal may still be used for research purposes after my withdrawal from this study	
I understand that my interview will be audio-recorded.	
I understand that relevant sections of my data collected during the study may be looked at by the primary research and the research supervisors. I give permission for these individuals to have access to my records.	
I understand that any information I provide, including personal data, will be kept confidential, stored securely and only accessed by those carrying out the study.	
I understand that any information I give may be included in published documents, but all information will be anonymised.	
I agree to take part in this study.	
Participant signature .... date : / /	
Name of participant	
Researcher signature .... Date : / /	
Name of researcher: Mufleh Alomrani	

*One copy for the participant; one for the researcher.
This project has been reviewed by the research ethics review committee at the University of York, UK, and by the Ethics Committee of your institution.

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Appendix 12: Example of Coded Transcript

***Please note that, all the identifiers were removed and replaced with numbers, 0 for the researcher and 1 to 6 for each participant

Text	Areas of emergency preparedness/response/Indicative codes
0: Ok, can we start by having you all speak about what you know about disasters?	
5: Look, <mark>we all know that they are no good at all</mark>… you know.	Previous experience of disaster
1: <mark>Of course, they aren't good at all</mark> (slight laughter) – nobody likes disasters!	Previous experience of disaster
6: To be honest… <mark>I cannot imagine it</mark>… it's… <mark>a weird thing</mark> (pause for a few seconds).	Previous experience of disaster response
0: Can we please hear from the rest of you? What do you think about disasters?	
3: You know, I mean <mark>from my experience in disasters</mark>. I can tell you that a disaster is a situation or event in which <mark>the hospital is unable to accommodate the number of injuries or cases directed to it. Also, a disaster takes place when there are 30 injuries or more, which exceeds the hospital's capacity.</mark>in other words……….<mark>its really difficult</mark>…as my frinds said, its….its a disaster!	Previous experience of disaster Experience of problems associated with emergency response. Previous experience of disaster
2: You are absolutely right, mmm…<mark>I agree with you</mark> as….as I mean <mark>from working in disasters before</mark> like mekkah,….mmm…<mark>It's incredibly scary … mmm … there are a lot of patients everywhere</mark>	Previous experience of disaster response Experience of problems associated with emergency response. Experience of problems associated with emergency response.
6: You're right – <mark>there's a huge number of patients with different enjuries,…..mmmm….. you know we did not expect it</mark>	
0: Okay. Could any of you share any personal stories or experiences working in disasters?	
2: Shall I start as <mark>I responded to three disasters myself, two of which were here in the hospital and one in</mark>	Experience of problems associated with emergency response

0: Could you please tell us more about your experiences, if you don't mind?

2: Yeah sure I can tell you but you know I don't remember every thing as it was…..I mean…..Look the big problem was There were just too many patients coming in. In a single hour we were receiving so many … mmm … God, maybe over 100 patients. On top of having so many patients in the Emergency Department, there was a fire in the unit and … and … it was a disaster, just as you called it. I really don't want to remember those days.

Experience of problems associated with emergency response

0: Thank you very much for sharing your experience with us, Would anybody else like to share his/her experience?

Lack of confidence in emergency response

4: Yeah I would love to share my experience if that will help, hopefully, I don't ….I mean…..you don't want to listen to it …… I was involved in the response to the 1438 H (2016) Hajj stampede…also,I was present at the Sara Obeida hospital and the Sharaf General hospital in Najran. I was certainly present during most of these disasters, or heard of them. I was working in the field, near the border at the port. The numbers were terrible.I mean the victims…….look, We had to deal with dying and injured martyrs and wounded soldiers from the war, while also treating civilians and patients from other places such as Yemen……you know…….2 worked with me, we were together in the same place; can you tell them, please,

Awareness of roles during disaster situations

Awareness of roles during disaster situations

Experience of problems associated with emergency response

Experience of problems associated with emergency response

2: Yes, sure, listen, I also worked there. You know, War came suddenly and the hospital was not equipped to deal with it beforehand. We found ourselves facing totally different situations and vast numbers of patients and serious injuries … Even with the nurses supporting the hospital, we nearly fainted when we saw the extent of the cases and the problem … and … mmm … and some of us had no experience dealing with such cases.

Indication of lack of good training in emergency response

Indication of gaps in knowledge of appropriate responses to disasters

Experience of problems associated with emergency response

The situation was terrifying. We didn't know if we were safe or not.	Experience of problems associated with emergency response
6: The beginning of the war was something new for us – something unusual.	Previous experience of disaster response
1: She was the first girl … I mean, part of the first team of nurses from our hospital to respond to the war.	
3: No no no, the Najran hospital was the first event. I went there during two disasters. I was in a different hospital, but when disaster struck, they asked us for … I mean… internal support (pause for a few seconds).	Previous experience of disaster response
0: Okay, please continue.	
2: Also, I saw you in Makkah when the crane hit the sanctuary and toppled onto the pilgrims and when the stampede happened…	
3: Yeah, you are right…silent…………………	Previous experience of disaster response
0: What about the rest of you? Could you please tell us a bit about your experiences?	Knowledge of drills for emergency preparedness
4: Ok, I think, I can tell you, I worked in the South and responded to road bus accidents here. I've also had similar experiences to 2 and 3 during the Hajj. My first experience was with drills (pause). I was involved in them because I was a member of the nursing support team in Tabuk. The first drill I participated in involved the sinking of a ship in the port of Dhuba.	Poor communication during disaster or poor communication of disaster events
	Poor communication during disaster or poor communication of disaster events
5: No no, that was a real accident. The Alsallam ship sank?it was a true disaster.	
4: Yes, yes you are right,…mmm I meat, at the beginning we thought it was a drill.	Previous experience of disasters
1: Oh, god bless you, you know, I wanted to be there, to help but I was unable to go.	Poor communication during disaster or poor communication of disaster events

4: You know you missed a lot of thing: ==This was the event that taught me what responding to disasters meant.== **I'm sorry, but you know when we arrived** ==there was no clear leader or way to act== **… look, how are you supposed to behave?** ==I follow the leader and take orders.== **How –** ==I mean,in the hospital we know how to work and from whom we take orders but there it was a totally new thing for us to deal with.== ==I learned from that experience that leaders must give orders.== **In the first instance, each platform gave …**

3: It is true what – sorry to interrupt you – ==when there is a disaster and nobody takes responsibility, it becomes a mess, chaos upon chaos.==

1: ==I mean, if there is a leader on the scene…==

3: ==This is the most important thing==**, right…**

1: ==The scene became messy==**. The first experience, everyone becomes a manager.** ==Everyone wanted to be a leader==

4: Exactly, ==The scene became messy==**: first of all,** ==everybody became a manager==**;** ==everybody wanted to be a leader – the Coast Guard, the Army, the Police.== **It was …** ==the first day was spent in tears.== **After we concluded the work we did,** ==I found a lot of mistakes.== **Everybody was saying 'where is the leader? Who do we take orders from?', but there** ==was literally no clear leader==**.**

0: Can you tell us what mistakes have happened and what you learned please?

2: No no, the other time – this sort of thing has happened many times. ==Sometimes I take notes and try to convey my experiences, but there is no ear to hear me.==

0: Why do you think that is?

	Experience with problems associated with leadership during emergency response
	Experience with problems associated with leadership during emergency response
	Leadership during emergency response
	Previous experience of disasters
	Experience with problems associated with leadership during emergency response
	Experience with problems associated with leadership during emergency response
	Experience of problems associated with emergency response
	Poor communication during disaster or poor communication of disaster events
	Indication of gaps in knowledge of appropriate response to disasters

2: <mark>People didn't know what their role was. I'm a nurse</mark> – of course, it was the day of Eid; it was the tenth day of Eid.

5: Yes,…..A, Disaster …..silent………….

5: A disaster… (silence)

0: It's okay, take your time please.

5: No no, nothing … mmm …

Previous experience of disasters

6: Now, just like 0000<mark>, I responded to disasters. I'm an emergency worker; I can give you – I can serve people in emergencies.</mark>

4: I appreciate your ability to do the things I can, but there are <mark>things I have not studied</mark> – <mark>never, not at all.</mark>

Lack of training and skills

Awareness of roles during disaster situations

3: Yes, you're right. <mark>We don't know anything! We know that we need to work</mark>, <mark>but we don't know how.</mark>

Lack of training and skills

4: Listen, they <mark>bring girls into a disaster – an actual, real disaster – and the girls don't know how to deal with it.</mark> I mean … how to deal with patients. Look, <mark>We don't have courses to qualify the staff to face such disasters.</mark>

Participants have responded to disaster before

Lack of training and skills

Indication of lack of good training in emergency response

3: <mark>We're supposed to have courses that teach people and educate them on how you can manage</mark> [such disasters].

Knowledge of drills for emergency preparedness

Researcher: Like what; what is that; can you go to more details please?

0: Like what? Could you go into further detail please?

Indication of gaps in knowledge of appropriate response to disaster

Indication of lack of proper real life disaster response experience

4: <mark>Look, I don't really have a background in this – how to respond to such an event in reality</mark> – I mean… mmm before we responded to disaster…..<mark>even now I don't</mark>

know (slight laughter) … **we did it as a drill, but it's totally different on the ground.**	Indication of lack of proper real life disaster response experience
3: It meant the same thing … the information – **if it were me taking the course, I wouldn't know how to deal with it.** She might have taken what she took, but the rest of the staff didn't. That's just her point.	Poor communication during disaster events

Indication of lack of proper real life disaster response experience |
| **5:** Okay, I'll explain it to you as if you **have done a drill. We don't have any introduction or orientation for the drills.** The whole staff is present and involved. Then they announce 'code yellow', and all the staff are on the ground, **but unfortunately, do not benefit from the drill, and there is no need of it. Why**? **Because they don't know what they should be doing.** | Lack of proper knowledge of emergency response

Indication of lack of proper real life disaster response experience

Poor communication during disaster events |
| **6:** Yes, that's absolutely right, and I myself witnessed something like that previously. **They called us for a drill, yet when we came to the ER we did not know where to go or what to do.** The worst disaster was that they told us that the drill was successful, but we don't know how that could be. | Indication of lack of good training in emergency response |