An exploration of how critical care nurses make the decision to initiate restraint when managing hyperactive delirium.

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Intellectual property and publication statements

The candidate confirms that the work submitted is her own, except where work which has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

Chapters 2, 4, and 6 contain content which has also been published in jointly authored publications. The references for these publications are provided below:

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Abstract

Hyperactive delirium and its resulting psychomotor agitation is frequently cited as clinical rationale for initiating chemical or physical restraint. From an integrative review, nurses appeared to be the primary decision makers when initiating restraint, but little was known about this process.

This study used a pragmatic qualitative approach to explore critical care nurses' decision-making processes when considering restraint to manage a patient with psychomotor agitation secondary to hyperactive delirium. Thirty participants were recruited to a 'Think Aloud' study. Six audio-visual vignettes featuring simulated critical care patients acted as stimulus for participants to describe their decision-making processes.

Two analytical approaches were undertaken. Firstly, the Cognitive Continuum Theory was used to identify modes of decision-making. Secondly, a reflexive thematic analysis was undertaken. This identified five themes: Intrinsic beliefs and aptitudes; Handover and sharing of labels; Failure to maintain a consistent approach; The need to maintain constant vigilance; The tyranny of the now.

Decisions relating to restraint drew primarily upon intuitive and reflective cognitive modes. When participants perceived greater time for decision-making, more analytical modes were employed. Restraint was more frequent when staffing ratios were reduced and opportunities for vigilance reduced. This led to intuitive decision-making which was associated with restraint. Caring for a patient with hyperactive delirium was described as relentless and described their physical and psychological exhaustion and how this might lead to restraint to create 'space' for respite.

Recommendations for practice and future research were made. Pre-emptive planning for delirium and safe staffing was associated with a reduced need to restrain. The struggle to manage agitated behaviour was associated with burnout and reduced engagement with therapeutic management, suggesting the need for additional support. Further research was indicated to identify whether hyperactive delirium is managed differently to non-delirious agitation and explore the role which memories of restraint play in patient recovery from critical care.

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Abbreviations

AAA	Abdominal aortic aneurysm
ACCP	Advanced Critical Care Practitioner
BACCN	British Association of Critical Care Nurses
BIPAP	Bi-phasic positive airway pressure
CAM-ICU	The Confusion Assessment Method for the ICU
CAP	Community acquired pneumonia
CC3N	Critical Care National Network Nurse Leads Forum
CCT	Cognitive Continuum Theory
CPAP	Continuous positive airway pressure
CTD	Cognitive Test for Delirium
CVC	Central venous catheter
CVVH	Continuous venous-venous hemofiltration
DoLS	Deprivation of Liberty Safeguards
DSI	Daily sedation interruption
EBP	Evidence-based practice
ECG	Electrocardiogram
EQUATOR	Enhancing the QUAlity and Transparency Of health Research
ETT	Endotracheal tube
FICM	Faculty of Intensive Care Medicine
FiO2	Fraction of inspired oxygen

HDU	High dependency unit
HTN	Hypertension
ICDSC	Intensive Care Delirium Screening Checklist
ICS	Intensive Care Society
ICU	Intensive care unit
IV	Intravenous
LPS	Liberty Protection Safeguards
MDT	Multi-Disciplinary Team
MMAT	Mixed-Methods Appraisal Tool
NG tube	Naso-gastric tube
NIBP	Non-invasive blood pressure
NICE	National Institute for Health and Care Excellence
NMC	Nursing and Midwifery Council
PCA	Patient controlled analgesia
PEEP	Positive end expiratory pressure
PMH	Past medical history
PRN	*Pro re nata*
PAD	Pain, Agitation and Delirium guidelines
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RASS	Richmond Agitation and Sedation Scale
SAS	Sedation and Agitation Scale
SHREC	School of Healthcare Research Ethics Committee
SJT	Social Judgement Theory

SpO2	Peripheral oxygen saturations
UK	United Kingdom
USA	United States of America
VAP	Ventilator associated pneumonia

Introduction

Origins

This thesis is grounded in and builds upon my clinical and research interest in the use of restraint in the management of hyperactive delirium in the critical care environment. Using a pragmatic qualitative approach, it aims to explore how and why critical care nurses make the decision to apply restraint to a patient experiencing psychomotor agitation secondary to hyperactive delirium. In 2016, when this study began, restraint guidance in critical care was over ten years old (Bray et al., 2004). My clinical experience suggested that the use of restraint was inconsistent, grounded in the nurse's preference and clinical routine rather than evidence-based practice.

Since this PhD study began in 2016, there has been increased interest in how critical care nurses use physical restraint. This includes adjuncts such as padded gloves, splints or cuffs. In my clinical experience, nurses use chemical restraint alongside and interchangeably with physical restraint especially when managing hyperactive delirium. This thesis aims to reflect and explore the dilemmas and decisions faced by my colleagues and I in clinical practice.

The COVID-19 pandemic began just after data collection was completed in February 2020. The pandemic brought great changes and challenges to critical care departments, including a potential increase in delirium (Kotfis et al., 2020), reduced staffing ratios (UK Critical Care Nursing Alliance, 2020), and increased psychological and physical exhaustion amongst staff (Alharbi et al., 2020). In addition, both teaching and research had to adapt to embrace remote methods. This study used an innovative remote data collection method in YouTube hosted audio-

visual vignettes. This approach has the potential to influence further remote research and educational strategies.

The purpose of this thesis is to enable an understanding of how and why critical care nurses apply forms of restraint to patients with hyperactive delirium and to make recommendations for future practice, policy and clinical decision support tools. This thesis and the associated integrative literature review and qualitative study aim to:

> *To explore how critical care nurses make the decision to apply different types of restraint when caring for a patient with psychomotor agitation secondary to hyperactive delirium.*

This thesis makes a unique contribution to the current evidence-base and thinking around how and why critical care nurses make the decision to initiate restraint. It used an innovative data collection method to study nurses' decision-making processes. Bespoke audio-visual vignettes were created to stimulate participants to 'Think Aloud' and describe their decision-making processes and external factors which influence the decision to initiate restraint. This approach created a safe and focussed simulated clinical setting in which participants could describe their experience of managing hyperactive delirium. Participants' primary rationale for restraint was to preserve patient safety, especially when opportunities for vigilance were reduced due to lower staffing ratios. However, participants acknowledged that they were aware that evidence did not support restraint for patients with hyperactive delirium. Restraint was seen as a 'last resort', which could be used to create respite or space to think critically and avoid mistakes, however, this brought feelings of guilt, shame and moral discomfort. This study demonstrated wide variations in how and why restraint is used. Its use appeared to be rooted in custom and routine rather than evidence-based practice. Some factors leading to restraint appeared to

be modifiable, suggesting that improved support and education may lead to reduced reliance on restraint.

Organisation of the thesis

This thesis is divided into seven main chapters (Figure 1).

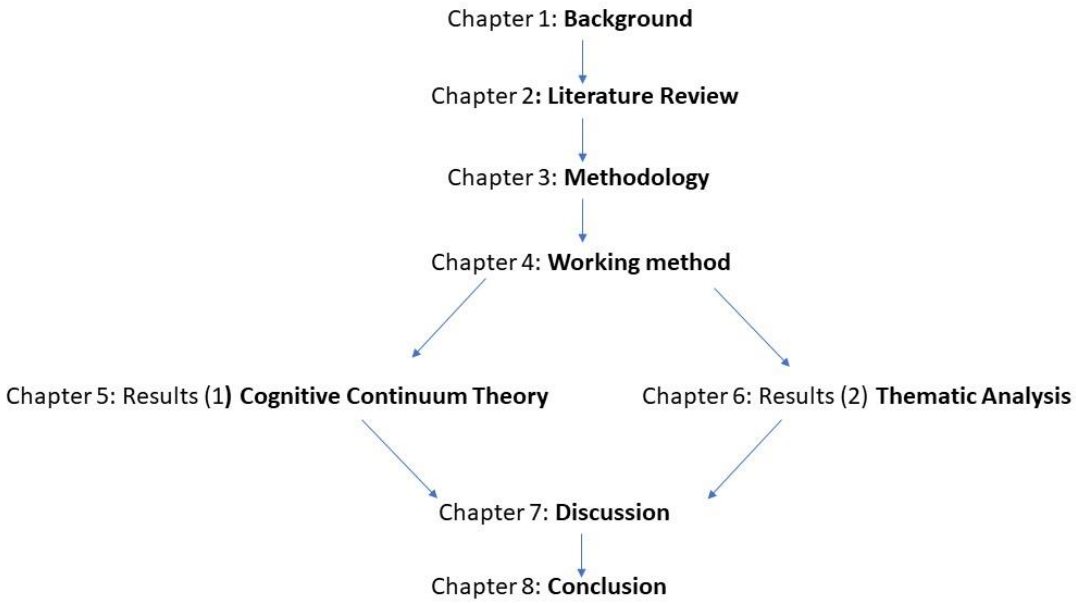


Figure 1: Thesis outline

Chapter 1 explains the rationale for the study and discusses underpinning ideas and current policy relating to delirium, restraint, critical care and clinical decision-making. The second chapter presents the method and results of the review of empirical literature. Chapter 3 describes the underpinning qualitative and pragmatic methodology. The working methods undertaken to develop a series of audio-visual vignettes used to stimulate participants to 'Think Aloud' (Ericsson and Simon, 1980) and understand their decision-making processes are described in the fourth chapter. At this point, the linear structure of the thesis diverges. Chapters 5 and 6 are both results chapters. They present the results of the study following two

separate analytical processes. Chapter 5 approaches the results from a theoretical perspective, whilst the second presents a rich thematic analysis of the interview transcripts. Chapter 7 draws the thesis together through a synthesis of the findings from both results chapters and discusses these in terms of the wider body of literature and unique insights from the author. The strengths and weaknesses of the study are identified and recommendations for future research are made. Finally, the thesis is concluded in Chapter 8.

Chapter 1 Background

1.1 Introduction

This chapter presents definitions of the three main sub-types of delirium, critical care and restraint, together with an overview of the prevalence of sub-types of delirium and restraint amongst the critical care population. Relevant international policy which guides the management of delirium and the use of restraint is discussed. Clinical decision-making and judgement in the context of critical care is introduced alongside the role that the study of this process can play in improving evidence-based practice.

1.2 Critical Care

1.2.1 Introduction and definitions

Critical care is a specialised area of acute secondary care where patients in single or multi-organ failure are monitored and treated (Intensive Care Society, 2015). It was recognised as a clinical speciality in the 1950s, when the technology to sustain life during critical illness became available (Bray et al., 2010). Critical care units can be general, meaning patients from all specialities are accepted, or dedicated to a speciality, such as cardiothoracic, neurosciences or burns. Some units are defined as intensive care (ICU) and provide treatment to critically ill patients requiring multi-organ support. High dependency units (HDU) care for patients who have stepped down from ICU and those requiring single organ support, such as non-invasive ventilation. These patients can be at risk of deterioration. Mixed critical care units accept both ICU and HDU patients (Intensive Care Society, 2009). Critical care units are located in district general and central teaching hospitals in the United Kingdom (UK). There are approximately 4056

critical care beds in England, with an occupancy rate of 82% in 2017 (NHS England, 2017). Critical care bed capacity was increased to accommodate the surge of patients due to the COVID-19 pandemic and occupancy rates were high, however, beds available and occupied are returning to pre-pandemic levels (NHS England, 2021).

1.2.2 Levels of dependency

Critical care patients are divided into levels of dependency based on the severity of their illness (Intensive Care Society, 2009). These are summarised below in Table 1.

Level of dependency	**Definition**
Level 0	A patient requiring hospital care.
Level 1	A patient requiring ward-level care who may be recently discharged from critical care or require a minimum of four-hourly cardiovascular observations.
Level 2	Patients require close observation and intervention for one failing organ. They might also be patients who are stepping down from a higher level of care. They can be nursed in a HDU or mixed critical care unit.
Level 3	Patients are critically ill. They require advanced invasive respiratory support, or support for two or more failing organs. They should be nursed on an ICU or ICU bed in a mixed unit.

Table 1: Summary of patient dependency levels (Intensive Care Society, 2013).

1.2.3 Safe staffing ratios

Both the Intensive Care Society (ICS) and British Association of Critical Care Nurses (BACCN) have issued guidance on safe-staffing levels for critical care in the United Kingdom. The BACCN statement includes guidance regarding the minimum

number of nurses with a post-registration qualification in critical care who are on shift at a given time. The BACCN and ICS state that mechanically ventilated patients should be nursed one-to-one and that a supernumerary co-ordinator should be present for each shift (Bray et al., 2010; Intensive Care Society, 2015). Level 2 patients are generally nursed with a ratio of two patients to one nurse in the United Kingdom (Intensive Care Society, 2015). It is recommended that level 3 patients are nursed one to one (Intensive Care Society, 2015). However, the ICS also suggests that clinical judgement should inform ratios. As such, an acutely agitated delirious level 2 patient may be deemed to require 1:1 nursing, despite being a lower level of clinical dependency (Intensive Care Society, 2015). The COVID-19 pandemic brought emergency temporary standards which allowed a reduction in the nurse to patient ratios, along with non-critical care trained staff working under the supervision of critical care nurses to accommodate the patient surge (UK Critical Care Nursing Alliance, 2020). The changes to ratios should be reversed once recovery from the surge is reached.

Staffing ratios vary outside the United Kingdom (Benbenbishty et al., 2010), with some countries, such as the USA, using technicians to manage mechanical ventilation and other invasive interventions, and therefore decreasing the nurse to patient ratio (Martin and Mathisen, 2005). Decreased nurse to patient ratios have been shown to increase patient mortality in critical care in a multi-centre study (Neuraz et al., 2015). However, recruitment problems and pressure for critical care nurses to work more flexibly have impacted on ‘gold standard’ staffing ratios in the UK (Bray et al., 2010).

1.3 Decision-making in critical care

Nurses are encouraged to be active decision-makers. This is especially true in critical care, where nurses have been shown to make a decision approximately

every 30 seconds (Bucknall, 2000). In evidence-based decision-making, nurses gather information from their own clinical expertise, patient preference, and research and combine these sources to arrive at a decision, often selecting from a range of potential decisions (Dowding and Thompson, 2004). Clinical judgements and decisions are defined below (Table 2).

Clinical judgement	An 'opinion' held by a healthcare professional about a patient or situation. For example, a nurse may make a judgement about a patient with delirium in terms of their cognitive ability.
Clinical decision-making	A choice which produces an outcome. For example, having judged the patient to have impaired cognition due to delirium, the nurse may make the decision to apply restraint in order to prevent disruption of treatment or devices.

Table 2: Definitions of judgement and decision-making (Thompson & Dowding, 2009).

As nurses are human rather than objective machines, their decision-making can be flawed. For example, uncertainty or ambiguity leads to increased risk of making the 'wrong' decision (Carroll and Johnson, 1990). When managing hyperactive delirium, nurses may experience high pressure to make rapid decisions. Pressure may be generated through the need to preserve life-sustaining devices such as endo-tracheal tubes which may be disturbed by agitated behaviour. Critical care nurses work in a high acuity environment where patients are at risk of physiological deterioration and nurses are required to be constantly alert. Making rapid decisions under pressure can lead to the use of shortcuts, known as heuristics, where decision-making is based on rules developed from previous experiences (Thompson and Dowding, 2009a). Decision-making can also be highly subjective. Clinicians often consider their decision-making to be of a high quality, but are not fully conscious of the process or rules which govern their process of judgement and decision-making (Thompson and Dowding, 2009a). Finally, decision-

makers may diverge from what is considered to be acceptable or desirable behaviour (Carroll and Johnson, 1990). An example from the context of this thesis is the possibility that a nurse may choose to restrain a patient rather than therapeutically manage their delirium in order to have an ‘easier’ shift.

Studying the process of decision-making has the potential to improve practice through increasing the understanding individual has of how and why they make their decisions. Critical care nurses make frequent high-impact decisions (Bucknall, 2000). There is a risk that some decisions may contribute to the iatrogenic harm caused to patients. Approximately 5% of patients are exposed to preventable harm in healthcare settings (Panagioti et al., 2019). This percentage increases in advanced specialities such as critical care (Panagioti et al., 2019). Therefore, an improved understanding of how and why nurses make certain decisions may enable the reduction of avoidable harm to patients (Thompson et al., 2013). In addition, an increased understanding by nurses regarding their own decision-making processes may improve the way they communicate their decisions to colleagues in the multi-disciplinary team (MDT) (Parker-Tomlin et al., 2017), further improving patient care.

1.4 Delirium

1.4.1 Definitions and prevalence of subtypes

Delirium is a common yet frequently underdiagnosed form of organ dysfunction in the critical care population (van Eijk, 2009). It is defined as a rapid onset, reversible, fluctuating condition characterised by inattention, changes in cognition, disordered sleep-wake cycle, and increased or decreased psychomotor activity (American Psychiatric Association, 2013). The incidence of all sub-types of delirium amongst mechanically ventilated patients is thought to be approximately 20-50% (Krewulak et al., 2018), however, others estimate it to be as high as 80%

(Brummel and Girard, 2013). There are three subtypes: Hyperactive, hypoactive, and mixed. Mixed delirium was the most common subtype, accounting for 54.9% of cases in a survey of 614 critically ill patients, whilst pure hyperactive delirium only occurred in 1.6% of patients (Peterson et al., 2006). The remainder experienced hypoactive delirium (Peterson et al., 2006). Although hyperactive delirium is the least common clinical presentation, it is the most obvious and clinically disruptive as psychomotor agitation risks the removal of life-sustaining devices and challenge the clinical routines of a critical care unit. Hyperactive delirium and the associated psychomotor agitation form the focus of this thesis and these terms will be used throughout the work.

All types of delirium present as a constellation of clinical symptoms and behavioural traits. A typical patient experiencing hyperactive delirium will exhibit agitated and restless behaviour, hypervigilance, and will be intolerant of clinical interventions and monitoring. A patient with hypoactive delirium will be withdrawn, lethargic and demonstrate reduced or absent speech (Cavallazzi et al., 2012). Mixed delirium presents as a combination of both clinical manifestations (Cavallazzi et al., 2012). The clinical manifestations of the subtypes of delirium are summarised in Table 3.

Delirium sub-type	**Clinical manifestation**
Hyperactive delirium	Agitation, hypervigilance, combative, sleep-wake cycle disturbance, inattention, hallucinations, and delusions.
Hypoactive delirium	Reduced alertness, absent or slowed speech, hyperkinesia, sleep-wake cycle disturbance, withdrawal, and lethargy.
Mixed delirium	Includes manifestations of both subtypes.

Table 3: Delirium subtypes (Cavallazzi et al., 2012)

1.4.2 Risk factors for delirium

The causes of all sub-types of delirium are multifactorial. Risk factors can be divided into pre-admission factors which predispose delirium development, and post-admission interventions which have been shown to increase the likelihood delirium. Predisposing factors include existing cognitive impairment, mental health disorders, and hypertension (Zaal et al., 2015b). Alcohol and nicotine use have also been linked with the development of delirium (Heeder et al., 2015; Van Rompaey et al., 2009). In addition, a high proportion of patients with COVID-19 receiving critical care develop delirium and encephalopathy (Kotfis et al., 2020; Helms et al., 2020).

Post-admission risk factors include multi-organ failure, deep continuous sedation, emergency admission, anticholinergic drugs, mechanical ventilation, and the requirement of tubes, catheters and invasive access lines (Van Rompaey et al., 2009). The physical environment of the critical care unit is linked to an increased risk of a patient developing delirium. Environmental factors included being nursed in an isolation room, the absence of visitors, lack of natural light, transfer from another ward and the use of physical restraint (Van Rompaey et al., 2009).

Post-admission factors must be considered in light of the COVID-19 pandemic and the necessary changes which were instituted in critical care units to maintain infection control measures. For example, patients were more likely to be nursed in isolation, lack of visitors, and the requirement for clinicians to wear full personal protective equipment (PPE) had a negative impact on the ability to engage therapeutically with patients (Pun et al., 2021).

Researchers differ in their views regarding benzodiazepine sedation, with some viewing it as deliriogenic and associated with increased ventilator time (Jakob et al., 2012). The use of continuous benzodiazepine infusions have been linked to transitioning into delirium from both awake and sedated states (Zaal et al., 2013;

Zaal et al., 2015a). However, a meta-analysis conducted by Zaal et al. (2015a) found inadequate evidence to link delirium and benzodiazepine sedation. The authors concluded that the results of the included studies included inconsistencies which made it difficult to draw a firm conclusion (Zaal et al., 2015b). The inconsistences were related to perceived interplay between delirium as a syndrome, indications for the use of benzodiazepines and opioids, and the potential adverse effects related to benzodiazepine administration (Zaal et al., 2015b). However, the use of dexmedetomidine, a short-term a_2 adrenoceptor agonist, was associated with a lower delirium prevalence. The same review found moderate evidence that multi-organ failure, common in critical care patients, is also associated with the onset of delirium (Zaal et al., 2015b).

1.4.3 Pathophysiology of delirium

Delirium is the result of acute brain dysfunction (Gunther et al., 2008). Neuroimaging suggests widespread, rather than local, brain damage. Delirium has been linked to long-term post-discharge white-matter changes, similar to those seen in dementia (Salluh et al., 2015). All sub-types of delirium have been linked to cerebral damage due to hypoxia or ischaemia, potentially due to the accumulation of micro-emboli following cardiopulmonary bypass (Steiner, 2011). Peripheral and systemic inflammation, as seen in sepsis, is associated with the development of delirium because of the interaction between pro-inflammatory cytokines and the brain (Steiner, 2011). Finally, complex interactions between the brain and neurotransmitters, such as acetylcholine and dopamine, have been linked to the development of delirium (Steiner, 2011). Cholinergic insufficiency is associated with agitated behaviour. Anti-cholinergic medications function by blocking acetylcholine from binding to its receptors. Parasympathetic nerve impulses are then inhibited, and thus involuntary movement or excess mucous secretion will be reduced (Gunther et al., 2008; Steiner, 2011). Additionally, hypoxia, common in the critically

ill patient, can disrupt the acetylcholine binding process, and is therefore linked with cholinergic dysfunction (Steiner, 2011).

1.4.4 The recalled experience of delirium

Delusions and hallucinations can be present in hyperactive, hypoactive and mixed forms of delirium. A delusion is a false belief stemming from an incorrect perception of reality and can be sustained over a period of time. A hallucination is a false, or distorted sensory perception. For some patients, delirium is a terrifying experience, with their hallucinations and delusions having a vivid, violent and persecutory nature (Svenningsen et al., 2016). Such memories can merge with factual memories of critical care interventions and cause considerable distress (Wade et al., 2015). Patient accounts suggest that such delusions may play a role in agitated behaviours (Aaronovitch, 2011), with patients attempting to 'fight off' nurses who are perceived to be threats. It is common for intrusive memories of hallucinations and delusions to trouble discharged patients for long periods (Wade and Page, 2016). Wolters et al. (2016) found that, at one-year post-discharge, 45% of a cohort of 567 persons exhibited symptoms of depression, anxiety, and/or post-traumatic stress disorder. However, an association was not found between delirium and the development of post-traumatic stress disorder (PTSD) (Wolters et al., 2016).

All sub-types of delirium are associated with reduced quality of patient outcomes and experience, both during critical care admission and following discharge (Salluh et al., 2015). The psychomotor agitation associated with hyperactive delirium can be clinically disruptive and is associated with increased use of chemical and physical restraint, which are further linked to impaired patient outcomes.

1.4.5 Delirium screening tools

This section will discuss the available delirium screening tools. Such tools are intended to detect all sub-types of delirium. Delirium cannot be diagnosed by any blood test or clinical investigation. Psychomotor agitation, which is associated with hyperactive delirium, is easy to identify, however, some researchers argue that not all agitation is symptomatic of hyperactive delirium (Almeida et al., 2016; Guenther et al., 2012). Subjective assessment by clinicians has been shown to markedly under-diagnose delirium (van Eijk, 2009). Appropriate and timely delirium management is an essential aspect of the management of a critically ill patient (Barr et al., 2013), and the use of a validated screening tool, enabling early treatment and management, can have a significant positive impact on patient outcomes (Trogrlic et al., 2016). Without a diagnosis of delirium, clinicians are unable to identify and treat the cause, and therefore the delirious state, with the clinical complications it entails, will be prolonged (Page, 2012).

Health measurement scales are used to measure specific symptoms or traits associated with various medical conditions (Keszei et al., 2010). Measurement scales and tools, such as the ones used to identify delirium, can be used to support clinical decision-making. For example, a diagnosis of delirium obtained from a measurement tool should prompt the nursing and medical teams to identify underlying factors leading to the delirious state and act to minimise these where possible. However, before a tool is used in this way, it must first be evaluated in terms of validity and reliability (Keszei et al., 2010). The common tools used for delirium screening will now be introduced, followed by a discussion of the reliability and validity of the two most used tools in critical care.

There are five main tools currently used in critical care areas to screen for the presence of all sub-types of delirium (Devlin et al., 2007). Of these, the

Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and the Intensive Care Delirium Screening Checklist (ICDSC) are most commonly used. These two tools have been validated in a number of studies (Cavallazzi et al., 2012) and enable a quick and accurate diagnosis to be made at the bedside. A summary of available tools is presented in Table 4.

Screening tool	**Content**
Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)	Acute onset mental status change or fluctuations; inattention; disorganised thinking. Specific to critical care and can be used in intubated patients.
Intensive Care Delirium Screening Checklist (ICDSC)	Eight domains: consciousness, attentiveness, orientation, the presence of hallucinations or delusions, psychomotor agitation or retardation, inappropriate speech or mood, sleep/wake cycle disturbances, and overall symptom fluctuation. Developed for ICU patients.
Cognitive Test for Delirium (CTD)	Five domains: Orientation, attention span, memory, comprehension and vigilance. Each domain carries a score.
NEECHAM Scale	Nine-item scale separated into three categories: 1) ability to process information; 2) behaviour; 3) physiological condition. Adapted for use in ICU.
Delirium Detection Scale	Nine domains: agitation, anxiety, hallucination, orientation, seizures, tremor, paroxysmal sweating, and altered sleep-wake rhythm. Adapted from Clinical Institute Withdrawal Assessment for Alcohol Scale. Not all domains are seen in ICU delirium.

Table 4: Delirium screening tools (Devlin et al., 2007)

A discussion of the reliability, validity and utility of the ICDSC and CAM-ICU will now be presented. When considering health measurement scales, the tool's ability to minimise the presence of random error, produce meaningful information about the patient being screened, and be feasible for use, must be considered

(Keszei et al., 2010). These facets correspond with the concepts of reliability, validity and utility. An instrument must be able to measure a symptom or trait in a reproducible manner. This means that if the tool is used by separate operators, or the same operator at a different time, similar results should be yielded if the patient condition has remained the same (Keszei et al., 2010). Interrater reliability is particularly important when the test is not self-administered, such as in the case of CAM-ICU and ICDSC. CAM-ICU has been demonstrated to have 'almost perfect' interrater reliability (95%/kappa 0.89) (Ely et al., 2001a; Boettger et al., 2017; Luetz et al., 2010). The ICDSC was tested by Ewers et al. (2020) and found to have a moderate interrater reliability (85%/kappa 0.56). Critical care units have large nursing and multi-disciplinary workforces. Therefore, high interrater reliability is necessary to ensure that a tool can screen consistently across professional knowledge boundaries.

Validity is concerned with the ability of the tool to yield meaningful data about the trait it aims to screen (Keszei et al., 2010). There are four main types of validity which are considered when evaluating a tool (Bahariniya et al., 2021):

- **Content validity** is concerned with how the test represents what it aims to measure.
- **Construct validity** refers to whether the test measures what it is intended to measure and explores how this fits with other constructs.
- **Face validity** asks whether the content of the test is appropriate to meet its aims.
- **Criterion validity** focuses on whether the test and results accurately measure the outcome they are designed to measure.

A highly valid tool will accurately portray, and produce results consistent with, the clinical reality being screened (Bahariniya et al., 2021). In the case of delirium

screening, a valid tool will accurately detect delirium. Within these types of validity, there is a hierarchy of quality. For example, face validity is the weakest and simplest type as it simply asks whether the tool appears to measure what it intends to. However, this is an important starting point when assessing validity. Content validity is more rigorous, as it evaluates whether the tool actually measures what it claims to, and whether it will be able to meet the goals of the research. Criterion validity relates to variables within the dataset and how they are related. Finally, a tool with high construct validity will combine all the previous measures to evaluate how the phenomenon being measured fits into both empirical and theoretical landscape (Bahariniya et al., 2021).

Both CAM-ICU and the ICDSC have been evaluated for use in critical care settings for both ventilated and non-ventilated patients (Boettger et al., 2017). CAM-ICU and ICDSC have been shown to demonstrate content validity, meaning that the tool measures what it is intended to measure, however, as noted above, this falls relatively low in the hierarchy of validity and should be considered with caution. CAM-ICU has a high specificity (95-89%) (Ely et al., 2001a; Boettger et al., 2017; Luetz et al., 2010). Gusmao-Flores et al. (2012) undertook a systematic review of nine studies (including 969 patients). They found that the pooled sensitivity of the CAM-ICU was 80.0% (95% confidence interval: 77.1 to 82.6%). The ICDSC scored slightly lower in the same review, demonstrating a moderate pooled sensitivity of 81.9% (95% CI: 76.7 to 86.4%) (Gusmao-Flores et al., 2012). A highly sensitive test is able to detect a true negative (Trevethan, 2017) and avoid false positives, giving accurate and consistent results. Pooled sensitivity refers to the statistical method of combining a number of studies regarding sensitivity (Trevethan, 2017). Gusmao-Flores et al. (2012) concluded that CAM-ICU was an accurate and appropriate tool to be used for the detection of delirium in ICU. In addition, the tool is used internationally, and has been

validated for use in a variety of languages (Ewers et al., 2020). The ICDSC was rated slightly lower in terms of sensitivity and specificity, but was also considered to be a good tool for use in detecting delirium in critical care (Gusmao-Flores et al., 2012).

A measurement tool must also be feasible and fit for use in the environment for which it is intended (Keszei et al., 2010). CAM-ICU has been described by nurses and other health professionals as a useful tool in identifying delirium (Ramoo et al., 2018). However, 33% of the nurses surveyed by Eastwood et al. (2012) found the tool ‘quite’ or ‘very’ hard to use correctly. Despite this, 82% of the 45 survey respondents were keen to persist with the tool as they found it facilitated appropriate delirium management and encouraged inter-disciplinary decision-making (Eastwood et al., 2012). In contrast, the ICDSC was rated as clear, easy to use, and relevant to practice by 97.1% of the 30 critical care nurses surveyed by Detroyer et al. (2020). However, four participants found that the aspects of the ICDSC relating to speech and fluctuation of symptoms were challenging to assess in intubated patients. This has been found to reduce the tool’s sensitivity when assessing this subgroup (van Eijk, 2009) thus affecting its validity and reliability.

The use of a validated delirium screening tool, rather than subjective interpretation and reliance on intuition, remains inconsistent amongst critical care nurses. Despite close monitoring of the heart, lungs and kidneys, studies suggest that screening for brain dysfunction through the use of a validated delirium assessment tool is considered a lower priority (Ely et al., 2004; Devlin et al., 2008). Identified barriers to nurses undertaking delirium screening include the incorrect belief that delirium is an inevitable consequence of critical illness, reluctance to change patient management practices, and the belief that delirium management guidance is difficult or cumbersome to follow in practice (Trogrlic et al., 2016; Ewers et al., 2020). One participant in the focus groups held by Ewers et al. (2020) saw

delirium assessment as a potential burden for critically ill patients. In addition, Elliott (2014) surveyed 149 nursing and medical staff members across three UK-based ICUs. 44% of respondents stated that they had received no education about the role of CAM-ICU in delirium assessment. However, when supported by continuous education, a delirium screening and management programme was associated with reduced mortality and length of critical care admission (Trogrlic et al., 2015).

1.4.6 Clinical guidance for the management of delirium

This section will discuss national and professional delirium management guidance. The guidance covers all delirium sub-types; however, a particular emphasis will be given to aspects which relate specifically to hyperactive delirium.

The National Institute for Health and Care Excellence (NICE) issued guidance for assessing and managing delirious patients in all hospital settings (NICE, 2019). Identification of risk factors and prevention of modifiable causes, such as dehydration and hypoxia are recommended. The guidance included advice about verbal de-escalation techniques for agitated patients. In the event of dangerous agitation, the administration of Haloperidol was recommended.

The Intensive Care Society (ICS) and the Faculty of Intensive Care Medicine (FICM) state that all critical care patients should be screened for delirium using a validated tool at least once per day, and that non-pharmacological measures should be employed to prevent and reduce delirium (Intensive Care Society, 2019). Non-pharmacological delirium management suggestions included environmental adjustments, such as the use of an analogue clock, and regular orientation and engagement by critical care staff (Intensive Care Society, 2019).

All delirium guidance documents emphasised the need for non-pharmacological or therapeutic management methods to be delivered as a priority,

alongside the identification of potentially deliriogenic factors. Therapeutic management can be defined as any non-pharmacological or non-restrictive intervention designed to reduce the incidence or duration of delirium. Such interventions include verbal re-orientation, optimisation of senses using aids such as glasses or hearing aids, sunlight, sleep hygiene, and early mobilisation (Bannon et al., 2019). The utilisation of multi-modal non-pharmacological delirium management strategies have been shown to reducing the duration of ICU admission (Deng et al., 2020). In addition, this systematic review of 26 studies found that family involvement appeared promising in reducing the incidence of delirium, however the authors note the need for further research to fully explore how the presence of relatives affects delirium.

National and professional guidance has generated clinical care bundles, such as the PAD guideline, which aims to prioritise, assess, and treat pain, agitation and delirium (Barr et al., 2013), and the awake and breathing co-ordinated approach (ABCDE). This bundle focused on early weaning from mechanical ventilation, careful choice of sedative agents, together with close monitoring for delirium, followed by early mobilisation (Pandharipande et al., 2010). The ABCDE bundle was extended to include the involvement of the patient's family in their on-going care (Balas et al., 2016). Guidance by Grounds et al. (2014) and Devlin et al. (2018) emphasised treatment and removal of the cause of agitation, light sedation, regular delirium screening and non-pharmacological management methods above the use of restraint. Local guidelines exist in UK Trusts and critical care units. These reflect the above guidance. The main guidelines associated with clinical management of delirium are summarised below in Table 5.

Guidance	Recommendations
NICE (2019)	Identification of risk factors, prevention of modifiable causes, verbal de-escalation. Haloperidol for dangerous agitation.
Intensive Care Society (20019)	Early detection, therapeutic management, avoidance of deliriogenic drugs, Haloperidol and Olanzapine suggested for management of hyperactive delirium. Specific guidance for delirium resulting from withdrawal syndromes.
Devlin et al (2018)	Assess, treat and prevent. Use of a validated tool for agitation assessment, therapeutic reorientation methods and identification of treatable causes of delirium. Avoid Benzodiazepines.
Pandharipande et al., 2010)	Assess, manage, and prevent pain. Enable spontaneous breathing, careful choice of sedation and analgesia, delirium assessment and management, and early mobilisation.

Table 5: Summary of delirium guidance

1.5 Physical and chemical restraint

Restraint is defined in section 6 (4) of the Mental Capacity Act (Department of Health, 2005) as the use of force, or threatened force, to make a person do something that they are resisting; or the restriction of freedom of movement. Definitions of the types of restraint referred to in this thesis are presented in Table 6 (overleaf).

Martin and Mathisen (2005) define physical restraint in critical care as '*all patient articles, straps, bed linen and vest, used as an intervention to restrict a person's freedom of movement or access to their own body'* (pp 134). Patient articles can include 'boxing gloves' and soft wrist restraints in the UK. Internationally, four limb restraints are also used (Luk et al., 2015a).

Type of restraint	Definition
Physical restraint	An adjunct (padded gloves, splints, cuffs) applied with the intention of immobilising or reducing the ability of a person to move their arms, legs, body, or head freely.
Chemical restraint	A drug administered in excess or in addition to the normal required dose for a patient to tolerate critical care therapies with the intension of reducing psychomotor agitation.
Manual restraint	'Hands-on' restraint – the use of forceful holding of limbs with the intention of immobilising or reducing the ability of a person to move their arms, legs, body, or head freely.

Table 6: Definitions of types of restraint as used in this thesis (Intensive Care Society, 2021).

Chemical restraint is commonplace in critical care. A degree of sedation is necessary to enable patients to tolerate an endotracheal tube and mechanical ventilation without discomfort or distress (Woodrow, 2012). However, additional *pro re nata* (PRN) or bolus sedation can be used to chemically restrain an agitated patient by sedating them beyond their standard therapy (Bray et al., 2004). The ICS recommend the use of sedation scoring systems to avoid prolonged over-sedation and advise staff to address the cause of psychomotor agitation (Grounds et al., 2014). Commonly used sedative drugs are summarised in Table 7 and may include benzodiazepines (Lorazepam, Diazepam), Propofol and anti-psychotic typicals (Haloperidol) and atypicals (Olanzapine) (Bray et al., 2004).

Drug family	Examples	Pharmacodynamics
Opiates	Morphine, Alfentanil, Remifentanil, Fentanyl	Bind to opioid receptors in the brain and enhance the effect of neurotransmitters to provide pain relief. Also cause respiratory depression and minimal diminished tone in venous vessels.
Benzodiazepines	Midazolam, Lorazepam	Increase the activity of gamma-aminobutyric acid (GABA) receptors to inhibit the central nervous system and cause anxiolysis and sedation. Minimal haemodynamic effects, ultra-short-acting. Infusions can cause accumulation and prolonged effects. Linked to prolonged ICU stays.
Typical anti-psychotics	Haloperidol	Blocks dopamine and serotonin receptors. 2-5 minute onset, half-life of several hours.
Atypical anti-psychotics	Olanzapine	Dopamine antagonist.
Anaesthetic agents	Propofol	Lipid-soluble solution, acts on GABA receptors. Rapid onset, and quick cessation of anaesthesia on cessation of infusion.
Alpha-2 agonists	Clonidine, Dexmedetomidine	Inhibits adenylyl cyclase activity, sedative and analgesic properties. Causes bradycardia and hypotension.

Table 7: Summary of drugs used to reduce agitation in critical care (Hall, 2009)

1.5.1 Why are patients restrained in critical care?

In hyperactive delirium, the patient is agitated, perhaps combative, and because of their disordered thinking they may be unable to appreciate the severity of their illness, nor the importance of nursing interventions and vital monitoring (Fan et al., 2012). Agitated behaviour places patients at a high risk of disrupting life-sustaining therapies and equipment, such as endotracheal tubes, central venous access and arterial lines (Kiekkas et al., 2013). The results can be catastrophic, including haemodynamic compromise, difficult reintubation, and death (Bouza et al., 2007). For this reason, chemical or physical restraint is often cited by staff as a method of preserving patient safety (Fan et al., 2012; Freeman et al., 2016;

Benbenbishty et al., 2010). However, studies report that there is a higher incidence of unplanned extubation amongst physically restrained patients (Tung et al., 2001; Curry et al., 2008; Chang et al., 2011; Ai et al., 2018). It is unclear as to whether the presence of restraints contributed to the unplanned removal of the endotracheal tube, or if patients more likely to self-extubate were restrained. However, physical restraint has been shown to increase agitation (Kiekkas et al., 2013). Chemical restraint appears to be considered by nurses to be 'kinder' than applying physical restraints (Freeman and Teece, 2017). However, periods of deep sedation have been shown to have a negative impact on the long-term recovery of patients (Jones, 2010).

There has been growing acknowledgment of the role that deep sedation has played in adverse patient consequences such as increased ventilator days, delirium, delayed mobilisation, and long-term psychological effects (Burry et al., 2014). Critical care patients require sedation to facilitate invasive therapies, however, there has been a move towards reduced sedation and the introduction of daily sedation interruptions (DSI). A DSI is a planned pause in the continuous administration of intravenous sedation. It enables the clinician to assess the patient neurologically, and prevents the bioaccumulation of sedation (Burry et al., 2014). In addition, there has been a move towards targeted sedation using assessment tools such as the Richmond Agitation and Sedation Scale (RASS) or the Sedation-Agitation Scale (SAS) (Guzman et al., 2009). These changes aimed to reduce the indiscriminate use of deep sedation for all critical care patients

1.5.2 Restraint guidance

The ICS (2019) advises clinicians to identify and actively treat the underlying cause of delirium if clinically possible. The use of targeted sedation is encouraged in order to avoid over-sedation, and therapeutic management of delirium should be the

first-line response. Later ICS guidance emphasised that restraint should only be used if other methods have failed to reduce agitation and patient safety was at risk (Intensive Care Society, 2021). Physical restraint must be authorised by the senior nurse and doctor on the shift and the need for restraint must be reviewed continually and documented 12-hourly as a minimum. Anti-psychotic drugs should be reserved for use in the management of acute agitation (Intensive Care Society, 2015). Haloperidol has been shown to have no modifying impact on the severity or duration of delirium (Page et al., 2013) and is recommended only in the short-term management of acute agitation (NICE, 2019).

The Critical Care National Network Nurse Leads Forum (CC3N) issued guidance regarding the use of physical restraint (Wilson et al., 2008). They advised that the decision to apply restraint is made by the senior clinical nurse or consultant on duty, and that only staff trained in the use and management of restraints should apply them. Again, the importance of timely documentation was emphasised, together with the need to remove restraints twice daily to facilitate the checking or pressure areas and identify whether continued restraint is necessary.

The British Association of Critical Care Nurses (BACCN) issued guidance in response to calls for clarity of definition and practice from critical care nurses (Bray et al., 2004). They stated that restraint should only be used to enable the nurse to provide optimal patient care, and only when all alternatives have been exhausted. Restraint should never be used as a replacement for staff. All decisions pertaining to restraint use should be agreed with the multi-disciplinary team (MDT) and the use of restraint should be continually assessed, evaluated and documented in the patient's notes. Education of staff and involvement of the patient and their family in decision-making is also recommended (Bray et al., 2004). Guidance for American nurses was issued in 2003 by the American College of Critical Care Medicine (Maccioli et al., 2003). The guidance is similar to that provided by the BACCN and

adds that practitioners should use the least restrictive approach possible, and that sedatives and anti-psychotics should be used to reduce the need for physical restraint. In addition to these national professional body position statements, local guidance for restraint is available. This is in line with advice from both the above discussed professional bodies. The main guidance related to the use of chemical and physical restraint in critical care is summarised in Table 8 below.

Author	**Chemical and/or physical?**	**Main recommendations**
Maccioli et al (2003)	Physical and chemical	Creation of least restrictive environment; avoid routine use of restraint; treat underlying cause; least invasive restraint option used; document rationale; 4hrly monitoring of restrained patients; education for family and patient; chemical restraint should be used to reduce the need for physical restraint, not replace it.
Bray et al (2004)	Physical and chemical	The purpose of restraint is to facilitate optimal patient care; restraint is not an alternative for inadequate staffing; units are responsible for protocol development; restraint use must be documented; education and involvement for family and patient; staff education and inclusion of restraint use in competency frameworks.
Wilson et al (2008)	Physical	Physical restraint can be used only on adult patients; CAM-ICU positive or lacking capacity; potential risk to themselves; escalating chemical restraint requirements if physical restraint not applied; identify and treat underlying causes; decision to restraint to be made by the senior clinician; documentation of decision and rationale; decision to be discussed with patient's next of kin.
Intensive Care Society (2021)	Physical	Restraint should only be used as a last resort and should apply the minimum restriction necessary to ensure patient safety. Restraint must not be used if the patient has capacity. Restraint must be authorised by the senior nurse and doctor on shift and reviewed by a consultant within 12hrs.

Table 8 - Summary of restraint guidance in critical care

1.5.3 The legalities of restraint in the UK

Critical care practitioners are bound by law and professional codes of conduct when engaging with delirious patients. The ICS has issued guidance on the Mental Capacity Act and Deprivation of Liberty Safeguards (DoLs)/Liberty Protection Safeguards (LPS) (Intensive Care Society, 2017). They state that,

following the recent Ferreira v HM Coroner case (Ferreira vs HM Senior Coroner 2017), critical care and the necessary interventions fall outside DoLs guidance. In this pivotal test case, Ferreirra, who had Downs' Syndrome and learning disabilities, died in intensive care following the dislodgement of her endotracheal tube whilst wearing physical restraints on her hands. The coroner found that her underlying illness and resulting treatment was the cause of her deprivation of liberty, rather than any restrictive practice, and that similar care would have been given to any person of sound mind (*Ferreira vs HM Senior Coroner* 2017). This suggests that the deprivation of a person's liberty may fall beyond the scope of Article 5 of the European Convention of Human Rights (1988) (Intensive Care Society, 2017). However, it is advised that, in the case of a patient requiring significant coercion, that the Trust seek legal advice (Intensive Care Society, 2017). The degree of coercion deemed 'significant' is not specified in the document. Critical care staff do not need to wait for a successful LPS/DoLS application before restraining a delirious patient. However, the duration of delirium should be considered together with the threat to treatment posed by agitation (Lakatos, 2020a).

1.6 Chapter summary

- Delirium has a high prevalence amongst the critical care population. Although hyperactive delirium is the least common sub-type, it is clinically disruptive as psychomotor agitation can risk the disruption of life-sustaining therapies and medical devices.
- Clinical guidance relating to delirium emphasises the importance of identifying underlying factors which may be contributing to the delirious state. Therapeutic management, such as communication, re-orientation, and mobilisation should be provided.

- Chemical and physical restraint are commonly used in critical care with the primary given rationale of preserving patient and device safety.
- However, the efficacy of restraint in achieving this goal is disputed. Physical restraint does not appear to reduce unplanned self-extubation and periods of deep sedation are associated with an increase in delirium.
- Critical care is a high-acuity and high-risk clinical environment. Nurses are tasked with preserving the safety of critically ill patients. They are estimated to make clinical decisions every 30 seconds.

Chapter 2 Literature Review

2.1 Introduction

Conducting a literature review involves the examination and appraisal of previous work, followed by the synthesis of the information gained from the investigation. In healthcare research, reviews can be used as the basis for evidence based-practice (Grant and Booth, 2009). An integrative approach was chosen for this review.

2.1.1 Selecting a method for the literature review

A wide variety of methods are available in for researchers undertaking reviews of healthcare-related literature. However, not all review types have a coherent and rigorous approach to searching, appraisal and analysis (Hopia et al., 2016). High-quality syntheses of research are useful to time-pressured healthcare professionals to enable them to remain up-to-date with evidence-based practice (Hopia et al., 2016). A number of potential approaches were considered which will now be discussed in terms of their strengths and limitations.

2.1.2 Scoping reviews

Scoping reviews have become increasingly popular in healthcare research as a method of reviewing and mapping large bodies of evidence (Anderson et al., 2008). The scoping method was initially proposed by Arksey and O'Malley (2005). Six stages were identified in the scoping process. Firstly, the research question is defined, followed by the identification of relevant studies and selection of those which contribute to answering the research question. The data should be charted, then collated and summarised. The sixth stage is an optional consultation with

stakeholders (Arksey and O'Malley, 2005). The scoping process was further developed by Levac et al. (2010) and Colquhoun et al. (2014) with additional steps added. Additional steps included increased clarity in how the question was expressed and considering the purpose of the review (Levac et al., 2010). The increased clarity regarding the rationale for undertaking the scoping review aimed to assist the researcher later in the study, for example during screening and data extraction. A scoping review aims to provide a broad overview of a given subject area and typically does not appraise the quality of the studies yielded through the search (Arksey and O'Malley, 2005).

The scoping methodology has been criticised for being imprecisely defined (Anderson et al., 2008), and lacking in consistency between applications (Tricco et al., 2016). Additionally, the lack of quality appraisal has been associated with potential challenges in translating the results into evidence-based practice (Grant and Booth, 2009) and can make the results difficult to interpret (Levac et al., 2010).

2.1.3 Integrative reviews

An integrative review aims to present a summary of existing empirical evidence from diverse methodologies and varied perspectives. An integrative review may also include theoretical papers alongside empirical studies (Whittemore and Knafl, 2005). This type of review aim to use its diverse sampling frame to clearly present the current evidence-base, potentially contribute towards the development of theoretical perspectives, and have direct applicability to clinical practice (Whittemore and Knafl, 2005; Hopia et al., 2016). The diverse types of evidence which can be included in an integrative review make the method appropriate for developing an understanding of complex or emerging phenomena.

Whittemore and Knafl (2005) identified five steps which guide the undertaking of a robust integrative review. These steps are summarised below in Table 9.

Step	**Description**
Define the question and purpose of the review.	Identify a clear problem and purpose for the review.
Undertake a search of the literature.	A comprehensive search should be undertaken, aiming to access all studies and literature available on the topic.
Evaluate and appraise studies.	An appraisal tool appropriate to diverse methodologies should be used.
Analyse data.	Three steps are involved: Reduction, display, comparison and conclusions.
Present the synthesised findings.	Results should aim to capture the depth and breadth of the topic.

Table 9: Steps in an integrative review

The inclusion of varied sources of data in integrative reviews has the potential to reduce rigour and introduce bias (Hopia et al., 2016). This is due to the variety of different approaches to data collection and analysis in the included studies which could present difficulties in creating a coherent data analysis (Hopia et al., 2016). Whittemore and Knafl (2005) suggest that this can be avoided through explicit descriptions of the data extraction and analysis processes used whilst undertaking the review.

Integrative reviews differ from other review typologies in several important ways. In contrast to a systematic review, a second reviewer is not necessary and non-empirical studies may be included if appropriate to the stated aim (Whittemore and Knafl, 2005).Systematic reviews aim for completeness of searching, in contrast to a literature or critical review (Grant and Booth, 2009). An integrative approach was deemed most appropriate for this review due to the expected range of

perspectives and methodologies in the topic area. An integrative design would accommodate the diverse sampling frame required to reach an understanding of how critical care nurses use restraint when managing psychomotor agitation. The method offers a rigorous approach with an emphasis on accurate reporting of processes with the aim of presenting evidence applicable to enhancing clinical practice.

2.2 Method

This section describes the integrative review process undertaken for this study, including generation of a question, facets of interest, search terms and inclusion and exclusion criteria. Rationales for decisions made are included throughout. The review followed the process outlined by Whittemore and Knafl (2005) and Hopia et al. (2016).

2.2.1 Research aim and objectives

Following the identification of the area of interest through reflection on clinical practice and discussion with supervisors and colleagues, an aim for the review was formulated:

To explore how restraint is used in the management of psychomotor agitation and hyperactive delirium in critical care.

The exploratory aim reflects the undefined nature of the use of restraint in critical care, both chemical and physical. The topic under review was deemed broad and reflected the need for completeness. It was therefore important to choose a method and methodology congruent with this. An initial search was conducted with the aim of mapping the extent of research focussed on the use of restraint in the

management of psychomotor agitation secondary to hyperactive delirium in critical care. The broad focus enabled emerging topic areas to be identified and examined, and the clarification of key concepts and research gaps (Hopia et al., 2016). This review aimed to identify and appraise research around the use of restraint in the management of patients with hyperactive critical care delirium. The specific objectives were:

- To identify the extent of research in this topic area.
- To explore how and why physical and chemical restraint are used in the management of psychomotor agitation secondary to hyperactive delirium.

2.2.2 Search strategy

To guide the generation of search terms, three facets relating to the topic were identified: Hyperactive delirium, physical and chemical restraint, and the clinical environment (adult critical care units, including both intensive and high dependency care). The clinical environment facet included studies relating to orally intubated patients, patients with a tracheostomy and self-ventilating patients who were being nurses on a critical care unit. The intention was to conduct a comprehensive search to scope all of the available research in this area (Whittemore and Knafl, 2005).

In critical care, patients exhibiting psychomotor agitation may be managed using physical and chemical restraint with the aim of maintaining patient and staff safety and preventing disruption of life-sustaining treatment and devices (Kiekkas et al., 2013). These forms of restraint may be used concurrently, or separately, during the course of the acute agitated episode (Bray et al., 2004). Because of this overlap, it was decided to search for both chemical and physical restraint to enable a comprehensive review of coercive management methods.

Restraint is well defined in mental health care settings, but less so within critical care (Bray et al., 2004). For this review, bed linen, side rails, monitoring devices and intravenous access devices were disregarded as forms of physical restraint, as they are common to all critical care patients. Physical restraint was defined as the use of padded gloves (Posey Mitts, mittens, or boxing gloves), wrist restraints or other restraint points (Bray et al., 2004). Such interventions deliberately limit the patient's freedom of movement and access to their own body.

Chemical restraint is common in critical care. Patients require continuous sedation infusions of drugs such as Propofol, plus an opiate, such as Alfentanil, to enable tolerance of adjuncts including endotracheal tubes and invasive positive pressure ventilation. However, the focus of this study lay in the use of chemical restraint in the coercive, rather than general, management of the delirious critical care patient. For this review, chemical restraint was defined as the use of sedation beyond the minimum amount to ensure tolerance of interventions and safety. The use of boluses of sedation or other drugs to allow a patient's behaviour to be controlled through reduction of agitation and subsequent sedation, were also included. Papers were also searched for references to 'hands on' or manual restraint.

Changes to a patient's baseline consciousness, such as psychomotor agitation, and inattention are key features of hyperactive delirium (American Psychiatric Association, 2013). Tools such as the Confusion Assessment Method for Intensive Care Units (CAM-ICU) and the Intensive Care Delirium Screening Checklist (ICDSC) enable bedside staff to screen for the presence of delirium (Cavallazzi et al., 2012). Not all psychomotor agitation is caused by delirium (Guenther et al., 2012; Almeida et al., 2016), however, the acute clinical management of the patient would remain the same in terms of preserving safety

and maintaining therapies. Additionally, any agitated patient was likely to score positive for the presence of delirium if a screening tool was used. Therefore, papers relating to agitation were screened for potential inclusion.

2.2.2.1 Inclusion criteria

Studies relating to the use of chemical or physical restraint in the adult critical care population were included for screening. Patients experiencing hyperactive delirium show signs of psychomotor agitation and can experience vivid persecutory hallucinations (Svenningsen et al., 2016). All studies relating to agitation, psychomotor agitation, and delirium were screened for potential inclusion. Pre-existing neurological or mental health conditions are known predictors for the development of delirium and were therefore also included (Van Rompaey et al., 2009). Studies from 1995 onwards were included, to reflect the trend towards lighter sedation and recognition of delirium as a complication of critical illness (Ely et al., 2001b).

2.2.2.2 Exclusion criteria

The critical care management of psychomotor agitation and delirium is often focussed on preventing disturbance to continuous monitoring and life-sustaining devices such as endotracheal tubes and central venous catheters (Kiekkas et al., 2013). Such devices are uncommon in non-critical care ward areas and therefore studies relating to restraint in ward areas were excluded. Paediatric patients were excluded due to the different ethical and legal considerations regarding the application of restraint to minors. Non-coercive delirium management strategies (non-pharmacological or therapeutic delirium management, delirium prevention, evaluation of educational strategies), and studies comparing sedation regimes in

terms of mechanical ventilation days were all excluded as they did not focus on restraint. Inclusion and exclusion criteria are summarised in Table 10, below.

Inclusion	**Exclusion**
Hyperactive delirium	Accident & Emergency and ward settings
Agitation	Paediatric patients
Pre-existing neurological or mental health disorder	Papers published prior to 1995
Critical care/ICU/HDU	Non-coercive delirium management strategies
Chemical restraint	Conference abstracts
Physical restraint	
Adult patients	
English language texts	

Table 10: Inclusion and exclusion criteria

2.2.2.3 Databases

Studies were identified through searching six databases of published work and one of grey literature. The databases searched were CINAHL, PsychInfo, Medline, Cochrane Library, Embase, PubMed and ProQuest. The searches were undertaken between the 5th and 31st January 2017, for papers published between 1st January 1995 and 1st January 2017. The databases used included a wide range of subjects in keeping with the multi-disciplinary focus on the review. The databases and searches were revisited in December 2017, yielding a further two papers for review.

Prior to the submission of this thesis, the search was revisited for a third time. The same terms and databases were searched in July 2021 for studies published between 2017 and 2021. A further five papers were identified which met the criteria for inclusion. Their contributions to the review are summarised at the end of this chapter (section 2.6).

2.2.2.4 Search terms

Search terms were generated from reading studies related to delirium and restraint, reflection on clinical practice and discussion with other health professionals and academics. Terms were matched to each facet, as shown in Table 11 (below).

Facet 1: Delirium	**Facet 2: Restraint**	**Facet 3: Clinical environment**
Delirium	Restraint (Restr*)	Intensive Care
Confusion	Chemical	ICU
ICU syndrome	Coercion/Coercive	High Dependency
ICU psychosis	Pharmacological	HDU
Neurocognitive disorder	Behaviour control	Critical Care
	Sedation	
	Device removal	
	Propofol	
	Unplanned/self extubation	
	Benzodiazepines	
	Treatment interference	
	Dexmedetomidine	
	Physical	
	Haloperidol	
	Boxing gloves	
	Anti-psychotics	
	Posey Mitts	
	Antihistamines	
	Mechanical	
	Opiates	
	Immobilisation	
	PRN	
	Rapid tranquilisation	

Table 11: Search facets and terms

A test search was run via the CINAHL database on 1st December 2016. Initially the third facet (environment) was not applied. However, when the search was run via other databases, the number of studies yielded was very large, for example, over 31,000 studies from Embase. Additionally, a rapid title screen showed that numerous studies were irrelevant, mostly stemming from the mental health and prison sectors. Therefore, the third facet (clinical environment) was applied to subsequent searches, with the result of a narrowed focus.

Boolean operators were used to combine the search terms. In each facet, the terms were combined with ‘OR’ to form one large facet search. Each facet search was then combined with ‘AND’ to produce the final search. This process was replicated in each of the databases listed above. The returned studies were exported into EndNote (The EndNote Team, 2013), a software program dedicated to reference management.

The total number of studies retrieved from each database is presented in Table 12 below. 2968 duplicates were then removed via EndNote and a further manual check. The resulting studies were exported from Endnote into Covidence, a dedicated systematic review software package, for title screening (Veritas Health Innovation, 2018).

Database	**Without clinical environment**	**With clinical environment**
CINAHL	1646	589
Medline	4715	1287
PsychInfo	3269	222
Cochrane	2206	614
Embase	31157	5024
PubMed	1024	129
ProQuest (theses)	14591	2048

Table 12: Databases and numbers of studies returned

2.3 Data evaluation

The screening process undertaken is described in this section. The number of studies retained after each stage of screening is illustrated in figure 2. Whittemore and Knafl (2005) and Hopia et al. (2016) emphasise the need for this process to be made explicit to increase rigour and avoid bias.

2.3.1 Title Screening

Studies were included if the title met the inclusion and exclusion criteria described above. Despite applying search terms which aimed to filter out non-critical care environments, many studies were still based in mental health, prison, or accident and emergency settings. These studies were discarded during title screening.

2.3.2 Abstract screening

The abstracts of the retained studies were screened for suitability for inclusion. Studies were included if the abstract suggested that they would be able to contribute to answering the research question, for example, having a focus on coercion, restraint or management of acute agitation. Non-appropriate studies were excluded.

2.3.3 Full-text screening

Included studies were exported back from Covidence to Endnote for full-text screening, and full-text versions were located. Authors of manuscripts not available from the library service were contacted directly. In the event of receiving no response from the author, the documents were sourced from other libraries. Full-texts for all studies eligible for full-text review were obtained. Conference abstracts were excluded at this stage. A further search was conducted for other papers by the authors of the conference abstracts. These studies were screened and included for full-text reading if appropriate. Some extracts, on full-text screening, were found to be misleading, and the study did not contribute to answering the research question. These were then excluded.

Full-text screening resulted in the exclusion of 40 studies. Reasons for study exclusion are detailed in Table 13, below. Figure 2 shows the PRISMA diagram which details the search process resulting in the identification of 22 papers for data extraction. Statements from professional bodies were excluded from the studies selected for data extraction. This decision was made because the data did not add value to the review and was repetitious. The professional statement papers were retained for background information.

Reason for exclusion	**Number of studies**
No data suitable for extraction	12
Not coercive management of delirium	19
Not ICU delirious population	3
Repetition of included evidence	1
Focus on educational intervention	3
Professional body position statements	2
Total studies excluded	**40**

Table 13: Summary of excluded studies

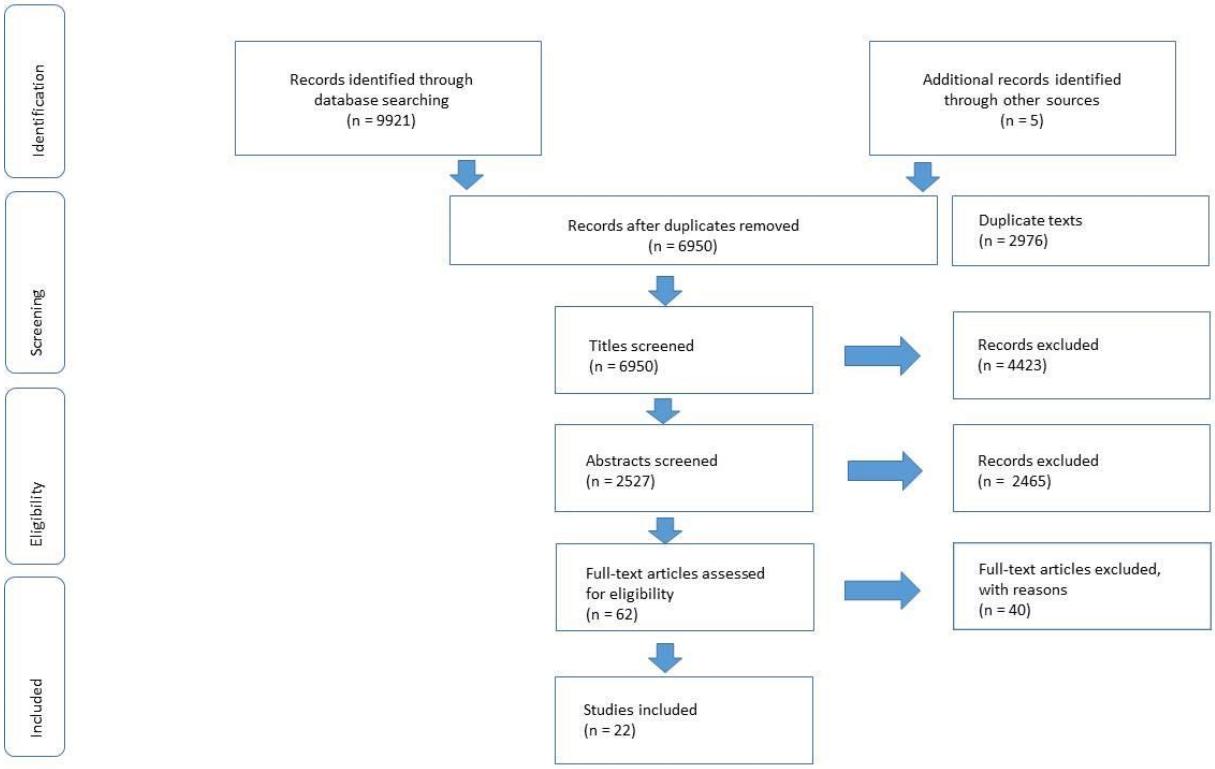


Figure 2: PRISMA diagram

2.3.4 Data Extraction

Data extraction aimed to identify and document data from the studies which would contribute to answering the research question. The process involved iterative readings of papers. A table was created which included headings such as authors, location and study population, and more detailed sections relating to the methods, analysis and results (Appendix A). This both guided and focussed the reading of papers, and ensured that the same type of data was extracted from each paper, therefore reducing bias (University of York and NHS Centre for Reviews & Dissemination, 2009). A sample of the extracted data was reviewed by supervisors with the aim of reducing bias and ensuring accurate reporting.

2.3.5 Critical Appraisal

This section will describe the process undertaken to appraise the studies chosen for inclusion in the review. The role of critical appraisal in literature reviews and evidence-based practice is also discussed.

2.3.5.1 Introduction

Reviews of all types aim to summarise and synthesise large bodies of research. They enable understanding of areas of research and promote quality, evidence-based healthcare (Wang et al., 2015). Clarity of reporting is vital to achieve these aims (Moher et al., 2009). Poor reporting blocks study appraisal and limits effective dissemination of research (Wang et al., 2015). To ensure high quality, standardised reporting, consensus guidance for the reporting of research studies and systematic reviews have been developed. Critical appraisal is a fundamental aspect of literature reviews (Moher et al., 2009). Comprehensive appraisal avoids the inclusion of poor quality or biased evidence in a review. It also

prevents the assumption of the presence of research activity in a given area of interest, as the presence of poor quality research may hide a potential research gap (Katrak et al., 2004). .

2.3.5.2 Choosing an appraisal tool

Critical appraisal can be defined as the systematic assessment and evaluation of research to determine its strengths and weaknesses (Crowe and Sheppard, 2011). It enables a decision to be made regarding the validity and reliability of the study, and allows the reader to consider the study in terms of potential utility for practice and indications for further research (Katrak et al., 2004; Crowe and Sheppard, 2011). To structure the appraisal process, the researcher may wish to use a critical appraisal tool (Katrak et al., 2004). A critical appraisal tool enables the researcher to analyse the quality of a study through answering questions which interrogate the rigour and trustworthiness of the study. Such questions may focus on the sampling process, methodology and measures applied to reduce potential bias (Katrak et al., 2004).

Deciding upon which appraisal tool to choose can be problematic. In their systematic review of appraisal tools, Katrak et al. (2004) identified 121 different published tools from 108 papers. 87% of these tools were specific to a given research method (Katrak et al., 2004). The situation was further complicated by variations in the content, depth, quality and empirical basis of the tools (Katrak et al., 2004; Crowe and Sheppard, 2011). An appraisal tool can be assessed in terms of validity and reliability. To be a valid, a tool must measure what it is intended to measure (University of York and NHS Centre for Reviews & Dissemination, 2009). A reliable tool will return consistent results when employed by a variety of users over a period of time (University of York and NHS Centre for Reviews & Dissemination, 2009).

There is little consensus regarding which aspects of a study should be critiqued by an appraisal tool (Katrak et al., 2004). Crowe and Sheppard (2011) identified 8 categories and 22 items from a review of 44 appraisal tools. Common items for appraisal included aim, sample selection, randomisation, blinding, intervention, outcome, analysis method, bias and external validity (Katrak et al., 2004; Crowe and Sheppard, 2011). The items varied according to which methodology the tool was intended to critique, with further variations within each specific type. To be effective in appraising research, it is necessary that the tool be able to identify and evaluate important aspects of a study.

Evidence that a tool has been tested offers an indication of inter-rater reliability and ease of use which may assist the researcher in making their decision. However, Katrak et al. (2004) found only 12% of the tools reviewed had an empirical basis. Crowe and Sheppard (2011) echoed these findings, noting that 77% of the 44 tools they reviewed had not been tested for reliability, and that 25% lacked a reported validation test. Using an untested tool could result in inaccurate and distorted appraisal.

The researcher still faces the challenge of choosing an appropriate tool from amongst the huge variety available. The EQUATOR (Enhancing the QUAlity and Transparency Of health Research) Network aims to improve the quality and transparency of the reporting of research studies (Moher et al., 2010) and provides links to various resources and training for researchers. Additionally, the Network provides reporting guidelines for various methodologies, including randomised trials, observational studies, case reports and qualitative studies. However, these guidelines remain focussed on individual study types, and no guidance for mixed-studies reviews is included on the EQUATOR network.

2.3.5.3 Mixed methods appraisal

With the advent of meta-synthesis and mixed methods reviews, alternative appraisal tools have been devised to meet researchers' needs. Mixed studies reviews have the potential to create a rich and detailed synthesis, with excellent potential for practical clinical impact (Pace et al., 2012). For example, qualitative studies can assist in the interpretation of quantitative data, whilst a quantitative study might show how qualitative results could be generalised. Additionally, the combination of qualitative and quantitative research in a review can promote understanding of phenomena and measure their potential effects (Pluye and Hong, 2014). In this way, the approaches become complementary when synthesised. However, mixed studies reviews bring challenges in terms of choosing a tool to critically appraise the included studies.

Traditionally, if a review included studies from diverse methodological backgrounds, it would be necessary to separate the studies into quantitative and qualitative designs and appraise them separately (Sirriyeh et al., 2012). This would lead to challenges in comparing the various studies in terms of quality, as the tools would comprise of differing assessment criteria (Sirriyeh et al., 2012). In addition, some researchers argue that qualitative studies should be not appraised in the same way as quantitative studies, due to the variation in approaches and philosophical underpinnings. This leads to difficulties in establishing universal features which are indicative of a high quality, rigorous study (Sirriyeh et al., 2012; Pope and Mays, 2006). There are far fewer qualitative appraisal tools available. Crowe and Sheppard (2011) found eight in their review of appraisal tools. Of these eight, half were content validated, and only one had been reliability tested.

As a result, tools which can be used in the appraisal of mixed studies reviews have been developed. This avoids the challenge of comparing the quality of studies which have been appraised using different tools (Crowe and Sheppard,

2011) and facilitates the pragmatic comparison of large bodies of varied evidence, such as the studies yielded by the review for this project. Such tools are currently in the minority, and there are no standardised reporting guidelines for mixed studies reviews. Crowe and Sheppard (2011) identified six appraisal tools suitable for generic use from their review of 44 peer reviewed tools. Sirriyeh et al. (2012) conducted a systematic search and found only one tool that enabled a pragmatic assessment of mixed methods studies. Their review has since been challenged by the authors of the Mixed Methods Appraisal Tool (MMAT), who believed that their tool should have been included in the discussion (Pluye, 2013).

2.3.5.4 Choosing an appraisal tool for this review

Two mixed studies review appraisal tools were considered. The first was the Mixed Methods Appraisal Tool (MMAT) (Pluye et al., 2011). This tool was developed in response to increased interest in mixed methods reviews and their potential to promote a deeper understanding of healthcare issues. The MMAT consists of two parts. The first details the criteria against which studies are appraised. This includes two general screening questions for all types of studies, then separate sets of prompts for qualitative studies, and different types of quantitative research papers (Pluye et al., 2011). This enables the tool to be used when screening qualitative, quantitative, or mixed methods studies. The second part is a tutorial, designed to support the reviewer in using the MMAT. The tool has been piloted and tested for efficacy and reliability, with good inter-rater reliability scores (Pace et al., 2012).

The MMAT can be used to produce a descriptive summary of an appraisal, or to produce summary or individual scores. Scoring can focus on the quality of each component, or form a summary score to reflect the overall appraisal of the quality of the study (Crowe and Sheppard, 2011). However, the use of a summary score can hide flaws within a study. For example, a poor method may be

compensated if other areas of the paper achieve high scores. The MMAT tutorial suggests a weighted scoring system which may avoid this problem; however, this was not used for this review due to concerns about the potential masking of flaws.

The second tool considered was The Quality Assessment Tool for Studies with Diverse Designs (QATSDD), a 16 item quality assessment tool designed for the pragmatic appraisal of bodies of mixed evidence (Sirriyeh et al., 2012).The tool focusses on the congruency, transparency and quality of the reporting of each study (Fenton et al., 2015). It comprises of 16 questions, to which the reviewer grades the evidence as ‘not at all’, ‘very slightly’, ‘moderately’ or ‘complete’. Each grade carries a numerical weighting. In contrast to the MMAT, the questions are not divided into study types, with the majority being generic and appropriate to any study method. The QATSDD has an empirical basis and has been pilot tested whilst in development (Sirriyeh et al., 2012). Substantial agreement was found amongst users (Sirriyeh et al., 2012). However, the QATSDD has been subsequently criticised for its imprecise language, which could impact negatively on inter-rater reliability. The inclusion of service user involvement as a criteria for appraisal has also been negatively received. Fenton et al. (2015) stated that a good score on this criterion could unfairly elevate one study over another. The lack of criteria relating to blinding and randomisation was also criticised. Because of these issues, and the suggestion by Fenton et al. (2015) that the QATSDD risks subjectivity together with its use of a potentially problematic scoring system, it was decided that the MMAT would be used to appraise studies included in this review. The MMAT has been shown to be comprehensive, objective and simple to use, and has ongoing online support via the dedicated Wiki (Pluye et al., 2016). The results of the appraisal are discussed at the start of the results section (2.5).

2.3.6 Data synthesis

An integrative review aims to present a synthesis of diverse types of data. It was therefore necessary to consider how to undertake this synthesis to ensure data was not distorted (Hopia et al., 2016).

2.3.6.1 Introduction

Synthesis is the stage in a literature or systematic review at which evidence extracted from individual papers is brought together to form a cohesive story (Pope et al., 2006). In a review drawing on both qualitative and quantitative evidence, it is necessary to choose a suitable design to guide the process of synthesis (Agarwal et al., 2005).

2.3.6.2 Synthesis designs

Hong et al. (2017) undertook a review of systematic mixed-studies reviews with the aim of identifying the various synthesis designs used by authors. They found 459 mixed-studies reviews, of which only 24% provided a rationale for the combining of different evidence types. Doubt has been cast over the acceptability of the synthesis of different review designs (Agarwal et al., 2005), with concerns expressed over the use of potentially under-developed and untested methods. However, as described earlier in this chapter, the popularity of mixed-studies reviews is increasing, due to their ability to explore and promote understanding of complex phenomena (Pluye and Hong, 2014).

It is necessary for a form of data transformation to occur, either quantitative into qualitative, or vice versa, to be undertaken to produce a synthesis (Agarwal et al., 2005; Hong et al., 2017). A qualitative synthesis method aims to produce themes, concepts or frameworks from the interpretation of mixed data (Hong et al., 2017). In contrast, a quantitative synthesis would aim to summarise specific

variables (Hong et al., 2017). Hong et al. (2017) identified two main types of synthesis: convergent and sequential.

2.3.6.3 Convergent synthesis

Three sub-types were seen in the convergent design: data-based, results-based or parallel-results (Hong et al., 2017). Synthesis at data-based level involves the use of a single synthesis method for all studies, necessitating data transformation. This is referred to by Sandelowski et al. (2007) as an integrated synthesis and was the most common approach found by Hong et al. (2017). In parallel-results synthesis, qualitative and quantitative evidence are analysed separately. Finally, result-based synthesis involves the separate analysis of qualitative and quantitative data, and then a further synthesis to integrate the results (Hong et al., 2017).

2.3.6.4 Sequential synthesis

A sequential synthesis design involves two steps. One set of data is collected and synthesised, which then informs the same process for the second set of data (Hong et al., 2017). This might be achieved through the initial synthesis providing qualitative data to answer the question, and the second quantitative synthesis provides data on the prevalence of issues identified during the initial synthesis. The potential design types are summarised in Table 14 (overleaf).

Synthesis design	**Method**	**Sub-types**
Convergent/integrated	Qualitative and quantitative data analysed together with data transformation.	Data-based: All studies are analysed concurrently using the same method. Parallel-results: Different data types are analysed separately, then integrated in the discussion. Results-based: Separate analysis then integration using a further synthesis method for comparison.

Sequential/segregated	One data type analysed first, the results of which influence the analysis of the second data type.	

Table 14: Synthesis designs (Hong et al., 2017; Sandelowski et al., 2007; Frantzen and Fetters, 2016)

2.3.6.5 Potential challenges in data synthesis

As the synthesis of mixed studies reviews is a relatively new trend (Hong et al., 2017), it is important to note that the designs are relatively untested. The synthesis of studies from mixed methodological backgrounds could potentially cause difficulties due to the studies' differing epistemological and traditional backgrounds (Agarwal et al., 2005). For example, qualitative and quantitative studies have separate methodologies and bringing these together in a synthesis could lead to difficulties in identifying themes across them.

The transformation of data into either qualitative or quantitative could also present challenges to the reviewer. For example, if the process of conversion has not been accurately described (Agarwal et al., 2005), there is a risk that data could become distorted. Due to these potential problems, Hong et al. (2017) recommend that reviewers offer justification for their decision to undertake a mixed studies review and offer a detailed description of the synthesis process, referring to the methodology employed. Through doing this, the trustworthiness and replicability of the review is increased.

2.3.6.6 Rationale for choice of synthesis design

The choice of synthesis design and method should be relevant to the question being asked of the literature (Agarwal et al., 2005). This review was concerned with the identification of the breadth of knowledge and an exploration of the use of chemical and physical restraint by practitioners in critical care. The first

aim was achieved through the systematic search and appraisal process documented earlier in this chapter.

To achieve the second aim, a qualitative convergent data synthesis method was decided upon. This would enable data from all study designs to be brought together at data level. A convergent data synthesis method is particularly suitable for reviews with broad, exploratory questions, such as this one. This is because it enables the description of findings from included studies, and enables the identification of themes or concepts within the data relevant to the question (Hong et al., 2017).

2.3.6.7 Synthesis method

To undertake this convergent synthesis, the contents of the data extraction form were drawn upon. Through a process of aggregation at study level, the findings relevant to answering the research question were combined (Sandelowski et al., 2012). The use of an aggregate synthesis disputes the idea that qualitative and quantitative studies have intrinsically different aims, as shared or similar aims in all included studies is a pre-requisite for undertaking this type of synthesis (Sandelowski et al., 2012). Through the intervention of the reviewer, factors relevant to answering the research question are identified. For example, prominent or statistically significant quantitative findings were treated in the same way as themes from qualitative studies. However, results in quantitative studies are usually very clearly presented, whilst qualitative findings are themselves the result of the interpretation of the authors (Sandelowski et al., 2013). Sandelowski et al. (2012) refer to this an *'an exercise in convergent validation'* (pg 324). In this way, the synthesis relies on the researcher's ability to detect patterns across the data yielded by different research approaches.

The data extraction sheet allowed the easy identification of similarities in results between studies of different methodological approaches. The sheet also

noted the context, sample, and method used for each study (section 2.3.4). Aggregate synthesis has a degree of interpretivism, and caution must be taken to ensure that the context of the information is not lost. Attempts were also made to anchor statements to their significance (Sandelowski et al., 2013). For quantitative studies, this meant that relevant percentages and *p*-values were included. For qualitative findings, instances of 'verbal counting', for example, 'some', 'many' or 'few' were retained. In this way, the context and meaning of the original studies was retained through the process of aggregate synthesis.

2.4 Data analysis

Whittemore and Knafl (2005) suggest a constant comparison approach to data analysis. In such an approach, data is divided into categories and sub-categories which allow data of similar types to be grouped together. The chosen analytical approach for this review was thematic analysis.

2.4.1 Introduction to thematic analysis

Thematic analysis is a common approach to qualitative data analysis. It involves the generation of codes, which are organised into themes with the aim of unpacking semantic or latent meanings within the data. It can be descriptive or interpretative. Themes can be generated as part of several approaches to qualitative data analysis, including interpretative phenomenological analysis (IPA), grounded theory, and discourse analysis. Braun and Clarke (2006) proposed thematic analysis as a theoretically flexible generic qualitative method, rather than one which is bound to a specific theoretical or philosophical position.

In thematic analysis, important or reoccurring codes are identified through the iterative reading of data. This type of analysis is known as 'data driven' (Agarwal et al., 2005). The identified codes then provide the basis for themes, where codes of

similar meaning are grouped together. The process is iterative throughout, with emphasis placed on the checking of themes to ensure they do not become decontextualized from the source data (Braun and Clarke, 2006). The purpose is not simply to summarise, rather to interpret the data, using the research question as a guide (Braun and Clarke, 2006; Clarke and Braun, 2017). In this way, data is disassembled, then rebuilt as a cohesive narrative in reply to the question asked (Sandelowski et al., 2012).

However, thematic analysis has been criticised for a lack of clarity regarding how themes are identified and weighted, with some researchers citing the frequency at which themes occur being more important that their perceived value in explaining or exploring the subject (Agarwal et al., 2005). For this review, all themes were considered as equally contributing to the exploration of the topic area.

2.4.2 Method

The first stage in thematic analysis as described by Braun and Clarke (2013) is transcription. As the method was being used to analyse the results of existing studies, it was not necessary to undertake transcription. Therefore, the process of analysing the results for the integrative review began at stage two: becoming familiar with the data.

2.4.3 Data familiarisation

Data familiarisation is the process of iterative reading through which the researcher becomes immersed in the world of the data which they have collected. Through reading and re-reading, the researcher begins a process of ‘noticing’ (Braun and Clarke, 2013). Familiarisation is a process of constant observation and reflection (Braun and Clarke, 2013). The ‘noticings’ are influenced by and reflect the experience of the researcher (Braun and Clarke, 2013; Braun and Clarke, 2019).

They indicate what the researcher is bringing to the analysis. For example, in this review, the researcher felt drawn into accounts which mirrored some of her own clinical experiences. Such accounts included participants describing how they struggled to balance the care of more than one patient, fear for their patients' safety, and worries about being seen to cope. It was important that this was recognized as there was a risk that results which did not resonate with the researcher in this way might not receive as much attention. To avoid this, the researcher reflected on her feelings and experience and acknowledged that she felt more drawn to some accounts than others but recognised that all accounts were valuable and could contribute to the review.

Familiarisation is not a passive reading process (Braun and Clarke, 2013). The researcher is active throughout. They are responsible for reading the data as data, and reading it in an analytical and critical way (Braun and Clarke, 2013). For this review, active reading involved a careful and deep reading of the results, noting concepts or impressions and considering how the researcher's own clinical and theoretical background influenced the reading. The data extraction form helped to guide close reading and maintain focus on the research question.

2.4.4 Coding

During coding, the researcher identifies aspects of the data which can be used to answer the research question (Braun and Clarke, 2013). The identified aspects of data might be paragraphs or single sentences. There is no stipulation on what might constitute a piece of data which can be coded as long as it is able to contribute towards answering the research question.

There are two approaches to coding. The first is selective coding, where the researcher engages in a process of data reduction through identifying the instances where the phenomenon under review occurs (Braun and Clarke, 2013). This approach requires pre-existing analytical knowledge to enable the identification of the concepts to be selected for further analysis. It is typically used in discourse analysis (Braun and Clarke, 2013). The second approach is complete coding. This is the chosen approach for this review. In complete coding, the researcher assigns everything in the dataset which relates to the research question to a code. Coding can be semantic or latent, or a combination of the two. Semantic coding is data-driven and offers a short summary of explicit data content (Braun and Clarke, 2013). In contrast, latent coding looks for and identified implicit meanings within the dataset and invokes the inference of the researcher's knowledge, background and theoretical position (Braun and Clarke, 2013). Codes act as a label to allow data which potentially answers an aspect of the research question to be clustered together (Braun and Clarke, 2013). The process was iterative, with codes being merged or divided as the analysis evolved.

Coding was achieved through iterative reading of the papers included in the review. The data was systematically reviewed, with codes highlighted on the original data, and then noted into a Word document. The citation for each code was noted in this table. At this stage, the codes were noted as keywords, with the context of the word highlighted on the data extraction form. A common criticism of thematic analysis is that codes can easily become decontextualized (Braun and Clarke, 2006). This was avoided through noting the context of the codes and iterative reading of the data. Semantic coding was used for this review. This involves the identification of explicit themes in the data which were seen to have a meaningful relationship with the question. This approach was chosen over the identification of latent themes because interest lay with the explicit meanings of the data, rather than

an interpretation (Braun and Clarke, 2006). Identified codes were data-driven, meaning that they stem directly from the data, which will, in turn, shape the emerging themes.

2.4.5 Search for patterns across the codes and develop themes

A theme is broader in scope than a code. To identify themes, each code was written on a piece of paper. These were moved around until they were grouped with others which shared a similar meaning. A shared meaning goes beyond simply a shared topic, meaning can run deeper and be more subtle than a group of codes which on the surface appear to deal with a similar topic. Pattern-based analysis allows the researcher to systematically identify and report patterns across the dataset (Braun and Clarke, 2013). Some meanings appear frequently amongst codes, however although this was noted, it was important that meaningful ideas which occurred less often were also reported.

Groups of codes with shared meanings formed candidate themes which were iteratively reviewed through the analysis process. Themes are differentiated from recurring features of the data (Braun and Clarke, 2013). A theme must have a central organising concept which draws codes of shared meaning together (Braun and Clarke, 2013). Thematic maps were created for each theme. Initial themes were discarded for being either too simplistic or failing to move beyond description.

2.4.6 Review themes

Candidate themes were reviewed to ensure that each theme illustrated something meaningful about the data, had clearly defined boundaries, enough data, and related to other themes and the overall story of the analysis. This process was guided by a checklist created by Braun and Clarke (2013). Four candidate themes

were identified, and summaries were written for each. The theme summaries were useful in the review process as they allowed any repetition to be clearly identified. To make this process simpler, key messages from each theme were assigned a colour which allowed a visual picture of any overlaps. Braun and Clarke (2013) state that themes should be related but distinct. After reviewing the candidate themes several times and condensing them as described above, it was felt that this aim had been achieved.

2.4.7 Define and name themes

Four over-arching themes were identified following iterative reading of the codes and their contexts. They reflect the complex interplay between intrinsic and extrinsic factors effecting the coercive management of patients with hyperactive delirium. Phase four of the thematic analysis process involves the refinement of themes (Braun and Clarke, 2006). At this point, codes were re-read, and extracts from the data were linked to themes. Some sub-themes could have potentially contributed to more than one larger theme. Mapping software was used to generate a thematic map, which allowed text representing themes to be moved around. This procedure was repeated until themes formed a coherent pattern and narrative. Themes were named to represent their content, ensuring that the essence of the data within the theme is captured (Braun and Clarke, 2006). For example, *The struggle in practice as experienced by nurses* is comprised of data which reflects the challenges faced by nurses caring for delirious patients. Such struggles include environmental challenges, the emotional impact, and the threat of violence.

To produce a final thematic map, the over-arching and sub-themes were considered in relation to the data as a whole (Braun and Clarke, 2006). The data was reconsidered as whole, using the data extraction form created for this review.

Themes were checked against the data extraction Table to ensure that all appropriate data was included in the themes and that the themes were representative of the data set as a whole. The four candidate themes, shown below in Figure 3, were found to be an accurate representation of the data set. The depicted thematic map shows how the sub-themes formed and contributed to the four over-arching themes.

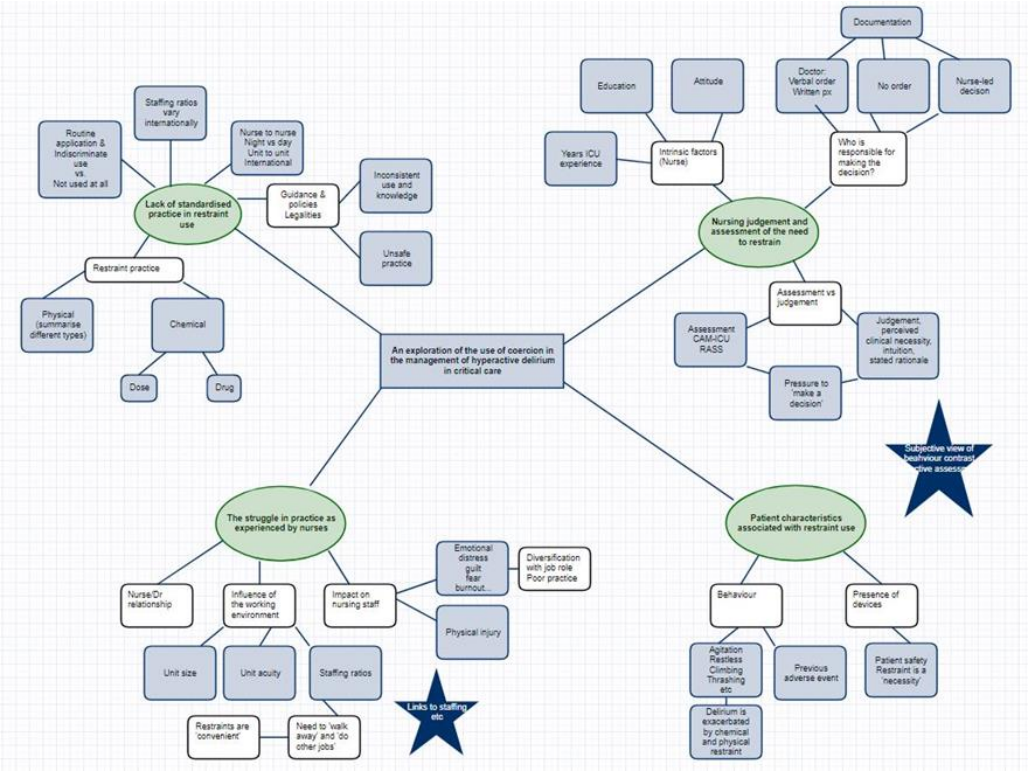


Figure 3: Thematic map

2.4.8 Report

Writing is part of the process of qualitative analysis (Braun & Clarke, 2013). The writing must represent the dominant patterns from the data and define the scope of each theme whilst addressing the research question (Braun and Clarke, 2013). At this point in the analysis, each theme felt individually defined, whilst together they told a coherent story. The use of extracted quotations when writing-up qualitative analysis is central to the process. Extracts should be compelling and

accurately illustrate the analytical point being made (Braun and Clarke, 2013). For this review, extracts were selected from the results of included papers. The explanatory narrative was woven around the extracts with the aim of creating plausible arguments which answered the research question (Foster, 1995). The narrative aimed to tell the reader something more about the extract such as why it was interesting and how it contributed to answering the research question. Braun and Clarke (2013) suggest that narrative and extracts should be either evenly balanced or that slightly more narrative should be included.

2.5 Integrative review results

This section presents the results of the literature review and subsequent thematic analysis as detailed in this chapter. This review was abridged and published as Teece et al. (2020). A copy of the publication abstract and links to full text are included in Appendix C.

2.5.1 Summary of included papers

22 studies were identified for inclusion. Included papers consisted of 16 quantitative, 4 qualitative, and 2 mixed methods studies. The studies reflected international perspectives, including the USA (*n*=6), Canada (*n*=3), United Kingdom (*n*=3), mainland Europe (*n*=5), and Australia, South Korea, Egypt, South Africa, Jordan, and Turkey (*n*=1 per country). A summary of the papers selected for inclusion is presented in Appendix A.

2.5.2 Appraisal of included papers

A summary of the appraisal of the papers included in this review is included in Appendix B. Specific issues relating to the quality, strengths, and limitations of the included studies and identification of gaps in knowledge will now be discussed.

All included studies were found to meet the tool's basic screening questions as they had a clear aim, and the collected data allowed the authors to address their identified research question (Pluye et al., 2011). If a paper does not meet these criteria, it suggests that the study is not empirical and is therefore not able to be appraised using the MMAT as it contains criteria specific to methodology (Hong et al., 2018). Failure to meet these criteria would have led to exclusion from the review. All included studies contained empirical evidence.

The included studies stemmed from a variety of critical care specialities, including general, neuro, and mixed ICU/HDU. The included studies were therefore considered to be reflective of the heterogeneous critical care patient population. Each study was appraised using the appropriate MMAT tool. The MMAT recognises that different methodological approaches have distinct characteristics and therefore require specific screening tools (Hong et al., 2018). For each appraised study, the answer for the specific questions asked by the MMAT was recorded ('yes', 'no', 'can't tell') and is included in Appendix B. Scoring is discouraged by the MMAT as it may mask areas of methodological weakness (Hong et al., 2018; Crowe and Sheppard, 2011).

Following appraisal with the MMAT and consideration of the questions posed to assess quality, some limitations to the included studies were identified. Limitations included reduced generalisability due to single-centre studies (Fraser et al., 2000; Micek et al., 2005; Pisani et al., 2013; Aitken et al., 2009; Dolan and Looby, 2017; Choi and Song, 2003). Two studies (Choi and Song, 2003; De Jonghe

et al., 2013) made use of self-report from staff to identify the extent of restraint use. Self-report, rather than direct observation, carries the risk of social desirability bias, when participants' report is influenced by what they consider to be socially acceptable (Bergen and Labonté, 2020). Restraint is a challenging topic in critical care, and there is a risk the participants under-reported their use of restraint. The studies did not describe any attempts to limit social desirability bias and therefore this must be considered a limitation when appraising these papers. Qualitative interviews also risk social desirability bias. Interviews or focus groups were used by five of the included studies (Dolan and Looby, 2017; Freeman et al., 2016; Lopetrone, 2006; Langley et al., 2011; Palacios-Cena et al., 2016). These studies did not describe any methods undertaken to limit social desirability bias amongst participants. Again, this must be considered to be a potential limitation as it is possible that participants felt unwilling to fully disclose their attitudes towards restraint in critical care. Secondary analysis was undertaken in one study (Luk et al., 2014), although the authors sought to cross-check data with the original participants. One study sample contained 88% 'expert' nurses (Stinson, 2016) and was therefore not representative of the whole critical care nursing population.

2.6 Identified themes

The themes identified via the process of thematic analysis and synthesis outlined in sections 2.3 and 2.4 will now be presented.

2.6.1 The lack of standardised practice and guidance

The first theme identified was the lack of standardised practice and guidance surrounding the use of chemical or physical restraint. The theme featured in 17 of the papers analysed and described the variations and inconsistencies in the use of restraint.

2.6.1.1 Type of physical restraint and chemical drug and dose

The data showed variation in the types of physical restraint applied, with the majority using commercial wrist or other limb restraints, whilst one unit made use of gauze bandages to tie patients' wrists (Kandeel and Attia, 2013). The use of chemical restraint also highlighted a lack of standardised practice. A participant in focus groups held by Palacios-Cena et al. (2016) spoke of the lack of a medication of choice and variations in dosing between different prescribers. The variations found are summarised in the Table 15 (overleaf).

2.6.1.2 Variations in nurse and unit practice

International variations in practice were described in two studies (Benbenbishty et al., 2010; Martin and Mathisen, 2005). Benbenbishty et al. (2010) conducted a point prevalence study of physical restraint use in 34 general ICUs across Europe. The use of physical restraint within a critical care unit varied from 100% in Italy, to 0% in the United Kingdom and Portugal. The study was undertaken by volunteer clinicians and did not cover every unit in each country. For example, only four units in the UK took part. International variation in the use of physical restraint was also described in the observational study conducted by Martin and Mathisen (2005). They compared the prevalence and use of physical restraints in two comparable ICUs, one located in Norway, the other in the United States. They found that physical restraint was not used in the Norwegian unit but had a prevalence of 39% in the United States. Again, this study is limited as it only considers practice in two units. The study also found that morphine as an analgesic and sedative was administered in greater doses to the Norwegian patients. No further comparison of sedation practice was possible as prescriptions were *pro re nata* (PRN) based (Martin and Mathisen, 2005).

Citation	Type of physical restraint	Drugs used for chemical restraint	Dose
Bebenishty et al (2010)	Commercial wrist restraints		
Choi & Song (2003)	Bi-lateral wrist restraints		
De Jonghe et al (2013)	Wrist restraints		
Fraser et al (2000)		Opiates, benzodiazepines, Haloperidol, combination therapy	
Freeman et al (2016)	'Boxing gloves'		
Kandeel & Attia (2013)	Wrist (37.3%), upper and lower limb (37.9%), commercial restraints or gauze bandages		
Langley et al (2011)	'Mittens', splints	Morphine and Midazolam	
Lopetrone (2006)		Patients are chemically restrained at the first sign of delirium.	
Luk et al (2015)	Wrist restraints, four-point 4%, Uni-lateral 2%		
Luk et al (2014)		Benzodiazepines, opiates, Propofol, anti-psychotics	
Martin & Mathisen (2005)	Wrist restraints, vests		
Micek et al (2005)		Midazolam, Fentanyl	
Palacios-Cena et al (2016)		Haloperidol, Dexmedetomidine, 'No medication of choice'	Variation in dosing
Pisani et al (2013)		Fentanyl, Lorazepam, Haloperidol	Increasing doses of Haloperidol and Lorazepam
Svenningsen et al (2013)		Midazolam, Propofol, Alfentanil	Delirium associated with sedation
Mac Sweeney et al (2010)		Haloperidol is the first-line drug of choice for hyperactive delirium (74%) Propofol and benzodiazepines were other first-line drugs.	64% specified a starting dose of Haloperidol, 83% 5mg or less. 15% dose greater than 5mg
Turgay et al (2009)	Wrist and ankle restraints		
van der Kooi et al (2015)	98% of patients had their upper limbs restrained	Restrained patients received anti-psychotics, benzos and Propofol more often than non-restrained patients.	

Table 15: Summary of restraint types mentioned in included studies.

Variations in restraint practice were found within the same country in three studies (Luk et al., 2014; De Jonghe et al., 2013; van der Kooi et al., 2015). Luk et al. (2014) conducted a prospective observational study in 51 Canadian ICUs. They found that physical restraint was less prevalent in university-affiliated hospitals than in other local units. van der Kooi et al. (2015) surveyed a representative sample of 25 Dutch ICUs. They found a wide variation in the use of physical restraints, with prevalence ranging from 0-56%. De Jonghe et al. (2013) found a lower level of variation in France. 93% of the issued surveys were returned by intensivists from 121 ICUs. The surveys demonstrated a high level of restraint, with 82% of ICUs restraining greater than 50% of ventilated patients.

Variations in restraint use on a shift-by-shift basis were reported in four studies (Palacios-Cena et al., 2016; Luk et al., 2015a; Turgay et al., 2009). Nurses involved in the focus groups held by Palacios-Cena et al. (2016) noted that agitated or delirious patients received a different chemical treatment each shift according to the doctor's preference. Two studies noted that physical restraints were more commonly applied by nurses working the night shift (Turgay et al., 2009; Luk et al., 2015a). Luk et al. (2015a) observed that 83% of all reported restraint was applied on the previous night shift. In addition, Pisani et al. (2013) found an increase in the dose of Lorazepam and Haloperidol during the evening and night shifts amongst their study group of 309 critical care patients. In contrast, Choi and Song (2003) found no significant association between restraint application and the shift undertaken. This descriptive study investigated the patterns of restraint use in a Korean ICU. The authors observed 23 physically restrained patients and found no significant differences in the frequency of restraint use between day and night shifts.

2.6.1.3 Variations in the presence of a policy

Benbenbishty et al. (2010) found large variations in the presence of local restraint policies across Europe. From a total of 34 units, 9 reported the presence of

local guidance. Smaller units were more likely to have a local policy. However, the presence of a policy was found to have a non-significant association with lower use of restraint. This was supported by findings by De Jonghe et al. (2013). Their study found a high prevalence of physical restraint use, but only 21% of French units had a local restraint policy. In contrast, 92% of Dutch ICUs have local guidance (van der Kooi et al., 2015) and both units surveyed by Freeman et al. (2016) had their own policies.

Palacios-Cena et al. (2016) linked confusion in delirium and restraint management to the absence of a local protocol. The small ICU studied by Fraser et al. (2000) lacked a local sedation policy. This prospective cohort nurse study of 130 patients showed a wide variety of drugs being prescribed to manage agitation. The absence of a policy appeared to be linked to the indiscriminate use of restraint and lack of practice development. The lack of protocolised practice led to conflict and peer pressure amongst nursing staff (Palacios-Cena et al., 2016).

2.6.1.4 Inconsistent use and staff knowledge of local guidance

Local policies were found to be inconsistently read and used. Despite a high prevalence of local guidance, van der Kooi et al. (2015) found that only 31% of nurses cited the guidance when choosing a coercive management method. 78% of nurses in the units surveyed by Freeman et al. (2016) had read the policy. However, they still expressed confusion regarding their rationale for choosing chemical or physical restraint as a first-line method in managing the agitated patient. Staff involved in this survey also expressed confusion regarding the safe application of physical restraints. This was further emphasised by a low response rate (21.3%) to a question focussing on the safe duration of physical restraint, indicating poor staff knowledge despite a well-read local policy.

An absence of guidance and poor staff knowledge was linked to unsafe practice in two studies (Langley et al., 2011; Suliman et al., 2017). Nurses interviewed by Langley et al. (2011) demonstrated poor knowledge of the legalities surrounding

restraint use. The nurses held an erroneous opinion that a doctor could 'cover' their practice should any complications occur. A doctor mentioned that court cases had occurred due to significant injury to a patient caused by poorly applied physical restraints (Langley et al., 2011). In addition, only five of the twenty participants knew that their hospital had a local restraint policy. These five participants displayed varying knowledge and interpretations of the policy. Suliman et al. (2017) also associated poor knowledge to unsafe practice and patient injury. The presence or absence of local policies was not described in this survey-based study which consisted of a convenience sample of 400 Jordanian critical care nurses. However, despite 74% of nurses stating that they felt knowledgeable and confident in using restraints, the responses to the survey indicated a high prevalence of unsafe practice, such as applying very tight restraints and infrequent.

2.6.2 The struggle in practice as experienced by nurses

The second theme described the challenges and difficulties faced by nursing staff caring for patients with hyperactive delirium. The challenges related to the patient, the clinical environment, and how this aspect of practice impacts on the nurse themselves. This theme was drawn from 14 of the studies included in this review.

2.6.2.1 Critical care unit size and acuity

Studies disagreed as to whether unit size impacted on the prevalence of restraint. Kandeel and Attia (2013) explored the use of physical restraint across 11 intensive care units in Egypt. The capacities of the units ranged from 5-20 beds. They found no significant association between unit size and prevalence of physical restraint. However, restraint was found to be more common in thoracic, gastro-intestinal, and neurological speciality ICUs (Kandeel and Attia, 2013). In contrast, both Benbenbishty et al. (2010) and Luk et al. (2014) found that nurses working on larger units were more likely to employ physical restraints.

Martin and Mathisen (2005) used the Nursing Manpower Use Score to objectively assess unit acuity. They found that the Norwegian unit had a higher clinical acuity than the American unit. However, physical restraint was not used at all in the Norwegian unit.

2.6.2.2 Staffing ratios

Reported staffing ratios varied between 1:1 to 1:4. A summary of staffing ratios is presented in Table 16.

Citation	Country	Nurse to patient ratio
Aitken et al (2009)	Australia	Not stated
Bebenishty et al (2010)	Israel, Switzerland, UK, Spain, Italy, France, Portugal, Finland, Greece	Various 1:1 – 1:4
Choi & Song (2003)	South Korea	Not stated
De Jonghe et al (2013)	France	Median 1:2.8
Dolan & Looby (2017)	USA	1:1 or 1:2
Fraser et al (2000)	USA	Not stated
Freeman et al (2016)	UK	Not stated
Kandeel & Attia (2013)	Egypt	Higher during morning
Langley et al (2011)	South Africa	1:1
Lopetrone (2006)	Canada	1:1 (ICU) 1:4-5 (step down)
Luk (2015)	Canada	Not described
Luk (2014)	Canada	Not described/
Martin & Mathisen (2005)	Norway and USA	1.05:1(Norway) 0.65:1 (USA) (patient to nurse)
Micek et al (2005)	USA	Not described
Palacios-Cena et al (2016)	Spain	1:3
Pisani et al 2013)	USA	1:2 1:1 (CVVH)
Stinson (2016)	USA	Not described
Suliman et al (2017)	Jordan	Not described
Svenningsen (2013)	Denmark	1:1 (day) 1:1.5 (night)
Mac Sweeney et al (201	UK	Not described
Turgay et al (2009)	Turkey	Not described
van der Kooi (2015)	Holland	1:1 (66%)

Table 16: Summary of reported staffing ratios.

Lower nurse to patient ratios were associated with the use of physical restraint in four studies (Benbenbishty et al., 2010; Martin and Mathisen, 2005; Dolan and Looby, 2017; Langley et al., 2011). Extra staffing was noted to be a possible alternative to physical restraint as it facilitated continuous vigilance. However, this was not always possible (Dolan and Looby, 2017; Freeman et al., 2016). It was observed

that delirious patients were unpredictable and required constant attention (Palacios-Cena et al., 2016). Being 'doubled' therefore reduced the nurse's capacity for vigilance (Dolan and Looby, 2017). The presence of multiple delirious patients on a poorly staffed unit was considered to compromise safety (Lopetrone, 2006). In contrast, Luk et al. (2014) and Kandeel and Attia (2013) found that there was no significant relationship between decreased staffing ratios and the use of physical restraint.

Nurses expressed contradictory views regarding the association between lower staffing ratios and the use of physical restraint. For example, participants in the survey conducted by Freeman et al. (2016) strongly denied that restraint was used as a substitute for staff. However, they also stated that alternative approaches to the management of psychomotor agitation were not possible due to the absence of available staff. This division of opinion was also evident in the study by Suliman et al. (2017). Their participants were evenly divided in their views of whether restraint was used as a substitute to adequate staffing. In contrast, only 1.4% of nurses surveyed by Kandeel and Attia (2013) initiated physical restraint to compensate for poor staffing.

2.6.2.3 The emotional and physical impact of caring for delirious patients

Nurse participants in the focus groups held by Lopetrone (2006) shared vivid memories of their reactions to a violent attack by a delirious patient on a colleague. The resultant feelings of shock and fear, together with poor support from senior management, impacted on their decision-making with other delirious patients. They described the physical and emotional strain of caring for delirious patients, citing numerous injuries, including broken bones and head wounds, alongside a sense of being hardened and unwilling to engage with agitated patients (Lopetrone, 2006). Caring for delirious and agitated patients was also cited as a cause of stress and unrest amongst staff in two further studies (Freeman et al., 2016; Palacios-Cena et al., 2016). Nurses expressed concern that this stress was not always recognised by management, and that breaks were important to ensure staff did not experience burnout or respond in anger (Freeman et al., 2016).

Resentment towards delirious patients and dissatisfaction with work was described in two studies (Lopetrone, 2006; Langley et al., 2011). The nurses interviewed by Lopetrone (2006) described how, following physical assault by delirious patients, they now prioritised their personal safety, leading to an increased reliance on chemical and physical restraint. Some participants commented that the prevalence of delirium was so high in their workplace that they had begun to look for alternative roles (Lopetrone, 2006). Feelings of dissatisfaction were echoed by participants in interviews held by Langley et al. (2011), where medical and nursing staff commented on the deteriorating standards of care and poor team cohesion. Poor practice was also evident from the results of the survey conducted by Suliman et al. (2017), where nurses demonstrated poor knowledge and inappropriate use of physical restraint.

2.6.2.4 The relationship between nurses and medical staff

The delirious patient was considered to be a nursing, rather than medical, responsibility (Palacios-Cena et al., 2016). However, nurses remarked on poor medical support (Freeman et al., 2016; Lopetrone, 2006), and expressed frustration at the anger and blame directed at them by medical staff in the event of device removal (Langley et al., 2011). The doctors involved in the observational study conducted by van der Kooi et al. (2015) were unaware of which patients were physically restrained on their units, suggesting that this was considered a nursing, rather than medical, task. Nurses surveyed by Freeman et al. (2016) expressed the need for a greater level of medical support and engagement with the care and management of agitated patients. In contrast, the medical staff who responded to the survey issued by MacSweeney et al. (2010) were largely in agreement that delirium requires active medical treatment, suggesting a potential willingness to engage with the care of such patients. However, Palacios-Cena et al. (2016) found that doctors did not view delirium as a medical emergency, and were slow to respond to nursing requests for intervention.

Nurses felt that their requests for physical or chemical restraint were misinterpreted by doctors (Langley et al., 2011; Lopetrone, 2006). Doctors in these

studies stated that they felt patients were restrained for the benefit of the nurse, for example to enable the nurse to sit at the station or sleep (Langley et al., 2011), or that nurses were seeking an easy shift (Lopetrone, 2006). Doctors expressed frustration at nursing demands for an, in their view, impossible solution to psychomotor agitation (Palacios-Cena et al., 2016). This led the doctors in this study to avoid engaging with nursing staff, adding further conflict to this relationship.

2.6.3 Patient characteristics associated with restraint use

This theme explored patient behaviour traits and treatments which were associated with the application of chemical or physical restraint. The theme also considered the potential exacerbation of delirious or agitated behaviour through the initiation of physical and chemical restraint. 18 studies contributed to this theme.

2.6.3.1 Patient behaviour

The majority of studies cited agitated behaviour as a rationale for restraint. However, sedation or drowsiness were also cited as reasons to apply physical restraint (van der Kooi et al., 2015; Benbenbishty et al., 2010). Subjective descriptors of behaviour were used in the large majority of studies, with only three citing objective validated tools such as CAM-ICU (Luk et al., 2014; Svenningsen et al., 2013; Micek et al., 2005). In the study by Choi and Song (2003), a minority of nurses cited ‘poor behaviour’ as a rationale for restraint. Delirium was given as a rationale for restraint in eight studies. Table 17 (overleaf) summarises the behavioural attributes associated with the application of physical or chemical restraint.

Citation	Patient behaviour associated with restraint use
Aitken et al. (2009)	Agitation, anxiety.
Bebenishty et al. (2010)	Restlessness, delirium, confusion, disorientation, drowsiness, aggression and violence.
Choi & Song (2003)	Poor behaviour.
De Jonghe et al. (2013)	Awakening from sedation, awake and agitated.
Dolan & Looby (2017)	Post-surgery, impaired mental status, restlessness, confusion, agitation, delirium.
Fraser et al. (2000)	Agitation, anxiety, delirium.
Lopetrone (2006)	Delirium, aggression.
Luk et al. (2015)	Agitation, restlessness, delirium, thrashing.
Luk et al. (2014)	Raised SAS score, sedation holds.
Martin & Mathisen (2005)	Immediate threat to safety, pulling at lines, climbing, striking out, biting tube, attempting to sit up.
Micek, et al. (2005)	CAM-ICU positive score.
Palacios-Cena et al. (2016)	Stereotypical delirious behaviour.
Pisani et al (2013)	Delirium.
Svenningsen et al. (2013)	Raised RASS score.
Turgay et al. (2009)	Restlessness, impaired mental status.
van der Kooi et al. (2015)	Delirium, unable to communicate, comatose, aggression.

Table 17: Summary of characteristics associated with the initiation of restraint.

2.6.3.2 The presence of medical devices

Maintaining patient safety is the most commonly cited reason for restraint. In the presence of agitated behaviours, such as those described in above, devices are at risk of disruption, with implications for life-sustaining therapies. Therefore, patients with such devices were more likely to be restrained (Luk et al., 2015a; Turgay et al., 2009; Choi and Song, 2003; van der Kooi et al., 2015; Pisani et al., 2013). Oral intubation was associated with restraint use (Luk et al., 2015a; Benbenbishty et al., 2010; van der Kooi et al., 2015). Physical restraints were justified in these studies as preventing self-extubation. Dolan and Looby (2017) found that that presence of an oral ETT was the primary rationale amongst nurses for the use of physical restraint. Doctors interviewed by Langley et al. (2011) took a wider view of patient safety, stating that self-extubation can lead to re-intubation and prolonged ventilation and potential ventilator associated pneumonia (VAP). They also emphasised their legal obligation to maintain patient safety.

Other medical devices associated with restraint use include intravascular lines, such as those providing central venous and arterial access (Luk et al., 2015a;

Benbenbishty et al., 2010; van der Kooi et al., 2015), and naso-gastric (NG) tubes (Choi and Song, 2003). In contrast to ETTs and invasive lines, a NG tube is a non-life sustaining device. However, its presence was found to be statistically significant in leading to the use of physical restraint (Choi and Song, 2003).

Two studies cited the role of restraint as a precautionary measure (Luk et al., 2015a; Dolan and Looby, 2017). Nurses did not identify a particular risk, rather restraint was initiated with the aim of reducing risk factors which might compromise patient safety. Restraint was also justified as being in the best interest of the patient (Freeman et al., 2016).

2.6.3.3 Delirium is exacerbated through restraint

Svenningsen et al. (2013) conducted a prospective cohort study across three mixed ICUs. They found that fluctuations in sedation level, caused by the administration of bolus or increased doses of continuous sedative drugs, were significantly associated with the development of delirium. The authors suggested that reducing fluctuations in sedation level may reduce the risk of delirium developing.

Physical restraint was linked to the exacerbation of delirium by three studies. Nurses described how restraint might increase agitation and heighten patients' sense of paranoia and confusion (Freeman et al., 2016; Dolan and Looby, 2017; Suliman et al., 2017). Kandeel and Attia (2013) observed patient behaviour following the application of physical restraint. They noted that 18.3% of patients showed an increase in agitation levels after being restrained. 48.4% were observed to cry or moan. In this study, the use of physical restraint was shown to increase distress in the majority of patients observed.

2.6.4 The decision to apply restraint

The final theme explored how nurses make the decision to initiate chemical or physical restraint. The subthemes compare how nurses used validated tools or their own judgement and intuition to make rapid clinical decisions. Intrinsic staff factors,

such as experience and education, impacting on that decision are also described, together with healthcare professionals' beliefs regarding who has the ultimate responsibility for the decision to restrain. This theme was drawn from 19 studies.

2.6.4.1 Assessment

Critical care nurses have access to a number of validated tools to guide their assessment of agitation and delirium. However, it was unclear whether such assessments were used to rationalise the use of chemical or physical restraint. Agitation scores featured in four studies (Luk et al., 2015a; Luk et al., 2014; Martin and Mathisen, 2005; Svenningsen et al., 2013). Typically, a higher score indicates greater levels of agitation. The American patients in the Martin and Mathisen (2005) study showed greater levels of activity and subsequent physical restraint. Agitation was also linked to the administration of chemical restraint (Svenningsen et al., 2013). However, in both studies by Luk et al (2014; 2015), physical restraint was associated with both agitated and sedated or drowsy states.

CAM-ICU is a validated tool used to screen for the presence of delirium in critical care patients. A positive score was linked to the use of physical restraint by two studies (Freeman et al., 2016; Micek et al., 2005). CAM-ICU positive patients were also found to receive greater doses of sedation (Micek et al., 2005; Svenningsen et al., 2013).

The need to assess the underlying cause of delirium or agitation was described in three papers (Langley et al., 2011; Palacios-Cena et al., 2016; Aitken et al., 2009). The nurses contributing to these studies emphasised the need to assess the patient's physiological and neurological state prior to the use of chemical or physical restraint.

2.6.4.2 Judgement and intuition

In contrast to the previous sub-theme, some nurses and doctors were seen to reject the use of screening tools in favour of their own judgement based on clinical experience and intuition. Physical restraint was deemed a clinical necessity by some

doctors and nurses (Freeman et al., 2016; De Jonghe et al., 2013). In these cases, restraint was initiated prior to assessment, with patient safety being the primary rationale. 61% of nurses surveyed by Suliman et al. (2017) stated that an effective alternative to physical restraint does not exist. Only 37% attempted alternative measures prior to using physical restraint. Two studies likened the use of physical restraint to a 'balancing act', where the potential negative impact was weighed against the 'stakes' of treatment interference (Langley et al., 2011; Dolan and Looby, 2017). Again, validated tools are not used in this assessment.

CAM-ICU assessment was openly rejected by nurses interviewed by Lopetrone (2006) in favour of their own intuition. Other nurses expressed frustration with screening tools, stating that doctors' assessments found patients to be more orientated than when they were assessed by the bedside nurse (Palacios-Cena et al., 2016). Again, the tool was rejected by nursing staff in favour of bedside judgement and subjective behaviour descriptors. The nurses stated that, in an emergency, they favoured treatment which they were certain would work (Palacios-Cena et al., 2016). This decision was based on their previous experience, rather than evidence-based guidance.

The decision to restrain was also based on perceived clinical need. Nurses expressed feelings of being under pressure to make a rapid decision (Palacios-Cena et al., 2016). Physical restraints were described as being convenient for nurses (Choi and Song, 2003; Turgay et al., 2009), and a necessity in allowing them to attend to multiple clinical tasks.

2.6.4.3 Who is responsible for making the decision?

Nurses were the primary decision maker when initiating physical restraint (De Jonghe et al., 2013; Choi and Song, 2003; Suliman et al., 2017; Turgay et al., 2009; Kandeel and Attia, 2013). The majority of nurses surveyed by Freeman et al. (2016) stated that doctors rarely suggested the use of physical restraint. Langley et al. (2011)

found that nurses initiated physical restraint and sought a written prescription from doctors later. However, several of the doctors interviewed described their reluctance to issue a written prescription, believing that such an action left them legally accountable for any injury suffered by the patient. Doctors were described as ignoring the presence of restraint, which nurses perceived to imply that they were endorsed (Langley et al., 2011). One study indicated that unit policy for that restraint must be prescribed (Palacios-Cena et al., 2016). However, this policy was poorly adhered to, and restraint use was indiscriminate and frequently not prescribed.

Chemical restraint required the presence of a prescription. However, critical care nurses can titrate infusions according to need and administer boluses of sedative drugs. Nurse-led sedation titration featured in the 'think aloud' study conducted by Aitken et al. (2009). Within prescribed parameters, nurses increased sedation if they observed patient anxiety or agitation.

Nursing documentation of restraint use was largely described as poor (Choi and Song, 2003; Turgay et al., 2009; van der Kooi et al., 2015; Luk et al., 2015a). The rationale and purpose of physical restraint was not documented in 98% of cases observed by Kandeel and Attia (2013). Poor documentation leads to confusion regarding the duration and purpose of coercion (Luk et al., 2015a), and, potentially, continued inappropriate use of restraint.

2.6.4.4 Professional factors impacting on nurse decision-making

The duration of a nurse's critical care experience was not found to have a significant impact on their use of physical restraint (Stinson, 2016; Choi and Song, 2003; Suliman et al., 2017). However, experienced ICU nurses felt they were 'well-versed' in chemical restraint (Lopetrone, 2006), suggesting that more experience led to greater knowledge of interventions. However, as described above, experience and judgement-based decisions may not be reflective of evidence-based practice. More experienced nurses are more likely to have learnt about restraint use (Stinson, 2016).

However, it is unclear whether that knowledge is based on formal teaching or accrued experiential learning from practice.

A need for formal education regarding the use of physical restraint was expressed (Freeman et al., 2016; Palacios-Cena et al., 2016). Poor knowledge and lack of education were associated with neglecting to assess underlying causes of delirium and agitation (Freeman et al., 2016), doubt regarding the correct interventions (Palacios-Cena et al., 2016), and unsafe practice (Suliman et al., 2017). Nurses who had received educational input demonstrated improved knowledge and safer restraint practice (Suliman et al., 2017).

2.7 Additional papers contributing to the review

The searches were re-run in July 2021. Five additional studies were found which met the inclusion criteria for this review. All five studies had quantitative methodologies including nested case-control, cross-sectional observational, and online surveys. The studies were based in China (*n*=2), Turkey (*n*=1), Spain (*n*=1), and the UK (*n*=1). The approaches undertaken to appraisal and analysis were the same as described for the main integrative review earlier in this chapter. Following iterative reading of the studies, no new codes or themes were identified, therefore the studies' contributions to the established themes are discussed below.

2.7.1 The lack of standardised practice and guidance

Gu et al. (2019) undertook a prospective cross-sectional observational study over five months across three ICUs. They identified that restraint was most commonly initiated at the start of the evening shift (4pm to midnight). The same study found that their process was complicated through incomplete nursing records of restraint use and a lack of standardised guidance for practice.

Inconsistent practice was attributed to the allocation of junior nurses to agitated patients by respondents in the study by Freeman et al. (2019). Junior nurses were described as lacking the knowledge and experience to manage such patients and were thought to over-use restraint in an attempt to be seen to cope. Lack of training was also associated with a readiness to apply restraint and poor knowledge of potential alternative management methods (Ertuğrul and Özden, 2021).

2.7.2 The struggle in practice as experienced by nurses

The results of the multi-disciplinary survey undertaken by Freeman et al. (2019) suggested that the management of delirium and psychomotor agitation was viewed as a nursing responsibility. Nurses felt that they were expected to be able to cope, and that their medical colleagues were reluctant to authorise restraint or become involved in collaborative discussions. Nurses recruited to the elicitation study undertaken by Via-Clavero et al. (2018) described how they would initiate restraint in an attempt to preserve patient safety. Nurses who disagreed with the use of restraint described feeling powerless to change practice in the face of an overwhelming opinion that restraint was justified in critical care.

Lower nurse to patient ratios, attributed to poor retention and recruitment difficulties, were linked with the perceived need to initiate restraint. In the study undertaken by Gu et al. (2019), a 15-bed unit was staffed at a ratio of 1.875 patients per nurse in the day, and 3 patients per nurse at night. This was linked to the increased use of restraint over the night shift. Poor staffing and subsequent increased workload was also linked to restraint by Ertuğrul and Özden (2021) and Via-Clavero et al. (2018). Increased workload was associated with lack of time to engage with therapeutic delirium management methods (Via-Clavero et al., 2018).

2.7.3 Patient characteristics associated with restraint

Pan et al. (2018) undertook a year-long nested case-control study. Of the 593 patients studied, 447 were physically restrained. 39.8% of the restrained patients were identified as delirious through the CAM-ICU tool. The authors identified a reciprocal relationship between delirium and restraint. Patients who were identified as delirious were more likely to be restrained and restrained patients were three-times more likely to develop delirium. Delirious patients were restrained for significantly longer (p=<.001). Patient disorientation, the potential for self-harm and device interference were also associated with the initiation of physical restraint (Ertuğrul and Özden, 2021).

In contrast, one factor was identified by Gu et al. (2019) as reducing the likelihood of restraint. These authors found that, in their sample of 312 patients, the administration of analgesic drugs was an independent protector against the use of restraint (p=0.001). Via-Clavero et al. (2018) found that the presence of the family, administration of chemical restraint, and collaborative MDT planning could reduce reliance on physical restraint.

2.7.4 The decision to apply restraint

Freeman et al. (2019) distributed an online survey to 163 critical care-based multi-disciplinary practitioners. The majority of respondents were nurses (69.9%). They felt confident in identifying delirium or agitation but showed poor knowledge of decision-making and appropriate management. The physical restraint policy was described as long and overly complex. Participants felt that it was easier to administer chemical restraint. Nurses were identified as the primary decision-makers in a number of studies (Ertuğrul and Özden, 2021; Freeman et al., 2019).

2.8 Conclusions

This review has highlighted the complexities of nurse decision-making in the use of restraint to manage hyperactive delirium. It suggests that the decision to initiate restraint may be influenced by unit culture and previous adverse experiences with agitated patients. However, the process of how this decision is made remains unclear and requires further research. Gaps in the existing evidence base were identified (2.3.5.6) and will influence the design of the planned research study.

Nurses found the management of psychomotor agitation to be emotionally and physically challenging. There was evidence to indicate that nurses require greater multidisciplinary support to effectively manage psychomotor agitation and reduce the risk of burnout. Support and education may also facilitate the use of non-pharmacological delirium management. The large variations in practice evidenced in this review indicate the need for clear guidance and precise language to describe the appropriate and safe use of restrictive practices in critical care.

2.9 Identified gaps in the literature

This integrative review allowed the identification of gaps in the current evidence base surrounding the use of restraint in critical care. The majority of studies (20 of the 28 included) were quantitative. Whilst quantitative studies can yield useful data in terms of the prevalence of restraint use and when and to whom it is applied, such studies do not explore the nursing experience of managing psychomotor agitation secondary to hyperactive delirium. As such, there appeared to be a need for further qualitative research to explore how and why nurses made the decision to initiate restraint. In addition, as described above, seven the included studies who used self-report or interviews, did not state steps taken to minimise social desirability bias. Therefore, there is a risk that the frequency of the application of restraint may be

under-reported and that studies have, up until now, not fully identified nurses' true attitudes towards restraint.

2.10 Chapter summary

- The primary rationale for the use of restraint of any type was to preserve patient and device safety. However, wide variations in practice were evident in the studies reviewed and little appeared to be known about the decision-making processes undertaken by nurses prior to applying restraint.
- The results of the review suggested that unit culture and routine may play a role in influencing the decision to restrain.
- Studies found through the literature review focussed on either chemical or physical restraint. There was a paucity of evidence describing how nurses used different types of restraint in conjunction to manage psychomotor agitation
- A lack of clear and objective language around restraint and psychomotor agitation was evident from the review. Negative subjective descriptors were used to describe patient behaviours. It was possible that such descriptors might influence practice through the development of bias against patients.
- Past experiences of violence from patients and poor support from the clinical team appeared to increase the likelihood of restraint being used. The care of a patient with psychomotor agitation secondary to hyperactive delirium was deemed a nursing role and this caused tensions between the nursing and medical teams.
- Gaps in the literature were identified as discussed in section 2.9. There was a paucity of qualitative research and included studies relied heavily on self-report which risked social desirability bias.

Chapter 3 Methodology

3.1 Introduction

This chapter will outline the aims and objectives of the research study and describe how these are underpinned by methodological theories. An overview of research paradigms will be presented and the chosen approach for this study identified. Following this, a discussion of relevant decision-making theories will be presented. Finally, characteristics of the researcher will be detailed alongside approaches which were implemented to enhance methodological quality. This chapter provides the theoretical rationales for decisions described in the following 'Working Methods' chapter.

3.2 Aims and objectives

The results of the interpretative review described in the previous chapter allowed the aim of this study to be further refined to reflect the gaps in the current evidence base (2.3.5.6). The aim for this research study was:

> *To explore how critical care nurses make the decision to apply different types of restraint when caring for a patient with psychomotor agitation secondary to hyperactive delirium.*

This aim was achieved through meeting the following objectives:

- Undertake a literature review to identify the extent of research in the topic area.
- Develop and undertake a study to extend the current knowledge base and draw upon decision-making theory to analyse the decision-making processes.
- Develop practice recommendations to contribute to restraint guidance for critical care and identify potential opportunities to reduce restraint use.

3.3 Methodological approaches

This section will define and introduce different methodological approaches which underpin research. It will also discuss and explore the rationale to undertake a pragmatic study using qualitative methods.

3.3.1 Reality and knowledge

Health and social research is underpinned by philosophical debates about how the world should be studied (Ormston et al., 2014). Debates surround ontology, which is concerned with the fluid nature of reality, and epistemology, which is concerned with the nature of knowledge and how we learn and know (Ormston et al., 2014; Sergi and Hallin, 2011). There are two main ontological positions: Realism and idealism. In realism, it is believed that an external reality exists which is independent of our belief and understanding (Ormston et al., 2014). Idealists believe the opposite, that the only existing reality is the one which we understand and believe in. Therefore, in research, realism makes a distinction between the way the world is seen and understood by participants, and the way it actually is. In contrast, idealists believe that the world is only knowable through human interpretation.

Epistemology is concerned with the nature of knowledge, learning and knowing. Inductive research is ‘bottom up’, and describes the way knowledge is built through studying the world, leading to the development of theories (Ormston et al., 2014). Deductive research is the opposite. This ‘top down’ approach begins with a theory and a hypothesis, which are tested through observations of the world (Ormston et al., 2014). However, healthcare research does not simply fit into either category in isolation. For example, qualitative research is often considered to be inductive by nature (Braun and Clarke, 2013). However, the researcher is unable to proceed with a completely empty mind. A formal hypothesis may not be in place, but assumptions will have been generated through the process of data collection. Blaikie (2007) suggests a

further two strategies. Reductive logic refers to the researcher attempting to identify mechanisms which may have caused patterns to occur in the results. Abductive logic enables the researcher to isolate a ‘technical’ account from the everyday descriptions provided by participants.

It is also important to consider the relationship between the researcher and the researched. In qualitative research it is difficult to achieve full independence as a researcher, and thus objectivity (Ormston et al., 2014). Indeed, subjectivity is an important and embedded part of qualitative research (Sergi and Hallin, 2011). Participants in qualitative research are affected by the process of being studied, and their thoughts and experiences are processed by the researcher (Ormston et al., 2014). A position of ‘empathetic neutrality’, where the researcher acknowledges the potential impact of their own values and assumptions on the research, can be advocated (Ormston et al., 2014). An openness about the researcher’s subjective beliefs may further enrich the analysis of the topic under study (Sergi and Hallin, 2011). This self-awareness can be demonstrated through the inclusion of a reflexive account. Reflexivity will be discussed later in this chapter.

An inductive qualitative approach was chosen for this study. Qualitative research is an umbrella term for a range of interpretative approaches which aim to generate understanding of various phenomena (Sergi and Hallin, 2011). This study aimed to develop an understanding of how critical care nurses make the decision to apply restraint and was therefore concerned with participants’ personal subjective experience. A qualitative approach would therefore allow critical care nurses’ decision making to be understood.

3.3.2 Paradigms

There are three overarching paradigms which underpin research philosophies. Broadly, positivism is associated with quantitative research, and interpretivism aligns

with qualitative approaches. Pragmatism has been described as the third paradigm (Ormston et al., 2014), and is the approach chosen for this study.

3.3.2.1 Positivism – A quantitative approach

In the positivist tradition, knowledge is produced through careful scientific observation. The researcher is objective and separate from the subject under scrutiny, and the enquiry is based on deductive logic. The method is reproducible and involves the production and testing of logically produced hypotheses. Researchers believe that they can accurately know reality through research (Ormston et al., 2014). Common data collection methods include surveys, and questionnaires, and data is collated in the form of statistics. It has, however, been argued that this approach does not capture the complexity of human behaviour, experience, and interactions (Jensen, 1989). For this reason, a positivist approach will not be applied.

3.3.2.2 Interpretivism – A qualitative approach

In contrast, interpretivists believe that social reality cannot be objectively interpreted through research. Instead, emphasis is placed on the meanings and explanations constructed by participants (Ormston et al., 2014). The process is inductive. However, the presence of theories is acknowledged because of the inherent assumptions of the researchers. There is also an element of subjectivity, with the researcher interpreting the data. These are made transparent through reflexivity. Rich data is commonly collected through in-depth interviews and observation and presented as words (Ormston et al., 2014). However, data may also be collected and presented in visual formats such as comics or other art (Al-Jawad, 2015).

3.3.2.3 Pragmatism – The third paradigm

Long et al. (2018) suggest that most healthcare workers would identify as pragmatists. In pragmatism, problems are defined by those who experience them (Allemang et al., 2021) and its aim is to produce actionable research questions in response to these experiences. Pragmatism does not align itself with any individual

philosophical approach or tradition (Ormston et al., 2014), rather the researcher is encouraged to take a hybrid view, and to choose the method most suited to the research question. Pragmatism is suitable for healthcare research because it enables the research to be conducted in a manner which reflects the needs of the service without being bound by specific methodological traditions (Ormston et al., 2014). In pragmatism, knowledge requires action to become meaningful (Long et al., 2018). This allows it to address and potentially solve problems experienced by those involved in healthcare.

A pragmatic approach was adopted for this study. This decision was made because the study had the broad main aim of exploring critical care nurses' decision-making processes when considering the use of restraint for a patient with psychomotor agitation. Various methodological approaches were considered in terms of which would be most appropriate to meeting this aim. Morgan (2007) states that *'the pragmatist approach does not ignore the relevance of epistemology and other concepts from the philosophy of knowledge. It does, however, reject the top-down privileging of ontological assumptions'* (pg 68). The researcher was keen to avoid being restricted to a single philosophical standpoint. A pragmatic approach would enable different approaches to be drawn upon as required to enhance the study. The differences between a purely qualitative or quantitative approach versus a pragmatic approach are summarised in Table 18.

	Qualitative	**Quantitative**	**Pragmatic**
Connection of theory and data	Induction	Deduction	Abduction
Relationship to research process	Subjectivity	Objectivity	Inter-subjectivity
Inference from data	Context	Generality	Transferability

Table 18: Summary of differences between methodological approaches (Morgan, 2007)

Criticisms have been made against the adoption of the pragmatic paradigm in healthcare research. For example, the emphasis on using the right method to answer the question, and not adhering to a single methodological approach has the potential

to create confusion and lack of consistency in complex studies (Kaushik and Walsh, 2019). In addition, it has been suggested that pragmatic studies should always involve mixed methods (Kaushik and Walsh, 2019). However, this has been refuted as pragmatism aims to use the most appropriate research design to answer the question and certainly does not aim to exclude any methods (Kaushik and Walsh, 2019).

This study aimed to use decision-making theory to further analyse the qualitative data yielded from interviews. Morgan (2007) suggests that a common use of *'abduction in pragmatic reasoning is to further a process of inquiry that evaluates the results of prior inductions through their ability to predict the workability of future lines of behaviour'* (pg 71). This process allows the researcher to work back and forth between data arrived at through different analytical processes. Morgan (2007) also argues that either complete objectivity or subjectivity is impossible and therefore suggests a pragmatic approach of inter-subjectivity. In this approach, both the presence of a 'real world' and the reality of subjects' interpretation of that world is acknowledged and the value and role of each is recognised by the researcher (Morgan, 2007). Finally, pragmatism rejects the stance that knowledge is either specific to a given context or widely generalisable. Morgan (2007) suggest that pragmatically, some aspects of the results will be more specific, whilst others might be transferred to wider settings.

3.4 Decision-making theory

3.4.1 Introduction

This section will present an overview of decision-making theory related to healthcare settings. The decision-making process will be defined and discussed in the context of the management of psychomotor agitation in critical care. Different theoretical approaches to the study of decision-making will be described and rationale will be provided for the choice of the model which will be used in this thesis.

3.4.2 Clinical decision making

A clinical judgement is defined as an opinion formed about a patient or situation, whilst a clinical decision represents a choice between alternatives which produces an outcome (Thompson and Dowding, 2009a; Dowie, 1993). In general, a decision will follow a judgement. Nursing has been likened by Allmark (1992) to a moral enterprise. This suggests that nursing decisions have goals which may not always be technical, instead they may be seemingly less important tasks shaped by a desire to 'do good' and create benefit for the patient (Harbison, 2001).

Critical care nurses have a complex clinical role which involves managing technology, medications, and providing patient-centred care to critically ill patients in a high acuity environment. They make a clinical decision approximately every thirty seconds (Bucknall, 2000). This study aims to explore how and why nurses make the decision to apply restraint to a patient with psychomotor agitation secondary to hyperactive delirium. This situation is considered high risk and high pressure due to the possibility of agitated movements disrupting or removing life-sustaining devices and monitoring.

3.4.3 Why is it important to study clinical decision-making?

Historically, nursing decisions were based on the experience or clinical opinions of the healthcare practitioner (Majid et al., 2011). However, contemporary healthcare decision-making has shifted to be based in research. Research data can be used to create and inform evidence-based practice (EBP). EBP aims to provide nurses with a way of delivering scientifically proven or critically appraised high-quality healthcare interventions (Majid et al., 2011).

Despite ideally being based in EBP, clinical decision-making can be flawed or informed by subjective interpretations or experience (Majid et al., 2011). Clinical decision-making can be improved through improved understanding of the process and the decision-maker (Carroll and Johnson, 1990). However, sometimes decision-

makers diverge from what might be considered ideal behaviour, for example, a nurse might apply restraint in order to have an ‘easy shift’ because they are tired or feeling burnt out. It is common for nurses to demonstrate poor insight into their own behaviour and decision-makers often find it challenging to objectively articulate the processes underpinning their judgements and decisions (Carroll and Johnson, 1990). Social desirability bias can lead to the manipulation of how the process is expressed, with the aim of creating a more favourable impression.

It is important to study decision-making because it enables greater self-knowledge and awareness amongst clinicians. Through this process, it is possible for nurses to develop greater accuracy in decision-making and increase their understanding of the rationales and bias which underpin their decisions (Cader et al., 2005; West et al., 2008). This greater understanding would enable nurses to explain and justify their decisions to the wider multi-disciplinary team. In addition, through studying the rules which govern how decisions are reached in a clinical environment, targeted education can change these rules, resulting in improved practice (Carroll and Johnson, 1990).

3.4.4 The process of decision-making

A process of clinical judgement generally precedes a decision. Clinical judgement involves the nurse, or other healthcare professional, gathering and collating clinical information about an individual (Thompson and Dowding, 2009a). Such information may include haemodynamic status, consciousness level, or simply how the patient appears clinically. The nurse’s judgements will influence future interventions, for example, continuing psychomotor agitation may positively influence the nursing decision to administer sedation or chemical restraint. Lamond et al. (1996) identified four types of judgement: Causal (diagnosis), descriptive, evaluative, and predictive. These types of judgement are defined in Table 19 (overleaf). These judgements may

be used together, or individually to build a clinical picture of the patient and facilitate decision-making.

Type of judgement	Example
Causal	The nurse diagnoses delirium based on their assessment.
Descriptive	The nurse feels that the patient's psychomotor agitation has the potential to disrupt treatment.
Evaluative	The nurse judges that the patient's level of psychomotor agitation has changed.
Inference	The nurse judges that delirium could cause long-term problems for the patient.

Table 19: Summary of types of judgement (Thompson & Dowding, 2009)

A clinical judgement is essentially a choice (Thompson and Dowding, 2009a). The nurse may choose to take one of several available actions, or to do nothing. Carroll and Johnson (1990) identified seven stages in the decision-making process. These are illustrated in Figure 4 and defined below.

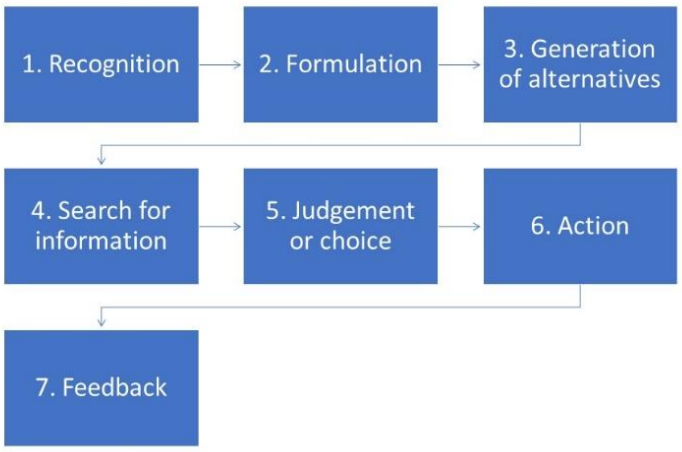


Figure 4: Stages in the decision-making process (Carroll & Johnson, 1990)

3.4.4.1 Recognition

The process of judgement and decision-making begins here when the person identifies that it is necessary to make a decision. The deliberate avoidance of making a decision can also be defined as a decision in itself (Carroll and Johnson, 1990).

3.4.4.2 Formulation

At this point, it is necessary to classify the decision-making situation in terms of aims and values (Carroll and Johnson, 1990). In the context of this study, the preferred outcome (aim) may be to reduce the level of psychomotor agitation to preserve patient safety. The decision-maker may hold patient autonomy to be of high value, and therefore prefer to manage the patient therapeutically rather than with restraint.

3.4.4.3 Generation of alternatives

The decision-maker will choose between alternatives. This may be influenced by prior experience in terms of interventions or choices which the decision-make r has found to be effective in the past (Carroll and Johnson, 1990). For example, critical care nurses may develop a repertoire of techniques for managing hyperactive delirium including approaches such as re-orientation, distraction or repositioning to ensure comfort. The situation may exclude some alternatives as not possible at that moment, for example, poor staffing and high acuity may limit the time a nurse can spend interacting with their patient.

3.4.4.4 Search for information

The decision-maker will search for information about the possible alternatives. Clinical decision making is complicated by uncertainty, and the nurse must calculate the possible advantages and disadvantages of a given choice (Thompson and Dowding, 2009a). This is further complicated by the clinical environment. In critical care, decisions are often made under considerable pressure and are time sensitive.

This is especially true of the decision to restrain a delirious patient, as psychomotor agitation can rapidly cause the disruption of life-preserving therapies.

3.4.4.5 Judgment or choice

At this point, the decision-maker sorts through and evaluates the possible options and makes their judgement. The choice of a judgement is based amongst decision rules (Carroll and Johnson, 1990). Decision rules are developed by individuals through clinical experience and education. However, nurses may lack the capacity and experience to make accurate clinical judgements, which will go on to influence the appropriateness of their action. For example, a nurse who has not received education regarding the correct screening and management of delirium may choose to administer a deliriogenic drug to a patient who has hyperactive delirium. The drug would reduce agitation in the short term, but potentially exacerbate the delirium in the longer term.

3.4.4.6 Action

Until an action is taken, the judgement or decision remains in the mind of the decision-maker (Carroll and Johnson, 1990). It is at this stage which the judgement and decision-making process is acted upon. Not all judgements produce appropriate decisions. A ‘correct’ judgement may be followed by an inappropriate decision; or an ‘incorrect’ judgement might lead to a correct course of action (Thompson and Dowding, 2009a).

3.4.4.7 Feedback

Following the implementation of the decision, information may be provided to the decision-maker regarding the effectiveness of the action (Carroll and Johnson, 1990). This feedback may go on to positively or negatively influence future judgements and decisions through a process of learning. Learning may allow individuals or organisations to develop new decision rules which improve patient management and care.

3.4.5 Intuition

Intuition is a complex phenomenon. It can be described as knowing and understanding without reasoning, or having logical clarification (Benner and Tanner, 1987) and has been recognised as a legitimate approach to clinical decision-making. Intuition is thought to be largely unconscious (Melin-Johansson et al., 2017), however critical care nurses interviewed by Hassani et al. (2016) described it as an 'internal feeling' which led to quick thinking with no firm plan. Intuition was seen by this group of nurses as a kind of sixth-sense, and one which they felt confident would lead to accurate and effective decisions (Hassani et al., 2016).

Intuitive thought is a sudden process, associated with the nurse's prior experience and expertise (Li and Fawcett, 2014). In order to make use of a previous experience to inform decision-making, it must first be recalled. However, it has also been suggested that only positive experiences are accurately recalled (Hastie and Dawes, 2001). If this is the case, intuitive decision-making may not always be accurate and effective.

All nurses along the novice to expert continuum are able to draw upon intuitive decision-making. Experts may be less aware that they are using intuition as they will have a greater store of accumulated experiences and associated outcomes to draw upon (Li and Fawcett, 2014). This store of experience allows expert nurses to react rapidly to subtly changing clinical situations. For example, the expert nurse may become aware that their patient is becoming increasingly restless and confused and intervene before severe psychomotor agitation develops.

3.4.6 Heuristics

Heuristics save time and facilitate decision making by drawing on previous experiences (Carroll and Johnson, 1990). They are cognitive 'shortcuts', which are used in daily decision making. The shortcuts are based in memory and past

experience and as such are a subjective assessment of the possibilities in a clinical situation (Li and Fawcett, 2014). Heuristics are dependent on three factors:

- **Representativeness:** How similar is this situation to one in the decision-maker's memory?
- **Availability:** The ease by which the memory is recalled.
- **Anchoring:** The decision-maker seeks a standard on which to 'hang' the decision. For example, a nurse may be confident that a certain dose of sedation will reduce severe agitation and would therefore administer a smaller dose to a less agitated patient.

However, this type of decision making is at risk of bias. Decision-makers may over-estimate the success of their previous decisions, and therefore subsequent decisions can be based on poor evidence (Carroll and Johnson, 1990). West et al. (2008) define cognitive bias as errors in judgement or decision-making which stem from patterns of thought or bias. Bias can be divided into four sub-types:

- Belief
- Hindsight
- Omission
- Confirmation

Of these sub-types, confirmation bias, which can be defined as the observation of what is expected rather than the objective reality, is thought to be most common amongst healthcare practitioners (Lean Keng and AlQudah, 2017).

3.5 Theories of decision-making

Decision-making theory can be broadly divided into three meta-theories: Prescriptive, descriptive, and normative. This section will provide an overview of these meta-theories.

3.5.1 Prescriptive theories

Prescriptive theories focus on the ‘real world’ element by emphasising criteria for a ‘good’ decision-making process and identifying methods which enable individuals to make better decisions (Bekker, 2009; Carroll and Johnson, 1990). They aim to adapt decision rules to reduce bias or inconsistencies (Carroll and Johnson, 1990).

3.5.2 Descriptive theories

Descriptive theories are used to describe ‘how’ an individual arrives at a given judgment or decision (Thompson and Dowding, 2009b). This type of approach sees the decision-maker as an active problem-solver who is seeking to make judgements and decisions in a complex world (Bekker, 2009).

3.5.3 Normative theories

Normative theories describe the manner in which a rational person should act to make a consistently ‘good’ decision if there were no constraints placed upon them (Thompson and Dowding, 2009b; Von Neumann and Morgenstern, 1947). Such good clinical decisions, in an ideal context, form the benchmarks against which our actual decisions (in ‘real life’) can be measured. However, very few decisions in clinical practice are simple, and most involve divergence from this model. Clinical decisions frequently involve the nurse making a ‘trade off’. For example, a nurse may choose to re-sedate an agitated patient to preserve their safety, however, this action would increase the duration of their critical care admission and may impact negatively on their psychological recovery.

3.6 Theoretical models of the decision-making process

This section will review common decision-making models which can be used to investigate the process through which a decision is made. Not all are specific to healthcare, but they highlight a number of issues which can improve the understanding of how decisions are made.

3.6.1 Hypothetico-deductive reasoning

Elstein et al. (1990) proposed that nurses go through a number of stages when completing a reasoning process (Figure 5).

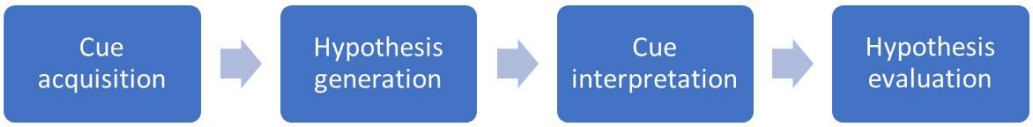


Figure 5: Stages in the reasoning process (Elstein et al., 1990).

For example, a nurse may gather information about their patient which might come from their notes or from a handover. Initial explanations or hypotheses may then be generated. For example, the patient may be displaying signs of inattention, disordered thinking, and psychomotor agitation. The nurse may hypothesise that the patient is delirious. Cue interpretation involves reviewing the initial cues and interpreting them in relation to the initial hypothesis. For example, a CAM-ICU screen might confirm or reject the hypothesis that the patient is delirious. Finally, the nurse weighs up the evidence, and selects the most likely explanation for the patient's presenting condition.

However, this model appears overly simple and does not represent all the ways a nurse may make clinical decisions. For example, the model only represents a single linear process and does not account for the use of other reasoning strategies, such as intuition and heuristics (Thompson and Dowding, 2009b). For these reasons, this model was deemed unsuitable for use in this study.

3.6.2 Social judgement theory

Brunswick (1952) proposed that the environment in which a decision is made should be studied alongside the decision-maker. His lens model (Figure 6, overleaf) demonstrates how the uncertainty of the environment can influence decisions. The

'cues' represent the uncertainty of decision-making and the environment. They are interpreted by the decision-maker and weighed up during the judgement process. The left side of the model represents the 'to-be-judged' state of the world, the cues which inform and influence judgement are in the centre, and the right-hand side depicts the judgement. The lines connecting each side of the model demonstrate the accuracy of the decision-maker's judgement (Cooksey, 1996; Thompson and Dowding, 2009b).

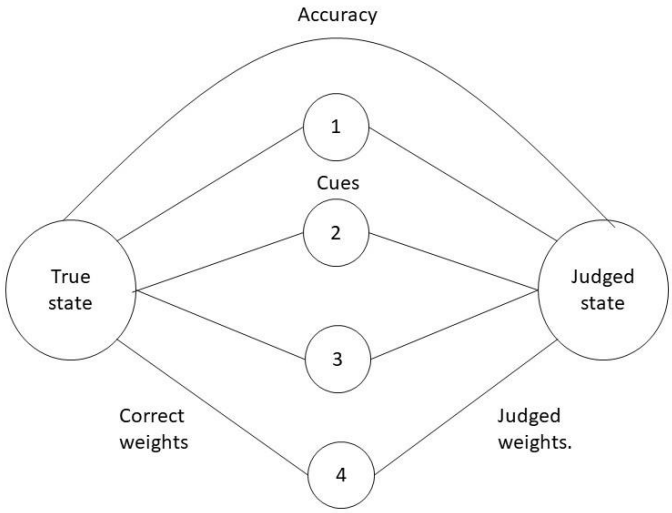


Figure 6: Brunswick's Lens Model (1952)

Social judgement theory (SJT) can help researchers to understand the weighting given by clinicians to cues, for example, some may be favoured above others and used predominantly in the judgement and decision-making process (Thompson and Dowding, 2009b). This information could be used in clinical education to ensure that nurses are applying the 'correct' weighting to clinical cues and thus arriving at accurate judgements and effective decisions (Thompson et al., 2005). SJT can therefore promote understanding of decision-makers and their environment, however it is unable to predict how the environment will impact on the type of judgement process.

3.6.3 Dual process theory

Dual process theory aims to promote understanding of different types of decision-making process. In this theory, two systems are presented as being at work during judgement and decision-making. The first system is unconscious, fast, and automatic (Epstein, 1994). The second is a conscious, slow, and deliberate process. In this theory, the slower process is thought to monitor and correct initial rapid judgements. The characteristics of the two systems are summarised in Table 20.

Characteristic	**System 1 (Unconscious and rapid)**	**System 2 (Conscious and slow)**
Control	Unconscious	Conscious
Flexibility	Inflexible	Flexible
Speed style	Rapid	Slow
Context	Highly- contextualised	Decontextualised
Emotional involvement	High	Low

Table 20: Dual Process Theory (Epstein, 1994; Hammond, 1996).

Dual Process Theory recognises the role of intuition in decision-making (Pelaccia et al., 2011). The situation in which the decision is made governs the system employed by the decision-maker. For example, analytical decisions are used in complex situations, where there is time to consider the judgement carefully, and the outcomes carry high risk (Pelaccia et al., 2011). In contrast, the rapid intuitive style of decision would be employed where a rapid judgement and action were required, or for common decisions in daily life. In addition, the two systems represent polar points or opposites. It is theorised that clinical decision-making is able to draw upon both systems simultaneously (Pelaccia et al., 2011). This model recognises the plurality of processes involved in clinical decision-making but does not allow the researcher to explore how and why an intuitive or analytical system was chosen for a particular situation and decision.

3.6.4 Cognitive Continuum Theory

Cognitive Continuum Theory (CCT) is the method which will be used in this thesis to reach a greater understanding of how nurses make the decision to apply restraint. Cognitive Continuum Theory (CCT) is a descriptive theory which illustrates how judgement situations or types of task relate to cognition (Hamm, 1988; Hammond, 1981). It advances Dual Process Theory by presenting intuitive and analytical modes of condition as on a continuum rather than as opposing forces (Thompson and Dowding, 2009b). The original theory includes six broad modes of cognition along a continuum beginning at intuition and ending with analytical cognitive modes such as experiments. Intuitive approaches are highly adaptable but can be subject to bias (Thompson and Dowding, 2009b). Analytical approaches to decision-making adhere to the principles of evidence-based practice and represent rational and systematic problem-solving methods. CCT argues that a range of modes of cognition along the continuum must be drawn upon in response to the task in order for effective decision-making to occur.

CCT also considers the complexity of the task presented. Simpler tasks lead to intuitive responses, whereas more complex tasks promote an analytical response. An organised task is likely to lead to an analytical mode of cognition, whilst ambiguity would prompt an intuitive judgement. In addition, more familiar tasks prompt clinicians to develop complicated ways of dealing with the cues presented. An unfamiliar task is likely to lead to an intuitive response as time has not been allowed to generate an analytical response. Finally, CCT considers the how the task is presented to the decision-maker. A task which is easy to break down into simple sub-tasks promotes an analytical response. Visual cues are thought to lead to intuitive responses, whilst written evidence promotes analytical modes of cognition (Thompson and Dowding, 2009b; Hamm, 1988).

The theory suggests that an appropriate mode of cognition is necessary for a 'good' or 'accurate' judgement to occur. In the CCT, analysis and intuition are not seen as rival opposing forces, rather a person is able to use both forms of judgement, with quasi-rational modes providing a link between the two poles. This is in opposition to the traditional view that intuition and analysis are rival forms of knowing (Cader et al., 2005).

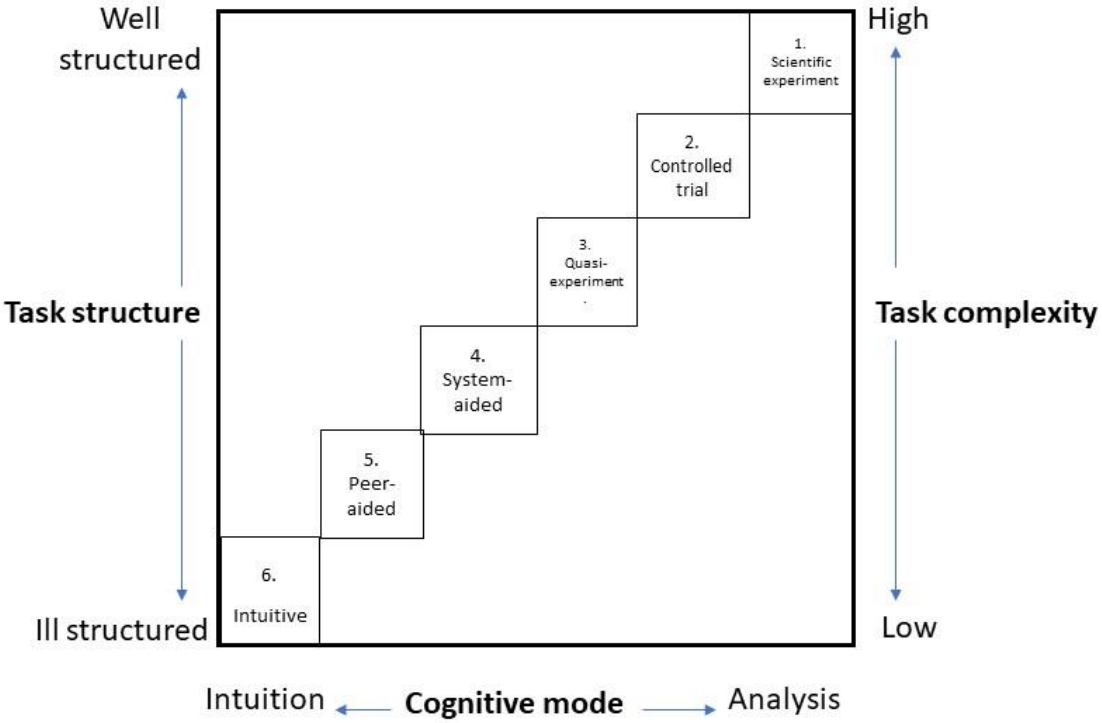


Figure 7: Cognitive Continuum Theory (1988)

CCT is not a nursing theory. It has roots in cognitive psychology and draws on elements of Social Judgement Theory (SJT) (Cader et al., 2005). However, CCT could be used to assist nurses in decision making in a number of ways. In order to deliver evidence-based care, nurses need to be able to understand how they make decisions (Thompson and Dowding, 2009a). CCT can contribute to this understanding through offering a theory to facilitate the analysis of judgements and decisions. CCT can also assist decision makers in identifying the most appropriate mode of cognition for a

given task. Finally, an understanding of the theory could assist nurses in explaining the rationales behind their decisions (Cader et al., 2005). Standing (2008) created an updated and nursing-specific version of the original CCT (Hammond, 1981; Hamm, 1988). In this version, an additional three modes of cognition have been added, the numerical order has been removed to avoid judgement on the value of modes or undermine the premise that a person can oscillate along the continuum in response to a changing task. In addition, task structure was renamed as high or low structured instead of well and ill-structured.

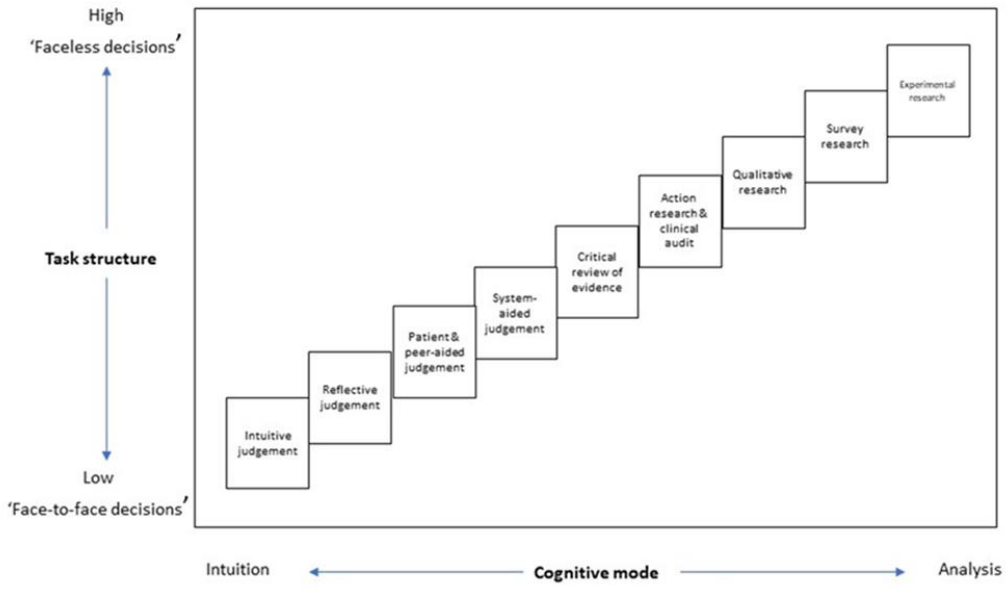


Figure 8: Updated Cognitive Continuum Theory (Standing, 2008)

Mode of cognition	Definition
Intuitive judgement	Forming ideas and opinions based on subconscious personal experience without explicit awareness of the process leading to their formation.
Reflective judgement	Reflection during or after an event with guides judgement and decision-making.
Patient or peer aided judgement	Includes patient preference or seeks advice from peers.
System aided judgement	Use of validated assessment tools, guidelines or protocols to support decision-making.

Critical review of research	Nurse thinks critically about procedures and questions them, identified knowledge deficits and applies research to enhance practice.
Action research and audit	Used to study and improve the consistency of clinical care.
Qualitative research	Draws on the lived experience of research participants.
Survey research	Seeks answers to specific questions via a sample of a population.
Experimental research	Underpins the development and evaluation of clinical interventions.

Table 21: Definitions of cognitive modes (Standing, 2008).

3.7 Methods through which decision-making can be measured

There has been increasing interest in attempts to measure the process of decision-making since the 1950s. Initial methods were largely mathematical and aimed to reduce the decision to stimulus and response. However, later research approaches have sought to understand the cognitive processes which underpin judgement and decision-making (Carroll and Johnson, 1990). This section will outline some common methods through which decision-making can be measured.

3.7.1 Weighted-additive structural models

Weighted-additive models attempt to capture the decision-maker's preferences and build a representation of their behaviour (Carroll and Johnson, 1990). They can be reduced to input and output and are suitable for quantitative research approaches aiming to predict decision-making.

3.7.2 Process methods

Process-driven methods aim to capture the cognitive processes undertaken whilst making a decision and facilitate understanding of these processes (Carroll and Johnson, 1990). Processes can be explored through various methods such as task analysis or cognitive interviewing. In task analysis, participants are faced with a decision task (problem space) for which the researcher has identified a number of

goals. The researcher aims to move the participant from one point of the problem space to another and explore the decisions and judgements as they are made (Carroll and Johnson, 1990).

Cognitive interviewing is another process method which aims to capture the steps in judgement and decision-making. The most common cognitive interviewing method for tracing the process of decisions is ‘Think Aloud’. This was the chosen method for this study and will be explained in detail below.

3.7.3 Think Aloud

‘Think aloud’ is a qualitative data collection method which enables researchers to capture the problem-solving and decision-making activities used by participants as they perform a given task. The task might be simulated, or participants might ‘think aloud’ as they make decisions in their workplace, such as in the study by Aitken et al. (2009) where critical care nurses described their decision-making processes when administering sedation. The method was proposed by Ericsson and Simon (1980) and enables the capture of sequential thought processes, as participants talk through their decision-making process in a specific clinical scenario. Think aloud has roots in cognitive psychology and has also been used to track and explore the thought processes of computer programme developers and users (Burbach et al., 2015). The strengths and limitations of this method will now be discussed.

Think Aloud has been previously used in studies based in critical care (Han et al., 2007, Aitken et al., 2009) and can be used during direct observation of care or scenarios. Vignettes and scenarios will be discussed in detail in the next section of this chapter. The method is appropriate for use with audio-visual vignettes as it captures decisions made in response to visual cues. Think Aloud is differentiated from video reflexive ethnography through its focus on remote constructed scenarios rather than actual clinical practice (Ajjawi et al., 2020). However, the validity of the method has been criticised, with questions posed regarding the individual’s access to their

unconscious decision-making processes (Nisbett and Wilson, 1977). When describing decision-making processes whilst thinking aloud, participants are able to quickly draw upon active information, which is stored in the working memory (Jaspers et al., 2004). Information might also be retrieved from the long-term memory to supplement the working memory (Jaspers et al., 2004). In Think Aloud, there is a risk that only the contents of the working memory are verbalised (Jaspers et al., 2004) and therefore does not fully represent the decision-making process. In addition, this could lead to possible bias, with only conscious processes reported. However, these processes still offer an insight into participants on-going thought processes (Jaspers et al., 2004).

Cotton and Gresty (2006) used Think Aloud to explore Year 1 pre-registration nursing students experience of e-learning. The authors were concerned that participants might be influenced by the presence of the researcher and attempt to provide the perceived 'right' answer for fear of their judgement and decision-making being criticised. This is known as social desirability bias and was defined in the context of self-report in research studies in Chapter 2. However, Cotton and Gresty (2006) report in their evaluation of the think aloud method that although some participants noted that their decisions might be different in 'normal' non-observed situations, they believed that data returned did reflect the genuine thoughts of their participants. In addition, Jaspers et al. (2004) found think aloud to offer unique data regarding concurrent thought-processes undertaken during a set task. Because of these strengths, the decision was made to make use of Think Aloud for this study.

A process driven method was chosen for this study because it was deemed the most appropriate approach to explore participants' decision-making processes and reach an understating of how and why they made their judgements and decisions. Think Aloud was selected because it offered a pragmatic method of data collection. Think Aloud can be used to collect verbal reports of sequential judgements and thoughts and is appropriate for use in a simulated clinical setting. In order to create a

simulated clinical environment, the decision was made to develop audio-visual vignettes.

3.7.4 What is a vignette?

Finch (1987) described vignettes as *'short stories about hypothetical characters in specified circumstances, to whose situation the interviewee is invited to respond'* (pp 105). Within these specified circumstances, they allow the exploration of participants' beliefs, attitudes, judgements, and perceptions (Spalding and Phillips, 2007; Stacey et al., 2014). Vignettes can be constructed as written paper-based scenarios or case studies, or, as in the case of this study, short audio-visual films. Written vignettes are limited because they are static and are less well retained by participants (Hughes and Huby, 2002). In contrast, audio-visual vignettes have been found to provide a better representation of clinical reality (Hughes and Huby, 2002). A vignette will never be able to fully capture the dynamic nature of clinical care, however, vignettes offer the researcher the opportunity to focus on selected elements of clinical care which are appropriate to their study (Hughes and Huby, 2002) without the potential distractions which can be problematic during direct observation (Hillen et al., 2013). In contrast, a focussed vignette allows the researcher to draw specific conclusions about cause and effect.

Vignettes have been increasingly used in healthcare education, research and in the development of clinical decision pathways (Brauer et al., 2009). Their popularity has been associated with recognition of the limitations of questionnaires when studying participants' perceptions beliefs and social norms (Hughes and Huby, 2002). Vignettes or scenarios have been identified as a novel research method, which can produce rigorous and actionable data (Ramirez et al., 2015). They allow the researcher to address complex clinical realities and aim to provide an immersive simulated decision-making environment without requiring direct observation in the clinical setting and causing disruption to practice.

Two main methods of vignette development have been identified (Brauer et al., 2009): the first is the factorial method. Vignettes are created to describe all the possible combinations seen in a given circumstance or problem. This approach can be used in quantitative studies. The second method involves storytelling, where typical scenarios are created by the researcher (Finch, 1987). The second method is more commonly found in qualitative studies and was the chosen approach for this research because the study sought to explore how participants' decision-making would be affected by an evolving scenario.

However, issues affecting the content validity of vignettes in research have been identified. Vignettes are commonly rooted in the reflections of the researcher on their own practice or experience. This lends vignettes elements of descriptive detail and face validity, but can also increase the risk of researcher bias (Brauer et al., 2009). Content validity is vital as a poorly designed vignette, which is not representative of the situation it aims to depict, will not engage participants nor yield responses which are reflective of clinical reality (Hughes and Huby, 2002; St. Marie et al., 2021). St. Marie et al. (2021) undertook a three-step process including focus groups and experts, to evaluate and optimise the content validity of their vignettes. They found that vignettes must represent the world which they claim to depict, and that their content must be relevant to the topic under study. Poorly-designed vignettes resulted in participant disinterest and confusion (St. Marie et al., 2021).

Vignettes also have been identified to have strengths which lend them to being used in healthcare research. Unlike observational studies, vignettes can be crafted to focus on a specific topic with limited distractions (Hillen et al., 2013). Hillen et al. (2013) reviewed 18 studies which used vignettes to explore physician communications. They found that realistic vignettes with high content validity could immerse participants and produce valid and informative results (Hillen et al., 2013). Vignette-based research studies create a distance between the participant and the situation. This is useful when exploring sensitive topics, such as restraint, as the

distance reduces the likelihood of distress to the participant and offers space in which reflection can be facilitated (St. Marie et al., 2021).

3.7.5 Why was the vignette method selected for this study?

The decision was made to choose audio-visual vignettes because they offered a higher level of realism, without the potential patient harm and clinical disruption which could occur if an observational study was undertaken (Hughes and Huby, 2002). Critical care is a high acuity area of secondary care and patient deterioration can occur unpredictably. Direct observation of clinical staff may cause disruption to clinical activities or cause distress to patients or relatives. Asking nurses to verbally articulate their decision-making whilst involved in direct clinical care could have a negative impact on their ability to engage fully with their patients or confuse patients with delirium. This decision was driven by clinical experience and reflection on accounts of critical care by patients who had experienced delirium. In addition, vignettes have a research advantage over direct observation in that they allow participants to focus on a specific task in a controlled simulated environment (Hughes and Huby, 2002).

3.7.6 Deciding on a format for the vignettes

Written and audio-visual formats were considered for the vignettes. Written scenarios are common in healthcare research and education (Brauer et al., 2009). They are easy and cost-effective to produce. However, they struggle to reproduce the sights and sounds of clinical practice and, as such, lack realism. This can have a negative impact on the quality of the data produced (Hughes and Huby, 2002). In addition, a written format offers the participant time to consider their choices and return to the written details they have been provided with. This was deemed clinically unrealistic and unlikely to accurately capture the decision-making processes undertaken when managing acute psychomotor agitation secondary to hyperactive delirium.

Audio-visual vignettes have several advantages over written case studies. Showing a visual representation of an agitated critical care patient was intended to place the nurse under pressure to make a decision regarding their choice of clinical intervention. This aimed to reduce the possibility of responses rooted in social desirability bias. Participants engaging with self-report may attempt to create a favourable image of themselves and their practice, which they feel will align with ideals of what is expected in their role (van de Mortel, 2008). The chosen approach aimed to optimise the ability to study potential stigma and preconceptions relating to the management of psychomotor agitation.

In line with the pragmatic approach underpinning this method, audio-visual vignettes represent a practical and effective choice of data collection tool. They are relatively low cost, replicate the clinical environment without causing disruption, and offer a flexible method for describing and understanding decision making (Brauer et al., 2009).

3.7.7 Understanding the social environment in which decisions are made

This study aimed to determine best practice and develop the evidence-base around how critical care nurses make decisions. It was therefore important to consider the social environment in which critical care nurses work alongside the physical clinical environment.

3.7.7.1 Culture

Culture can be simply defined as a set of core values and beliefs shared within an organisation (Ford and Walsh, 1994). For the purpose of this chapter, culture will be considered within the context of the nursing workforce on a critical care unit. Culture is influenced by the working environment, and is both a product and output of the shared beliefs (Ford and Walsh, 1994). Therefore, a busy and short-staffed unit may lead nurses to value efficiency over patient centred care (Sharp et al., 2018) and

adopt a task-centred approach, resulting in the over-use of restraint to facilitate the rapid accomplishment of tasks. Such an approach becomes an accepted cultural norm amongst the group, perpetuating restraint use as part of practice. Culture influences nurses' behaviours and attitudes without their awareness. Therefore change becomes challenging as nurses are both unconsciously influenced by, and influence, the culture in which they work (Sharp et al., 2018). This influence leads to a perpetuation of behaviours and beliefs of existing staff which are then shared with new members of staff joining the team.

3.7.7.2 Labelling patients

The idea of the unpopular patient was first proposed by Stockwell (1972). She described her premise which is based on a patient displaying 'deviant' behaviour, which departs from the norm expected by staff. The term 'deviant' has its roots in labelling theory (Price, 2013; Becker, 1963). Nurses want to think of themselves as supportive and caring and their reactions to perceived 'deviant' behaviour may disrupt this curated self-image. Through labelling a patient, individuals can reconstruct reality to match their needs and cast a patient in a negative light whose actions prevent the nurse from behaving in their normal caring manner (Price, 2013). In the context of this thesis, deviant behaviour is defined as anything deemed by nurses to be atypical or undesirable (Carveth, 1995). For example, the patient may not comply with treatment, they might ask too many questions, or be aggressive (Michaelsen, 2012). In the context of critical care, a patient with hyperactive delirium might be considered to display deviant behaviour because they are displaying psychomotor agitation and are non-concordant with treatment. Such a patient would contrast strongly with a fully sedated patient, who might be considered to be the desirable 'norm' by critical care nurses (Williams, 2007).These factors are seen through the lens of the culture of a particular unit or the perceptions and beliefs of the nurse.

Psychomotor agitation is a frequent manifestation of perceived deviant behaviour in critical care. This can lead the patient to be labelled as 'unpopular' by

staff, and to subsequent reduced staff engagement and avoidance (Michaelsen, 2012). Delirious patients are considered to be unpopular and challenging by critical care staff (Zamoscik et al., 2017). Psychomotor agitation and delirium, although not uncommon in critical care, mark a departure from the compliant sedated and ventilated patient. Delirious patients are widely considered by staff to be a ‘proper’ or genuine critical care patient (Williams, 2007). In contrast, a patient with delirium may not have the same level of physiological dependence or complex organ support. Caring for a patient with delirium draw upon a different skill set and might not provide the technical challenge and mental stimulation that many critical care nurses expect and thrive upon. They can be labelled as ‘not a ‘proper’ patient’ (Williams, 2007). This label is potentially harmful as it devalues vulnerable patients through its implication that they do not deserve a critical care bed or expert nursing care (Lowbridge and Hayes, 2013). This is further emphasised through the frequent practice of allocating junior staff to such patients (Williams, 2007).

In critical care, patients may be deemed to be popular and unpopular at different points during their stay. A deeply sedated patient in multi-organ failure requiring advanced organ support is certainly regarded as a ‘proper’ critical care patient, and one which nurses are keen to be allocated to. However, as the patient’s condition improves, they may take on ‘unpopular’ attributes. In addition, there has been a move towards lighter sedation in critical care which is associated with reduced length of stay and improved patient outcomes (Burry et al., 2014). However, this paradigm shift has presented challenges for critical care nurses. Mortensen et al. (2019) undertook interviews with ten ICU nurses with varying durations of experience (2-8 years). Participants expressed frustration towards lightly sedated patients and struggled with communication and perceived ‘demanding’ behaviour. Such patients, who present a different challenge to the intellectually and technically stimulating multi-organ failure patient have been anecdotally named ‘not a proper ICU patient’.

A patient who is weaning from mechanical ventilation over a long period of time is likely to become delirious (Cavallazzi et al., 2012). They will require continuous nursing vigilance to prevent device interference and to preserve their safety. In addition, long-term patients are likely to be un-sedated and ventilated via a tracheostomy rather than an oral endotracheal tube. They will therefore require two-way communication from the nurse. This is made difficult by the presence of the tracheostomy, which commonly renders the patient voiceless, and is further complicated by the presence of delirious hallucinations and delusions. Communication with ventilated patients is a source of anxiety and frustration for critical care nurses (Dithole et al., 2016). The frustration with communication difficulties may lead the nurse to avoid engaging fully with the patient, for example by avoiding eye contact (Mortensen et al., 2019). This, together with the physical and psychological nursing challenge presented by delirious patients (Zamoscik et al., 2017), can lead to nursing exhaustion and burnout. These factors were associated with an increase in the use of physical and chemical restraint (Lopetrone, 2006).

3.7.7.3 Nurse socialisation on the critical care unit

The stages by which a new critical care nurse becomes socialised into the workforces was examined by Leathart (1994b) and Bradby (1990) and is described here. Status passage, where the new nurse becomes a ‘critical care nurse’ is dependent upon three stages. During the first stage, known as serial passage, the nurse arrives on the unit with stereotypical views of what critical care nursing will be. They are mentored by an experienced nurse. During which time they learn vital skills. Emphasis is placed on conforming to the social norms of the existing team. During disjunctive passage, the new nurse begins to care for patients alone. Anxiety is high, and they wish to be seen as a ‘proper’ critical care nurse who can cope. Delirious patients are frequently allocated to nurses at this stage because they are of low acuity in terms of organ support. However, the majority of new nurses lack the knowledge and resources to manage delirium (Williams, 2007). The need to be seen to be coping

can lead them to resort to chemical or physical restraint. The final socialisation stage is divestiture. At this point, the new nurse discards their individual identity and conforms to the team identity. As they become more experienced, this stage is reversed as the nurse becomes a competent and valued member of the critical care team and feels able to suggest clinical practice changes and improvements.

3.7.7.4 Sharing of value-based judgements

Nursing handover facilitates the sharing of judgements of dysfunctional or deviant patient behaviour (Carveth, 1995). Subjective terms such as ‘mad’, ‘poorly behaved’, and ‘not a proper patient’ have been used by nurses to describe behaviours caused by hyperactive delirium despite the existence of objective tools such as RASS and CAM-ICU (Teece et al., 2020). Once a consensus regarding a patient is reached amongst nurses, biases can be established and shared (Carveth, 1995). Bias can be defined as an unfair inclination or prejudice.

Delirious patients are described as more challenging to nurse (Zamoscik et al., 2017) than sedated and ventilated patients. However, it could be said that they present a different type of challenge. Caring for a delirious patient demands a different skill and mind-set. Instead of minute adjustments to drugs and ventilation, the nurse is tasked with ensuring the comfort and safety of an agitated patient, making rapid clinical judgements to ensure oxygenation and perfusion are maintained in a patient who is intolerant of monitoring equipment.

Labelling holds power. Handovers based on personal rather than objective evaluations can allow biases to pervade the staff group (Johnson and Webb, 1995). Patient identity can be constructed in handover before staff meet the patient. This could cloud and influence a nurse’s view of that patient and prevent an objective assessment. Thus, a label can become permanent through being repeatedly communicated and can lead to an assumption of deviance in the labelled patient (Carveth, 1995). If labels are expressed by dominant or senior members of the staff

group, they can be difficult to challenge (Johnson and Webb, 1995) and can be adopted by junior staff to enable them to better ‘fit in’ to the culture of their new workplace (Leathart, 1994b). Such collective opinions can help maintain the integrity of the nursing team in the face of challenging situations and offer staff a defensive mechanism through which to better cope (Carveth, 1995).

3.7.7.5 Routine, ritual, and power

Perceived deviant patient behaviours, such as psychomotor agitation, challenge nurses’ power and disrupt the routines and rituals of their practice (Michaelsen, 2012; Rytterström et al., 2011). Routines offer nurses comfort and can promote patient safety (Rytterström et al., 2011). When new staff adopt the routine, they are more readily accepted into the team (Rytterström et al., 2011).

Nursing care in critical care units is built on routine. Cardiovascular observations are taken and charted on the hour, pressure area care is provided 2-4 hourly, and drugs and infusions are maintained. Routine can be harmful if conducted in an unthinking manner and individualised care is neglected. Routine in critical care is an expression of the culture of the speciality. In taking control of patients’ bodily functions and survival, the nurse is tasked to maintain these safely. This is enabled by a safe routine. Ritual is more difficult to define and identify in critical care. It can be seen as an affective commitment which creates meaning in nursing practice (Rytterström et al., 2011). In critical care, ritual and routine both function to maintain safety and order and can reduce decision-making stress, by reducing the amount of potential decisions a nurse must make (Leathart, 1994a).

The presence of a ‘deviant’ patient is disruptive of routine and ritual and seen as a patient safety risk. Delirious patients place increased demands on a nurse’s time through the need for constant vigilance and communication. Typically, communication with a sedated patient is task-based, for example, an observational study showed that one ICU patient received only 1hour and 17 minutes nursing contact time in a 24 hour

period (Meriläinen et al., 2013). Patients who are ‘awake’, rather than sedated, place greater demands on nurses’ time through their need for two-way communication. Without sufficient support, communication with a challenging patient can lead to exhaustion and further reliance on task-based approaches to care (McDonnell and Timmins, 2012).

Labelling is one way nurses can regain emotional control or power over patients exhibiting behaviour deemed to be deviant (Smith and Hart, 1994). As previously described, caring for delirious patients is physically and emotionally draining for the nurse (McDonnell and Timmins, 2012). Faced with this type of emotional labour, nurses repress their own feelings, and engage in ‘surface acting’, to ensure any unprofessional feelings are not evident in their practice (Michaelsen, 2012). In critical care, this might cause the nurse to supress their feelings of disappointment and frustration at being allocated to care for a delirious patient. This act further drains the nurse emotionally. In the event of prolonged deviant behaviour, such as delirium, nurses can detach from the patient physically and emotionally in order to cope (Michaelsen, 2012). Such behaviour might involve requesting a colleague to take over care of the patient or not being ‘present’ during interactions. This has a profound impact on patient care and the development of a therapeutic relationship.

3.7.7.6 Impact on care and compassion

Once a decision is made to label a patient as deviant and a consensus is reached, exclusionary measures can be applied by nurses (Carveth, 1995). Such measures include physical and emotional avoidance (Michaelsen, 2012) which can lead to unsupportive nursing care. This is contrary to the compassionate and patient-centred care which forms the foundation of nursing practice (Jones et al., 2016). When a nurse’s behaviours are contrary to their values, for example, if they avoid interacting with a vulnerable patient, moral distress and compassion fatigue can result (Jones et al., 2016). This has a negative impact on the nurse’s ability to deliver compassionate care.

The therapeutic management of delirium requires nursing presence. Regular reorientation to time and place, restoring the sleep/wake cycle, early mobilisation, and reduced sedation are cited as methods of reducing delirium (NICE, 2019). However, a systematic review was unable to find significant evidence to suggest that non-pharmacological methods had an impact on the incidence or duration of delirium, with the exception of family voice reorientation (Bannon et al., 2019). However, a bedside nursing presence is required to facilitate delirium screening and ensure patient safety (Whitehorne et al., 2015). It is suggested that avoidance leads to further disruptive behaviour. In the case of critical care, the nurse might leave the bedside and return to find that their patient has removed their naso-gastric feeding tube. The disruptive behaviour was allowed to occur due a lapse in the nurse's vigilance, and the action reinforces the labelling of the patient as difficult or challenging as they do not conform to ideal behavioural norms.

To be therapeutic, communication must be two-way (Leathart, 1994a). Communication with a delirious patient can be problematic due to the presence of an artificial airway which prevents speech, alongside agitated behaviour and delusions. Critical care nurse communication is influenced by patient responsiveness (Leathart, 1994a) and is experienced as difficult and ineffective by 40% of patients (Happ et al., 2011). Labelling a patient as challenging or deviant could further reduce opportunities for conversation, leading the patient to feel devalued and alone (Happ et al., 2011) and engage in further perceived deviant behaviour to attract a nurse to the bedside.

3.8 Issues of quality in qualitative research

There is no unified approach to theory, methodology or method in qualitative research (Rolfe, 2006) and therefore no absolute criteria of quality against which a piece of qualitative research can be measured (Braun and Clarke, 2013). This has led to attempts to apply positivist quantitative measures to qualitative studies in an effort to gauge quality and add certainty (Rolfe, 2006). However, such measures are

inappropriate for qualitative research and Tobin and Begley (2004) argued that terms should not be transferred between specific research paradigms. Braun and Clarke (2013) liken the judgement of quality in qualitative studies to film criticism. They suggest that implicit criteria are used by experienced researchers when appraising studies, but inexperienced researchers may find guidelines useful. This section will discuss whether it is appropriate to use adjusted quantitative criteria to appraise quality in qualitative studies. The steps taken to assure quality in this study will be fully discussed in Chapter 4.

3.8.1 Generalisability and transferability

These criteria are usually referred to as generalisability when discussing quantitative studies. Generalisability refers to the extent to which the results of one study may be applied to wider populations (Lewis et al., 2014) and can also be referred to as external validity when considering a quantitative study (Rolfe, 2006). Qualitative studies are typically more subjective and use smaller sample sizes than quantitative projects. This has led to criticism that their worth in terms of generalisability is limited and attempts to define the concept of generalisability in appropriate terms for qualitative studies (Lewis et al., 2014). There are inherent values in qualitative research studies which can be transferred from one context to another. Shenton (2004) suggested that although the context of individual cases within qualitative studies is unique, each case is also part of a broader group. Therefore, it is possible that some elements of qualitative studies can be transferred from one context to another. Transferability reflects a more flexible approach to the notion of generalisability. It refers to the extent to which results can be applied to other contexts or populations (Lewis et al., 2014). To facilitate this, it is vital that a full description of the context of a qualitative study is provided. Specific descriptions of the participants, circumstances, and setting of the study must be detailed (Lewis et al., 2014). These descriptions enable the reader to judge whether they may be able to apply these results to their specific context.

In a pragmatic approach, the concept of either full or very limited generalisability is rejected (Morgan, 2007). Instead it is suggested that some aspects of the results may be widely generalisable or transferable, whilst others may be specific to a single context. The burden of this decision rests with the reader (Morgan, 2007).

3.8.2 Validity – A quantitative concept

Validity is the degree to which the research shows what it claims to show or the extent to which it captures 'reality' (Braun and Clarke, 2013). This concept is more appropriate to quantitative research, which seeks objective truths, than qualitative research which embraces multiple lived realities. However, construct validity may be demonstrated through detailed accounts of how the data has informed the conclusions drawn. This can be achieved through the use of quotations and rich description (Seale, 2012). Ecological validity is considered to be more relevant when considering qualitative research (Braun and Clarke, 2013). This is because qualitative data is often collected in 'real world' settings and is therefore less removed from 'real life' than its quantitative counterpart. This was considered when developing the vignettes for this study, which are discussed in depth in Chapter 4 (4.2).

3.8.3 Reliability and trustworthiness

Reliability refers to the possibility that other researchers employing the same methods would arrive at the same results (Braun and Clarke, 2013). This is considered important when developing tools for use in quantitative studies as a number of researchers might be involved in data collection for a large study and the methods must facilitate reliable and objective measurements (Braun and Clarke, 2013). In contrast qualitative research does not strive for objectivity. The researcher cannot be separated from the study as their subjective lens is part of the generation and analysis of data. In this way, reliability is not a suitable criterion against which to rigidly measure qualitative research (Lewis et al., 2014). Rolfe (2006) argued that qualitative realities

are multiple and subjective, and therefore that repeatability is not an appropriate measure of quality when appraising qualitative studies. Attempts to force repeatability and reliability into qualitative studies could potentially reduce the meaningfulness of the study (Rolfe, 2006).

Trustworthiness is considered to be a better criteria than reliability for appraising this aspect of qualitative research (Rolfe, 2006). To demonstrate trustworthiness, an accurate decision trail must be presented. The researcher's position and attributes should be clearly described alongside those of the study setting and population (Braun and Clarke, 2019). This is known as reflexivity and will be discussed in detail in section 3.10. Rolfe (2006) argued that a paper can only be considered trustworthy if the reader considers it to be so. However, this approach was criticised as elitist by Porter (2007) as it suggested that studies can only be appraised by those proficient in undertaking research. In their view, research is a two-way conversation and the researcher must play a role in demonstrating the quality of their work rather than leaving this judgement to the reader. Porter (2007) also cautioned that such an approach could lead to reduced quality in research output as researchers would no longer need to prove the reliability and rigour of their work.

3.8.4 Rigour

Rigour can be defined as how trustworthy the process of data collection is in a research study. Tobin and Begley (2004) argued that if we choose to fully reject the concepts of validity and reliability in qualitative research, then we also reject rigour. Without methodological rigour, qualitative studies may not be seen as able to contribute to the development of evidence-base and knowledge (Tobin and Begley, 2004). Qualitative research can demonstrate rigour through accurately representing the reality of the process of data collection. This can be achieved through the documentation of a clear decision trail (Rolfe, 2006) which assures the reader that the study was undertaken with authenticity and trustworthiness. Arminio and Hultgren

(2002) referred to these criteria as ‘goodness’ and felt that they were integral to the process of undertaking high quality qualitative research.

3.9 Sampling and recruitment

Qualitative research tends to employ smaller sample sizes than quantitative studies, with between 15 and 30 participants being common (Braun and Clarke, 2013). When considering sample size, the purpose and method of the study together with practicalities such as time constraints and the availability of participants should be considered. Various strategies for sampling exist, with probability or random sampling being held to be the most rigorous approach (Ritchie et al., 2014). This type of sampling aims to achieve a statistically representative sample. However, it is very rare for this type of sampling to be seen in qualitative research (Ritchie et al., 2014).

Non-probability methods are usually used in qualitative studies. Such approaches involve the conscious and deliberate selection of participants who have particular features (Ritchie et al., 2014) with the aim of developing a deep understanding of the topic being researched. A broader question using a survey to gather data generally requires more participants than a specific question explored through in-depth interviews (Braun and Clarke, 2013).

3.9.1 Sampling strategies

Various sampling strategies are available to the qualitative researcher. These are briefly defined below.

3.9.1.1 Purposive sampling

In purposive sampling, participants are selected for the study based on whether they meet set criteria (Ritchie et al., 2014). The sample should contain enough diversity to enable the topic to be thoroughly explored. Stratified purposive

sampling adds subgroups within the purpose sample to enable comparison (Ritchie et al., 2014).

3.9.1.2 Convenience sampling

Selection in convenience sampling is based upon the availability of participants. This approach can enable rapid and cost-effective data collection, but the approach also limits the validity of the findings (Ritchie et al., 2014).

3.9.1.3 Snowballing

Snowballing often forms part of convenience sampling. In a snowballed sample, participants are recruited via the networks of the researcher and other participants (Braun and Clarke, 2013). Social media, such as Twitter and Facebook can be used in snowballing.

3.9.1.4 Theoretical sampling

Theoretical sampling involves the recruitment of participants who contribute to a theoretical purpose. The process is iterative, and further samples allow the further refinement of the theoretical perspective (Ritchie et al., 2014).

3.9.2 Sample size

Sample sizes in qualitative research studies are typically small. For their 'Think Aloud' study, Aitken et al. (2009) had a sample size of 12. Large samples which aim to identify incidence and prevalence are not required in qualitative studies, which generally aim to develop in-depth understanding of topics. Pragmatically, a large sample providing quantities of rich data would be difficult to manage, and the researcher may potentially not be able to thoroughly analyse the data (Ritchie et al., 2014). Conversely, a too-small sample may miss important characteristics within the population (Ritchie et al., 2014). Sample size should be guided by the nature of the sample – for example, more heterogeneous and diverse populations would likely

require a larger sample size to be studied correctly. The chosen data collection method will also impact on decisions regarding sample size.

3.9.3 Saturation

The concept of data saturation is derived from Grounded Theory (Braun and Clarke, 2013). It describes the point at which no further data can be gathered to generate new information (Saunders et al., 2018). In terms of the thematic analysis of qualitative data, it is the point at which no new codes can be generated (Given, 2015). Drisko (1997) suggested a hybrid approach to identifying a saturation point. He suggested that both data collection and analysis should feel comprehensive, with enough data present within themes to allow them to become rich and insightful.

However, identifying saturation can be problematic. It is easier when the study has a deductive approach. This type of approach is more akin to positivist models, where studies aim for completeness against a pre-set criteria (Saunders et al., 2018). In an inductive approach, saturation may be identified as a process rather than an explicit stopping point (Saunders et al., 2018). The researcher may begin to notice 'diminishing returns' during interviews. If analysis is undertaken concurrently with data collection, it is possible that no new codes are identified, and themes feel rich. Saturation remains a method by which the quality of studies is judged, but it is not always appropriate for qualitative studies. Completeness is difficult if not impossible to objectively quantify. Nelson (2017) suggests that the researcher aims for 'conceptual depth' rather than a complete picture of the phenomenon under investigation.

3.9.4 Recruitment

Potential participants must be informed about a study in order to join it. This can be achieved through advertising. Advertising materials can be distributed in a variety of ways, and should be appropriate to the population the researcher is attempting to access (Braun and Clarke, 2013). For example, written information might be distributed at an event involving the target population, or relevant organisations

might be willing to distribute materials via a mailing list. Social media is an accessible and pragmatic way to access potential participants. Millions of people internationally use social media to share content and exchange information (Arigo et al., 2018). This has led healthcare researchers to use social media as a method of recruitment as it enables them to reach specific or general populations and has low or no cost (Arigo et al., 2018). King et al. (2014) identified that the immediacy of social media is an important strength in participant recruitment. Questionnaires and study information can be linked and accessed easily. Social media also allows easy access to participants. Although ethical approval remains mandatory, social media may allow the researcher to bypass some professional or institutional gatekeeping through directly addressing potential participants (King et al., 2014).

Recruitment materials can be shared with potential participants through relevant hashtags or 'tagging' accounts which have influence in the field of interest to increase the reach of the original post. In addition, the recruitment process is flexible when using social media. Hashtags or posts can be altered to improve reach or target specific groups (King et al., 2014), allowing the researcher to respond dynamically to under-represented parts of the identified sample.

However, there are some disadvantages to using social media as a method of distributing recruitment materials. There is limited research regarding the optimal time to upload a post and the number of 'shares' required to ensure a sufficient number of potential participants engage and respond to a post (Arigo et al., 2018). In addition, once materials are posted onto a social media platform, the original author has little control over how and to whom they are shared. Hashtags and accurate descriptions of the research topic should enable loose targeting of an appropriate audience, however there is a risk that respondents may be non-appropriate to the study or lack diversity (Arigo et al., 2018).

3.10 Reflexivity

This section will describe the researcher and how their experience shaped the design and analysis of this study. It will also provide details of the field notes and diaries kept throughout the study.

3.10.1 The researcher

Prior to joining the University of Leeds, I worked as a registered nurse in adult critical care. I had been involved in the care of many patients who were experiencing psychomotor agitation secondary to hyperactive delirium. I had found these patients challenging to nurse. Physically, combative behaviour could cause injury to the nurse and psychologically, there was a fear that if vigilance was not maintained constantly then the patient may injure themselves or disrupt their therapy. As a shift leader, I was able to appreciate the challenge posed by hyperactive delirium at a more organisational level. Some patients were not considered to be of an acuity which warranted 1:1 nursing, which caused considerable stress to the nurse allocated to both a delirious patient and another patient, who would have their own clinical and emotional needs. I noticed that physical and chemical restraint appeared to be used inconsistently, and certainly my own use of these methods was related to my workload, the acuity of the patients around me, and the support my colleagues were able to provide.

Through attending critical care follow-up clinics, I was able to listen to patients' recalled accounts of their delirium and how it was managed by their nurse. Some recollected physical restraint in the form of padded gloves and recalled their anxiety at the sensory deprivation these caused. Periods of deep sedation were also recalled as confusing and frightening.

3.10.2 Reflexivity

My experiences and interests informed my choice of research focus, methodological approach, data collection and analysis. Reflexivity refers to a capacity for self-awareness and critical reflection on the knowledge produced (Braun and Clarke, 2013). Reflexivity makes the researcher visible in the research process and acknowledges the impact their personhood, experiences and interests have on the process (Braun and Clarke, 2013; Braun and Clarke, 2019). Reflexivity plays a role in determining the quality of a piece of qualitative research.

Ormston et al. (2014) advocate a position of *empathic neutrality.* This stance recognises that pure objectivity is not possible in qualitative research, but that the researcher should attempt to avoid bias where possible. One way of achieving this is to identify and reflect on bias. As described above, I have experience of caring for patients with delirium and experienced this as being challenging. I felt empathy towards both the patient and the nurses allocated to patients with delirium. A diary was kept throughout the data collection and analysis processes. I was able to record my thoughts, impressions and feelings and identify any bias. For example, I felt drawn to nurses'' accounts of the challenge of caring for patients with hyperactive delirium, possibly because their struggles mirrored my own. I was able to capture these thoughts, recognise and record them, and prevent them from affecting how I valued other parts of the dataset which did not resemble my own experience as closely.

3.11 Chapter summary

- A pragmatic approach was adopted for this study. Pragmatism is sometimes referred to as the 'third paradigm' and is not allied to any particular philosophical stance. Therefore, it offers a flexible methodological underpinning for this study.

- Structural and process methods are appropriate for studying decision-making. However, process methods attempt to describe the psychological processes undertaken. A process-driven approach was selected as this study aimed to explore critical care nurses' decision-making processes.
- Within these broad categories, a number of models have been developed to attempt to understand the decision-making process. This study will refer to the Cognitive Continuum Theory (CCT) to support analysis of nurses' decision-making. In CCT, approaches to decision-making are presented along a continuum reaching from pure analysis to pure intuition. Decision-makers can move along this continuum as they reach a judgement and make decisions.
- This theory was selected because it considers the impact how the type of task and how it is presented affects the analytical mode employed to reach a decision. This theory was considered to be most representative of the environment in which nurses' make decisions.
- A number of methods to capture aspects of the process of decision-making have been proposed. 'Think Aloud' is a form of cognitive interviewing where participants are prompted to 'think aloud' and describe their decision-making process.
- Qualitative studies have been described as challenging in terms of assessing their quality. Traditional measures of quality are rooted in the positivist paradigm and are not always appropriate to qualitative studies.
- Reflexivity is an important way of ensuing quality in a qualitative study. Through reflexivity, the researcher was able to identify how their subjectivity and personhood impacted on the collection and analysis of data.

Chapter 4 Working methods

4.1 Introduction

Following the discussion of the theoretical underpinnings and rationales for the decisions made (Chapter 3), this section will describe the working methods undertaken to develop the audio-visual vignettes. This will include a discussion of the use of vignettes in qualitative research and the rationales for the content of each vignette. The filming, editing, and hosting of the vignettes will also be described, followed by how they were used in the study and the process of recruitment, sampling and interviewing participants. The use of audio-visual vignettes in a qualitative 'Think Aloud' study is an innovative and novel approach to data collection. A discussion of this approach was published (Teece et al., 2021) and a copy of the abstract and link to the full-text is included in Appendix C.

The results of the study were analysed via two different approaches: firstly, a reflexive thematic analysis was undertaken, and secondly the decisions described in the interviews were mapped against the Cognitive Continuum Theory, which was described in Chapter 3. Reflexive thematic analysis builds on the approach used for analysis in the literature review (Chapter 2). It emphasises the role of the researcher in the analysis and encourages reflection throughout the process (Braun and Clarke, 2019). The two analytical approaches will be discussed before the results are presented in the following chapters.

4.2 Developing a series of audio-visual vignettes

This section will discuss the process of developing the audio-visual vignettes. The vignettes were drawn from cues which were identified in the integrative review

(Chapter 2) which were seen to lead to the initiation of restraint. In addition, decision-making theory and the discussions around nursing culture and labelling described in Chapter 3 played a role in the development of the vignettes.

4.2.1 Composing the vignettes

The vignettes were written with the aim of eliciting reactions and decisions from the participants and therefore allowing their decision-making processes to be studied. Their content and structure were based on reflection, theory, and the results of the literature review conducted as background to this study (Chapter 2). In addition, various nursing theories regarding how nurses perceive, interact with, and share opinions about patients were reviewed (Chapter 3).

The vignettes were developed to reflect a range of risk inferences and patient types and behaviours. For example, some patients were self-ventilating (low risk if treatment disrupted through agitation), whilst some were mechanically ventilated with invasive lines in-situ. These could be life-threatening if disrupted. A number of key behavioural and clinical cues which were associated with the application for restraint were identified from the literature review (Chapter 2). These cues could include devices such as invasive lines or oral endotracheal tubes (ETT), or behaviour such as attempting to sit up or get out of bed.

Having identified patient behaviours which may lead to the decision to restrain, six cases were drafted which made reference to these cues and the theories around nursing culture and the labelling of unpopular patients as described in Chapter 3. The simulated patients were given past medical histories and presenting complaints which reflected the patient population of an adult general critical care unit. Notes were made about the type and number of medical devices which would be in place alongside sound effects which would be necessary to create an immersive vignette.

An illustrated storyboard was created for each vignette (Appendix D). The storyboards depicted the view which was intended to be captured on camera – an

image of the patient seen from the bottom of the bed, where a critical care nurse would commonly sit. The development of psychomotor agitation was detailed over the course of the vignette. Physical and/or verbal agitation increased over the duration of each vignette. The vignettes were written to last approximately 3 minutes each, including the verbal handover which began each clip. This time limit was deemed appropriate as it represented a realistic clinical picture of agitation escalation. In addition, the patient was depicted alone. Critical care patients are rarely left unsupervised for more than a few minutes. Finally, the concentration span and engagement of participants was considered when deciding the length of the exercise. Thinking aloud is not a normal state and can be tiring (Ericsson and Simon, 1980), therefore short vignettes were chosen.

4.2.2 Scripting the handovers

Each vignette began with a verbal handover. The aim was to simulate clinical practice, offer participants background to their patient, and understand how handover style might impact on preconceptions and decision-making. The handover gave information about the patient, including past medical history, presenting complaint, oxygen requirements, cardiovascular state, and cognition and delirium status. The handover was delivered off-screen. The patient was visible on screen, but the video was paused during handover delivery. This gave participants a visual image of the patient, but they were able to concentrate on handover without distractions. The content of the handovers is reflective of cues identified in the background review which were noted to lead to increased use of restraint. The cues included being ‘doubled’ (Dolan and Looby, 2017) and the presence of multiple delirious patients on the unit (Lopetrone, 2006). Patients represented known ‘unpopular’ attributes, such as deviant behaviour (Carveth, 1995) and addictions (Michaelsen, 2012). The acuity of the unit was also described. This offered participants an idea of how much support they might expect from colleagues. Each handover was defined as either subjective or objective. Subjective handovers were more personal, and included some derogatory comments

about the patient's behaviour, linking to theories of nurse socialisation (Leathart, 1994b) and the communication of patient labels and subsequent social judgement (Carveth, 1995; Williams, 2007). Objective handovers used validated clinical tools to describe patient behaviour, with no personal opinions or subjective evaluations expressed. Summaries of each vignette are presented below in Table 22 and copies of the handover scripts are included in Appendix E. The vignettes can be viewed here.

Vignette	Handover style	Unit acuity	Patient	PMH	Adjuncts	Delirium status	Behaviour	Sound effects
1. Michelle Patterson	Subjective	High	**Michelle Paterson** (55) Day 4 post RTA #ribs 8-10 left side. Extubated day 2 onto facial O2 .45. Weaned to 3lts via nasal cannulae. Cardiovascularly stable. Normal diet and fluids. Good urine output. Self-voiding. Moderate pain controlled by Morphine PCA.	Alcohol excess Smoker	Nasal O2 Peripheral cannula (bandaged) Morphine PCA NIBP cuff ECG SpO2	CAM-ICU not performed (patient would score as +ve)	Shuffling to end of bed, using bed rails to sit up. Verbally confused. Inattentive. Pulling at bandages with teeth. Motor movements indicate hallucinations. Removes SpO2 probe.	Basic monitor alarms. Patient able to verbalise.
2. Philippa Edmonds	Objective	Low	**Phillipa Edmonds** (74) Day 4 post Hartmanns for Ca colon. Formation of end colostomy (pink, warm, functioning). Extubated day 2 onto Hi-Flo, resp deterioration, required CPAP for ?pneumonia on IV antibiotics. FiO2 .55 +7.5 ABGs acceptable, but PEEP dependent.	Ca colon Type 2 diabetes	CPAP via facial mask Arterial line (left radial) X2 peripheral cannulae NG tube (fine bore) plus feed line Arterial line and transducer. ECG SpO2 IV antibiotics	CAM-ICU not performed (patient would score as +ve)	Visibly distressed and confused. Hallucinating. Pulling at lines and disconnecting O2 from mask. Verbally confused – asking to go home and for relatives. Trying to get out of bed, using rails to sit up and attempting to swing legs out of bed. Removes monitoring.	Basic monitor alarms. Patient able to verbalise if removes mask.

3. Jack Simpson	Subjective	High	**Jack Simpson** (78) Day 23 community-acquired pneumonia. Intubated for exhaustion following three days NIV, trache on day 14 (post-failed extubation). Slow wean via trache. Pressure support 12/7.5 FiO2 .35, high sputum load. Delirium +ve on Olanzapine. Required Haloperidol bolus last night for agitation.	COPD Type 2 diabetes	Percutaneous trache Arterial line (right brachial) NG tube (fine bore) plus feed line. Arterial line and transducer. ECG SpO2	CAM-ICU +ve on previous assessments.	Restless ++ Shuffling, and swinging legs out of bed. Disconnects from the vent (coughs ++) Aggressive (kicks out and punches) Removed monitoring.	Monitor and ventilator alarms. Patient non-verbal.
4. Roger Lakeland	Objective	Low	**Roger Lakeland** (65) Day 5 post emergency open AAA repair. For sedation hold this morning and aim to extubate. BiPAP 16/7.5 FiO2 .4 ABGs good, chest non-productive. BP supported by weaning dose Noradrenaline. Propofol and Alfentanil off since 7am, patient beginning to wake.	HTN Smoker	Oral endo-tracheal tube (ETT) Central venous catheter Arterial line Peripheral cannula Ryles tube ECG SpO2	CAM-ICU not yet performed.	Patient wakes and localises to ETT and CVC. Eyes open, mouthing words around ETT and coughing. Moving all four limbs, shuffling down bed. Removes SpO2 probe.	Monitor and vent alarms.

5. Sarah Robinson	Subjective	Low	**Sarah Robinson** (27) Day 2 post poly-pharmacy overdose. No sedations on, aim to extubate and return to her own team. CPAP ASB 10/5 .35 ABGs good, nil on suction. Cardiovascularly stable.	Prev overdoses	ETT Peripheral cannuale Fine bore NG tube ECG SpO2	No CAM-ICU provided	Patient to appear frightened and disorientated. Localise to tube with hands. Cough +++ Attempt to remove monitoring. Moving all four limbs increasingly strongly.	Monitor and vent alarms. Patient non-verbal. Cough +++
6. Sharon Dobbs	Objective	High	**Sharon Dobbs** (45) Day 14 with a severe CAP. Failed extubation due to agitation and sputum load yesterday, so perc trache performed this morning. Pressure support 12/8 .45, ABGs acceptable. AF, BP maintained with 0.2mcg/kg/hr Norad. NG feed restarted. Sedations off. Non-appropriate.	COPD Smoker HTN T2DM	Trache CVC A-line NG tube ECG SpO2	CAM-ICU +ve	Disorientated and restless. Hypervigilant – looking around. Picking at lines and touching trache tubing. Wriggling in bed. Removes attachments.	Monitor and vent alarms. Coughing.

Table 22: Summaries of the vignettes.

4.2.3 Validity

Validity refers to how well the instrument measures what it is intended to measure (Braun and Clarke, 2013). In the case of this research study, the vignettes are intended to enable the measurement of nurse decision making when managing a patient with psychomotor agitation secondary to hyperactive delirium. Validity is also discussed in section 3.8.2.

Storytelling vignettes are commonly rooted in the reflections of the researcher on their own practice or experience. This lends the vignettes elements of descriptive detail and face validity. Face validity is a measure of how well the instrument captures the reality of that situation (Braun and Clarke, 2013). However, this level of subjectivity can also increase the risk of researcher bias (Brauer et al., 2009). To avoid this, the vignette handover scripts and storyboards were peer reviewed by an independent clinical expert to ensure that they represented patient behaviours accurately. The review process also helped to ensure internal validity. This aligns with the suggestion made by Cooksey (1996), who states that the context in which the judgement is to be made should be clear and unambiguous when using scenarios or vignettes to explore decision making.

4.2.4 Rigour and trustworthiness

Rigour and trustworthiness are also discussed in the Methodology chapter of this thesis (3.8.3-4). They were demonstrated in this study through the accurate and explicit accounts of decision-making processes. For example, section 3.7 provides the reader with a detailed account of how a vignette-driven Think Aloud approach was decided upon (Rolfe, 2006). Alternatives were discussed and considered in terms of their strengths, limitations and ability to answer the identified research question in a way which aligns with the chosen pragmatic approach. In addition, the processes of data collection and analysis are clearly documented in the following sections of the

current chapter. This study therefore demonstrates its rigour through its accurate representation of the process of data collection and underpinning decision making.

To ensure trustworthiness, Braun and Clarke (2019) emphasise the need to identify the researcher's own position and attributes. The researcher is evident throughout this thesis – the topic was drawn from their clinical experience and relates strongly to their research interests. Specific reflexive sections are included (3.10) and reflections on the initial period of data collection alongside subsequent decisions made are included in section 4.7.

4.2.5 Filming, editing, and hosting

The vignettes were filmed by a University cameraman. The simulated patients (actors) were portrayed by University staff. All actors were required to sign a release form which allowed the vignettes to be used in this research and related presentations and publications. The staff recruited to act as simulated patients all had experience of clinical practice, some had worked in critical care and had witnessed patient behaviour stemming from hyperactive delirium. Participants were fully briefed prior to filming and were issued with copies of the storyboard for the simulated patient which they would portray. The storyboard detailed how their behaviour should develop through the vignette. Filming was undertaken in the School of Healthcare Clinical Skills Suite in a room designed to replicate the critical care environment. The bedspace which was filmed is shown in Figure 9.

Figure 9: Image of the empty bedspace where the vignettes were filmed.

Adjuncts and devices such as airways, monitoring, and invasive lines were sourced from the School's clinical skills store. Airways and intravenous lines were adapted so that they could be taped into place without causing discomfort to the simulated patient whilst maintaining the appearance of a critical care patient. Figure 10 shows a simulated patient with a tracheostomy, central and arterial lines and a naso-gastric tube. A monitor featuring continuous cardiovascular monitoring was not included in the vignettes due to difficulties in accessing appropriate simulated observations. There was concern that the presence of 'unrealistic' cardiovascular observations would detract from the clinical realism of the vignette and distract participants from basing their decisions on the patient's behaviour.

Figure 10: Image of the simulated patient featured in Vignette 6.

Each vignette was shot from a ‘nurse’s eye view’ perspective, as if the nurse was seated at the front of the bed area. This is where ICU nurses frequently sit to write notes and chart patient observations. Audio was recorded on two channels. The first was the verbal handover and the second captured patient vocalisation if appropriate and ambient noise such as the rustling of sheets. Monitor alarms, muffled voices and footsteps, and ventilator sounds were added as appropriate during editing. These effects were obtained via YouTube’s creative commons licence.

The vignettes were broken up into segments during editing, with pause cards inserted to indicate the times for ‘Think Aloud’ and discussion to occur. The breaking up of the vignettes draws on the educational theory of ‘Chunking’. Chunking occurs when information is organised in the memory of the participant. A chunk is a collection of information segments which have strong associations with each other (Gobet et al., 2001). As participants watched the vignette progress, further chunks can be added to

the memory. These chunks may be only weakly associated with the content of the previous chunk (Gobet et al., 2001). The aim of using chunks and segmenting the vignettes in this way is twofold. Firstly, there was a concern that nuanced cues might be missed if Thinking Aloud was conducted concurrently with the vignette playing. Secondly, the use of chunks increases the amount of information that can be held in short-term memory (Gobet et al., 2001). This is because similar information and cues, for example device interference, is grouped together rather than being held in the memory as individual pieces of information (Gobet et al., 2001). Therefore, breaking up the vignettes to promote chunking enables participants to retain a greater amount of information about the patient and their rationales for their decisions.

The edited vignettes were uploaded to the researcher's YouTube channel. The vignettes were marked as 'unlisted'. This prevented the videos being searched for by title or hashtag. They can only be accessed via a direct URL. This decision was made to prevent participants viewing the vignettes prior to their interview and introducing bias and preconceptions.

4.3 Data collection

4.3.1 Telephone interviews

Telephone interviews were the most pragmatic approach to data collection, as participants were drawn from across the UK and would be undertaking shift work. Face-to-face interviews are often regarded as the ideal way to collect qualitative interview data (Braun and Clarke, 2013). However, they can be time-consuming to organise and the lack of anonymity can lead to reluctance to discuss sensitive issues (Braun and Clarke, 2013).

A criticism of telephone interviews is the absence of non-verbal communication between interviewer and participant (Braun and Clarke, 2013). However, this limitation can also be a potential strength of a virtual interview. The participant may feel a

greater ability to answer sensitive questions honestly as they are speaking into a non-judgemental device rather than conversing with another person (Braun and Clarke, 2013). In addition, the interviewer receives no social cues from the participant, thus avoiding potential social judgements (Braun and Clarke, 2013).

4.3.2 Developing the topic guide

The chosen method for this study was Think Aloud. This method is largely led by the participant, with the researcher acting as a guide and prompt to encourage the process. A topic guide was developed to support the interviews. This was focussed around three main issues:

- How nurses perceived and assessed the behaviour of a delirious patient.
- How the working environment impacted on their management.
- If and how they made the decision to apply chemical or physical restraint or chose an alternative method of managing the patient.

The topic guide and vignettes aimed to explore factors leading to the decision to apply restraint. Prompts were included to encourage the participant to further explore their decision and identify their rationales at each point in the vignette (post-handover, at each pause point, and at the close of the vignette). Further discussion points drawn from the integrative review were included, for example, 'You didn't mention *x*, can you tell me why that was?' or 'Why did you chose to do *x* over *y*?'. The content of the topic guide was discussed with supervisors and is included in Appendix F.

Decision making theory was also considered during the development of the topic guide. The Cognitive Continuum Theory (Hamm, 1988) proposes a range of modes of inquiry, with analytical thinking and intuition placed at opposite ends of the continuum. Analytical thinking is slower and more conscious than rapid, automatic decisions. A nurse is able to draw upon both modes concurrently or separately. Tasks are described in parallel to the continuum, ranging from well-structured to ill-structured. Hamm (1988) suggests that nurses adapt their decision-making method to the task

being considered. The topic guide aimed to explore decision making in the context of this theory through recording initial rapid decisions, but also allowing participants time to undertake more analytical thinking as the vignette progressed.

4.4 Ethical approval

This study was underpinned by ethical principles and guidance from the University of Leeds School of Healthcare Research Ethics Committee (SHREC). The study protocol, data management plan and participant information and consent sheets were approved by SHREC in February 2019 (reference: HREC 18-003). Further approval was sought and granted from the Health Research Authority in June 2019 (reference: 19/HRA/3341). Copies of these letters are included in Appendix I.

4.4.1 Consent

Consent was established at the beginning of each interview. The researcher briefly outlined the aims of the study and offered the participant the opportunity to ask any questions. A copy of the consent form is included in Appendix G. All participants were assured that taking part was voluntary and that they could withdraw their data at any point up to data analysis beginning. The study consent sheet was read aloud to the participant and they were asked to confirm their consent to each point. This process was audio-recorded.

Once consent was established, each participant was allocated an identification code. This included a letter to signify which strata they belonged to (Novice, proficient, or expert) and a numerical identifier. Only one list matching these identification codes to the participants' details was retained. This was kept under password protection in a folder on the University M-drive.

4.4.2 Participant distress

The vignettes had the potential to cause distress, either through what was depicted or through participants revisiting distressing memories of their clinical experiences. In the event of distress, it was decided that the interview would be paused and only recommenced with the participant's consent. In addition, participants would be advised to seek support from their doctor, clinical supervision, or Trust occupational health services.

4.5 Sampling and recruitment

The following section of this chapter will discuss the process through which a sampling frame and recruitment strategies were developed. The decisions made were underpinned by the theoretical discussions presented in section 3.9 of the previous chapter.

4.5.1 Identification of participants

A combined purposive and snowballing approach was undertaken. A pragmatic decision was made to identify potential participants through professional networks, peers and clinical contacts, and social media sites. Recruitment aimed to represent novice to expert nurses (Benner, 1984) and the structure of the UK critical care nurse competences (Critical Care National Network Nurse Leads Forum, 2016). The competencies are structured as 3 levels. Level 1 nurses are new to critical care, level 2 nurses have completed baseline competencies and will be engaging in a locally run post-registration critical care course. Level 3 competencies are aimed at highly experienced nurses undertaking management duties on the critical care unit.

The primary method of approaching potential participants was through Twitter. A tweet was circulated which provided details of the aims of the study and invited interested parties to contact the researcher via email or direct message. The image used in the tweet is included below in Figure 11. It featured an image drawn by the

researcher which reflects the persecutory delusions endured by some critical care patients. The image formed the 'logo' for the study and was used on the participant information sheet and any correspondence relating to the study. The tweet was first sent on 31st July 2019 and has received 24,850 impressions and 716 engagements on Twitter. Subsequent tweets were written to express thanks for retweets and provide updates on the progression of recruitment. 'Influencers' relevant to critical care were 'tagged' to prompt further retweets and the sharing of the content (Arigo et al., 2018). Appropriate hashtags, such as #ICUdelirium and #NurseTwitter were also used on the first and subsequent recruitment tweets. Recruitment closed in February 2020.

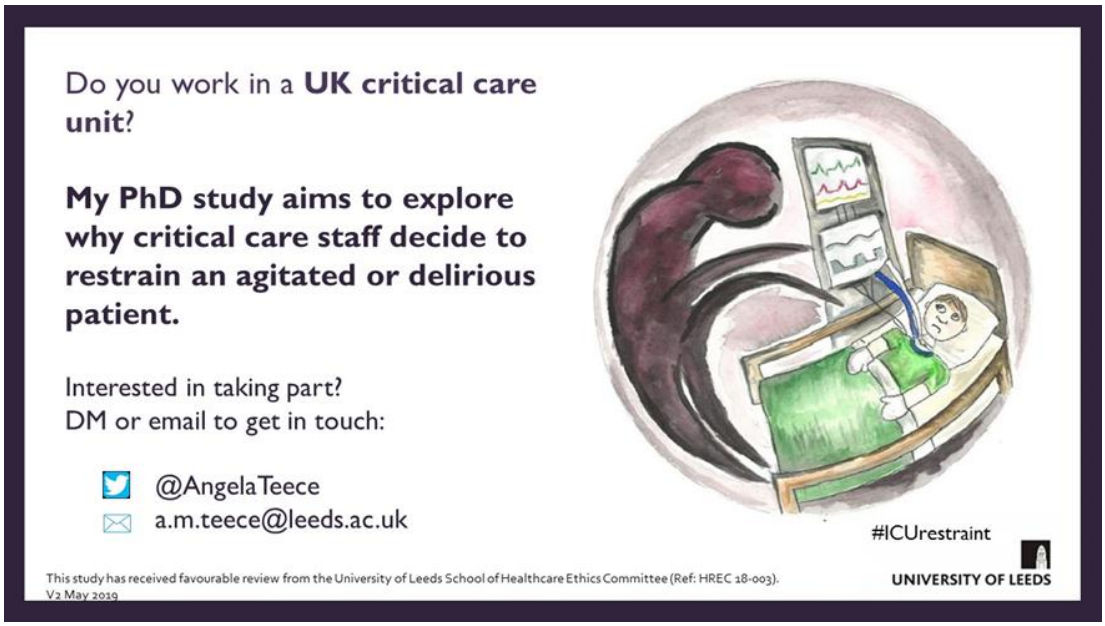


Figure 11: Image used in recruitment tweets.

To further assist in attracting attention from potential participants, a blog about the creation and filming of the vignettes was released on the day recruitment began, together with a study webpage hosted by the Mental Health Research at Leeds website. Tweets included links to the webpage, directing potential participants there for further information. A copy of the participant information sheet, which was uploaded to the website and sent out to interested potential participants is included in Appendix H.

4.5.2 Inclusion criteria

Participants were eligible for inclusion if they were currently employed as a Nursing and Midwifery Council registered health care professional on a critical care unit in the UK and involved in direct patient care. Nurses and Advanced Critical Care Practitioners (ACCPs) were eligible to take part.

4.5.3 Exclusion criteria

Non-registered healthcare workers were excluded, as they would have been unable to administer chemical restraint. Medical staff and allied health professionals, such as physiotherapist, were excluded as they do not participate in sustained bedside care. The study was not open to international staff due to practicalities such as translation and practice or legislative differences.

4.5.4 Recruitment

Potential participants who responded via email or direct message received a participant information sheet and consent form. Participants who fitted the eligibility criteria, and informed the researcher that they wish to enrol, were contacted via email to arrange a convenient date and for the interview to take place. Attention was paid to ensuring an even distribution of participants in terms of experience. Due to the recruitment approach adopted, it was not possible to anticipate the number and experience level of potential participants. Applicants who were not required to participate were informed of this decision via email and thanked for their interest.

4.5.5 Sampling

A purposive snowballing approach was undertaken. Table 23, below, illustrates how an example stratified sample of 18 participants (labelled ‘a’ to ‘r’) might be allocated to vignettes. The sampling frame was developed to ensure that each participant viewed vignettes with different risk inference and handover styles to ensure coverage of the vignettes and exposure of participants to different decision-making

stimuli. In the framework, the lower-case letters in each box each indicate a participant. In this worked example, each participant watches three vignettes.

	Novice (Level 1 competency)	**Advanced beginner/proficient (Level 2 competency)**	**Expert (Level 3 competency)**
	6 nurses	6 nurses	6 nurses
Vignette 1 L2 patient (doubled) Subjective handover Low risk	a c e	g i k	m o q
Vignette 2 L2 patient (doubled) Objective handover High risk	b c f	h i l	n o r
Vignette 3 L3 patient (wean) Subjective handover Medium risk	a c e	g i k	m o q
Vignette 4 L3 patient (ETT) Objective handover High risk	b d e	h j k	n p q
Vignette 5 L3 patient (ETT) Subjective handover Medium risk	b d f	h j l	n p r
Vignette 6 L3 patient (new trache) Objective handover High risk	a d f	g j l	m p r

Table 23: Worked example of a sampling framework.

The sampling framework was representative of the pragmatic approach adopted in this study. The frame was designed to achieve the purpose of ensuring even coverage of the vignettes by participants of various levels of experience. This was a pragmatic choice because the framework meets a specific function rather than fitting a given philosophical paradigm.

4.6 Undertaking the interviews

Approximately ten minutes prior to the decided interview time, the URL for the study's YouTube channel was sent to the participant via email. The channel was

unlisted and could not be searched for by name or hashtag on YouTube. This prevented participants from accessing and viewing the videos prior to the interview. Think aloud as a method is critically discussed in section 3.7.3.

4.6.1 Before the 'Think Aloud' task

At the start of each interview, biographical data was collected, including length of experience in critical care, the type of unit employed on, role, location in the UK, and whether participants had undertaken any post-registration training on delirium and/or restraint. This was designed to ease the participants into the interview and allow the interviewer to contextualise their experience and decisions. This information also impacted on which vignettes were selected. For example, a nurse who had never cared for a ventilated patient would not be shown a vignette depicting such a patient as this would lead to clinically unrealistic decision making and participant discomfort. In such an instance, the sampling frame and vignette allocation would be modified. Further data, such as type or exact location of hospital were not recorded. This decision was made to preserve the anonymity of participants.

The task was explained verbally to participants. They were told that they would be watching two or three short videos on the study YouTube channel. Participants would be asked to 'Think Aloud', that is, to verbally express the thoughts that would be going through their minds if they were caring for the patient in the video. These thoughts might include opinions, assessments, and management decisions. The researcher would use simple prompts to encourage the participant and may ask questions if they were unclear or wanted the participant to elaborate. An opportunity to ask questions related to the methodological approach was offered at this point.

4.6.2 Recording and data storage

The interviews were digitally audio-recorded using an encrypted device and with the participant's consent. The audio files were uploaded to a secure, password-

protected encrypted University M-drive directly after the interview. The audio files were then deleted from the recording device.

4.7 Observations and reflection from the interviews

As discussed in chapter 3, field notes were taken throughout the interview process to ensure quality and rigour. The following sections describe personal reflection and reflection on feedback provided by participants. The feedback was captured and reflected on during the period of recruitment and data collection.

4.7.1 Researcher reflections on piloting the vignettes

The vignettes were piloted with three participants (two expert, one proficient). Each participant watched three vignettes, ensuring that each vignette had been watched at least once. The vignettes were found to elicit appropriate responses from participants with no technical issues relating to YouTube hosting. No changes were made to the vignettes prior to beginning formal data collection. Observations made by the researcher are detailed in Table 24 below, together with any amendments made to the method.

Researcher observation	**Evaluation and amendment if required**
The task can be quite quick to complete (especially the first and third vignette).	The task could be enhanced through additional questioning to further explore the decision-making process. The task was amended to include only two vignettes.
By the third vignette, there was some repetition and participants seemed to tire.	Decision made to include only two vignettes per interview.
HDU staff are not comfortable with ICU-focused vignettes (4-6).	Ensure HDU staff undertake appropriate vignettes (1-3).
The participants seemed to engage best with the task from the second vignette onwards.	Vignette order randomly rotated to ensure that no one vignette was consistently undertaken first.
Participants seemed to forget some information from the handover (eg past medical history, staffing, acuity). Decision making could be based on the patient alone, rather than the wider clinical situation.	Prompts built into the task: 'Remember, you have that theatre patient coming in soon. How would that affect your decisions here?'

The vignettes seemed to work well and elicit both emotional responses and clinical decisions from participants.	The vignettes accurately represent patient types and situations commonly found in clinical practice.
Participants gave rationales for their decisions without prompting.	This could be related to their clinical practice, where rationales are expected.
Minimal technical issues, YouTube appears to be an effective way of hosting videos for research.	Continue with YouTube video hosting and consider again for future research.
Some staff attempting to undertake the task on NHS premises encountered difficulties in accessing YouTube or problems with audio.	Add detail to standard email requesting that participants check equipment prior to the interview beginning.

Table 24: Researcher observations and reflections

4.7.2 Participant feedback on the task and vignettes

A participant feedback log was maintained. The feedback and responses are summarised below (Table 25).

Participant feedback	**Evaluation and amendment if required**
The vignettes are linear and do not respond to management decisions made by the participant.	Encourage participants to keep developing their management: 'if that didn't work, what might you try next?'
The patients are alone and unsupervised.	Encourage the participant to believe they are at the end of the bed observing the patient.
The patients with artificial airways (3-6) had audible coughs/leaks. This reduced the realism for the participant.	This is a flaw in the realism of the videos. Acknowledge, but encourage the participant to move beyond this.
'It would never have got this far' – participants believed their interventions would have prevented clinical emergencies.	Participant reassured and encouraged to described how they would manage the situation.
Request for intubation and sedation (vignette 2).	In one instance (P10), this vignette was stopped at the participant's request as they felt the patient needed full sedation and anaesthetic management.
Clinically realistic scenarios. Felt pressure to make decisions in real time.	Vignettes are effective and true to life.
Good stimulus for personal reflection.	

Table 25: Participant feedback

4.8 Saturation

As discussed in Chapter 3, the concept of data saturation may not be wholly appropriate to a qualitative study. Recruitment for this study stopped with thirty participants. This was a pragmatic decision – the worked example of a sampling frame

(section 4.5.5) was used to calculate the approximate number of views each vignette would have from participants of each level of experience. The aim was to ensure broadly even coverage of the vignettes. Transcription was undertaken concurrently with interviews. In reflexive thematic analysis, transcription forms the first step of the analytical process (Braun and Clarke, 2019; Braun and Clarke, 2013). Saturation in qualitative research is a process rather than an event (Saunders et al., 2018). As the interviews and analysis progressed, data collected became repetitious and redundant (Sandelowski, 2008). Saturation was also reached within each vignette, with minimal new data being yielded in response. At this point, the study had reached a natural stopping point and enough data had been collected to develop themes.

4.9 Reflexivity

Reflexivity is a central component of qualitative research. It involves a critical reflection on the knowledge produced and a consideration of the role of the researcher in the research process (Braun and Clarke, 2013).

In qualitative research, the researcher is a visible presence in the research process (Braun and Clarke, 2013). Prior to commencing an academic role, the researcher was a clinical nurse on a general adult critical care unit. As such, they share many experiences and knowledge with the healthcare professionals interviewed for this study. In early interviews, supervisors noted that some statements were not queried or explored by the researcher. This was due to an assumption on their behalf that their interpretation of the participant's statements was correct. This could be attributed to the shared culture between the researcher and participants. For later interviews, the researcher made efforts to leave her assumptions behind, and ask participants to further explore their decisions and rationales.

4.10 Analysis working methods

This study employed two different analytical approaches to the same dataset. Firstly, the judgements and decisions made by each participant were identified from the transcripts. The Cognitive Continuum Theory (CCT) (Hamm, 1988; Standing, 2008) was used to review these judgements and decisions and identify where they lay along the continuum. Secondly, a reflexive thematic analysis of the interview transcripts was undertaken.

4.10.1 Working methods 1: Judgement and decision analysis

This section will describe the steps undertaken to map the decisions and judgements made by participants to the Cognitive Continuum Theory.

4.10.1.1 Mapping decisions to the Cognitive Continuum Theory

The transcripts were considered alongside the continuum of judgement and decision-making. Standing (2008) drew on the work of Hamm (1988) and Hammond (1981) and suggested that judgement and decision-making was affected by the structure of the task presented. Ideas around the Cognitive Continuum Theory and its adaptation by Standing (2008) to reflect the specific types of judgement and decisions made by nurses are discussed in Chapter 3.

The clinical scenarios depicted in the vignettes fit with the definition of a low structure task, being face-to-face and unpredictable. However, due to the high prevalence of delirium in the critical care population, it was expected that participants would feel a degree of familiarity with the task of managing psychomotor agitation secondary to hyperactive delirium. In addition, the vignettes were drawn from reflection on clinical practice and cues leading to the initiation of restraint identified via the integrative review (section 4.2), suggesting again that participants may be familiar with the patient ‘types’ presented in the vignettes.

Iterative close reading of the interview transcripts was undertaken to identify participants' decisions and the context in which they were made. The decisions were summarised and recorded. The transcripts were then re-checked to ensure that the context in which the decision was recorded as being made, as well as the actual decision itself, was accurate and had not become decontextualised. Each decision and the context in which it was made was reviewed using the adapted nursing Cognitive Continuum Theory as developed by Standing (2008). The type of cognitive mode deemed most appropriate to the decision was recorded. A worked example is provided below.

Vignette 'chunk' and behaviour	**Participant decisions**	**Mode of cognition**
Handover (Subjective)	N2: Assess withdrawal, request HCA to sit with patient	Critical review of research. Reflective judgement
Patient shouting and restless.	N2: Reassure and re-orientate	Reflective judgement
Device interference and removal.	N2: Draw on support from colleagues to ensure vigilance	Intuitive judgement Patient or peer-aided judgement
Further device interference and increased agitation.	N2: Attempt to deescalate. Medical review to address withdrawal	Reflective judgement Patient or peer-aided judgement
Tries to get out of bed.	N2: No change	Reflective judgement

Table 26: Worked example of mapping of cognitive modes to participant decision-making

The Table above summarises the decision-making of a novice participant viewing Vignette 1. This vignette depicted a patient with low respiratory and cardiovascular support requirements who had a history of alcohol excess and verbal aggression towards nursing staff. The context and content of the participant's decisions were recorded and then mapped to the Cognitive Continuum Theory. Where multiple decisions were made in a 'chunk' of the vignette, it was possible that one or more cognitive modes were drawn upon. Cognitive modes were assigned through deep reading of the transcripts and reflection on the context in which the decision was made, including any rationales provided by participants. For example, this participant began the vignette by listening to handover. They based their decision to assess for alcohol withdrawal, which they believed may have contributed to delirium, on research

evidence. They also reflected on previous experiences with similar patents where they had needed to request a member of staff to sit with the patient to ensure safety. The majority of this participant's decisions were identified as reflective, based on their articulation of how they would be influenced by previous clinical experiences. They also identified a couple of instances where they would draw on colleagues for advice. An intuitive decision to remain close by their patient was made in response to verbal agitation and restlessness. This response was rapid, and no rationale was provided other than a perceived urgency to be close to the patient and prevent harm.

This process was repeated for all the transcripts. The summary tables were then checked back against the transcripts to ensure accuracy and any required changes were made.

4.10.1.2 Illustrating the results of the analysis

Various methods of depicting these results were considered. It was important that the results were depicted visually to enable changes of cognitive mode made in response to specific patient behaviours to be seen clearly. Cognitive mode would be the axis, with specific decisions marked, and the 'chunk' of the vignette to which they related clearly indicated. A hand-drawn version (Figure 12) was drafted and discussed with supervisors.

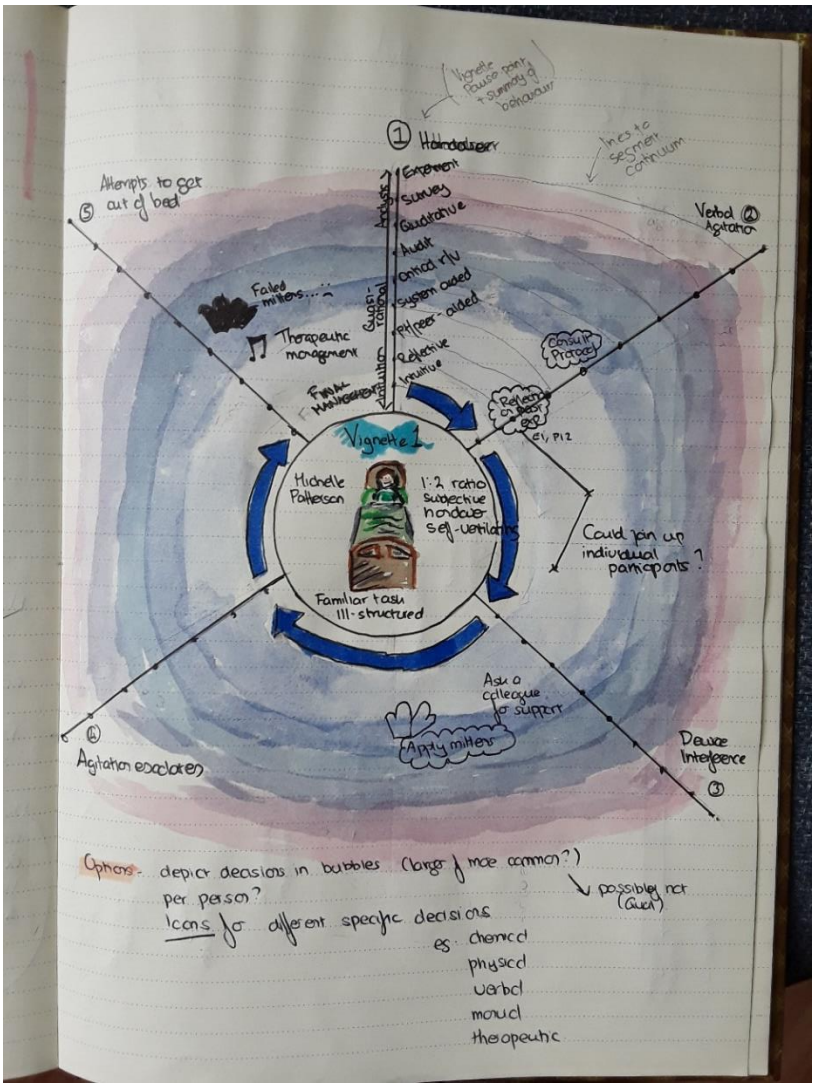


Figure 12: Early draft idea of how the analysis might be illustrated

The idea of using icons to represent specific decisions was rejected as it risked making the charts too busy and unclear. In addition, decisions were not limited to a type of restraint or therapeutic management. It was important that the charts were able to clearly summarise visually the range of decision-making demonstrated by participants.

The decision was made to convert the decision and cognitive mode summaries to numerical values and import them into Excel. Excel offers functionality which enables the creation of clear Tables and graphs based on the inputted data. To convert the data to numerical values, each cognitive mode and vignette ‘chunk’ were assigned numbers. The cognitive modes were numbered from one to nine with

'intuition' being the first mode and 'experimental research' the ninth mode. The vignettes were divided into 'chunks' identified by patient behaviour summaries and given a numerical value. These reflected the points at which pauses had been inserted into the edited vignettes. A worked example of how numerical values were allocated is shown below (Table 27).

Vignette 'chunk' number	**Vignette 'chunk' and behaviour**	**Participant decisions**	**Mode of cognition**	**Numerical value assigned to mode of cognition.**
1	Handover (Subjective)	N2: Assess withdrawal, request HCA to sit with patient.	Critical review of research. Reflective judgement.	5 2
2	Patient shouting and restless.	N2: Reassure and re-orientate.	Reflective judgement.	2
3	Device interference and removal.	N2: Draw on support from colleagues to ensure vigilance.	Intuitive judgement. Patient or peer-aided judgement.	1 3
4	Further device interference and increased agitation.	N2: Attempt to deescalate. Medical review to address withdrawal.	Reflective judgement. Patient or peer-aided judgement.	2 3
5	Tries to get out of bed.	N2: No change	Reflective judgement.	2

Table 27: Worked example of allocation of numerical values to cognitive modes

This data was entered into Excel and was used to generate radar charts. This was the chart with the greatest similarity to the hand-drawn mock-up and was judged as being the clearest way to represent changes in cognitive mode in response to a changing scenario. The radar chart produced by this data, alongside that of a further novice participant who watched this vignette, is shown below (Figure 13).

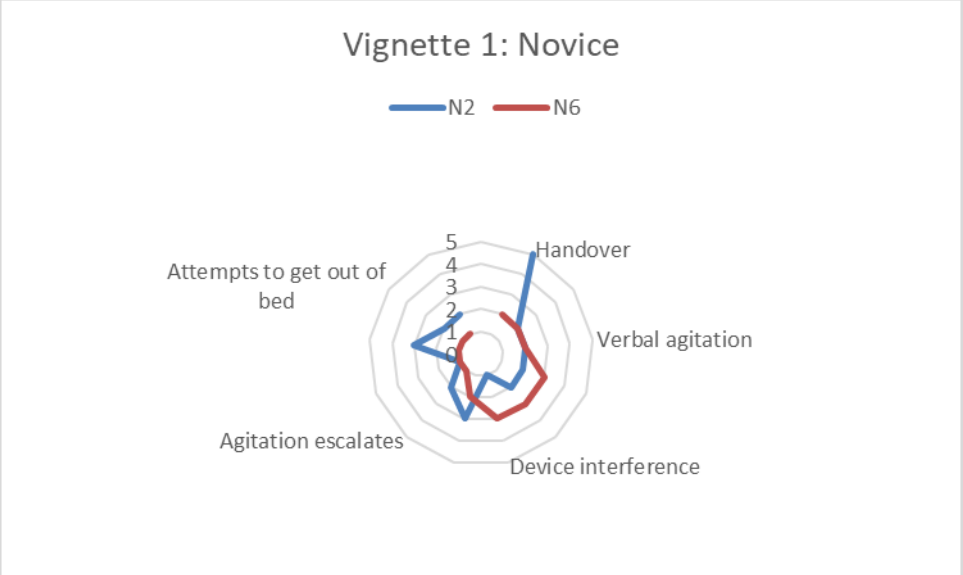


Figure 13: Example radar chart

4.10.2 Working methods 2: Reflexive thematic analysis

A thematic analysis approach was undertaken to complete the analysis of the data. Thematic analysis is described in Chapter 2 alongside rationales for its use in both the integrative review and for the analysis of data from interviews. Aspects of this analytical process which deviated from that described in Chapter 2 are discussed in the following sections.

4.10.2.1 Reflexive thematic analysis

Since the integrative review was undertaken, work around the process of thematic analysis has developed. Braun and Clarke (2019) now suggest a reflexive approach. This updated approach was undertaken in this study. Points where the process differed from that undertaken for the review of secondary data are highlighted and discussed below.

Reflexive thematic analysis is differentiated from other approaches through the placing of the researcher and their role in knowledge production at the heart of the process (Braun and Clarke, 2019). The researcher makes clear their own philosophical and theoretical assumptions and acknowledges the role these play in shaping how they use thematic analysis. Braun and Clarke (2013) identify 7 stages in

the thematic analysis process. Following this format provides the researcher with a clear audit trail of their decisions and rationales. The diary was maintained concurrent with the research process.

4.10.2.2 Transcription

The first stage of the thematic analysis process as described by Braun and Clare (2013) is to transcribe the interviews. The aim of transcription is to consistently translate the recorded spoken word into the written word in order to facilitate analysis. Nineteen of the 30 interviews were transcribed by the researcher. Orthographic transcription was undertaken to produce a verbatim account of what was said during the interviews. Undertaking the bulk of the transcription offered the opportunity to achieve familiarity with the data during the transcription process, noting down ideas and recurring phrases. The remainder of the interviews were transcribed by a professional transcription company with an agreement with the University of Leeds. These transcripts were checked on receipt by the researcher, offering a further opportunity for immersion in the data. Checking transcripts is an essential part of the analysis process. A typed transcript is two steps removed from the original interview (Braun and Clarke, 2013). The interview has been recorded, listened to, and typed. As such, it is a product of this interaction between the recording and the transcriber (Braun and Clarke, 2013). There are possibilities for error, both in listening and recording. Verbal emphasis and jokes are easily lost, and technical terms may be misunderstood. Checking ensured that the transcripts were a clear and complete rendering of the meanings expressed in the interviews and allowed Familiarisation to begin to occur. Transcriptions were anonymized, for example references to specific places of work were changed to *Hospital.* References to unit types (neuro, general, or cardiothoracic) were retained. Transcribed interviews were stored in a password protected folder.

4.10.2.3 Familiarisation

In thematic analysis, there is no clear boundary between data collection and data analysis (Braun and Clarke, 2013). The bulk of transcription was undertaken concurrently with data collection for this study. This allowed the researcher's increasing familiarity with the collected data and emerging areas of interest to inform interviews. Familiarisation is not a passive process of reading (Braun and Clarke, 2013). The researcher is active through the process. They are responsible for reading the data as data, and reading it in an analytical and critical way (Braun and Clarke, 2013). For this study, active reading involved a careful and deep reading of the transcripts, noting concepts or impressions and considering how the researcher's own clinical and theoretical background influenced the reading.

4.10.2.4 Coding

Codes act as a label to allow data which potentially answers an aspect of the research question to be clustered together (Braun and Clarke, 2013). For this study, computer assisted qualitative data analysis (CAQDS) was used. The University of Leeds subscribes to the Nvivo package. Therefore, this program was used for coding data in this study. CAQDS offer a range of strengths in terms of data management. They facilitate the storage data in one place and offer the capability to group codes together under customisable headings (Spencer et al., 2014). Transcripts were imported directly to Nvivo. Pragmatically, this offers the researcher the opportunity to code quickly and easily. The colour-coding function facilitates the easy identification of codes within the main transcript. Codes can be seen as extracts and grouped under headings, or as part of the transcript as a whole. This reduces the risk of decontextualization (Spencer et al., 2014). CAQDS also have the potential to increase the rigor of the analytical process through providing an accurate record of the coding process (Spencer et al., 2014). However, CAQDS has been criticised for offering researchers the opportunity to 'cut corners' (Weitzman, 1999). This argument is

countered by Flick (2014) who likened CAQDS to word processors in that they do not perform the task independently of the operator, rather they make it easier for the operator to undertake the task.

Transcripts were uploaded to Nvivo and data excerpts were ‘dragged and dropped’ into codes. Initially, many codes were generated and required naming. As coding progressed, data could be dropped into existing codes. Data excerpts can be assigned to one or more codes. The names of each code should capture the essence of the data contained within and codes should be distinct from one another (Braun and Clarke, 2013). The process was iterative, with codes being merged or divided as the analysis evolved.

For this study, the question was broad, aiming to explore nurse decision making when using restraint to manage psycho-motor agitation. Therefore, complete coding was undertaken with a mixed semantic and latent approach with the aim of conducting a wide and comprehensive analysis. An example of coding is shown below in Figure 14.

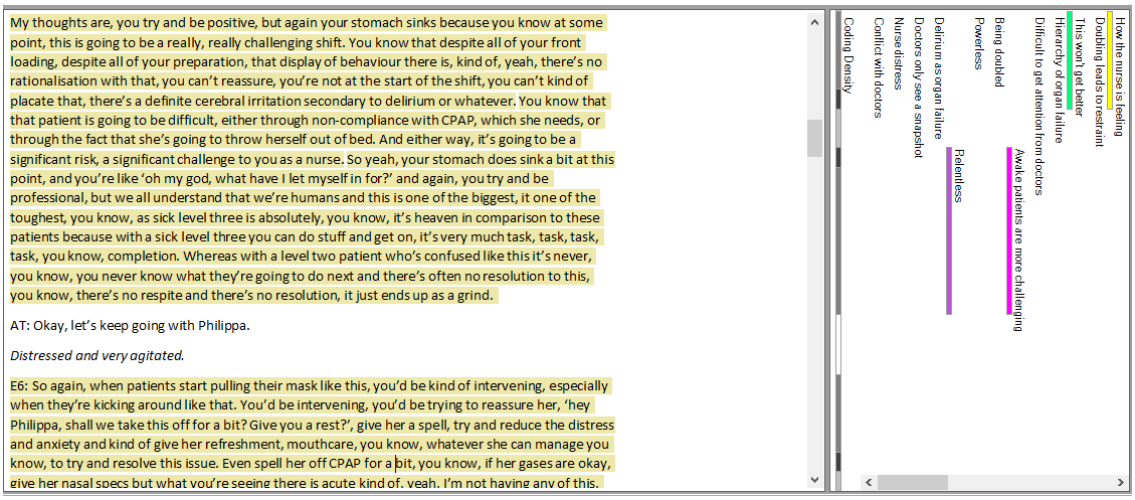


Figure 14 - Example of coding in Nvivo

4.10.2.5 Search for patterns across the codes and develop themes

A theme is broader in scope than a code. To identify themes, each code was written on a piece of paper. These were physically moved around until they were

grouped with others which shared a similar meaning to allow the researcher to display themes visually. A shared meaning goes beyond simply a shared topic, meaning can run deeper and be more subtle than a group of codes which on the surface appear to deal with a similar topic. Pattern-based analysis allows the researcher to systematically identify and report patterns across the dataset (Braun and Clarke, 2013). Some meanings appeared frequently amongst codes, however although this was noted, it was important that meaningful ideas which occurred less often were also reported.

Groups of codes with shared meanings formed candidate themes which were iteratively reviewed through the analysis process. Themes are differentiated from recurring features of the data (Braun and Clarke, 2013). For example, 'being doubled is hard' is a recurring feature whilst 'the tyranny of the now' encompasses the struggle of nursing two critical care patients and forms a theme with other codes of shared meaning. A theme must have a central organising concept which draws codes of shared meaning together (Braun and Clarke, 2013).

4.10.2.6 Review themes

An initial seven candidate themes were identified, and summaries were written for each. When these summaries were reviewed, overlaps were found between two themes. These were subsequently merged into one. A further theme was removed from the first section of results as it consisted of more of a description of types of management employed, whether restraint or therapeutic, rather than data relating to how and why management decisions were made. The theme summaries were useful in the review process as they allowed any repetition to be clearly identified. To make this process simpler, key messages from each theme were assigned a colour which allowed a visual picture of any overlaps. Braun and Clarke (2013) state that themes should be related but distinct. After reviewing the candidate themes several times and condensing them as described above, it was felt that this aim had been achieved.

4.10.2.7 Define and name themes

Following the process of reviewing and finalising the themes, the summaries were revisited to ensure that they accurately defined each of the five remaining themes. Themes require names which signpost the content and signal the author's analytical interpretation of the data (Braun and Clarke, 2013). The final themes and summaries are presented overleaf in Table 28.

Attention was also paid to the order in which the themes were presented. The order should tell a logical story, with each subsequent theme building on the previous (Braun and Clarke, 2013). For this study, the initial themes explored participants'' beliefs about restraint and delirium and how these might be consolidated through the sharing of opinions at handover. The themes go on to explore the experience of caring for a delirious patient and how extrinsic factors, such as staffing ratios, impact on the nurse's decisions about restraint.

Theme	**Summary**
Nurses hold intrinsic beliefs about restraint	Beliefs about restraint are described, overall restraint is viewed as a negative and a 'last resort' when managing delirium. There is some confusion over what constitutes restraint which is exacerbated through imprecise language (mittens, sleep).
Handover and sharing labels can influence restraint practice	Delirious patients are the subject of a number of negative stereotypes and these can influence the way a nurse approaches them and the likelihood of the initiation of restraint. Some participants rejected the labelling of patients and demonstrated compassion and understanding of delirious behaviour.
A consistent approach to restraint is not maintained	Participants identified a variety of ways thy might approach delirium management. Therapeutic methods were used as first-line by all participants. A variety of chemical, physical and manual restraints, alongside continued therapeutic management was used. Some participants were critical of the ways they perceived medical staff to approach delirium, suggesting they did not appreciate how it impacted on the nurse. Inconsistencies were reported between different medic's approaches.

'If I turn my back on her, god knows where she could end up' – the need to maintain constant vigilance	Caring for a patient with hyperactive delirium requires constant vigilance. Where this cannot be maintained, for example when a nurse is 'doubled' with two patients, restraint becomes more likely with the rationale of preserving patient and device safety.
'The tyranny of the now'	In this theme, participants described the emotional and physical labour involved in caring for a patient with hyperactive delirium. They described a lack of space to think critically and their fear of making a mistake and compromising patient safety. Restraint played a role in relieving nurse distress and creating space to think and rest.

Table 28: Theme summaries

4.10.2.8 Reporting

The Consolidated criteria for reporting qualitative research (COREQ) is an explicit checklist which can be used when reporting qualitative findings (Tong et al., 2007). Adherence to this checklist facilitates transparent reporting of all aspects of the qualitative research process. This checklist was adhered to in the published version of this study (Teece et al., 2020).

In thematic analysis, the reporting of the findings is the final part of the analytical process (Braun and Clarke, 2013). For this study, extracts were selected for each theme and copied and pasted into a Word document. Notes were added to each extract to ensure they were used in the correct context. The extracts were chosen for their ability to exemplify or expand upon precise aspects of the identified themes. An explanatory narrative was woven around the extracts with the aim of creating plausible arguments which answered the research question (Foster, 1995). The narrative aimed to tell the reader something more about the extract such as why it was interesting and how it contributed to answering the research question. Braun and Clarke (2013) suggest that narrative and extracts should be either evenly balanced or that slightly more narrative should be included. In reflexive thematic analysis, the data does not speak for itself. Instead, the researcher consciously speaks for the data and demonstrates awareness of their own interpretation through reflexivity whilst taking care not to impose their own meanings on the data (Braun and Clarke, 2013; Clarke

and Braun, 2017). Through the writing process, the researcher becomes even more deeply involved with their data.

4.11 Synthesis of results

A further convergent aggregate synthesis of the results of the literature review and two analytical approaches was undertaken prior to considering the results in the wider context of research in this topic area. The synthesis was undertaken using the same approach as described for the integrative literature review (2.3.6.7). The results were considered together with reference to the context from which they were drawn. From this synthesis, four central issues relating to the how critical care nurses made the decision to initiate restraint were identified. These are discussed in Chapter 7.

4.12 Chapter summary

- Vignettes are a pragmatic but innovative approach to remote data collection and the study of decision-making. They allow the exploration of complex clinical decision-making processes without disrupting clinical practice.
- To accurately capture decision-making, it is essential that the vignettes are close to ‘real life’ clinical practice. For the audio-visual vignettes in this study, filming was undertaken in the School clinical skills suite with appropriate clinical devices and adjuncts. Sound effects were added during editing.
- This study used a snowballing approach to recruitment. A sampling frame supported the aim of recruiting participants with a variety of durations of critical care experience.
- The analytical process closely followed the guidance from Braun and Clarke (2019). This process assisted in assuring the reliability of the analysis process as decisions and rationales made during analysis were clearly identified.

- Reflexive thematic analysis emphasises the role of the researcher in the creation of the research. Whilst this was embraced, a reflective journal helped identify and reduce potential bias.

Chapter 5 Results 1: Decision-making theory and restraint

5.1 Introduction

This chapter will explore the judgements and decisions made by participants by aligning them to the cognitive continuum theory (CCT) (Hammond, 1981; Hamm, 1988; Standing, 2008). The first section of this chapter will review the CCT and how it can be used to explore and understand nurses' decision-making. The judgements and decisions are mapped to the CCT and discussed in the context of that theory using the method described in Chapter 4. A thematic analysis using the method described in Chapter 4 will then be presented with the aim of summarising the types of restraint applied by participants and what behaviour of circumstances led to that decision.

5.2 Sample characteristics

30 participants agreed to take part in the study. The interviews took place between July 2019 and February 2020 and lasted between 43 and 90 minutes. A summary of the nurses and critical care practitioners recruited to the study is provided in Table 29 (overleaf). Participants originated from across the UK (England *n*=27; Scotland *n*=2; Wales *n*=1). Restraint and delirium guidance applies to the UK and Wales, with mirrored guidance in Scotland (NICE, 2019; Intensive Care Society, 2021; SIGN, 2019), therefore it was expected that participants would have awareness of clinical guidance regardless of which part of the UK they originated from. Of the 30 participants, 11 were recruited via Twitter and 3 via Facebook. The remainder were recruited from the researcher's own professional network (*n*=8), via a presentation delivered to newly-qualified nurses (*n*=2) or by snowballing via previous participants (*n*=6).

Each participant was allocated a code which related to their level of experience and identified their transcript, for example, E1, P5. These codes are used in the results section to identify quotations.

Participant group	**Number of participants recruited**	**Mean duration of critical care experience in years**	**Role**	***n***
Novice (N)	6	1 year	Band 5 Staff Nurse	6
Proficient (P)	11	9 years	Band 5 Staff Nurse Band 6 Sister/Charge Nurse Trainee Advanced Critical Care Practitioner (ACCP)	6 4 1
Expert (E)	13	19 years	Advanced Critical Care Practitioner (ACCP) Band 7 Senior Sister/Charge Nurse Practice Development Nurse	8 4 1

Table 29: Participant demographics

5.3 Review of the principles of the Cognitive Continuum Theory

Cognitive Continuum Theory (CCT) is a descriptive theory which illustrates how judgement situations and how a task is presented relate to cognitive modes (Hamm, 1988; Hammond, 1981). It advances Dual Process Theory by presenting intuitive and analytical modes of condition as on a continuum rather than as opposing forces (Thompson and Dowding, 2009b). The original theory includes six broad modes of cognition along a continuum beginning at intuition and ending with analytical cognitive modes such as experiments. CCT was adapted for nursing by Standing (2008). (Hammond, 1981; Hamm, 1988). An additional three modes of cognition were added, the numerical order was removed to avoid judgement on the value of modes or undermine the premise that a person can oscillate along the continuum in response to a changing task. In addition, task structure was renamed as high or low structured

instead of well and ill-structured. A more in-depth discussion of theories of decision-making including the CCT was presented in Chapter 3.

5.4 How can the Cognitive Continuum Theory promote understanding of decision-making?

Standing (2008) draws on the work of Hamm (1988) and Hammond (1981) and suggests that judgement and decision-making is affected by the structure of the task presented. The situations depicted in the vignettes fit with the definition of a low structure task, being face-to-face and unpredictable. Iterative reading of the interview transcripts was undertaken to identify participants' decisions and the context in which they were made. These decisions were reviewed in conjunction with the cognitive modes identified by Standing (2008) and the decisions were mapped to the defined modes of practice.

Benner (1984) acknowledges that nurses must have a sound and thorough knowledge base with which to underpin the intuitive reasoning which she characterises as being an aspect of expert nursing. In a clinical emergency, such as escalation of agitated behaviour which risks patient safety, a nurse would and should act quickly and intuitively (Harbison, 2001). This was seen to occur, with the majority of decisions being based on intuition or reflection. However, when participants had time to consider their judgement critically, quasi-rational and analytical modes were used.

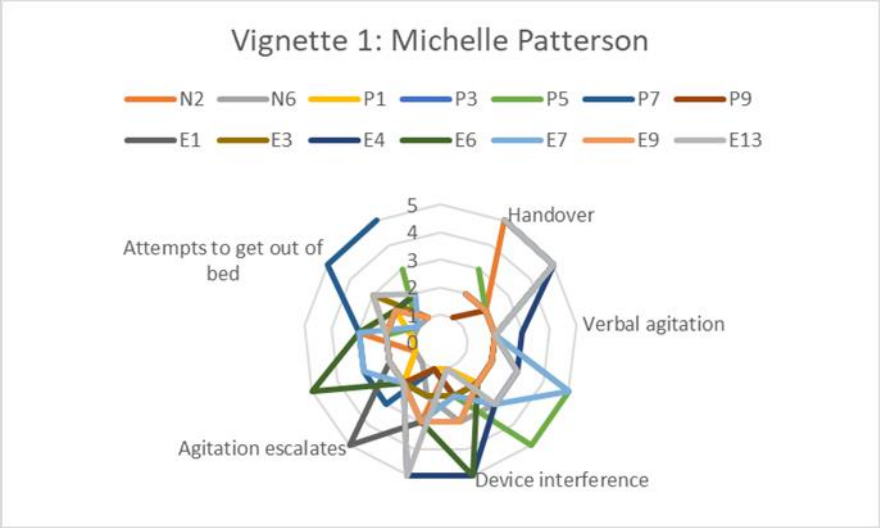
5.4.1 Vignette 1: Michelle Patterson

Vignette 1 depicted an agitated female patient who had been involved in a poly-trauma. She had a history of alcohol excess and smoking. She was clinically low dependency, requiring only some nasal oxygen and IV analgesia. Her handover was highly subjective, with derogatory opinions presented about the patient. Participants were told that they would nurse Michelle in addition to another patient.

Vignette 'chunk' and behaviour	Novice participants	Proficient participants	Expert participants
Handover	N2: Assess withdrawal, request HCA to sit with patient. N6: Review Morphine as may exacerbate delirium.	P1: Concerned for potential deterioration. P3: Cautious because of aggression. P5: Ensure pain under control. P7: Address underlying causes P9: Will require supervision and Haloperidol.	E1: Address underlying causes E3: Address underlying causes E4: Address underlying causes E6: Leave her alone if she is settled E7: Address withdrawal chemically E9: Considers sedation to manage. E13: Keen to control agitation to ensure unit safety.
Shouting	N2: Reassure and re-orientate. N6: Reassure and re-orientate. Make nurse in charge aware and request someone to sit with patent.	P1: Healthcare assistant to observe patient. P3: Re-orientate P5: Reduce alarms. Get relatives in. P7: Someone to sit with the patient. Reassure and re-orientate. P9: Therapeutic management	E1: Therapeutic management E3: Vigilance E4: Talk, try to find out what she wants E6: Orientate, reduce stimulation, get relatives in. E7: Change analgesia, reduce alarms. Try to find out what she wants. E9: Supervision E13: Reduce alarms. Address underlying issues. Get relatives in.
Device interference	N2: Draw on support from colleagues to ensure vigilance.	P1: Haloperidol P3: No change	E1: Find out what she wants E3: Considers sedation. E4: Address withdrawal

	N6: Request medical review. Continue therapeutic management.	P5: De-monitor. Therapeutic management. P7: Ensure vigilance. De-monitor. Consider escalation to chemical management. P9: Close supervision	E6: Communication Consider mobilisation. E7: Minimise attachments, distractions. E9: Offer a drink. E13: Vigilance. Diazepam.
Further device interference and agitation.	N2: Attempt to deescalate. Medical review to address withdrawal. N6: Haloperidol	P1: Reassure, re-orientate, Haloperidol. P3: Reassure and re-orientate P5: Support from HCA. P7: Medical review. P9: No change	E1: Observe and address underlying causes. Change analgesia. E3: No change E4: Check on patient and reassure. E6: Assess underlying causes, draw on MDT support to manage. E7: Offer a drink. E9: No change E13: No change
Tries to get out of bed	N2: No change N6: Request review of analgesia.	P1: No change. P3: No change P5: Urgent support from colleagues. Mobilise if safe. P7: Treat underlying issues. P9: Haloperidol if therapeutic management fails.	E1: No change E3: Support at bedside, chemical restraint. E4: No change E6: No change E7: Lorazepam E9: Supervision, Haloperidol. E13: Reassurance and re-orientation (missed opportunity).

Table 30: Summary of decisions for Vignette 1



Key:
1. Intuitive judgement
2. Reflective judgement
3. Patient or peer-assisted judgement
4. System aided judgement
5. Critical review of research

Figure 15: Vignette 1 Decisions mapped to CCT.

Judgements and decisions made by novice and proficient participants who watched this Vignette drew primarily on intuitive and reflective modes (levels 1 & 2). Of these participants, only one (N6) chose to administer Haloperidol as a form of restraint, the remainder focused on therapeutic management.

Expert participants watching this Vignette made greater use of quasi-rational judgement modes (level 5) at the beginning of the Vignette. They considered the potential causes of the patient's behaviour and thought critically about potential solutions. One participant critically discussed the use of Haloperidol and drew on evidence which suggested it was ineffective in delirium. However, without an alternative, he felt he would have to use that drug. As the Vignette progressed, and the patient became more agitated, participants drew upon more reflective and intuitive decision-making modes. One participant (P7) reverted back to critical thinking (level 5) at the end of the vignette by considering potential reversible factors leading to the patient's delirium.

This group were evenly divided between the use of medication to either address withdrawal or control agitation, or reliance on therapeutic management methods.

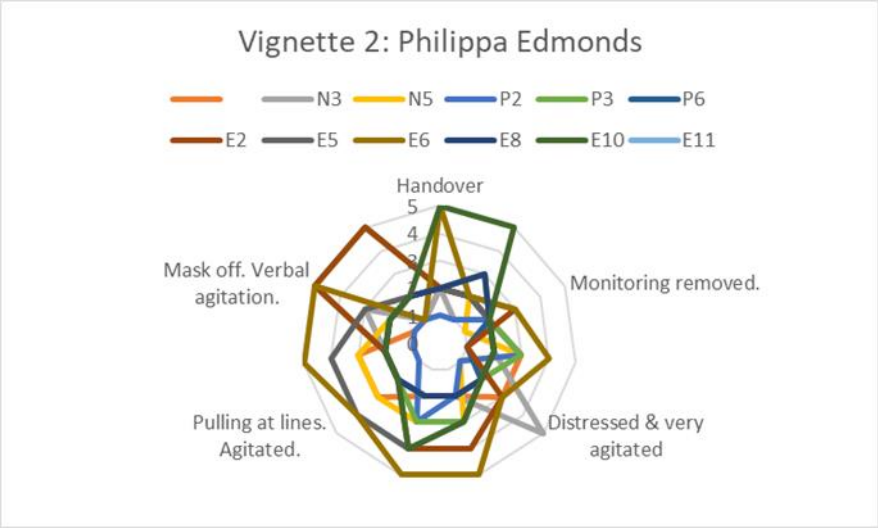
5.4.2 Vignette 2: Philippa Edmonds

The second Vignette showed a further self-ventilating patient who would be nursed at a 2:1 nurse ratio. However, this patient was presented with a high clinical acuity with a risk of deterioration. She was dependent on CPAP and FiO2 .5. Her handover was objective and suggested that her condition may be linked to post-operative sepsis.

Vignette 'chunk' and behaviour	Novice participant	Proficient participant	Expert participant
Handover	N3: Concern about patient deterioration. N5: Concern about doubling.	P2: Concern about doubling. P3: Concern ability to cope P6: Requests a HCA for support.	E2: Constant vigilance E5: Concerned about doubling. E6: Concerned about doubling. E8: Concerned about doubling, request HCA to support. E10: Request HCA to sit with patient. E11: Address pain and underlying factors (infection).
Very restless. Monitoring removed. Distressed.	N3: Change CPAP delivery method. HCA to supervise. Make nurse in charge aware. N5: Reassure and re-orientate. Trial off CPAP.	P2: Medical review, request Haloperidol. P3: Check mask, comfort measures. P6: Change mask to hood. Adjust position for comfort. Direct supervision.	E2: Reassurance. Replace devices. E5: Medical review. 'Something' to calm her down. E6: Concern about how he will manage this patient. E8: CAM-ICU assessment, talking. E10: Trial off CPAP. Reassure and re-orientate. E11: Reassure and re-orientate. Support at bedside. Trial off CPAP.
Distressed and very agitated.	N3: Ensure comfort, trial off CPAP. N5: Assess for causes of agitation.	P2: Mittens and support at bedside. P3: Reassurance. Medical review to request Haloperidol. P6: Trial off CPAP.	E2: Medical review. Haloperidol or Lorazepam. E5: Change CPAP delivery method. Clonidine.

			E6: Supervise, trial off CPAP, medical review, sedation. E8: Reduce unnecessary devices. ?intubate E10: Take off CPAP. E11: Medical review. Low dose Lorazepam.
Pulling at lines, verbally and physically agitated.	N3: Medical review, request sedation. N5: No change	P2: ?Intubate P3: Second line drug – Diazepam. P6: Assess for underlying factors. Medical review to request Lorazepam.	E2: No change E5: Urgent medical review. E6: Consultant review. E8: Rescue therapy/intubate E10: Support at bedside. Relatives. E11: Haloperidol and Lorazepam. ?intubate
Arterial line out. Mask off. Shouting.	N3: Mittens, Lorazepam. N5: Support at the bedside.	P2: No change P3: Further sedation. P5: Bring relatives in.	E2: No change E5: Bring relatives in. E6: Intubate E8: Reassess. Support from medical and nursing colleagues. E10: Therapeutic management. E11: No change.

Table 31: Summary of decisions for Vignette 2



Key:
1. Intuitive judgement
2. Reflective judgement
3. Patient or peer-assisted judgement
4. System aided judgement
5. Critical review of research

Figure 16: Vignette 2 Decisions mapped to CCT.

Again, the modes of cognition used by novice and proficient participants were similar and drew mostly on intuitive and reflective modes (levels 1&2). All these participants except one made the decision to administer chemical restraint and/or apply physical restraints. One participant (P10) felt that the patient's condition required urgent anaesthetic review and possibly intubation and sedation. These decisions were primarily based on past experience or intuitive reactions to the video.

Expert participants made greater use of patient or system aided modes, using validated tools to support their judgements and protocols (level 3) to guide decision making. However, this group also drew on their past experiences with similar patients to predict how the patient would behave and what interventions would be necessary. All the expert group except one participant chose to treat the agitation and delirium chemically, with one participant (E6) querying the need to progress to intubation and continuous sedation until the underlying issues were addressed.

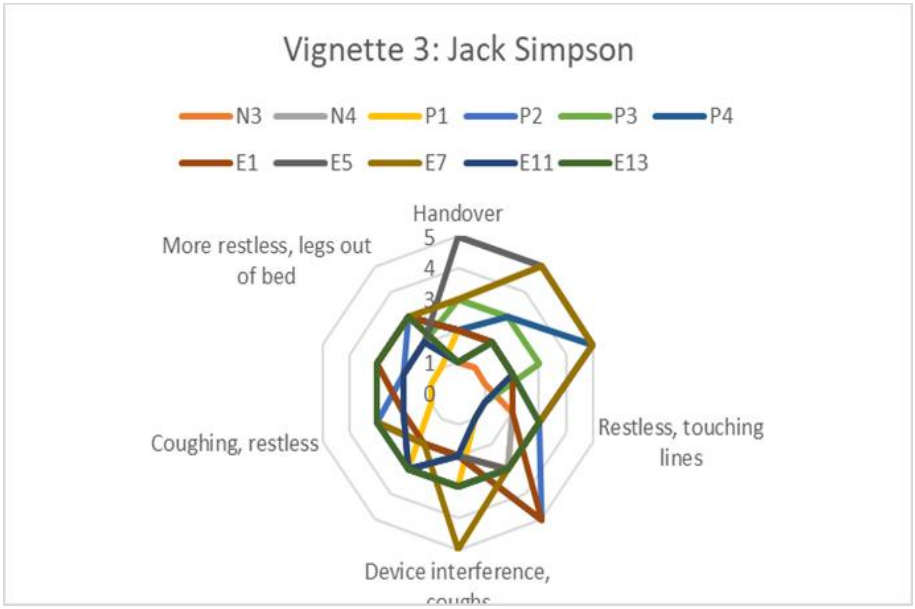
5.4.3 Vignette 3: Jack Simpson

Vignette three showed a patient who was mechanically ventilated and slowly weaning via an established tracheostomy. He had an arterial line and peripheral venous access in situ. This patient had a lower risk inference as his airway was secure and well-stablished and he was nursed one-to-one. The handover given was subjective and suggested that the patient was aware of the problems his device interference was causing to nursing staff but continued to do so anyway.

Vignette 'chunk' and behaviour	Novice participant	Proficient participant	Expert participant
Handover	N3: Concerned it will be a long and challenging day. N4: No concerns.	P1: No issues perceived. P2: Concerned about agitation but would use PRN drugs. P3: Unhappy with allocation. P4: Mobilise. Plan active day. Relatives.	E1: No issues perceived E5: Considers potential underlying factors. E7: Pro-active planning – stimulation and therapeutic management. E11: Consider asking for Lorazepam as rescue therapy. E13: Wary due to handover.
Restless, touching lines	N3: Reassure and re-orientate. N4: Reassure, re-orientate. Minimise attachments.	P1: Move up the bed, replace devices P2: Address root causes (pain) P3: Manageable P4: Communication and reassurance	E1: No intervention E5: Reassure and provide distraction (elephant tubing or twiddle mitt). E7: Mobilise, relatives, distractions. E11: Supervision, communication. E13: Mobilise
More restless. Device interference. Coughing.	N3: No change N4: Suction, mobilise.	P1: Suction. Tell patient not to touch trache. P2: No change P3: Tell patient not to touch trache. P4: Provide distraction (elephant tubing), minimise devices, mobilise.	E1: Vigilance, address underlying issues E5: Assess comfort, mobilise. E7: No change E11: Suction E13: Distraction and stimulation.
Coughing, restless	N3: Stimulation and distractions. N4: Suction, reassurance.	P1: Suction. Make sure comfortable. P2: Check trache.	E1: No change

		P3: Suction. Reassurance. P4: Make sure comfortable.	E5: Check trache. Distraction and relatives. E7: Progress weaning E11: Check trache and ventilation. Distraction. E13: No change
More restless, legs out of bed	N3: Progress rehabilitation plan. N4: Ensure comfort.	P1: Apply mittens P2: Consider mobilising if help available. P3: No change. P4: Progress rehabilitation	E1: Therapeutic management, mobilise. E5: No change. E7: Mobilise E11: Increase ventilator support. E13: No change

Table 32: Summary of decisions for Vignette 3



Key:
1. Intuitive judgement
2. Reflective judgement
3. Patient or peer-assisted judgement
4. System aided judgement
5. Critical review of research

Figure 17: Vignette 3 Decisions mapped to CCT.

The two novice participants who viewed this Vignette used reflective and patient-aided modes (levels 2&3) to make their decisions. This patient, like the two above, was awake. However, participants seemed more willing to communicate with this patient and involve him in their decisions. Both participants elected to use therapeutic management, such as re-orientation, distraction, and mobilisation. These interventions were associated with reflective, patient-aided and critical cognitive modes.

Proficient participants were more likely to restrain the patient, with two participants deciding to use physical restraint (P1 and P2). The remainder of participants made use of therapeutic management methods. This group mainly drew on reflective and intuitive modes (levels 1&2).

In contrast, the expert participants who viewed this vignette made minimal use of more intuitive modes of judgment and instead drew on more quasi-rational and patient-aided modes (levels 5&3). This could be due to their greater clinical

experience, the majority stated that they had looked after patients like Jack before and were confident in how to manage him. The one-to-one nursing allowed greater space for critical thinking and involving the patient in decision making. All expert participants made the decision to avoid restr1aint and use therapeutic management methods when caring for Jack.

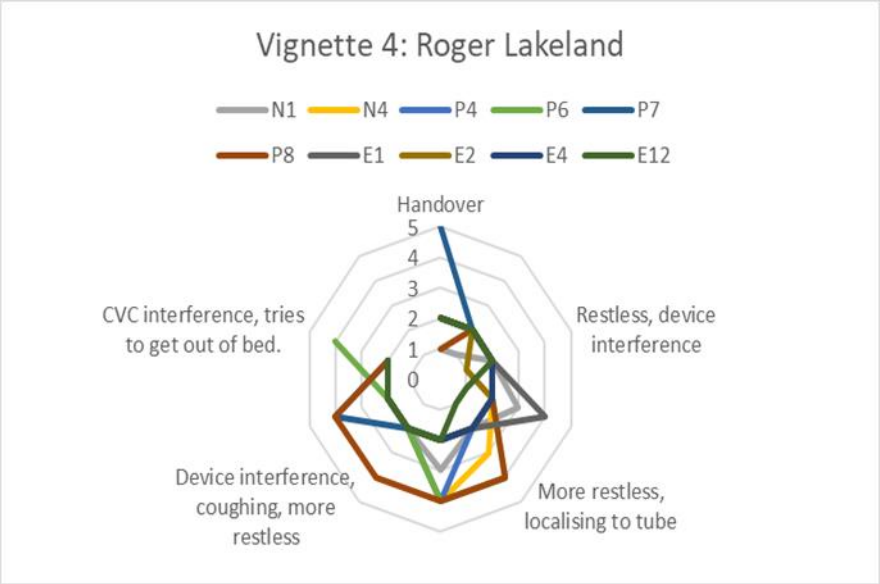
5.4.4 Vignette 4: Roger Simpson

The fourth Vignette featured a mechanically ventilated patient who was orally intubated following emergency surgery for a ruptured aortic aneurysm. He also had central venous and arterial lines, adding to the risk inference of any device interference. An objective handover was given, which detailed the medical aim to extubate but added that this patient had failed his sedation hold the previous day due to agitation secondary to delirium.

Vignette 'chunk' and behaviour	Novice participant	Proficient participant	Expert participant
Handover	N1: Will need support if plan is to extubate. N4: Concerned due to PMH but plans to reassess.	P4: Maintain background low-dose Alfentanil P6: Concerned due to PMH. P7: Address underlying issues leading to failed sedation hold. Get relatives in. P8: No concerns. A 'good day' if patient re-sedated.	E1: Plan to extubate E2: May need to re-sedate due to previous failed hold. E4: Plan to extubate E12: Ensure colleagues aware of plan to extubate.
Restless, device interference	N1: Reassure, move devices out of reach, twiddle mitt. N4: Reassure. Minimise attachments.	P4: Verbal re-orientation P6: Supervision, reassurance and re-orientation. P7: Direct supervision, communication, distraction. P8: Reassure and re-orientate	E1: Plan to extubate E2: Vigilance, move hands away, considers mittens E4: Reassurance E12: Explanations. Tell patient not to touch tubes.
More restless, localising to tube.	N1: Position bed to prevent patient moving about. Medical review to see if ready to extubate. N4: Make nurse in charge aware. Aim to extubate.	P4: Extubate P6: Supervision. Wait for medical order to extubate. Support from experienced colleague. P7: Hand holding, distraction. Aim to extubate. P8: Wait for medical order to extubate.	E1: No change E2: Supervise closely, prevent device interference. E4: Reassure and re-orientate. Close supervision. E12: Block access to tube by placing hand.
Removes SpO2 probe, more agitated, coughing.	N1: Distraction. Extubate.	P4: No change	E1: Supervise closely E2: Extubate

		P6: Supervision, reassurance and explanations. P7: Prevent device interference. Medical review and consider extubation. P8: No change.	E4: Assess cognition and consider extubation. E12: Talking.
CVC interference. Tries to get out of bed. Coughing.	N1: Extubate N4: Extubate with support.	P4: No change P6: Extubate if doctors are happy. P7: Extubate P8: Extubate	E1: Extubate E2: Extubate E4: Extubate E12: Extubate

Table 33: Summary of decisions for Vignette



Key:
1. Intuitive judgement
2. Reflective judgement
3. Patient or peer-assisted judgement
4. System aided judgement
5. Critical review of research

Figure 18: Vignette 4 Decisions mapped to CCT.

Novice and proficient participants employed similar modes of cognition when making judgments and decisions for this patient. They reflected on previous experiences with patients who had undergone the same surgery, noting that they were often confused and agitated, and this had to be endured. Protocols (level 4) were used by several participants to gauge readiness for extubation.

Expert participants relied mainly on reflective modes (level 2), drawing on their experience to guide their interventions. One expert participant (E2) made the decision to apply physical restraints (gloves) prior to extubation as a precautionary measure against potential agitated behaviour. The remainder of participants at all levels of experience chose to extubate this patient.

5.4.5 Vignette 5: Sarah Robinson

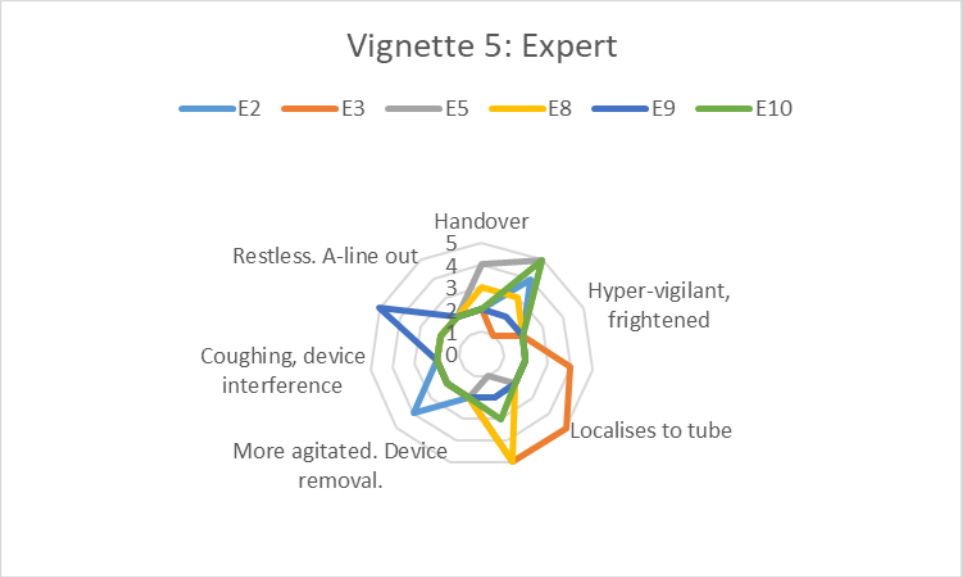
The fifth vignette showed a further orally intubated and mechanically ventilated patient. An arterial line and peripheral line were in-situ, presenting a slightly lower risk

inference than the previous vignette. Participants were told that the medical plan was for extubation. The given handover was highly subjective, with derogatory opinions expressed regarding the cause of admission (poly-pharmacy overdose). The patient was described as a ‘frequent flyer’ suggesting she was well known to staff on the unit.

Vignette 'chunk' and behaviour	Novice participant	Proficient participant	Expert participant
Handover	N2: Aim to extubate. N6: Aim to extubate.	P2: PMH may lead to increased patient anxiety. P9: Will need to be patient with her.	E2: May require further sedation E3: Anticipates restraint due to PMH. E5: Aim to extubate, PHM will contribute to agitation. E8: Contact usual mental health team. E9: Aim to extubate. E10: Concern that PMH will contribute to delirium.
Hyper-vigilant. Frightened.	N2: Reassure and re-orientate. N6: Reassure and re-orientate	P2: No concerns P9: Reassure and re-orientate.	E2: Vigilance, talking. E3: Assess cognition. E5: Reassurance and re-orientation. E8: Remove unnecessary monitoring E9: Reassurance and re-orientation. E10: Reassure, re-orientate, hold hands.
Localises to tube.	N2: No change N6: Ask patient not to touch tube.	P2: Reassurance, tell patient not to touch tube. P9: Check cognition pre-extubation.	E2: Hand-holding to prevent device interference. E3: Considers re-sedation, but pt physiologically ready to extubate. E5: Vigilance, tell pt not to touch tube. E8: Re-orientate. Consider re-sedation/chemically manage and re-attempt sedation hold later. E9: Reassurance, hand holding.

			E10: Relatives.
More agitated. Coughing. Device removal.	N2: Aim to extubate. Senior colleague to support. N6: Aim to extubate	P2: Extubate P9: Extubate	E2: Talking. Aim to extubate. E3: Extubate E5: Reassurance. E8: Re-orientate. Consider extubation but ready to re-intubate. E9: Extubate E10: Extubate
Coughing more and more. Touching lines. Slightly less restless.	N2: Extubate N6: No change	P2: ?mittens if hand holding and reassurance doesn't work. P9: Extubate	E2: Preserve devices, await doctor's order for extubation. E3: Extubate E5: No change E8: Extubate E9: Extubate E10: Extubate
Restless. A-line out.	N2: Extubate N6: Extubate with low dose Haloperidol.	P2: No change P9: Extubate	E2: Extubate E3: Extubate E5: Extubate E8: Extubate E9: Extubate with Haloperidol bolus. E10: Extubate

Table 34: Summary of decisions for Vignette 5



Key:
1. Intuitive judgement
2. Reflective judgement
3. Patient or peer-assisted judgement
4. System aided judgement
5. Critical review of research

Figure 19: Vignette 5 Decisions mapped to CCT

Again, novice and proficient participants used similar modes of cognition to make decisions about how to manage this patient. These groups of participants primarily used reflective modes (level 2) and based their decisions and judgements on similar patients they had nursed in their careers. They weighed up which interventions they believed had been most effective and made the decision to implement these for this patient. All participants in these groups chose to extubate the patient, who one requesting Haloperidol immediately before extubation and a different participant choosing to apply physical restraint (gloves) to ensure patient and device safety (level 2).

A wide variety of cognitive modes were drawn upon by expert participants. They moved between modes as the vignette progressed. Each participant had elements of critical judgement (level 5), but these came at various points in the course of the vignette and were most concentrated following handover. The majority of participants drew on intuitive and reflective modes (levels 1&2) as the vignette progressed. Device

interference focussing around the endotracheal tube initiated intuitive responses. All expert participants made the decision to extubate this patient, with two choosing to administer Haloperidol to control agitation or a benzodiazepine to address withdrawal on extubation.

5.4.6 Vignette 6: Sharon Dobbs

The final Vignette depicted a patient who was immediately post-tracheostomy insertion. This Vignette had a high risk inference as invasive devices were present, together with an insecure new airway. Previous episodes of hyperactive delirium were reported. The handover was objective and used validated tools to describe the patient's behaviour. A past medical history of heavy smoking was provided.

Vignette 'chunk' and behaviour	Novice participant	Proficient participant	Expert participant
Handover	N1: Unconcerned N5: Speak to medical staff about management plan for agitation.	P1: Concerned for new trache. P4: Address underlying factors (high sputum load) P5: Aim to humanise ICU, therapeutic management. P8: No concerns P10: No concerns	E3: Need to reassess patient E4: Unconcerned E12: Would need support at the bedside.
Restless, nervous, device removal.	N1: Reassurance and re-orientation N5: Reassurance and re-orientation	P1: Reassurance and supervision P4: Reassure. Relatives. P5: Reassure and re-orientate. Distraction (twiddle mitt). P8: Reassurance and supervision.	E3: Talking and assess cognition E4: Communicate, assess for underlying causes. E12: Supervision
More agitated. Device interference.	N1: Close supervision N5: Hand holding. Request HCA to sit with patient.	P1: Mittens P4: Supervision, secure devices, distraction. P5: Member of staff to sit with patient. P8: Assess cognition. Get relatives in. P10: Mittens if unable to supervise continuously.	E3: No change E4: Increase vigilance E12: Supervision and hand-holding.
Trying to get out of bed. Coughing.	N1: Request special. Medical review and ask for sedation.	P1: Haloperidol P4: Supervision, mobilise.	E3: Talking but concerned may need to escalate.

	N5: Assess comfort. Request medical review to assess underlying causes of agitation.	P5: Medical review. Request prescription for mittens. P8: Medical review, ?Fentanyl. P10: Explanations, mittens. Make nurse in charge aware.	E4: Concerned about trache removal. E12: Block access to trache with hand. Consider getting relatives in.
Agitated, coughs.	N1: As above, plus music to distract. N5: Make nurse in charge aware and request advice.	P1: Relatives P4: No change P5: No change P8: No change P10: Medical and senior nursing support at the bedside. Hold hands to prevent device interference.	E3: Thinking about mittens, but 'try other things first.' E4: Administer rescue therapy and apply mittens. E12: Make colleagues aware of agitation.
Further agitation and coughing	N1: No change N5: No change	P1: Get healthcare assistant to support at bedside. P4: No change P5: No change P10: No change	E3: No change E4: No change E12: Support required at bedside.
Pulls CVC, coughs.	N1: Instruct not to touch devices, mittens if continues. N5: Consider mobilising.	P1: No change P4: Supervision, low dose Propofol or Haloperidol. P5: Secure A-line. Haloperidol. P8: No change P10: Consultant review. ? Dexmedetomidine or Haloperidol.	E3: Haloperidol E4: No change E12: No change

Table 35: Summary of decisions for Vignette 6

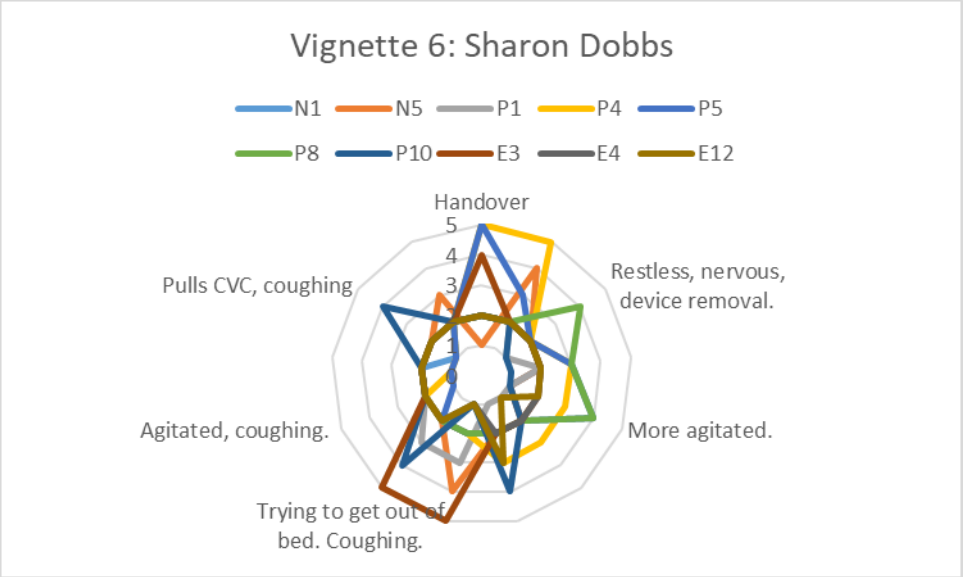


Figure 20: Vignette 6 decisions mapped to CCT

Two novice participants watched this vignette. One, a junior band 5 staff nurse (N1) on a large critical care unit, used primarily a reflective mode (level 2) to arrive a judgements and decisions. This participant made the decision to restrain the patient both chemically and physically. The second novice participant, a newly-qualified staff nurse (N5), drew on a variety of modes of cognition. Her intuitive (level 1) first response was one of panic, but she quickly moved on to use protocols (level 4) to support her judgement before returning back to reflective and intuitive modes as the patient's agitation increased. This participant chose to manage the patient therapeutically, citing reflection on previous patients where restraint had exacerbated agitation.

Variation in modes of cognition was also seen amongst proficient and expert participants. The majority of participants in these groups began with intuitive (level 1) responses of concern and panic immediately following handover, before moving to more critical or system-aided modes as the vignette began (levels 3, 4&5). Increased

agitation led to a return to reflective and intuitive responses as participants struggled to preserve patient and device safety. The majority of proficient participants made the decision to restrain this patient. Approaches varied between participants, with physical restraint being most common amongst proficient participants, whilst the expert group chose to administer Haloperidol or manage the patient therapeutically.

5.5 Summary of results

The primary decision-making modes adopted by participants across all the vignettes were intuition and reflection. According to Hamm (1988), if a mode of cognition which is appropriate to the task is used, then this is more likely to lead to a 'good' outcome. Intuitive modes of cognition are highly adaptable but can be prone to bias. They are thought to be more common in response to visual stimuli, such as the vignettes used for this study, and where time to undertake the judgement is limited (Thompson and Dowding, 2009). In addition, a familiar task was thought to promote analytical modes of cognition. Participants were all critical care nurses and practitioners and, as such, would be familiar with managing psychomotor agitation due to delirium. However, the format of the vignette was unfamiliar, which may have influenced the cognitive mode adopted by participants.

Managing psychomotor agitation secondary to hyperactive delirium requires rapid and adaptable decision-making. As such, it would be expected that participants would heavily rely on intuitive and reflective modes. However, the outcomes of the judgments and decisions were varied. It is difficult to identify the 'good' or 'correct' outcome, and this was not the purpose of this study. Rather it aimed to understand how and why nurses make decisions regarding the application of restraint.

'Being doubled' promoted greater use of intuitive and reflective modes of cognition for participants of all levels of experience. Vignettes where participants were allocated to nurse the patient 1:1 (Vignettes 3-6) prompted slightly more use of quasi-

analytical modes amongst expert participants. This could be due to participants feeling under less pressure to make rapid judgements as they were not responsible for two patients. System-aided judgements, such as referring to a protocol or validated assessment tool, were rarely used by participants of any level of experience. Where validated tools were used in handover, such as stating a patient was 'CAM-ICU positive', this slightly increased the use of tools amongst participants. However, the majority of patient descriptors used were subjective.

5.6 Thematic analysis: Judgements and decisions leading to restraint

This section will explore the final management decisions made by participants in response to the Vignettes. Approaches to delirium management are traditionally divided into pharmacological and non-pharmacological. Pharmacological approaches involve the use of drugs with the aim of reducing the severity or duration of delirium. Non-pharmacological management involves strategies such as re-orientation, noise reduction and communication (Bannon et al., 2019). Restraint is not considered to be a method of managing delirium, rather it is used to control behaviour which may risk causing harm to the patient or medical devices. This element of the results was isolated from the main thematic analysis results (Chapter 6) because it focused more on rationales for chosen interventions. Therefore, it was decided that it was better suited to this chapter, where it could be used to develop the discussion of decision-making and the Cognitive Continuum Theory.

5.6.1 Therapeutic approaches to delirium management

This section will discuss the non-restrictive approaches used by participants to manage the patients depicted in the vignettes and explore the rationales given for these decisions.

5.6.1.1 Identifying underlying causes of delirium

Participants generally began management with a therapeutic approach. One participant (P10 V6) stated that they would use restraint from handover. The majority of participants began their management by assessing and addressing underlying issues which may be causing or exacerbating delirium:

> *Sometimes, you know, we're saying, 'oh they're really getting agitated now, when in actual fact there is a reason behind that' (E11 V3).*

The majority of the decisions regarding restraint were made in reaction to persistent agitation. However, by not identifying 'the core of the problem' (E13 V1), critical care staff risk mismanaging delirious patients:

> *I think it's very common to say 'they're delirious'. That patient is delirious so we'll just sedate them, put boxing gloves on them because they're delirious. And I think we don't always take a step back and say 'but what is driving it? (P6 V2)*

Delirium is common amongst critical care patients which can mean that it is seen as 'normal' and part of critical illness. As this participant suggests, it is important to consider the reasons why a patient might be experiencing delirium. The need to explore all factors which might lead to agitation is described by a newly-qualified participant:

> *Try and assess the situation: is she too hot? Is there something making her uncomfortable? Is she in pain? Is there something else that's making her agitated, has she got a urine infection; is there some other reason? Maybe look at why she's behaving like she is. (N5 V6)*

5.6.1.2 Devices and the critical care environment can be restrictive

Medical devices were seen as potentially restrictive. Attachments such as blood pressure cuffs might exacerbate agitated behaviour:

> *…she clearly is very distressed, and it looks as if she is trying to get out of bed or get free from her restraint… (E13 V1).*

The patient behaviour in this Vignette is interpreted as being driven by a desire to escape. A novice participant suggested that the patient in Vignette 6 might be experiencing similar emotions:

> *…she's probably wondering why she's been trapped in the bed' (N5 V6)*

The presence of bed rails was perceived as contributing to the patient feeling 'trapped'. Bed rails are used with the majority of critical care patients and were present in all the Vignettes, with the given rationale of reducing the likelihood of falls. However, they could be perceived by patients as bars preventing escape. On viewing Vignette 5, which showed a patient waking from sedation following a deliberate overdose, a participant commented on the number of devices surrounding the patient:

> *…taking away any sort of physical restraints that are around her, of which there are multiple. And just because, then, you're not using things like boxing gloves or wrist restraints doesn't mean to say that the patient doesn't perceive that she is being restrained. (E8 V5)*

Large numbers of medical devices are commonplace in critical care. It could be argued that, in practice, nurses do not appreciate the number of devices attached to the patient and how they could be interpreted by a delirious patient. This expert participant clearly articulates that restraint in critical care goes beyond devices which are deliberately restrictive and encompasses many of the medical attachments.

Stepping back and offering the patient space was a common method which aimed to reduce psychomotor agitation in patients with delirium:

> *With these patients, it's important again that we try and keep the stimulation to a minimum so that we're not escalating things and we're not providing something that she's going to kick against. (E6 V1)*

Delirium can amplify perceptions of stressors and responses. Awareness of this was shown by several participants. For example, when caring for the patient in Vignette 2,

an expert participant recognised that she needed help at the bedside, but was keen for the patient not to be crowded:

> *But what I wouldn't want them to do is grab hold of her and restrain her because sometimes that makes the situation worse, especially if she's frightened et cetera. Usually if you're in a bay and there's a patient looking distressed like this, you do generally gather your additional nurses. But, yeah, I wouldn't want them to try and pin her down or anything. (E11 V2)*

The critical care clinical environment may also exacerbate delirium. Vignette 1 included a lot of background noise, from staff talking loudly to persistent monitor or device alarms. Several of the participants who watched this vignette emphasised that their first action would be to turn off the alarms with the intention of reducing the noise pollution:

> *I would want to turn them (alarms) off. For me, often when I walk into a room or I walk into a bay, I've met many patients like this, they are over stimulated by the noise and then they have got people talking very loudly to calm them down, which doesn't help often… (E13 V1)*

He described the situation from the perspective of a patient, emphasising the chaos and claustrophobia. The noise is distressing and the addition of strangers exerting force to prevent escape gives the situation a nightmarish quality.

5.6.1.3 Extubation

Vignettes 4 and 5 showed patients where the medical plan was to extubate. Vignette 4 (Roger Lakeland) depicted a gentleman who was post-emergency AAA repair. Participants were told he had failed a previous sedation hold (an elective pause or reduction in continuous sedation to enable neurological assessment) due to agitation. Vignette 5 (Sarah Robinson) focussed on a lady who had a history of mental health problems. She had been intubated following a polypharmacy overdose. All participants allocated to these Vignettes made the decision to extubate the patients. Elective extubation was seen as a method of reducing the number of devices attached to a patient and facilitating communication and further therapeutic management. An

oral endo-tracheal tube (ETT) was seen by participants as a high-risk device and participants were keen to reduce the likelihood of self-extubation:

> *I don't have to protect the tube anymore because it's gone, so I can just concentrate on everything else then… And I just think he might...if I can take that irritant out… he probably won't notice the NG tube as much, probably won't notice his art line as much because he'll be more comfortable. (E12 V4)*

Delirium was not identified as a reason to delay extubation:

> *But you see the thing is, just because you're confused and delirious, it doesn't mean you can't be extubated does it? It doesn't stop you breathing, so again if he's a danger to himself and he's not respiratory compromised, then you could still pull the tube. (E4 V4)*

Participants agreed that agitation would be easier to manage without the risk of the patient dislodging their endotracheal tube. However, one participant did describe how she had seen colleagues restart sedation quickly on patients who had previously failed sedation holds due to agitation and a further staff nurse commented that she would have a 'good day' if sedation was resumed.

5.6.2 Chemical restraint

Chemical restraint was used by participants of all levels of experience and its use was mostly suggested by those who watched Vignettes 1, 2, and 6. The majority of chemical restraint used was either Haloperidol, with the intention of reducing agitation, or benzodiazepines, which were used to manage withdrawal symptoms or reduce anxiety.

The most common given rationales for administering benzodiazepines was to address factors which might be leading to delirium, such as underlying mental health issues and addressing withdrawal from alcohol or cigarettes. No history of anxiety was given for the patients depicted in Vignettes 1 and 2, but participants interpreted their behaviour as stemming from an anxious response to critical care. Lorazepam and Diazepam were considered appropriate for this patient:

> *I would certainly consider giving her something to help her calm down a bit, like a benzodiazepine to reduce her anxiety. (E13 V1)*
>
> *And if I couldn't reason with her and she was becoming dangerous and dangerously agitated, and it was going to affect her breathing et cetera, then I might consider giving her something to chill her out, some Lorazepam or something in the first instance, just as a rescue. (E11 V2)*

Participants administered drugs with the aim to of 'chill her out' and 'reduce her anxiety' rather than create a respite for the nurse or facilitate control of the patient. Addressing withdrawal from alcohol and cigarettes was a priority for several participants caring for the patient in Vignette 1. Nicotine patches were suggested by most participants, with benzodiazepines used as a rescue therapy:

> *We tend to veer towards looking at any withdrawal, treating the withdrawal, and then using things like Olanzapine rather than Haloperidol, and perhaps Lorazepam as a rescue in a really dangerous agitated patient. (E4 V1)*

The patient featured in Vignette 5 had a history of mental health problems and previous critical care admissions. The participant (E4) was concerned that a period of intubation may have disrupted the patient's normal medication regime. This participant was keen to learn about the patient's history and not rush with plans to wake and extubate. The history given for that patient led another ACCP to doubt whether any additional pharmacology would impact on her agitation. He expressed a low threshold for recommencing continuous sedation:

> *For her, with that history, I would probably be more likely to reach for the sedation more readily than the first lady. I would probably be more likely to send her back to sleep if she started to become difficult… So she would be one that I may well send back to sleep fairly quickly if I think it's not gonna work. (E3 V5)*

In this excerpt, he contrasted his response with how he managed the patient in Vignette 6. That patient had no history of mental health problems or overdose. His response to Vignette 5 appears to be triggered by the reported overdose from the previous day and his clinical experience of managing patients from a similar

background. Benzodiazepines were used almost exclusively by participants from the expert category.

Haloperidol was used as chemical restraint by participants from all levels of experience, but especially those in the novice and proficient groups.

> *So I think if they are getting more agitated we use Haloperidol, if things like heart rhythm and everything are okay... Usually we start with Haloperidol. (N1 V6)*

Haloperidol was described as a first line agent by the majority of participants despite guidance suggesting it has little impact on the duration or severity of delirium. This was acknowledged by a minority of participants, who explained that they would still use the drug as there was not a viable alternative:

> *…and ultimately we are being told that we shouldn't use Haloperidol but I'm not sure anybody's got any alternatives at the moment… (E3 V1)*

The greatest variety of management approaches were made in response to the patient shown in Vignette 2. This patient was agitated, distressed and dependent upon CPAP. In addition, the nurse allocated to this patient is doubled with an incoming theatre admission. The clinical acuity and risk of deterioration is high. A senior staff nurse stated that restraint would be made necessary by the risk of device interference and delirium status:

> *This patient will definitely pull her mask and she will cause harm by desaturating and I would really think this patient will need both physical and chemical restraint maybe. I would do my assessment, but she's already CAM-ICU positive. (P10 V2)*

A positive CAM-ICU status was directly linked with the need for both chemical and physical restraint. This is in direct contrast to discussions in which participants from all levels of experienced stated that they believed physical restraint would exacerbate

delirium. For a small number of proficient and expert practitioners, the decision was made to intubate this patient and recommence continuous sedation:

> *Is she becoming more and more hypoxic, is this a situation where we need to be thinking about does this lady need an emergency intubation? Has she deteriorated from a respiratory point of view which has made this delirium the issue? (E8 V2)*

This decision was supported by the rationale of preserving safety and preventing further patient deterioration from a physiological point of view. Intubation and sedation was not described as restraint by any participant. This could be due to it being seen as a treatment necessity rather than a method of controlling agitation.

5.6.3 Manual restraint

Actions were not referred to directly as manual or hands-on restraint by any participant. However, a number of interventions were described which could be seen as forms of manual restraint. The rationale given such interventions was to preserve patient safety. For example, a participant described blocking a patient so they could not attempt to get out of bed and potentially fall:

> *She's hanging out, well she's pretty much out of the bed isn't she now? So I'd probably sort of block her in with my own body. (P5 V1)*

Blocking was also used to prevent device interference. One participant described her practice of 'blocking' a patient from accessing devices:

> *I would have personally put my hand over the ET tube. I think because he looks pretty calm, if I start to put his hands down for him then he's going to be...he'll feel trapped, if that makes sense? (E12 V4)*

This method was seen as less restrictive than holding the patient's hands or using pressure to move his hands away. Hand holding was used by several participants to prevent patients from raising their hands to dislodge devices:

Again, just try and explain to her why that's there, why it's so important. Hold her hand maybe to stop her pulling on it if you can do. (N5 V6)

A small number of participants considered their own strength in opposition to a patient. Using this degree of force was a last resort attempt to preserve patient safety.

5.6.4 Physical restraint

Physical restraint was defined as the use of adjuncts such as padded gloves or splints with the aim of reducing a patient's freedom of movement and preventing device interference. Physical restraint was used by participants of all levels of experience but was especially prevalent amongst the proficient group. The most common form of physical restraint was padded gloves. This device was also described as Posey Mitts or mittens. Padded gloves were applied to patients with the rationale of preventing device interference, although several participants acknowledged that they felt they were ineffective, could exacerbate delirium, and were easily removed by agitated patients.

The patient featured in Vignette 3 (a restless patient weaning via a tracheostomy) was physically restrained by a number of participants. This patient was handed over as regularly disconnecting himself from the ventilator. Mittens were seen as a way of preventing this:

In fact, I'm kind of surprised he didn't have the boxing gloves on already if he's been doing it overnight to be honest. (P1 V3)

A minority of participants described how they would profile the bed to make it difficult to the patient to move. Commonly, critical care patients are 'sat up' in bed to optimise respiratory function. A novice participant described how she would shape the bed to reduce patient movement:

Yes, so sometimes what I have found helpful for a little bit of time when the patient's tried to get out of bed is you know, sit them up really good, like the full-on sitting up with the legs raised, you know, the bendy bit, and then

> *tilt the whole bed backwards. That won't let them get out of the bed. (N1 V4)*

This action was not described as restraint by the participant, but the intention to prevent freedom of movement was clearly expressed. The patient featured in this Vignette displayed restless behaviour but had made no attempt to 'get out of the bed'. The decision to shape the bed to restrict movement was made pre-emptively:

> *I'd put, you know, the crease in the bed? So that he can't shuffle down as far, or it takes him longer to shuffle down. (P1 V3)*

This patient was mobile in the bed, and the participant had expressed her concern that she would need to repeatedly request assistance from colleagues to reposition him. Through the decision to restrict his movement, she is reducing this aspect of her workload and this forms the rationale to support this decision, in contrast to the usual emphasis on patient safety.

One participant made the decision to use a different form of physical restraint. She described the splints employed on her unit to restrict movement and prevent device interference:

> *…it's like a padded kind of thing that you would put on the elbow, so rather than having the glove…But, it basically stops them from bending their elbow. So, they can still use their fingers, but it would stop them from bending, to localise and to pull on things… (P11 V3)*

The participant was able to access the mitten-type restraints, but chose to use splints as she felt they reduced patient agitation:

> *I mean, that might actually still maybe make them agitated still, but I think a bit less so than losing the control of your fingers I feel. (P11 V6)*

The decision to apply restraint is made even with the knowledge that it may increase psychomotor agitation.

5.7 Summary of results

Intuitive and reflective modes of cognition were most common during the vignettes. Frequently, participants would use more analytical modes following handover, but then quickly change to intuitive and reflective judgements as the patient's agitation developed. All participants drew on therapeutic management options as a first line. Methods included re-orientation, stimulation and therapeutic touch. Touch was differentiated from manual restraint through the intention expressed. Manual restraint included handholding with the intention of reducing the patient's freedom of movement.

Chemical and physical restraint were most frequently used when participants were 'doubled' during Vignettes 1 and 2. The administration of chemical restraint was frequently rationalised as to improve patient comfort and reduce anxiety, rather than an explicit wish to control behaviour. Physical restraint in the form of gloves, 'mittens' or, less frequently, arm splints, was applied with the intention of preventing device interference. A number of participants acknowledged that physical restraint, in their experience, could exacerbate psychomotor agitation. However, they still went on to apply that type of restraint, suggesting they felt they had been 'backed into a corner' and had few further management options available to them. In contrast, analytical modes were drawn upon when participants felt they had more time to arrive at a considered judgement, such as directly after handover when the simulated patient's agitation level was at its lowest.

5.8 Chapter summary

- The Vignettes depicted a simulated face-to-face (low structure) task with a high level of ambiguity. It is suggested that in order to arrive at a 'correct' or 'good' decision, the mode of cognition should match the properties of the task (Thompson and Dowding, 2009b).

- Therapeutic management was the first-line approach for all participants.
- Chemical restraint was used participants of all levels of expertise and physical restraint was most common in the proficient group.
- Novice nurses were least likely to initiate restraint of any type.
- The majority of decision-making drew on intuitive or reflective modes of cognition.
- More analytical modes were less common and were rarely associated with the decision to initiate restraint.
- Participants were able to move along the continuum, drawing on various modes of cognition as suggested by previous research in this area (Cader et al., 2005). However, once the more intuitive modes had been engaged, it appeared harder for participants to ‘step’ back and apply a more analytical judgement.

Chapter 6 Results 2: Exploring how nurses make the decision to apply restraint to a patient with hyperactive delirium: A reflexive thematic analysis.

6.1 Introduction

The results from this study will be presented in this chapter and the following chapter. The results are based on the same dataset, but with two different approaches to analysis. This first results chapter presents the results of the reflexive thematic analysis process described in Chapter 4, the following chapter will explore the results through decision-making theory.

An abridged version of the results of the thematic analysis was published. The abstract is included in Appendix C.

6.2 Themes and sub-themes identified through reflexive thematic analysis.

Using the principles of reflexive thematic analysis (Braun and Clarke, 2013; Braun and Clarke, 2019), five main themes, each containing a number of sub-themes, were identified. These are presented in Table 36 overleaf.

Theme	Sub-theme
Nurses hold intrinsic beliefs about restraint	Restraint should be the last resort Discomfort around restraint Restraint won't solve delirium There's a 'right person' to allocate to a patient with delirium
Handover and sharing labels can influence restraint practice	Nurses hold preconceptions about patients with hyperactive delirium Some labels applied to patients are associated with the decision to apply restraint
A consistent approach to restraint is not maintained	Nursing management of psychomotor agitation can be inconsistent The presence of a protocol for restraint Medical management and decision-making can be inconsistent Education and evidence can influence restraint use A 'hierarchy of organ failure'
'If I turn my back on her, god knows where she could end up' – the need to maintain constant vigilance	'Being doubled' causes reduced opportunities for vigilance Delirious patients are more time consuming
'The tyranny of the now'	Repetition and losing patience '…you're trying to get on with all your normal tasks that you need to do but you can't' It's relentless 'The doctors can just walk away'

Table 36: Summary of themes identified.

6.3 Nurses hold intrinsic beliefs about restraint

This theme focused on beliefs expressed by participants about restraint and delirium and explored how these beliefs inform and influence their decisions in practice. Participants expressed a belief that some nurses are innately better at working with delirious patients and were able to avoid restraint because of this.

6.3.1 Restraint should be the last resort

Participants believed that physical and chemical restraint should be a last resort, and only used if therapeutic management methods have failed repeatedly and patient

and/or device safety was at risk. Therapeutic management, such as re-orientation and correcting reversible causes, was considered optimal as using chemical restraint in the form of sedation may delay discharge from ICU:

> *…he's gonna be a slow wean because he's got COPD. Re-sedating him isn't necessarily the answer unless you have to, you should ride these things out. (E1 V3)*

The decision to '*ride these things out'* (E1 V3) or that of '*sticking with it'* (E12 V6) was seen as good management, or a more *'progressive'* (E12 V6) option than using chemical restraint to control agitated behaviour. There was a belief amongst some expert participants that delirium and psychomotor agitation will pass given time, and that restraint should be delayed if possible:

> *You kind of just have to ride the storm sometimes and hope that it will eventually settle itself down… (E3 V6).*

The reference to 'the storm' (E3 V6) of patient behaviours suggested a physical and psychological struggle for both patient and nurses. This gave a sense of the chaos and pressure which nurses must manage to ensure patient safety. The relief felt by nurse and patient when acute psycho-motor agitation passes is identified by an ACCP: *'It's almost like a veil's been lifted, they're pushing through, they're through the other side'* (E7 V1).

One ACCP saw himself as *'quite old fashioned'* (E13 V1) due to his reluctance to prescribe sedation for an agitated HDU patient. His phrasing was echoed by another expert participant: '*I think the good old reassurance and touch at the bedside is more reassurance' and expressed sadness that the 'back to basics of nursing… can get easily forgotten in a technological environment*… (E9 V5). These participants set themselves apart from their less experienced colleagues through the implication that practice was different in the past, and that staff were better at engaging with their

patient through communication or touch instead of using restraint to control agitated behaviours.

Communication was a first-line approach for all participants, with the decision to *'try to talk her down first'* (E13 V1) instead of intervening with any kind of restraint shared by another ACCP:

> *Because sometimes you can, it does work sometimes, just talking to patients sometimes does work. Who'd 'ave thunk it? It does work because giving them support through this process is not just like fixing their ribs or you know curing their infection, or just banging them with Lorazepam. It's emotional support as well, because you've got to remember these things aren't forgotten are they? (E4 V1)*

This participant used sarcastic mock surprise ('*Who'd 'ave thunk it?*') to express his concern that simple communication is often neglected or forgotten when managing delirious patients. Again, it is inferred that quickly resorting to restraint rather than spending time communicating with the patient is poor management: '*You know, it's not just bang – on with the restraints, there's lots of other things we can do'* (E4 V6). This participant repeatedly used the word '*bang'* in relation to physical and chemical restraint in two different Vignettes, a verbally and physically agitated HDU patient and an ICU patient with a newly-inserted tracheostomy. The word is aggressive and immediate. It suggests a rapid act which imposes the will of the nurse over the patient without consideration of their experience. This participant used it in a way that showed his disapproval of this decision and that is an easy option to control behaviour without addressing the cause. The quick use of restraints is seen as showing a lack of thought and engagement with the patient and instead *'jumping to the conclusion of using mittens'* (P10 V6) or *'jump in with any pharmacology'* (E13 V1). The word 'jumping' suggests that the quick use of restraint bypasses several other interventions which may have mitigated behaviour and avoided the use of what a number of participants consider to be a last resort.

In contrast, therapeutic management was considered a more thoughtful approach:

> *But before I even went for any kind of sedation or lorazepam or haloperidol or anything like that, I would be going for positional changes, making sure he was comfortable. I'd be going through every different thing before, and that would be my last…resort. (N4 V3)*

This newly-qualified staff nurse was certain that they would try everything before resorting to restraint. A further newly-qualified participant described the use of restraint as '*quite a drastic thing to do'* (N5 V6). Her words further add to the collective rationale for restraint to be considered a last resort:

> *…sedating someone probably should be the last option really because it's probably just going to make the situation worse when she wakes up again. I think it's going to make her even more confused the next time the sedation is turned off, rather than help the situation. (N5 V6)*

This participant sought to avoid exacerbating or prolonging delirium through restraint.

Patient behaviours leading to the use of last resort are those which endanger their safety. Participants described such behaviour as '*uncontrollable'* (P10 V6).

> *…and certainly I have in my career utilised, sedation at that time to manage situations that evolve because you try with the best will in the world to manage it effectively non-pharmacologically… you try not to use restraint in any way, shape or form, just using reassurance, but you get to a point where 'nah, I can't manage this. She's just unsafe'. And once you start to feel unsafe you know, then you have to take action. And that action often is sedation. (E6 V1)*

The participant was reluctant to use restraint but was also conscious that patient safety must be maintained and that sedation had a place as a last resort if previous interventions failed to reduce agitation. The patient experience of agitation was considered by an ACCP when deciding when to use restraint as a last resort: *'it's inhumane to leave a patient in that state'* (E8 V2). Restraint was still seen as a last resort, but one which may be ultimately necessary for the patient's psychological

wellbeing. The word ‘inhumane’ indicates the distress this practitioner feels when observing the patient. The HDU patient in this Vignette is dangerously agitated and dependent on high supplementary oxygen via CPAP mask. The risk of physiological deterioration is high. In this instance, delaying the use of sedation may cause harm to the patient.

6.3.2 Discomfort around restraint

Many participants across the levels of clinical experience had an instinctive reaction that using restraint was poor practice, and something they felt was morally and ethically dubious. Even the word ‘restraint’ caused discomfort:

> *I don’t like using that word, but it is what we do isn’t it? ‘Cause it conjures up all sorts of things!’ (E4 V1)*

The reluctance to talk about restraint lead some participants to describe chemical and physical restraints as ‘*sleep’* and ‘*mittens’* respectively rather than fully acknowledge the reality of the interventions. Participants from all levels of experience appeared unwilling to use the words ‘*sedation’* or ‘*chemical restraint’*. Restraint is infrequently referred to in critical care, but sedation is a common practice. However, many participants did not refer to drugs such as Haloperidol as sedation. The most common way of describing the decision to use a sedative drug was to refer to it as ‘something’:

> *I probably would just give her something to take that edge off and orientate her again to time and place and where she is. (E9 V5)*

The intention is not described as to sedate, restrain or control the patient. Instead a variety of aims are given for the use of sedation including ‘*to chill her out just from a safety perspective’* (E11 V2), to *‘settle her down’* (N1 V6), to consider *‘giving her something to try and relax her a little bit’* (N3 V2), and *‘to keep her calmer and a bit more comfortable’* (P3 V2). These aims were focussed on the benefits of calming the patient. In addition, some participants emphasised that they would only use small

amounts of sedation to manage agitation, for example *'not a massive dose or anything'* (P6 V2) or '*something to calm her down a little bit, but not too much'* (E5 V2). Both participants sought to avoid using deep sedation which might delay recovery.

Sedation was described as enabling the nurse to attend to tasks they may not have had time to complete whilst managing patient agitation, or facilitating further restraint without the risk of harm:

> *'…that's why I wanted to go straight for the medicine, just to calm her down for the first bit and then while she is a bit you know, droopy kind of level, we would use the mittens so she wouldn't be able to get out of them like she could at this point'. (N1 V6)*

This staff nurse described sedation as '*medicine'*, suggesting a positive and therapeutic intervention. However, the *'medicine'* is used to render the patient unable to resist the application of further restraint. The non-clinical description of a reduced conscious level as '*droopy'* suggested that this participant was distancing herself from the extent of the restraint she was employing. This could be due to discomfort regarding the use of restraint or lack of awareness. Discomfort with the word 'restraint' was emphasised by an ACCP:

> *And if all those avenues had failed, then maybe some PRN Lorazepam, I'll say the word, as a chemical restraint, would be the safest means for her… (E7 V1)*

It was a conscious effort for this participant to say the word '*restraint*'. The title of the study and information provided to participants may have helped this participant to associate the use of a drug with restraint.

Language around the use of sedative drugs also indicated confusion from a minority of participants. A novice participant stated that she would request *'something to calm her down just a bit'* (N1 V6) to assist in her management of a patient with a new tracheostomy: '*Not sedation exactly, but what we usually use here is, for agitated patients, is some Clonidine or Quetiapine I guess'* (N1 V6). Both drugs this staff nurse

referred to have sedative effects but are clearly differentiated for her from continuous sedation such as Propofol. Referring to sedation as '*sleep*' also indicates purposeful or unconscious confusion regarding the restrictive nature of continuous sedative infusions.

> *…they might keep her with a little bit of Propofol and a bit of Alfentanil overnight and then start again the following morning when she's had a sleep and a rest. (P4 V6)*

'Sleep' and 'rest' are natural cycles which are disrupted through the use of sedation. Describing overnight sedation as something which enables rest and sleep suggests this participant wants to believe she is acting in the patient's best interests.

A minority of participants made responses and decisions which suggested that there was some confusion regarding what constitutes restraint in critical care practice. The distinction between manual and types of physical restraint appeared to be a source of confusion:

> *I mean, we don't do physical restraint per se, I mean we still use the old boxing gloves as we call them but that's not… well, it is a form of restraint but it's something that enables the patients to not to do any further harm to themselves by pulling lines out or climbing over the cot side. (E4 V1)*

Gloves were acknowledged to be a '*form of restraint'* but not '*physical restraint per se'*. This suggested that only manual or cuffs in the style used in other countries were seen as methods of physical restraint. Gloves were not considered restrictive even though they reduced the patient's ability to move freely as the participant notes. This was echoed by an ICU staff nurse: '*obviously we don't really use that much physical… I'd probably actually put gloves on him. Boxing gloves'* (P1 V3). This participant differentiated strongly between gloves and physical restraint. She stated clearly that the culture in her workplace is such that physical restraint is not used, but gloves were an appropriate intervention for a restless patient who is localising towards his tracheostomy.

One participant used a method of 'blocking' the patient to prevent an agitated HDU patient from getting out of her bed. Again, she explicitly stated that she would restrict patient movement, but that this was not restraint: '*So I'd probably sort of block her in with my own body… So yeah, so I wouldn't be looking at any sort of restraints for this lady just yet'* (P5 V1).

Discomfort with physical restraint was described, especially when participants felt restraint was being using as a substitute for adequate staffing:

> *I really don't like sedating people or giving them chemical restraints, it just doesn't seem the right thing to do. And then it's simply because we haven't got enough staff or the experience to sit there with the patient. (E13 V1)*

For one expert participant, the behaviour of the patient in Vignette 2 left him with no option but to administer sedation to maintain safety:

> *… there's just no managing that sympathetically… you're going to be forced… further down the route of chemical restraint, because it's the only way that you can manage her. That sounds terrible doesn't it? It's the only the way that we can manage her. (E6 V2)*

His discomfort was clear from this excerpt. He is unable to manage the patient in the way he would like to (*'sympathetically'*) and feels *'forced'* to intervene in a way which he was aware '*sounds terrible'*.

Comparisons were made between physical restraint practice in the UK and USA. Participants were deeply uncomfortable with the practice of '*restraining people and tying them to the bed'* (E13 V3). Others commented that '*in the States it almost seemed like common practice to restrain patients, and I was a bit horrified by that'* (N2 V5) and *'I'm absolutely against it. I know the Americans love that sort of thing'* (E13 V3). However, an expert participant expressed concern that the restraint practices used in the UK are not that different from those seen in other countries:

> *…because we always kind of go, oh in Australia, in America, they hard restraints, you know, they cuff patients using soft cuffs to beds. And we often have that discussion about what if, what's more ethical. Is it more*

> *ethical to manage a patient restrained with soft cuffs versus chemical restraint? They're both doing the same thing, it's just that one seems to be more ethically kind of palatable. It's dishonest in a way, but it's kind of more palatable to our view. (E6 V2)*

Instead of drawing favourable comparisons between UK practice and techniques used in other countries, this nurse focused on his discomfort on the deceit of using sedation to control patient behaviour and the way in which it feels more '*palatable*' when it is essentially similar in using restraint to manage and control agitated behaviour. Again, nurses felt reluctant to see their practice as one which used restraint, instead they sought *'palatable'* rationales for their actions.

6.3.3 Restraint won't solve delirium

Manual restraint in the form of hand holding or moving the patient's hands away from devices was considered to add to patient distress and feelings of being '*trapped'* (E12 V4). An ACCP observed that junior colleagues used manual restraint to prevent device interference. He felt this practice increased patient agitation and distress:

> *…we sometimes have this habit, certainly less experienced nurses do, of holding the patient's hand. The patient can't move at all, and I say to them 'no, let them move a little bit', you've got to be a little bit aware when they start to move towards the things you don't want them to pull at, but if you just pin their hands to the bed and don't let them move at all, you're probably going to stress them even further really. (E3 V6)*

This participant demonstrated his experience and confidence in managing agitated patients through his advocacy for allowing the patient to move. Several participants expressed a belief that physical restraint (gloves) also exacerbated agitation and delirium and did not solve the problem. They recalled patients for whom the gloves had been ineffective and were easily removed by a patient: *'I've seen in many, many places that the mittens come off with a quick slap of hand'* (N1 V6). For this junior staff nurse, the issue was not with agitation increasing following restraint but rather that it was easily displaced.

A number of participants from all levels of experience believed that the use of padded gloves in delirious patients exacerbated their confusion:

> *And for the patient it must be absolutely awful because they are already feeling paranoid and distressed. We're adding to it, I feel, by restraining them' (E13 V3).*

Gloves were believed to contribute to persecutory delusions such as imprisonment (P11 V3) and to cause annoyance to patients, leading to them *'just concentrating on trying to get the gloves off, it's just a constant thing and it's just more distressing for them'* (N3 V2). A senior staff nurse observed that *'as soon as you start to physically restrain people, it does wind them up a treat'* (P4 V3).

A staff nurse with three months ICU experience saw physical restraint as demonstrating a lack of care or engagement:

> *Really I think that's more for the benefit of the nurses rather than the benefit of the patient because gloves are not going to help the situation, they're not going to reassure her, they're not going to re-orientate her, they're not going to help her; they're just going to increase her agitation and make her a bit more frustrated…(N5 V2)*

Restraint was viewed as a short-term 'sticking plaster', covering up problems rather than dealing with their root cause. This participant suggested that the act of applying restraint is the easier option but that it represented a lack of care and communication with the patient.

Chemical restraint was considered equally ineffective in dealing with the root causes of delirium. Fundamental care and good communication were noted as being key: '*I think there isn't a pill for everything, is there, and it shouldn't be that way'* (E11 V2). Drugs such as Haloperidol were seen as largely ineffective in treating delirium:

> *But I see how Haloperidol as a… Oh, I can't think of the right word. But it's a symptom blocker or masker… rather than addressing the underlying problem… (N2 V1)*

Her words were echoed by an experienced ACCP who was unwilling to prescribe sedation for the management of agitation:

> *… I don't want to treat it because often you treat it and you are just waiting for the after effects of the drug therapy you have used to wear off. It doesn't treat the original problem' (E13 V1)*

It is suggested that it is unsafe and poor care to use drugs to manage agitation in the long term as this would lead to underlying issues being neglected. The use of sedation to reduce agitation was criticised by several participants as an action which passed the issue to the next shift and potentially increased patient agitation once sedation has worn off:

> *… if you give them a big slug what you do is you knock them out and then they're out for hours then, aren't they? And they've switched their sleep-wake cycle and then you're dealing with the problem during the night-time hours, which isn't ideal for the other patients. (E11 V2)*

Sedation created a cycle where staff '*throw drugs at people and they end up drifting off to sleep, but it's not a proper sleep, so then they wake up and they're just as agitated as they were before'* (E12 V6). The underlying issues were not resolved, agitated behaviour continued and more drugs were administered by bedside staff as a response:

> *So, if we go down the route of just sedating and keep sedating until she's flattened then you're going to possibly end up with this same scenario again. (E9 V1)*

The language used by these participants suggests further negative beliefs around the practice of sedating delirious patients. A '*big slug'* (E11 V2), '*throw drugs at people'* (E12 V6) and '*keep sedating until she's flattened'* (E9 V1) all feel like dehumanising actions based in managing behaviour from a distance without engaging with the patient. The goal of a 'flattened' patient was implicitly criticised by these experienced nurses and ACCPs.

6.3.4 There's a 'right person' to allocate to a patient with delirium

There was a belief that some nurses were better at coping with delirious patients than others. Attributes associated with being 'the right person' are good communication skills, patience, thinking creatively, engaging actively with rehabilitation and avoiding restraint use.

> *And on those times when we have the luxury of time and we're not too busy, you see these really experienced intensive care or HDU nurses sitting with them, and are absolutely brilliant with them. They develop a rapport with them, they start getting into their world or their experiences at the time and manage them really well without drug therapy, without having sedation or without chemical or physical restraint. (E13 V1)*

Such skills reflect good fundamental nursing practice and were effective when managing delirium. Experience was associated with these skills by a further participant:

> *Because I feel like, for example, new nurses or the nurses that have not that much experience, because of the lack of experience they will be really prompt on like 'oh we need to turn the sedation back on' or 'I cannot control this patient'. Like they will feel like overwhelmed. (P8 V6)*

This participant associated junior nurses' inexperience or lack of knowledge of therapeutic management methods with the use of restraint. However, the novice group was the least likely to make the decision to apply restraint, suggesting that this blanket perception of the abilities of junior nurses may be unfounded.

Nurses who were deemed 'good' with delirious patients seem to have abilities which are admired by participants. HDU patients are generally un-sedated so nurses working in this environment have more experience in two-way communication than those working in ICU. Nurses who were seen to be 'good' in this role appeared to be more frequently allocated to care for delirious patients or might ask to return to a patient. Such nurses were described as having higher levels of '*tolerance'* (E9 V1) than other members of staff. Again, it was suggested that the delirious patient is not a 'proper' ICU patient who requires skilled nursing, but rather an allocation which simply

requires a tolerant nurse who can cope with challenging behaviour. A similar dismissal of the nursing skills required is expressed by a trainee ACCP:

> *Or the talkative nurses, you know, some people are very good at just chatting to patients and you know those staff are often put in place to look after and oversee, supervise these patients. (P7 V1)*

The language used in this excerpt minimises the skills of these '*talkative'* nurses. This trainee ACCP saw '*just chatting'* as the most obvious skill shown in this situation. In contrast to earlier excerpts where the function of skilled communication in developing the nurse-patient relationship was identified.

The skills required to manage an agitated patient were thought to be fundamental to good nursing care:

> *Perhaps just a good way with patients. You know, a nice manner towards people really, but you'd expect that from any nurse anyway… (P2 V3)*

However, an ACCP commented that *'I think there's an element of good patient allocation that needs to go on'* (E5 V5). Even though these skills are essential to nursing care, it seems that some nurses were unable or unwilling to be allocated to a delirious patient: '*And some people just can't handle it'* (E4 V6). Being unable to cope with agitated behaviours and unable or unwilling to engage with therapeutic management was associated with restraint use:

> *… whereas others are a bit more quick to maybe rush ahead and maybe say, oh we need to put gloves on this patient, just a bit quick to rather than look at other ways to try and manage them. (N5 V6)*

The participant noticed that for these colleagues, restraint was not a last resort. Rather it was a quick and easier solution than spending time communicating with the patient and identifying causes of agitation and delirium. A similar situation, but relating to chemical restraint was described by another newly-qualified staff nurse:

> *And I've known nurses completely refuse to do sedation holds on certain patients…., because they've got a reputation for being agitated and they completely refused. I mean some nurses are better than others in certain situations. (N4 V4)*

The 'right' person was also seen as important in helping to reduce agitated behaviour. A newly-qualified staff nurse spent time at a follow-up clinic and found that patients remembered associating nurses with being a threat: *'All the nurses were against me and things like that'* (N4 V3). In such situations, drawing on support from colleagues was cited as a potential management strategy by a number of expert and proficient participants. A tall male ACCP noted that some patients reacted positively to his size and became less agitated, however he also reflected that he might be seen as a threat:

> *But then again, it works the other way, there are some patients that react more aggressively to me and it's usually the 5 foot 2 female nurse that can fall over in a breeze but basically can wrap them around their little finger and get them to take their medication etc. it just depends on how the patient responds to different individuals… (E7 V1)*

A small number of expert practitioners noted that inviting a colleague to approach an agitated patient could result in reduced agitation. This may be related to the patient's perception of one nurse as a potential threat, as suggested above, or simply a change in voice or face:

> *… sometimes just that change in voice is enough to settle them, like it's not personal, it's just, well it may be personal but yes, it's just sometimes with the change of face will be enough to help a little bit. (E5 V3)*

The ability to recognise that a pattern was being repeated 'over and over' (E5 V3) and that the nurse is no longer having a positive effect on patient behaviour and could be exacerbating the situation was seen as important. Participants also expressed their awareness of how changes in their voice or manner might exacerbate patient behaviour:

> *There is always the temptation that your temper… Not temper, that's the wrong word, but you let a bit of frustration come in your voice… (E6 V1)*

Delirious patients were thought to be especially sensitive to changes in nurses' voices that can result from frustration and anger: *'They grasp onto the little things like tone'* (P3 V3). Expressions of anger or shock at the patient's behaviour were also thought to increase agitation:

> *It's amazing how things can quickly escalate, and also I think it depends on your manner, doesn't it? If you come all 'Sharon, what the hell you doing?!' you know, you're just inflaming it straight away. (E4 V6)*

The accusatory tone of this exclamation was in direct contrast to the calm, sympathetic and patient-responsive relationships formed by nurses who were seen to be 'good' at caring for delirious patients. Such an exclamation might have a role in attracting the attention and support of colleagues, or it could simply be an expression of frustration from the nurse. However, such a response to agitation was unlikely to resolve an escalating situation.

6.4 Handover and sharing labels can influence restraint practice

This theme explored how preconceptions held by the nurse, or generated through handover, could influence the way the patient was approached and how decisions regarding restraint were made.

6.4.1 Nurses hold preconceptions about patients with hyperactive delirium

Participants shared their initial reactions to being allocated to a delirious patient. A newly-qualified band 5 staff nurse expressed her disappointment:

> *So, probably I'd be thinking, I don't know, probably wish I'd got a different patient. Shouldn't really say that – in the nicest possible way' (N5 V6).*

This view was mirrored by other participants with similar amounts of experience. A nurse who was asked to take over a delirious HDU patient in addition to the existing patient to whom she had been allocated stated she would feel *'a little annoyed that I'd been dumped this patient'* (N2 V1). Neither nurse expressed interest or excitement for their allocation in contrast to descriptions of so-called 'proper ICU patients':

> *Everybody wants the super sexy ventilated trauma or whatever that's on vasopressors... (E4 V1)*

The language used to describe these two distinct stereotypical critical care patient types made clear nurses'' preconceptions about being allocated to patients with delirium. Participants describe being *'dumped'* (N2 V1) with an agitated HDU patient, whereas sedated multi-organ failure patients are described as *'classy'* (E2 V4) or '*the really interesting juicy ITU patients that we all love'* (E3 V1). The negative stereotyping around delirious patients appeared to stem from a variety of causes. For example, an ACCP attributed the unpopularity to the *'unpredictability'* (E4 V1) of awake and agitated patients. The appearance of a 'proper ICU patient' was strongly contrasted against the untidy delirious patients depicted in the Vignettes:

> *I think he's not going to have that typical ICU patient look. I'm just going to have to like, accept that he's going to look like a bag of mess at the bottom of the bed. Half out, and sheets everywhere. (P1 V3)*

The way a patient, together with the bed and sheets, looks was associated with good management and satisfaction from the shift: *'…this whole kind of pristine arrangement of the bed, the patient being tidy'* (P11 V3). The *'pristine arrangement'* of patient and lines was not possible when caring for an agitated patient. This was associated with stress:

> *ICU nurses… we love our patients to look really nice and neat and we can find it stressful when that doesn't happen. (E3 V1)*

This experienced participant reflected on ICU nurses' preoccupation with how their patient looks and the pressure felt to maintain a neat veneer. If the veneer slipped, it indicated that the nurse was beginning to '*lose that control'* (E3 V6).

> *So often we, our own drivers and our own perceptions are a large proportion of the pressure that we feel you know, when we're trying to manage patients like that. (E6 V1)*

Here the participant acknowledged that the need to create and maintain a 'neat' patient was generated by the nursing staff themselves. An untidy patient was a stressor and could perhaps provide rationale for some restraint use. For example, nurses may feel under pressure to achieve an idealised '*catalogue style'* (P3 V2) patient who is compliant, posable, and neat. This could lead to the decision to apply restraint. In addition, delirious patients presented a clinical challenge which participants believed was not fully appreciated:

> *Just because they're not that trendy, CVVH, ventilated patient that you can get competencies for… they're still just as complicated to look after. (E2 V4)*

Vignette 3 depicted a delirious patient who was weaning from mechanical ventilation via a tracheostomy. He was described by a senior staff nurse as one of '*the patients that nobody wants really'* (P4 V3). In contrast, an experienced ACCP re-evaluated how they approached delirious patients:

> *It is weird cause I remember when I first started on critical care and you were given a slow weaner, it was like 'oh my god. Why, oh why, oh why?' But as you become more experienced, they're the ones that you like enjoy looking after… cause you can spend a bit of time with them, just get to know them. Some people are really interesting. (E7 V3)*

The participant recollected experiencing similar emotions to the junior staff described above when allocated to a long-stay patient. However, with experience, he was been

able to reconsider. More experienced participants were more likely to see beyond the veneer of a 'proper ICU patient' to the person underneath. His thoughts are echoed by another ACCP:

> *You might not have all the machines that go beep, but that's not the end of it is it? Although some people think that it is. But it's a different aspect of critical care. (E1 V4)*

Participant E1 demonstrated his disapproval of colleagues who do not see this through minimising the complexities of a ventilated and monitored patient to '*machines that go beep'*. Experience appeared to have enabled more experienced nurses to look beyond stereotypes of unpopular patients.

6.4.2 Some labels applied to patients are associated with the decision to apply restraint

Handover appeared to play a role in triggering preconceptions or exacerbating opinions already held by staff. These preconceptions could go on to influence the decision to restrain. An agitated and delirious patient with a history of alcohol excess was depicted in Vignette 1. Handover reported that she had been aggressive overnight and concluded by advising staff to discharge her to the ward as soon as they could. This personal judgement-driven handover triggered negative responses amongst a number of participants.

> *I think as much as we all kind of go in with a positive mind-set, she's clearly quite well known as a potential, for want of a better word, trouble-maker patient who nobody's really going to enjoy, she's got that reputation so it's going to affect how you deal with her. (P3 V1)*

Handover gave this patient a 'reputation'. The words used to define her by the nurse handing over created an image of a *'troublemaker'* which may influence the care and management she received from future nurses. Labelling is a powerful act in nursing. This was explored by a senior ACCP in response to a further subjective handover given for Vignette three:

> *I think invariably we negatively label these people because they are a difficult management problem, nobody wants to stand at the bed all day long managing these patients and not feel as if they are getting through. So often we label them negatively and often for the wrong reasons. (E13 V3)*

Labelling appeared to have a role in coping and helping the nurse to feel that they have done what they can, and that the patient's behaviour is intrinsic to the patient rather than the fault of the nurse. The act of placing the fault with the patient positioned nurses in opposition to a 'difficult' patient. The participant stated that he believed labelling stems from a need to '*manage our own anxieties'* (E13 V3). Perhaps this could be achieved through uniting colleagues 'against' a threat, in this case an agitated patient. However, this would lead to the perpetuation of the label. An ACCP working in cardiovascular intensive care described how she attempted to subdue her preconceptions:

> *And even if you think you've put it away, locked it in your brain somewhere, you don't know what's coming through and what they can see. And they can have preconceptions about what we're thinking about them as well, so it can be a bit of a toxic situation, but just like bubbling under the surface rather than overt. (E5 V5)*

Even consciously held and rejected preconceptions can influence care. This excerpt also introduced the idea that patients can be aware of negative preconceptions held against them and that this effected the nurse-patient relationship. One participant described approaching a delirious patient following handover as akin to going into battle:

> *It's like armour on, you're almost steeling yourself, take a deep breath before you walk onto the ward, 'right I'm ready'… When you know you're going to be looking after a delirious patient, your expectation of your shift is different. (P3 V2)*

The handover for Vignette 2 was objective but portrayed a potentially high risk scenario. The participant was allocated to two HDU patients, one of whom was delirious, agitated, and dependent on CPAP. This participant was unhappy about the

allocation. The use of the word 'armour' brings to mind images of battle and indeed the participant goes on to describe her expectations of this shift to be akin to a '*mini battle'* between herself and the patient. She admitted that the handover and her resulting preconceptions about the patient will change the management approach she takes: *'But I would imagine it would make me feel slightly more… slightly tougher than I would have been'* (P3 V2).

Past medical history was also seen to activate stereotypes and stigma. Vignette 5 described a patient with a background of chronic mental illness and recurrent critical care admissions for overdoses. She was referred to as a '*frequent flyer*'. Several participants reacted to this in differing ways. An ACCP had a strong negative response to the handover:

> *It's my idea of a nightmare shift ahead of me. First of two long days? I won't be looking after her on the second of those two days, I'll tell you that now. (E3 V5).*

However, approximately halfway through this Vignette, the participant became conscious of the bias he held: *'…I'm aware that I'm treating her completely differently really just based on the history rather than the way she is behaving'* (E3 V5). A similar thought process was followed by a junior staff nurse in response to demands for 'a drink' from a patient with a past medical history of alcohol excess:

> *So I'm cognisant of the fact that perhaps my judgement was a little harsh. I wouldn't be surprised if she was referring to alcohol. But I think it was prejudged of me to assume that, which is definitely what I did. (N2 V1)*

Past medical history provided in handover also played a role in influencing management decisions. This was especially obvious with three specific Vignettes: Vignette 4, which depicted a patient post-emergency AAA repair, Vignette 5 (a lady with a history of mental health issues), and Vignette 1 where the patient had a history of alcohol excess. The Vignettes had a mixture of subjective (1 and 5) and objective (4) handover styles. The patient in Vignette 4 was judged by participants in response

to the emergency surgery he had received and his history of cigarette smoking. A number of participants remarked on commonly held beliefs about patients post-AAA repair: '*Aneurysms are often agitated'* (E1 V4). This was put down to the demographics of the group:

> *AAAs anecdotally seem to have an issue with delirium, because they're generally of an older set, patient set, and they have a lot of co-morbidities and things. So yes, I think this is a high group for being delirious and that would be at the back of my mind. (E4 V4)*

Although not a derogatory label, their judgements were influenced by a stereotypical patient image. For example, a staff nurse working in HDU commented that: *'Yes, we have this thing on HDU where we say 'it'll be day three''. So you try to optimise them on one and two, so it's not so bad by three'* (P6 V4). Her management is influenced and framed by beliefs held by her HDU colleagues. Pro-active 'optimisation' is the priority in the immediate post-operative period with the intention of warding off the inevitable agitation which will occur on '*day three'*. On this day, management might be more focussed on controlling agitation. This belief held by the participant and her colleagues may lead to a lower threshold for restraint if the optimisation period had passed and the patient began to display agitated behaviours.

Cigarette use was also associated with challenging behaviour:

> *He's a smoker, and my past history of recovery, smokers don't come round very well anyway, 'cause all they want is a fag…(E2 V4)*

Again, a single patient was judged through a stereotypical lens. This led the participant to expect him display challenging behaviour during sedation hold. Similar judgements were applied to the patient in Vignette 1 who had a history of excessive alcohol consumption: '*History of ETOH excess instantly raises a red flag in my head'* (N2 V1). A more experienced participant acknowledged that such judgements might cloud and influence thinking and management:

> *…I know that when we have a patient that does have a flamboyant social past medical history, you sometimes think, 'oh that's it. They want one thing'. Maybe just take it back to basics? (P5 V1)*

Preconceptions might blind staff to other possibilities, for example, that this patient wanted a drink of water.

A number of other participants highlighted the importance of reassessing a patient post-handover rather than making decisions based on the description of the patient handed over to them by a colleague. Descriptions of behaviours during sedation holds were used as an example of when participants would prefer to reassess rather than rely on handover. A junior staff nurse described that they had observed colleagues who did act on suggestions to be cautious when undertaking sedation holds:

> *If it's been passed on that a patient's agitated, a nurse gets them, expects the sedation hold, as soon as they move, like oh, no, sedation back on. (N4 V4).*

It is possible that the observed colleagues used the suggestion that the patient is agitated during sedation holds as a permission to restart sedation quickly.

A range of subjective descriptions were used by participants to label the simulated patients. The patient in Vignette 1 was observed to have '*got herself into such a frenzy*' (E13 V1) that the participant needed to administer Diazepam to manage the situation. In this excerpt, the wording suggests that the blame for the 'frenzy' lies with the patient. However, this is contrary to the context of the excerpt as the participant expressed disappointment that the patient was left alone to become distressed. Expressions used by critical care nurses can place blame with the patient with humorous intent, however it is important that this is understood by the recipient of the handover. Vignette 2 showed a distressed and agitated patient.

> *It's very distressing to watch, because you know patients like this, and you've seen them. And wriggling around like a worm on a pin is never pleasant to watch' (E6 V2)*

'A worm on a pin' creates a strong visual image of a patient who is trapped, vulnerable and attempting to escape. The decision was made to chemically restrain this patient.

Therapeutic management was employed by the majority of participants who watched the long-term wean patient in Vignette 3. An ACCP described his behaviour as just '*messing about'* (E1 V3). Again, the blame is placed with the patient. His behaviour is an annoyance to this participant, but not something especially clinically interesting. In contrast, a different ACCP felt more sympathy towards this patient:

> *Just because he's moving all his legs and everything, he could probably run around the unit! And again, sitting out, you know, he's kicking his bedsheets off, he's looking round, yeah, he's almost, it almost feels to me that I'm looking at a caged animal. (E7 V3)*

The patient is compared to a '*caged animal'* who is trapped in bed and whose behaviour stemmed from a desire to escape and recover instead of '*messing about'* (E1 V3) with no real aim. Validated tools such as RASS and CAM-ICU were rarely cited by participants despite being used in the objective handovers which made up half of the Vignettes.

6.5 A consistent approach to restraint is not maintained

In this theme, participants described the variety of approaches they used or had seen in practice to manage hyperactive delirium. The theme also explored the frustrations experienced by nurses at inconsistent medical management decisions.

6.5.1 Nursing management of psychomotor agitation can be inconsistent

Inconsistencies in the ways different nurses managed delirious patients were noted by participants. The majority of the observations were from supernumerary newly-qualified staff nurses. These nurses had the opportunity to work with a range of

colleagues and observe differences in practice. When discussing the decision about whether or not to re-sedate during a sedation hold, one newly-qualified nurse noted:

> *This is going to sound really awful but it depends who did it…. I feel like everybody's tolerations (sic) are different. (N4 V4).*

As a new member of staff, this participant was not fully embedded in the culture of the unit and may have been more likely to question practice. She observed staff and noticed differences in practice which cannot be explained from her point of view beyond personal preference and tolerance. Participants discussed the difficulty of objectively quantifying levels of agitation and treating them consistently: '*One person's agitation for another isn't'* (E1 V4). Although tools such as RASS exist, there remained a degree of subjective interpretation:

> *…so what you would classify as a safe RASS to be able to double up with these patients might be very different to what I classify as a safe RASS. (E8 V2)*

Subjectivity might impact on the RASS level assigned to the patient, but also to the level of agitation at which it was appropriate to 'double up' the patient and reduce the nurse to patient ratio to 1:2.

6.5.2 The presence of a protocol for restraint

Protocols have the potential to reduce variations in practice by suggesting standard operating procedures. A minority of participants referred to protocols positively, commenting that they offered the nurse 'peace of mind' (P10 V6) and gave a clear step-by-step approach in challenging circumstances:

> *…the protocols that we have are quite good. It's just telling you like, do the test if they are CAM-ICU or not, and if they are, you do these things, and if it don't work, go to the next step, if that step doesn't work just try the next one. (P8 V6)*

A step-by-step approach with prompts as to how the nurse might progressively manage levels of agitation was thought to delay the use of restraint:

> *Maybe if there was a protocol to say use this, this, this, before you go onto chemical restraint. I think it will help. (P10 V6)*

One participant described difficulties in getting a medical review for a delirious patient. She used the unit protocol as evidence to state that restraint is necessary to enable the patient to be safely managed and, as such, found the presence of a protocol to be an advantage.

The majority of participants had no experience of working with protocols to guide the management of psychomotor agitation or felt that protocols were not appropriate for critical care. An ACCP stated:

> *I think protocols or guidance aren't necessarily stone law, you've got to have a degree of common sense as well. (E1 V4)*

'Common sense' might be likened to nursing intuition, the sense of just knowing what to do without a conscious thought process. This is especially common in senior nurses:

> *I rely a lot on intuition. Like how I feel the patient is gonna be or not gonna be. But as I say, that's because I've been experienced with these sort of patients for a long time now. (P8 V6)*

This participant felt she was able to accurately predict patient behaviours from past experience and use this knowledge to manage them appropriately.

Where protocols existed, they might be adapted or modified by expert practitioners:

> *And there is a protocol and the pharmacist is very good and he'll look at all the drugs and he'll say 'we don't want them to have that, we'd like them to have this'. (P6 V2)*

Deviations from protocol were couched within the need to provide patient centred care. It was observed that protocols were not appropriate for every situation '*because again it has to be down to the patient doesn't it? Rather than any particular protocol sometimes'* (P9 V1). Whilst patient care should be personalised, this approach would perhaps lead to inconsistent restraint use.

Protocols cannot predict every circumstance; they can only offer broad guidance and psychomotor agitation can present differently. However, there was a need to provide some sort of guidance regarding best practice to help staff who are new to such situations:

> *But for some new staff they would be lost, like myself, when I was new. There was no protocol to guide. It was all from somebody's experience and judgement, saying oh, do this, do that. (P10 V6)*

The participant recalls how she relied heavily on the experience and guidance of her colleagues. Nurses learn from working with each other, but poor management can also be passed on and perpetuated in this way.

6.5.3 Medical management and decision-making can be inconsistent

Inconsistencies in the way delirium and psychomotor agitation were managed by medical or prescribing staff were identified by a number of participants. The majority of the comments related to differences in prescribing practice and use of a 'drug of choice' rather than a protocol-based choice. Several participants were ACCPs and able to prescribe as part of their clinical role. Differences were noted in their practice:

> *…you've got the agents there, it's just obviously what you see fit. I've got a colleague who prefers Olanzapine to Haloperidol and he's had some good results with it. But, yeah, I've seen good results with Haloperidol, low dose Haloperidol initially and then olanzapine at night. (E11 V2)*

Drugs appear to pass in and out of favour due to changing evidence base or preferences of senior medical staff. Doctors were observed by one participant to be able to over-rule protocol and select a drug which they favoured: '*But sometimes it depends on doctor's preference as well and also on the patient as well'* (P9 V1). Drug of choice might also be governed by economic pressures and availability:

> *Oh, Dexmedetomidine is expensive and some really don't want to use it. Most of them are more using it, but there are some, two or three who really still use Haloperidol. (P10 V6)*

Choice of restraint can also vary depending on the knowledge base of the medical staff: '*there are some who are maybe just more familiar with using chemical restraint rather than physical mittens'* (N6 V1). Such inconsistencies led to confusion amongst the nursing staff who were responsible for administering medications:

> *So I think sometimes it can vary from shift to shift and I know I've had it where they've said 'we're not going to give any more Lorazepam' and then the next night I've come on and they've prescribed Lorazepam. I'm like, 'okay, so what is it we're actually doing? What is the sort of like goal?' Sometimes I feel like it's a bit up and down with what decisions are made. (P6 V2)*

Although agitation level and delirium status can change rapidly and management should be adjusted appropriately, the discontinuity described above led to the nurse feeling confused and distrusting seemingly contradictory medical decisions. Medical decisions about agitation management impacted directly on nursing practice and could lead to frustration.

6.5.4 Education and evidence can influence restraint use

Participants described how education and research informed their use of restraint. A number of participants felt that nurses and doctors lack education regarding delirium management. A junior staff nurse explained that agitation and restraint were rarely discussed during her training because *'…I think it's still seen as a taboo kind of thing'* (N4 V4). Observing senior colleagues might suggest successful

methods which the nurse could choose to incorporate into their practice. However, critical care workforces experience a high turnover of staff, leading to potential problems with the sharing of poor practice:

> *…in the last five, ten years we've lost an experienced skill mix in the critical care environment. We've lost that experience of managing these kinds of patients and seeing how they react, and knowing it's an individual thing; there's been a little bit more shift towards chemical restraint and physical restraint. (E9 V1).*

In contrast to what was found in previous themes, junior staff were seen by this participant as more likely to apply restraint. She expressed a concern that perceived poor practice and increased reliance on restraint will be passed between staff until it is accepted as customary practice.

Participants expressed a belief that delirium and agitation management training was absent from junior doctors' training. Junior doctors sought nursing or ACCP advice:

> *And usually they look to us anyway so if they did review that patient would say, my patient's delirious, I don't know what to give them. (E11 V2)*

This can lead to potential inconsistencies in management and confusion amongst nursing staff. The issue is further complicated by the paucity of clinical 'solutions' to agitation:

> *…everybody says we shouldn't use Haloperidol, but I was asking a psychologist this only a few months ago –okay, if my patient is kicking off, we've done all the right things, and she's still a danger to herself, what do I do next? And there wasn't an answer unfortunately. They don't know what the answer is, and I'm not sure anybody knows what the answer is. (E3 V6)*

This ACCP described his frustration with managing agitation in clinical practice. After all therapeutic methods are exhausted, and agitation persists, he described how he felt he is without options, barring the use of Haloperidol which evidence suggests is

ineffective in delirium. The lack of 'solution' to agitation and delirium causes staff to feel frustrated and may lead to lack of engagement with patients and new guidance if they feel it is ineffective in 'real life' situations.

6.5.5 A 'hierarchy of organ failure'

Participants described a perceived hierarchy of organ failures, with delirium being low on the list. This hierarchy was especially obvious when a nurse tried to engage with a member of the medical team. Whilst watching Vignette 2, which depicted a CPAP-dependent patient who was dangerously agitated, an expert participant commented:

> *With her, interestingly though, I think you'd get more play from the consultants because there was the pre-disposing need. The need would be her failure to oxygenate… (E6 V2)*

The same participant compared the vignette to Vignette 1, which featured an agitated patient who had minimal oxygen requirements. Although both patients represented a nursing challenge due to their behaviour, he believed he would '*get more play'* from the medical staff with the CPAP-dependent patient (Vignette 2). Psychomotor agitation was referred to as the '*poor cousin'* (N2 V1) of other forms of organ failure. Although delirium affects the brain and is associated with increased morbidity and mortality, participants felt that delirium was seen as a nurses' problem.

> *…unless it's a problem on the unit then they're not, they're not treating it as a failure of something, it is just 'oh they're a little bit delirious'. (P6 V2)*

As discussed in other themes, the psychological and physical burden of nursing a delirious patient is high. The nurse described delirium as minimised by the imagined doctor whilst she was left alone to care for an agitated patient whose main issue, in her eyes, was their delirium.

> *Absolutely, yes. Brain failure, nah that's alright, but lungs… Yeah, exactly, lungs, oh yeah, we'll play with that… and it's that kind of if it does pit*

> *professionals against each other, nurses against doctors, very much. (E6 V2)*

The participant expressed his concern that the perceived lack of medical interest and support offered to nurses caring for agitated delirious patients caused rifts within the multi-disciplinary workforce.

6.6 'If I turn my back on her, god knows where she could end up' – the need to maintain constant vigilance

This theme explored the challenge experienced by nurses who are asked to 'double up' with a delirious patient. Doubling was thought to have a negative impact on patient care and led to increased restraint use due to reduced opportunities for vigilance.

6.6.1 'Being doubled' reduced opportunities for vigilance

Participants described the need for vigilance when caring for patients who are delirious. They explored the unpredictability of delirious behaviours and the need to be close by the patient *'because if I turn my back on her, god knows where she could end up'* (E3 V1). Ensuring patient safety was the dominant rationale for vigilance. The nurse assumed full responsibility for vigilance:

> *You can't leave someone like that, you can't leave their side. And that's the way it is. If somebody wants you to go to break, then you have to get somebody to replace you. (P4 V4)*

Nurses described anxiously preserving devices and being worried about informing doctors if a device had been dislodged. This is in addition to the physical and psychological challenge of managing agitated behaviour. A junior staff nurse modified her bed area to ensure that she could always see her patient:

> *I push the system more close to the bed so I think I would keep looking at them like every other second as well. (N4 V1).*

Vigilance was described as a constant act, from which there could be no rest. Over a long shift, maintaining such a level of concentration is draining. A newly-qualified staff nurse described her experience of maintaining vigilance across two Vignettes, one HDU patient and one ventilated level 3 patient:

> *I think I'd probably be looking around to see what staff were on with me, see if there's anyone available, see what kinds of patients they had and hopefully they would be able to give me a hand and watch this patient if I needed to go away from the bed space to look after my other patient, which I'd need to do. (N5 V2)*

The need to maintain vigilance for an agitated level 2 patient, whilst balancing the need to attend to her other patient, caused this participant significant worry. She was 'looking around' at her colleagues to see who might be able or willing to help. As discussed in previous themes, some participants observed that not all colleagues are willing to assist in the care of agitated patients. A busy shift was associated with a reduction in available support and 'eyes' to watch a patient: '*Well, we're obviously short staffed… so there's physically less people on the unit just to keep an eye…'* (P6 V2). This caused additional pressure:

> *If you've got other things to do away from the bed space you'd have to make sure that there's someone to keep an eye on her while you're not there, which is a bit of a challenge sometimes if other people are busy… (N5 V6)*

As a newly-qualified nurse, this participant may have felt less confident in asking for support to maintain vigilance. Other more senior participants were happy to draw on the MDT, especially when caring for two HDU patients:

> *…it's all very dependent on you know, the fact that I'm an experienced, you know, band 7 nurse who's been in ICU a long time. In that context, I'd feel absolutely within my rights to grab you… As junior nurses you often don't have that self-confidence, and often that's when they start to drown, cause they kind of get caught in trying to manage that patient and do everything at once because they're not confident enough to say 'I can't do this' or 'yeh, I need some help'. (E6 V1)*

More junior participants expressed anxiety around asking for support:

> *I don't want to bother my colleagues because they're probably up against it as anybody is in the NHS. (N2 V1)*

'Being busy' or perceived busyness appears to be a barrier to delivering collaborative care as a team and ensuring support for junior staff involved in the care of challenging patients.

Vigilance, close proximity to the patient, and being able to provide reassurance and reorientation were linked to avoiding restraint:

> *…I don't think you need them type of restraints, if you like when you've got the time to sit with your patient and talk to them. (E2 V5)*

Vigilance was dependent upon multiple factors, such as the nurse's own ability and experience, the team, and the clinical environment. Participants described situations where vigilance was not possible and how they might manage that situation. An ACCP described his discomfort at using restraint to replace staff:

> *I really don't like sedating people or giving them chemical restraints, it just doesn't seem the right thing to do. And then it's simply because we haven't got enough staff or the experience to sit there with the patient. (E13 V1)*

High unit acuity and staff skill-mix were also associated with the use of restraint by a junior critical care sister:

> *I think it depends on who's on and stuff like the workload of the patient because the problem is sometimes you can't always keep an eye on everybody can you? And sometimes you do have to go to things like boxing gloves or Haloperidol and stuff just to just to take the edge off the agitation just to keep the patient safer. (P9 V1)*

This participant stated that she was frequently in charge of the unit and would make decisions regarding restraint based on the safety of both individual patients and the

unit as a whole. Adequate staffing, or the luxury of an additional member of staff to support nurses caring for patients with delirium was associated with reduced restraint use whilst maintaining patient and unit safety.

6.6.2 Delirious patients are more time consuming

Vignettes 1 and 2 depicted HDU patients who would generally be nursed at a 2:1 ratio. However, some participants stated they would be nursed 1:1 if there were enough staff due to their behaviour:

> *She'll be classed as a level 2, but you would sensibly be managing her as a one-to-one. But the situation has happened when you're short staffed more often than not. (E9 V1)*

Poor staffing was considered a '*harsh reality'* (P10 V1) of critical care nursing. The patients shown in Vignettes 1 and 2 were classed as HDU patients with only single organ failure. Both were presented as patients who would be nursed 2:1. However, these patients caused the greatest reported stress to participants and were the most frequently restrained. Doubled patients were seen as 'half a patient' who received half of the nurse's time. However, it was acknowledged that delirious patients are more challenging and time-consuming than sedated and ventilated patients:

> *Yes in that we will often nod sagely to each other and say 'you know, they're almost a level three patient aren't they? With this delirium, they're taking up so much of our patience.' And no, in that when we are asked to add up the numbers in our dependency, they are still half a patient. (E3 V1)*

Pro-active care planning and thoughtful allocation of staff was believed to reduce the likelihood of behaviour escalating to dangerous levels of agitation. However, poor staffing was perceived as a barrier to pre-emptive practices:

> *But unfortunately it's a time and resources challenge. Proactive stuff, relies information from the patient, patient group directives for people in this scenario, having extra pairs of hands to deal with patients in this scenario. But it's all time and money. And being understaffed and under stretched at present, I don't see it being a reality. Prevention is always better than cure. (N2 V1)*

'Being doubled', meaning that a nurse undertook the care of two HDU/level 2 patients rather than 1:1 care with a level 3 patient was strongly associated with restraint by a number of experienced participants. Being doubled meant that the nurse cannot provide constant vigilance to both patients and therefore there was a higher risk of device dislodgement and risk to patient safety. To prevent this, some participants made the decision to use restraint to replace observation:

> *Because I was doubled up, boxing gloves would probably have been a good idea because of the lines. (E2 V2)*

In a similar situation, an experienced staff nurse made the decision to use sedation to manage the agitation level of her patient and enable her to care for both her patients:

> *…if she was one-on-one, then you could probably avoid chemical restraint a little bit more, but because she's doubled up, and because the unit's busy, it just makes it too challenging to be with both patients. (P1 V1)*

This participant associated lower nurse-to-patient ratios with restraint as a method of managing the care of two patients. This view was shared by an ACCP, who linked the use of sedation directly to being allocated to nurse two HDU patients:

> *… I do think that you're more likely to sedate your patients, keep them calm so that you've got more time to spend with your other patient. If you know that they're asleep from chemical agents then you've got more time to deal with them also but also to spend time with your other patients. (E11 V2)*

Being doubled with an agitated patient was considered unsafe and more likely to lead to the use of restraint in an attempt to preserve patient safety. One-to-one care, and avoiding restraint was considered to be 'better':

> *Because I would be with the patient all the time. Whereas if I was doubling up I would not be physically present there. If Sharon was my only patient and if I was in that room with her all the time, I would not straight away go onto putting on mittens. I would give some time, assess, and see if she*

would follow more instructions. And really monitor her closely, than jumping to the conclusion of using mittens. (P10 V6)

For this participant, doubling leads directly to the use of restraint to prevent device interference when the patient is not being directly observed by the nurse. She believes this would not occur if she was nursing such a patient one-to-one even though other participants commented upon the impossibility of watching a patient continuously.

6.7 'The tyranny of the now'

This theme centred on how it felt to be the bedside nurse caring for a patient with delirium. Participants described the emotional and physical labour involved with attempting to ensure patient safety whilst undertaking other nursing tasks. The theme explored how nurses might resort to restraint in an effort to gain some respite or to create space to think. From a senior perspective, the use of restraint to alleviate staff distress is described.

6.7.1 Repetition and losing patience

The experience of nursing a patient with hyperactive delirium was consistently described as emotionally and physically exhausting by participants of all levels of expertise. The majority of participants attributed this exhaustion to the repetitive nature of nursing a patient with delirium:

And you kind of almost dread your day with a delirium-positive patient because it's going to be quite monotonous, you're going to be saying, don't pull that, get back in bed, don't do this, don't do that. (E11 V3)

The verbal repetition feels fruitless, as the behaviour which the nurse discouraged was repeated almost immediately. Vignette 3 depicted a restless patient weaning from ventilation via an established tracheostomy. The comment made by the ACCP above was echoed by a band 5 staff nurse:

> *Yes, he looks like he's just going to be picky pully all day. I'm going to be forever putting on the sats probe, and forever telling him to stop sliding down the bed. (P1 V3)*

Both participants acknowledged they would be tired by the end of a shift with this patient. However, they also seemed bored and frustrated by their allocation. Participants described how repetition of instructions to patients who were descried as having '*memories like goldfish'* (E4 V6) led to loss of patience as the shift progressed:

> *I think it gets tiring as the day goes on, like initially when you're coming on a shift you're like, oh, you know, it's fine, but then by the end of the day you just get really tired and you get tired of repeating yourself and explaining the same thing. (N3 V3)*

As a more experienced staff nurse pointed out, '*you might be fed up of the sound of your own voice asking him not to touch stuff*' (P3 V3). Their engagement with their patient seemed progressively limited. At the start of the shift, the nurse was actively attempting to re-orientate. However, towards the end of the shift, their interaction was limited to telling the patient '*not to touch stuff*' (P3 V3) which has little therapeutic value. However, one ACCP considered repetition from the perspective of the patient:

> *And to hear the same phrases, because we all have a phrase that we use. You don't think you're doing it, but you're saying the same things over and over again. Yeah, so hearing the same tone and the same sort of wording all day must be very frustrating for somebody who can't tell you to go away. (E5 V3)*

Nurses have 'stock phrases' such as '*don't pull that, get back in bed, don't do this, don't do that'* (E11 V3). These phrases, if considered in isolation, have little meaning or therapeutic value. They do not indicate engagement with the patient. Rather they are a plea from the nurse to allow them space to think or rest.

Participants expressed that they had a finite capacity for patience with delirious behaviour and that this decreased as the shift progressed:

> *You get less patient. You sort of get to that point where you like think 'I'm fed up of you now' but in a way that's an important thing to accept as well because it shows that at the end of the day we are only human, we're nurses but we're only human… (P9 V1)*

This band 6 sister demonstrated awareness of her own limitations and those of her colleagues. She suggested that staff take a break to remove themselves from a patient who they are 'fed up' with and gain a 'reprieve'. The word 'reprieve' suggests that this participant is aware that allocating a member of staff to a delirious patient will test their endurance and prove to be a potentially unpleasant and challenging shift. As participants began to lose patience and seek a reprieve, some began to search for a 'solution':

> *I think we would start becoming a bit short tempered and probably less patient, less tolerant, and looking for a solution. (E9 V1)*

For some participants, the solution involved chemical or physical restraint. However, an ACCP explained that she did not believe delirious patients should be punished or painted as unpopular:

> *… you can be infuriated but you can't take it out because they're not doing it intentionally, like, they don't know where they are, they don't know why they're there. (E5 V3)*

This participant demonstrated empathy for the patient. When nurses are tired and stressed, it is easy to take patient behaviour personally. This expert participant was able to step back and reflect and consider the clinical reasons behind agitated behaviour, and how restraint might further exacerbate delirium.

6.7.2 '…you're trying to get on with all your normal tasks that you need to do but you can't'

Participants described how they experienced a conflict between the need to constantly observe a delirious patient and pressure to undertake other nursing tasks

such as charting, drug preparation and writing notes. This led to anxiety and frustration which was especially evident in newly-qualified or junior band 5 staff nurses. Participants discussed the difficulty of undertaking these tasks if they were unable to leave the bedside:

> *I am very worried that she might fall from the bed…There is a limit of time. You'll be doing other things as well, like medicines. I am not saying that this is not a priority but we also have to do that, and obs on time. (N1 V6)*

An ACCP observed that there is a fear of repercussions or failure if tasks are missed or delayed:

> *And nurses not being able to do things like give drugs and check pressure areas and all those other things that nurses are required to do but they can't do, but they will feel judged for at some point as well, so it starts to become really stressful for them as well. (E3 V5)*

Such judgement can lead nurses to experience feelings of failure or inadequacy if they are unable to care for their patient and complete necessary jobs:

> *I don't like failure, and I can see that she's going to be a time consuming patient, which is going to put me behind doing the stuff that we all need to do in this environment. (N2 V1)*

This participant had worked in critical care for one year. Before retraining as a nurse, she had held a senior position and was accustomed to feeling competent and able to manage. She associated the inability to complete all her tasks with 'failure'. The inability to complete tasks can lead staff to have to stay late after their shift ends:

> *And also with a patient like this, I won't be able to get my writing done and so I'm likely going to be getting off late because you can't sit and write while you've got someone who's going to rip their airway out. (P1 V6)*

Leaving a shift late could further contribute to staff exhaustion and reduced levels of work satisfaction.

6.7.3 It's relentless

Some participants offered detailed recollections of emotions and experiences whilst caring for a patient with hyperactive delirium in response to the Vignettes. They described an absence of space to think or plan. Restraint was described as having a role in creating space for staff to think and enabling them to cope with challenging behaviour. A practice development nurse described caring for an agitated patient whilst doubled:

> *But even so, but even over eight hours, looking after a patient like that, especially when you're doubled, is brutal… It is brutal because… you can't concentrate, you can't rest in terms of allowing your thought processes to go on. There's the constant worry and stress and strain that the patient will have an accident and hurt themselves, for which you will be directly responsible for, there's the stress and strain that you'll miss something next door. (E6 V1)*

He recalled the 'brutality' of the day, the physical and emotional exhaustion, and lack of space to think critically. He recalled 'being almost in tears' (E6 V2) in situations where he was doubled with agitated patients. He experienced helplessness and frustration at the unfairness of the situation both for him, because he had been placed in a situation which he saw as impossible, and for the patient because:

> *…she deserves to be treated better with more respect…. If she was kind of in her right mind, I wouldn't dream of treating her in this way' (E6 V2)*

His words emphasised that the situation has eroded the relationship between patient and nurse, leaving an object to be wrestled back into bed. Control of the patient, situation, and self have been lost. This is a direct contrast with participants' experience of caring for a sedated level 3 patient:

> *But at least with a sick ICU patient you are in control. With this kind of HDU/delirious patient it becomes stressful because you start to lose that control. (E3 V6)*

The loss of control is linked to the clinical situation as a whole rather than the patient's behaviour in isolation. The nurse is unable to see beyond the moment, and risks

making mistakes because '*you can't maintain that level of intensity for that long'* (E6 V1). The fear of making a mistake adds to the stress of the situation. Participant E6 likened the feeling to the 'worst moment' which lasts forever:

> *…there was a really interesting thing that I read called 'The Tyranny of the Now'. So it's literally that moment is the worst moment, and it seems to go on forever, and ever, and ever... But I always thought that phrase is a very useful phrase, 'the tyranny of the now', cause it just goes on. You have no control over it. It is just the situation you find yourself in. (E6 V2)*

In such a situation, the prospect of respite through the use of restraint became attractive. Senior participants described how they felt that restraint, especially chemical restraint, was often used for the benefit of the nurse rather than the patient:

> *… but when you're the nurse in that bed space and you're completely frazzled and you can't get anything done and the patient's a danger to themselves sometimes you're not left with any alternatives. (E3 V6)*

This ACCP experienced a tension in his practice. He was aware that evidence has shown Haloperidol to be ineffective in the treatment of delirium, but used it to gain space and respite from patient behaviour when alternatives have failed. A lecturer-practitioner believed that Haloperidol had little positive benefit for patients and was given mainly to enable staff to manage clinically: '*It might have helped us cope with them better but I don't think it's helped them much'* (E12 V6). Restraint appears to be used to relieve staff as much as treat patient agitation: *'…and we're thinking, god we can't carry on with this. And we're treating ourselves quite often rather than them*' (E13 V1). Restraint became a method of coping with a delirious patient:

> *It all ends up as being less than ideal but it's about survival at that point, as in yours from the professional perspective, because ultimately, you've just got to get through and make sure she's safe, so you're trying desperately to come up with ways increasingly to, kind of, creative maybe ways, of ensuring that she's safe and she doesn't come to any harm. (E6 V2)*

A small number of participants expressed how they felt that their safety might be compromised when caring for a delirious patient. Two ACCPs suggested that junior

nurses may feel especially unsafe when '*there is a risk of violence or attack*' (E13 V3) or may take verbal insults personally (E7 V1). This was considered to sour the relationship between nurse and patient. A further participant stated that she would avoid being physically in the vicinity of a patient with a history of aggression:

> *I would just make sure that I'm far enough for him not to punch me again! So I would make sure like pumps are far away from him and things like that. (P8 V6)*

Avoiding a patient in this way reduces the need to apply restraint but has a negative impact on developing a therapeutic relationship and could further exacerbate delirium. Two expert participants described how they might make use of chemical restraint when overseeing the care of an agitated and combative patient. Both participants used the rationale of behaviour control being necessary to assure staff and unit safety.

> *And I always think that if they're aggressive then you're more likely to give something chemical because nobody comes to work to be hit, do they? And we need them safe, you need them safe, the staff needs to be safe, you need to restrain them quickly and so, yeah, in those circumstances, you know, higher dose Lorazepam has been given. (E11 V2)*

This participant reacts with restraint to protect her staff. The risk of violence and injury from a patient appears to provoke her use of chemical restraint. The benefit is expressed in terms of staff rather than patient. An ACCP stated that '*violent patients I will sedate for their own good and for the staffs good*' (E13 V1), suggesting that despite restraint being seen as a last resort, it might also be used for the perceived benefit of the patient.

Senior nursing staff played an important role in recognising when nurses needed a break:

> *… you need regular breaks just so you can recharge and refocus and be objective in managing the patient. It's very easy to get worn out. (E9 V1)*

Breaks also facilitate the maintenance of high quality care: *'you feel a bit more refreshed and you can give the same care again'* (N3 V2). One sister described how she considered offering a change of patient to staff during allocation:

> *I don't think it's fair on staff to look after the same kind of agitated patients on shift and shift and shift like they are on three nights. I don't think it's fair on me, because it would give burnout to myself. (P10 V2)*

Burnout is closely related to the experience of the 'tyranny of the now' and has been linked with the use of restraint as a way of seeking respite. A considerate team was seen as essential to complete challenging shifts: '*you can manage anything with a really good team can't you?'* (P6 V2). A 'good team' appeared to be comprised of clinically able staff who would support colleagues with challenging patients. A trainee ACCP described how he requested that staffing be reviewed within his team to ensure he was adequately supported:

> *And I know in the past I've challenged the team that I'm working with and ensured that there's been a swap in staff really to be able to cope with the pressures in that area. (P7 V1)*

Poor support from nursing colleagues was associated with increased anxiety and frustration, and reduced opportunities for vigilance:

> *I think again it does depend on who you're working with. It doesn't matter if you're short staffed if you've got a really good team there, but we've all had it where we've worked shifts where there maybe not your ideal teammates there, or they literally just look at their patients and their eyes won't leave them. (P6 V2)*

This participant, an experienced HDU staff nurse, reflected on a shift where she had been allocated to care for an agitated patient who was withdrawing from alcohol and also to take a new admission. She had a student with her and was told to use that student to observe the agitated patient whilst she accepted the admission. When she raised that this was inappropriate, she felt she was not listened to. She contrasted this experience to a shift where '*you've got your support worker, you've got your nurse,*

and they're all working and they're all helping, and it's okay' (P6 V2). An ACCP identified that it can be difficult to draw on the team to support colleagues with challenging patients. In critical care, nurses are allocated to care for patients. This can lead to problems:

> *It's hard, it's hard. So it's getting everybody involved really and not just saying 'it's your responsibility, it's your patient, not mine' you know. It should be everybody's responsibility really. (E7 V1)*

Greater collaboration and team working amongst nurses could help to enable breaks, vigilance, and reduce the use of restraint.

6.7.4 'The doctors can just walk away'

Participants discussed the support they received from the ICU medical team. A minority of participants remarked on their positive experiences with doctors who they felt engaged with delirious patients, appreciated the nurse's experience at the bedside, and were involved in discussions around restraint. However, the majority of participants expressed a lack of support from doctors when managing agitated patients. In addition, they voiced a degree of resentment against doctors who were able to walk away from the bedside and leave the nurse to struggle:

> *And they're not stuck there. Thirteen hours. I mean, this kind of goes on that whole conversation about who ideally knows and understands more about the patient? The consultant who comes in and has a fifteen minute review in the morning, handed over by you know, juniors who also get a fifteen minute view, or whether or not it's the nurses who's stood there for twelve or thirteen hours. (E6 V2)*

This participant expressed his frustration that the concerns of nurses regarding the safe management of agitation were dismissed. Doctors are presented as only seeing brief snapshots of the patient, but making decisions based on these rather than the nurse's report. They are able to walk away, whilst the nurse is 'stuck there' at the bedside. The power is held by the medical staff:

> *…you are very, very dependent on the consultant. You are so isolated as a nurse, you know, I can remember feeling so powerless, you know, everything's out of your control, you can't manage the patient. Often you're not allowed to sedate until the consultant says…. (E6 V2)*

In this excerpt, the nurse was pictured as powerless, buffeted by the whims and decisions of senior medical staff and left alone to deal with the consequences of those decisions as best they can. Participants expressed resentment at the ability of medical staff to walk away, and linked this to a lack of empathy and appreciation for nurses:

> *I don't think they appreciate how much of a challenge an agitated patient can be, because that's… I think they see when the patient is like really aggressive, and they can maybe accept that as a challenge, and prescribe you something. But then they still walk off. (P1 V3)*

The doctors' ability to '*walk off'* held high value to nurses and was something to both envy and resent. One participant felt that the nurse's experience at the bedside was not considered by the medical staff when making decisions: '*You're there with the patient all the time and the medical staff do not even think about you'* (P10 V6). Such comments express and sustain a division between nurses and medical staff. This is further emphasised through an apparent division in the physical labour involved in each role:

> *So they don't know what the physical work is like, like hoisting an 18 stone patient back up and into bed constantly for hours, and hours, and hours. (E6 V2)*

Again, the contrast between the duties of nursing and medical staff are emphasised. A further participant described the gap between nursing and medical experience of agitated behaviour:

> *…in handover apparently they said the patient was very settled and the nurse in charge sort of said 'are you serious? He's punched the nurse, punched me today.' And he went 'he probably wasn't that intimidated by her' and that was the response. I mean, I shouldn't have to be intimidating not to be punched by my patient. (P6 V2)*

An expert participant noted that the doctor's reaction would be very different if the agitation impacted on their safety:

> *…as soon as they (doctors) get hit, the patient gets sedated. And literally, immediately the medical staff are in any danger, bang, sedated, tubes, you name it, security, police, everything else. But they'll quite happily stand at the end of the bed and watch as you're wrestling, kind of four of you are wrestling, an 18 stone guy who's determined to punch your face off, you know, 'oh yeah, might just have to ride this out.' (E6 V2)*

Participants who had experienced poor support from doctors emphasised the difference in their experiences of delirium and the divisions between their roles. The nursing responsibility to observe a delirious patient seems onerous in contrast a doctor passing by. The participant used emphasis and humour but painted a vivid picture of a nurse's struggle to manage agitated behaviour. Without support from the critical care team, nurses may be placed in situations where the decision to use restraint becomes unavoidable.

A number of participants agreed that they were not included in decisions and planning about agitation management where their knowledge of the patient would have been useful:

> *The nurses aren't involved in discussing them, the consultant may give a rationale but that rationale doesn't make sense if you're the nurse who's getting punched in the head. You might want to give them time for their kidneys to get rid of all the opioids, but that doesn't help when you're desperately trying to wrestle a patient back into bed and keep them safe and cope. (E6 V2)*

Delirium and the management of agitated behaviour were considered to be of less importance to doctors than supporting other organs. However, this is not reflective of the nurse's experience. The lived experience of managing agitation over a shift was all-consuming for the nurse. In contrast, doctors observed short snapshots of that experience as they are able to move away from the bed-space. One ACCP thought that some medical staff deliberately avoided engaging with nurses who asked for support with agitation management:

> *But I would imagine the doctor's made himself scarce and is busy writing some notes in an office down the corridor if he's got any sense. (E3 V1)*

This excerpt is humorous, but also reflects the resentment nurses feel for a colleague who has the ability to hide away from a challenging situation.

Several participants discussed doctors' reluctance to prescribe sedation, however a readiness to prescribe was also not associated with collaborative decision making. Doctors were criticised for their lack of engagement in decisions regarding the use of physical restraint, which were largely agreed to be a nursing responsibility:

> *The doctor's play a role in signing the sheet. And that's about it really. It's kinda like the nurse who decides, let's get the boxing gloves, let's put them on (P1 V3)*

The role of the doctor in the decision-making process was reduced by the participant to signing a chart without even seeing the patient. The divide between nursing and medical staff was emphasised, along with a lack of respect for their non-engagement in decisions. It is suggested by this and a number of other participants that the management of agitated behaviour is felt to be a nursing responsibility. The same participant described the sort of support she would like to receive from doctors:

> *Because I think the doctors could help support the nurses, in terms of like saying, oh well, why is he agitated? Why's he got delirium? Kinda like more of a conversation, and a decision together to say what the best management for them would be. (P1 V3)*

Collaborative decision making was thought to lead to improved patient care and more cohesive teamworking.

6.8 Summary of results

This study demonstrated critical care nurses' decision-making processes when initiating chemical or physical restraint in response to hyperactive delirium. Five themes were identified which brought a new understanding of the judgement

processes and influencing factors which may lead a nurse to initiate restraint. Restraint was more common when a nurse was ‘doubled’. This reduced opportunities for continuous vigilance, which was thought to guard against the need to restrain through maintaining patient safety. Participants suggested that the provision of additional support to assist in maintain vigilance could reduce reliance on restraint. The physical and psychological exhaustion which resulted from long shifts caring for a patient with delirium was described by the majority of participants. Restraint appeared to play a role in creating space for the nurse to think critically and re-establish routines seen as essential for patient safety. In addition, delirium was seen as a ‘nursing issue’. This led to resentment between nursing and medical colleagues and poor collaboration.

Chapter 7 Discussion

7.1 Introduction

This study aimed to explore how critical care nurses make the decision to apply restraint when managing a patient with psychomotor agitation secondary to hyperactive delirium. This chapter will present a synthesis of the findings of the two approaches used to analyse the data alongside the results of the integrative review. These results will be considered in relation to the wider body of literature in this topic area. The strengths and limitations of this study will be identified and appropriate recommendations for clinical guidelines, practice and for future research projects will be discussed.

7.2 Summary of main findings

This section will summarise the findings from the integrative review, thematic and decision-theory analyses and create a synthesis of the findings.

7.2.1 Summary of integrative review results

Four main themes were identified following review of 23 studies:

- The lack of standardised practice.
- Patient characteristics associated with restraint use.
- The struggle in practice.
- The decision to apply restraint.

Nurses appeared to be the primary decision-makers when initiating restraint. However, restraint practice, including the type of restraint and type of patient behaviour which led to restraint, varied hugely. Variations were noted internationally, and also on a more local scale, for example, chemical and physical restraint were more common at night (Luk et al., 2015b; Turgay et al., 2009; Pisani et al., 2013). Caring for a patient with

hyperactive delirium was recognised as psychologically and physically demanding and some nurses felt their restraint practice was influenced by previous adverse events (Lopetrone, 2006; Langley et al., 2011). Nurses also described tension between themselves and medical staff centred on their perceived need to initiate restraint to preserve safety and the reluctance of medical staff to prioritise delirium (Palacios-Cena et al., 2016; Langley et al., 2011).

Gaps in the current evidence-base regarding how nurses make the decision to initiate restraint were identified in section 2.9. In summary, there was a paucity of qualitative research on this topic, and concerns were identified regarding the possibility of social desirability bias leading to the under-reporting of restraint in the reviewed studies. These gaps guided the aims and design of the research study.

7.2.2 Summary of results: Cognitive Continuum theory

The primary cognitive modes adopted by participants were intuition and reflection. Intuitive modes of cognition are more appropriate for low-structure face-to-face decisions. The unpredictable nature of psychomotor agitation suggests that the decision tasks faced during the vignettes met these criteria. Therefore, according to Hamm (1988), the appropriate cognitive mode should elicit a ‘good’ or ‘correct’ action. Decisions for each vignette involved therapeutic management initially, with some progressing to the application of different types of restraint. Vignettes where the participant was ‘doubled’ were more likely to elicit intuitive judgements and the decision to restrain. Vignettes where participants felt they had the time to undertake quasi-analytical modes of judgement rarely led to restraint.

As suggested by Hamm (1988), participants were able to move along the continuum as the task progressed and draw on intuitive and analytical modes during the same task. Heuristics were also an important element in the way participants made judgements and decisions. Heuristics can be linked to intuitive and reflective cognitive modes because they act as decision-making ‘shortcuts’ based on memory and past

experience (Carroll and Johnson, 1990). The majority of participants used reflection on previous experiences to help guide their judgements and decisions whilst watching the vignettes. Heuristics can promote rapid decision-making, however, there is a risk of bias. Carroll and Johnson (1990) suggest that the success of judgements may be over-estimated in the decision-maker's memory. In this study, some decisions were made based on reflections of events which participants wished to avoid encountering again, for example 'the tyranny of the now' (E6 V2). It may be possible that unpleasant or frightening memories also influence heuristics in decision-making through either discounting management methods deemed ineffective in the past or relying heavily on restraint in order to avoid being placed in a similar situation again.

7.2.3 Summary of thematic analysis results

Five over-arching themes were identified via a process of reflexive thematic analysis (Braun and Clarke, 2013).

- Nurses hold intrinsic beliefs about restraint.
- Handover and sharing labels can influence restraint practice.
- A consistent approach to restraint is not maintained.
- 'If I turn my back on her, god knows where she could end up' – the need to maintain constant vigilance.
- 'The tyranny of the now'.

The results suggested that the sampled nurses and ACCPs viewed restraint as a negative intervention and were keen to avoid it. However, they considered that restraint played a role in ensuring patient and device safety, especially when vigilance was not possible due to reduced staffing or 'being doubled'. For some participants, this caused moral discomfort. Caring for a patient with hyperactive delirium was consistently described as physically and emotionally exhausting. Some participants expressed that they would use restraint to create space to think critically and avoid making mistakes. Tension and conflict with medical colleagues was also engendered

through differing understandings of hyperactive delirium. Medical staff were described as frequently disregarding the nurse's experience of managing psychoactive agitation and placing delirium low on a 'hierarchy of organ failure'. This, together with their ability to 'just walk away' led some nurses to express resentment and frustration towards them.

7.3 Synthesis of findings

The method for undertaking a synthesis of the findings from the integrative review and two analytical approaches is described in 4.11. The following main issues relating to the decision to apply restraint were identified:

- Reduced opportunities for vigilance were associated with restraint. The primary cognitive modes associated with restraint in these situations were reflection and intuition. Participants also made use of heuristics. Restraint was used to create a safe space for critical thinking.
- Restraint should be the 'last resort'. Some participants found talking about restraint uncomfortable and expressed moral discomfort, guilt and shame when they felt they 'had' to apply restraint.
- Restraint was associated with depersonalisation and dehumanisation in both patients and staff. Many participants described feelings of burn-out from managing psychomotor distress over long shifts. Burnt-out staff deliver less-than-optimal and depersonalised care (Mason et al., 2014). Restraint could be seen to contribute to the dehumanisation of critical care patients, but also indicate burnout amongst staff.
- A hierarchy of organ failure was identified. Manging psychomotor agitation stemming from delirium caused considerable stress to nurses but was perceived to be of less importance to medical staff. There was a lack of collaborative decision-making which eroded trust and respect between nurses and the medical staff.

Figure 21 (below) illustrates how these four main issues were drawn from the results of the analytical processes and integrative review. The four main issues identified from the scoping review and analysis of interview transcripts will be explored in detail in the following sections.

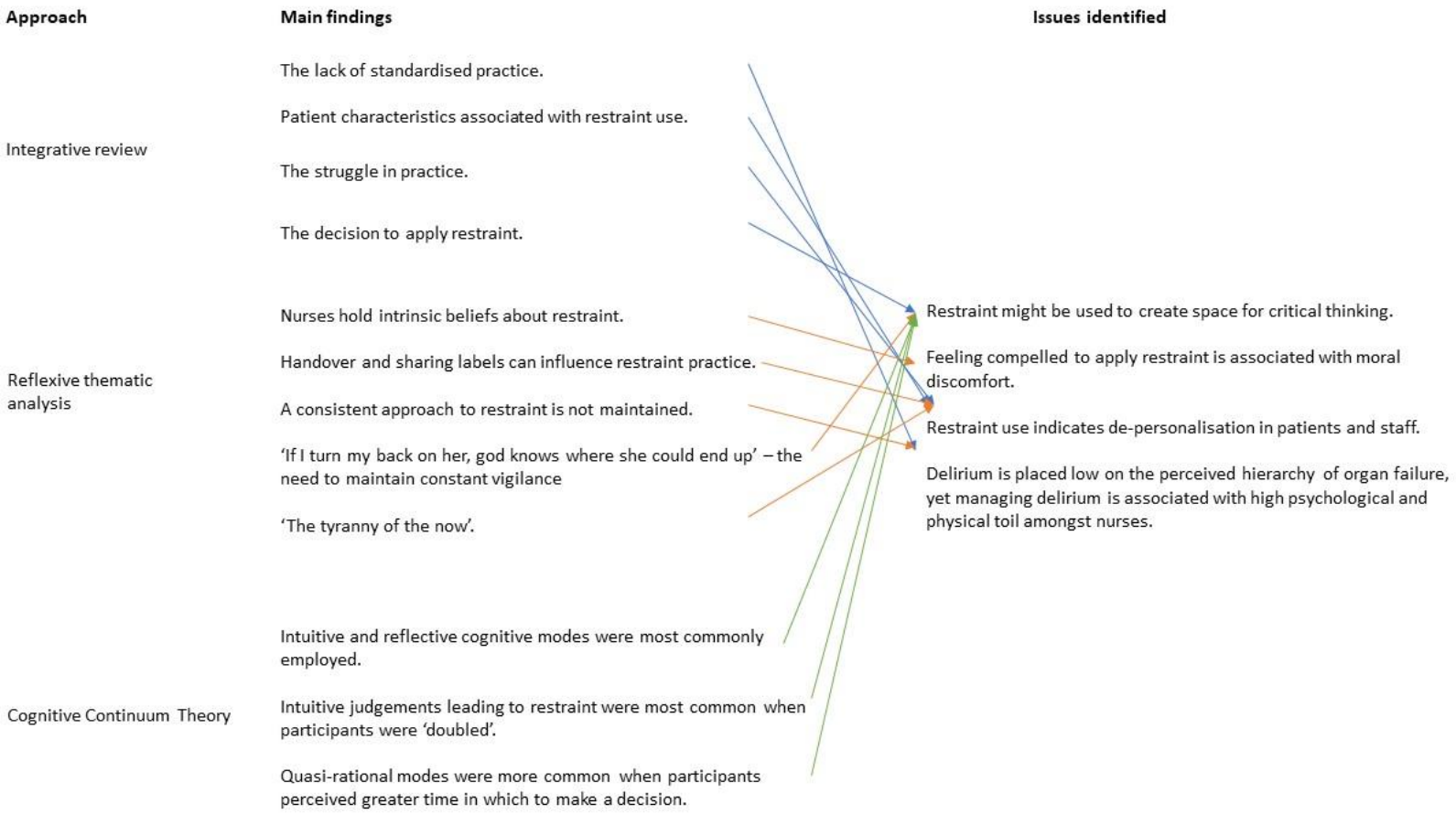


Figure 21: Map of how the main issues for discussion were identified from the analysis

7.3.1 Restraint might be used to create space for critical thinking

Critical thinking can be defined as a deliberate method of thought where the decision-maker is able to actively assess and regulate their cognitive processes (Hayes et al., 2017). Critical thinking requires decision-makers to draw on more analytical cognitive modes. These modes are typically slower, and are used for structured tasks, which are typically not 'face-to-face' (Hamm, 1988; Standing, 2008). Hayes et al. (2017) considered ways in which critical thinking could be developed in junior medical staff on critical care units. They aimed to educate doctors about decision-making processes and reduce an identified over-reliance on heuristics which could lead to cognitive bias and therefore diagnostic or treatment errors. Hayes et al. (2017) identified that doctors will often 'force' patterns, for example a hypotensive patient will be treated as septic as this is a common critical care presentation. The creation of such patterns is rooted in heuristics and the need to make rapid decisions in a quick-paced, high acuity clinical environment. Heuristics can facilitate rapid and accurate decisions. However, when these decisions fail they are referred to as cognitive bias (Norman et al., 2016). Cognitive bias is defined as a thought pattern which deviates from the norm and reflects the decision-makers subjective interpretation of the reality (Hayes et al., 2017). Cognitive bias commonly occurs when the decision-maker is under stress or time is limited (Hayes et al., 2017). The vignettes aimed to simulate these factors and accurately depict the immediacy of the clinical decision-making environment. In relation to the focus of this study, nurses could see psychomotor agitation and establish a pattern where such behaviour would always lead to the decision to restrain. In contrast, adopting a more analytical mode of cognition could lead to the

nurse thinking critically about possible causes of agitation and considering evidenced therapeutic interventions such as mobilisation.

Norman et al. (2016) argued that the most accurate clinical decision-making has a foundation in both intuitive and analytical cognitive modes. However, participants relied heavily on intuitive and reflective cognitive modes and made use of heuristics. The decision to initiate restraint was most frequently based in one of these cognitive modes, rather than a more analytical thought process. Some participants described how they were afraid of making mistakes, especially when 'doubled up' and would apply restraint to avoid this. Here, restraint was used to create time and space for critical thinking. Although there was a paucity of evidence linking intuitive thinking to clinical errors (Norman et al., 2016), bias was evident in the way a number of participants engaged with judgement and decision-making. Interestingly, the remote 'once removed' vignette method offered participants space to reflect on their bias. For example, one expert participant (E3), reflected on his bias mid-vignette. He described how he had been overly influenced by the subjective description of the patient in vignette 5 (a *'frequent flyer'* with a history of recurrent overdoses) and had become conscious that he was treating her differently than a patient with similar risk inference and a more objective handover. The participant had been influenced by the handover, which had in turn generated memories of similar clinical situations where the patient had required restraint. Had he not been offered space for critical thinking, he may have continued to act on his initial impression. It can therefore be suggested that not only can restraint be used to create space to think, but also that its use may be reduced if practitioners had time and space to consider their decisions.

In contrast to some of the situations described above, clinical guidance states that chemical restraint in the form of psychotropic drugs should only be used if agitation is intractable, uncontrollable, and risks the disruption of life-sustaining therapies (Neerland et al., 2019). Similarly, physical restraint should only be initiated when other methods of modifying psychomotor agitation have failed (Intensive Care Society, 2021) In this study, the patients most frequently restrained were Vignettes 1, 2, 3 and 6. Of these, only 2 and 6 were identified as having a high clinical acuity and life-sustaining devices in-situ. Although safety was found to be the primary rationale for the initiation of chemical or physical restraint in both the integrative review and results, the presence of life-sustaining devices was not the only cue to apply restraint. For example, the preservation of a naso-gastric tube was often cited as a reason for restraint.

7.3.2 Feeling compelled to apply restraint could be associated with moral discomfort

The majority of participants were firm in their belief that restraint of any type should only be applied as a 'last resort' once all other therapeutic methods had repeatedly failed. However, in some vignettes, participants felt compelled to apply restraint. They described how initiating restraint because they felt they had no other options to ensure patient safety or avoid mistakes caused them to experience symptoms of moral discomfort, guilt, and shame. Moral discomfort is defined as a feeling which is experienced when the nurse's professional and moral values are compromised through being unable to deliver care which represents their values due to organisational or institutional factors (Kälvemark et al., 2004; Choe et al., 2015). Moral distress is a more intense response. It is related to the nurse experiencing a feeling of moral responsibility, making a plan based on their values,

and then being unable to carry out this plan due to internal or external barriers (Mealer and Moss, 2016). In critical care, such barriers might include inadequate or unsafe staffing, lack of resources such as appropriate medication, or lack of support during decision-making. These causes of moral discomfort were clearly articulated by a number of participants in the study, such as when the need to initiate restraint due to the lack of continuous vigilance was described. Critical care nurses have been identified as being especially at risk of developing moral distress due to the complex and challenging nature of the patients and work environment (Mealer and Moss, 2016).

Sustained experience of moral discomfort has been associated with stress, burnout, exhaustion, job dissatisfaction, compassion fatigue and persistent concerns about making mistakes (Maiden et al., 2011). Again, these fears were articulated by a number of participants, with the need for respite cited as a rationale for the initiation of restraint. Further studies have linked persistent moral discomfort with high staff turnover which leads to further moral discomfort through inadequate staffing and a ‘vicious cycle’ of staff distress and poor patient care (Choe et al., 2015).

Morality-based decision-making is common in nursing (Choe et al., 2015; Allmark, 1992). Decisions may be made with the aim of ‘doing good’ for the patient (Harbison, 2001). Clinical decision-making was discussed in detail in Chapter 3, including reference to role of morality in this process (section 3.4.2). Choe et al. (2015) found that critical care nurses associated the application of physical restraint with moral discomfort, even when restraint was deemed ‘necessary’. The application of restraint was linked to the nurse experiencing moral discomfort due to the failure to respect patient autonomy. This result was mirrored in this study, where

restraint was linked to a lack of dignity. Physical restraint was described as a violation of patient dignity and nurses experienced anxiety when relatives challenged the presence of restraints (Choe et al., 2015).

Participants in this study did not explicitly state that they are affected by moral discomfort. However, they did articulate feelings of discomfort and conflict when organisational factors such as reduced staffing ratios, and subsequent doubling, led them to decide to initiate chemical or physical restraint. This was in direct opposition to participants' belief that restraint should only be applied as a 'last resort'. The most commonly given rationale for the initiation of restraint was to preserve patient safety in a high acuity environment when continuous vigilance could not be guaranteed. Feeling 'forced' by external factors into making the decision to apply restraint was associated by nurses interviewed by Choe et al. (2015) with feelings of powerlessness and resentment towards senior management figures. Similar emotions were described by participants in this study. Resentment towards colleagues not allocated to a patient with hyperactive delirium and towards the senior colleague who undertook the allocation were common across all levels of experience, alongside resentment towards medical colleagues who were able to 'walk away' from challenging situations. In addition, vignettes where the participant was 'doubled up' (vignettes 1 and 2) elicited vivid descriptions of powerlessness and discomfort at feeling 'forced' by circumstances to apply restraint to preserve patient safety. Decision-making in these vignettes was primarily driven by intuitive or reflective cognitive modes. Participants made rapid decisions to preserve patient and device safety. Decisions were supported by reflection on previous experiences or intuitive 'knowing' what was necessary. However, some participants were able to think critically about their decisions. It is possible that the distance offered by the vignette format, and the knowledge that this was not a real clinical situation,

provided participants with greater space to think critically than they may have had if they encountered the patient in clinical practice.

Moral discomfort may also be generated by the absence of appropriate resources (Choe et al., 2015). A number of participants expressed that chemical restraint, especially Haloperidol, had no positive impact on the duration or intensity of delirium. It was described by one novice participant as a ‘sticking plaster’ which simply covered up the clinically disruptive symptoms of hyperactive delirium. An expert participant expressed that he was aware of evidence against the use of Haloperidol in delirium from large-scale studies such as the MIND and REDUCE trials (Girard et al., 2018; Pu et al., 2018). Respectively, these trials indicated that Haloperidol at treatment (Girard et al., 2018) or prophylactic (Pu et al., 2018) doses had no impact on delirium in the critical care population. However, the participant felt that there was no other alternative available to him to reduce acute psychomotor agitation. Dexmedetomidine is associated with a reduction of the incidence of delirium and agitation amongst critical care patients (Ng et al., 2019). However, only a small number of participants were familiar with administering the drug and reported that some senior consultants were reluctant to prescribe it due to its cost. Lack of access to a drug with high-quality evidence supporting its benefits to critical care patients could cause further moral discomfort and job dissatisfaction amongst nurses as suggested by Choe et al. (2015). Their interviews identified that organisational factors and unavailability of key resources could lead to moral discomfort due to the delivery of perceived sub-standard care.

7.3.3 Restraint use might indicate personalisation in patients and staff

Accounts of patient experiences of critical care have emphasised the role that types of restraint play in contributing to dehumanised and persecutory critical care experiences (Aaronovitch, 2011; Slattery, 2021). Many discharged patients report memories of vivid persecutory hallucinations whilst delirious. Such hallucinations can include involvement in bizarre games, being held captive, or in perpetual motion (Svenningsen et al., 2016). In addition, the discharged patients interviewed by Van Rompaey et al. (2016) describe an acute deficiency in self-expression during their delirium. Critical care patients with delirium are frequently rendered voiceless. This could be due to the presence of artificial airways such as endotracheal tubes or tracheostomies. However, the feeling of having no voice may also be linked to the experience of delirium. Patients may describe hallucinations or delusions to nurses which sound bizarre and nonsensical and are therefore disregarded. Delirium has been described as a lonely experience (Van Rompaey et al., 2016), where patients are unsure of what is real, and what is not. The patient is isolated and dependent upon nurses to meet their needs. In addition, delirious critical care patients also lack autonomy in terms of the treatments they receive. A patient described a memory of receiving oxygen therapy via a CPAP mask (Svenningsen et al., 2016). They felt they were restrained and forced to receive the treatment. A lack of autonomy and difficulties in communication are associated with a depersonalised and dehumanised critical care experience for patients.

Little research has been conducted into the role of physical restraint in these hallucinations. Physical restraint often increases agitated behaviour (Kandeel and Attia, 2013; Dolan and Looby, 2017). It could be argued that the sensory deprivation

caused by covering a patient's hand or preventing their movement may feed into or result in persecutory hallucinations. Patients who have been physically restrained are more likely to experience post-discharge Post-Traumatic Stress Disorder (PTSD) (Jones et al., 2007). Fluctuations in sedation level, such as those incurred during the use of bolus sedation to control agitation, have been shown to exacerbate and extend delirium (Svenningsen et al., 2013). False memories stemming from delirium have been linked to the development of PTSD (Morrissey and Collier, 2016). However, there has been a movement towards a more humanised critical care, with an emphasis on modifying the clinical environment to improve orientation to time and place and reduce disruption of sleep-wake cycles (Herling et al., 2018). Open visiting has been recommended as part of the move to humanise ICU care (Wilson et al., 2019) and the opportunity for the patient to communicate with family members was shown to reduce the incidence of post-operative delirium (Eghbali-Babadi et al., 2017). Freeman et al. (2021a) undertook a qualitative meta-analysis and identified a range of interventions which discharged patients remembered as helpful during periods of psychomotor agitation. The interventions were all focussed around emphasising the humanity of the patient and avoiding depersonalised care. Therapeutic management methods cited as helpful to patients experiencing psychomotor agitation included touch, hand holding, effective communication and competence (Freeman et al., 2021a). In contrast, restraint of any type was associated with a dehumanising experience.

It could be argued that the use of restraint is indicative of the dehumanisation of critical care nurses through stress, compassion fatigue and burnout. These feelings were described with poignant immediacy in the theme 'The tyranny of the now' (section 6.7). The critical care environment is highly charged and stressful. Nurses make decisions approximately every 30 seconds (Bucknall,

2000). As discussed in the previous section, the decision to initiate restraint carries the potential burden of moral discomfort which can contribute to burnout (Maiden et al., 2011). The theme ‘The tyranny of the now’ situates this decision-making in the critical care environment and describes how it can be intensified by the physical surroundings, support from colleagues, and workload. Participants described the loneliness of nursing a patient with hyperactive delirium. Critical care nurses report feeling highly responsible towards their allocated patient (Scholtz et al., 2016). This was echoed by participants, who described a feeling of claustrophobia and panic when managing acute psychomotor agitation and attempting to preserve patient safety. Increased workload and inability to provide optimal care contributed to despondency amongst staff and feelings of being unable to cope, further exacerbating ‘The tyranny of the now’ (Scholtz et al., 2016).

Nurses who experience burnout through ‘The tyranny of the now’ are more likely to deliver cynical and depersonalised care and attempt to distance themselves from patients (Kerlin et al., 2020). Distancing can occur through several mechanisms. Participants in this study used subjective labels to describe challenging patients. Labelling is one way nurses can attempt to regain emotional control or power over patients exhibiting behaviour deemed to be deviant (Smith and Hart, 1994). Labelling theory was identified by the sociologist Becker (1963). In labelling theory, deviance is defined as any action with violates social rules and norms. This is discussed more fully in the context of critical care and this thesis in section 3.7.7.2. Through labelling a patient as ‘difficult’ or ‘challenging’, the responsibility for the behaviour is shifted to the patient and away from nursing staff and can be seen as a self-protective response to ‘The tyranny of the now’. This allows staff to consider themselves to be patient, caring and supportive, whilst casting patients whose behaviour challenges these curated self-images as ‘at fault’.

Thus, through labelling theory, we can see how nurses can construct their reality to privilege themselves and this can be seen as a way of coping with 'The tyranny of the now' (Price, 2013; Scholtz et al., 2016).

Labelling also links to the use of heuristics to guide judgement and decision-making. If a label is applied prematurely, such as via negative language during handover ('*frequent flyer*', '*unpleasant woman*', '*knows what he's doing*'), it can leave little scope for the patient be redefined beyond that label (Price, 2013). Once a patient has received their label, this may negatively influence the care delivered to them based on nurses' previous experiences of patients anchored to the same label. For example, one participant spoke of applying metaphorical '*armour*' prior to engaging with a patient following a subjective handover. The word 'armour' suggests a rigid protective barrier between nurse and patient. This is a direct contrast to the supportive and therapeutic relationship valued by critical care patients (Freeman et al., 2021a). Scholtz et al. (2016) explored critical care nursing culture. They identified armour as a difference between how nurses allowed themselves to be perceived and how they actually felt. Various behaviours were identified as armour, such as referring to patients by their diagnosis, displaying a high level of clinical skill, and being perceived to be able to cope. This latter aspect of armour was cited by participants as a cause of stress when allocated to a patient with hyperactive delirium.

Scholtz et al. (2016) identified the powerful sibling-like bonds between nursing staff as part of the critical care nursing culture. However, in this study, participants expressed dislike and frustration with colleagues who failed to offer support when they were struggling to manage psychomotor agitation, therefore not fitting the ideal team model. Perceived favouritism when allocating 'desirable'

patients further eroded the culture of teamwork. This was exacerbated by poor support from medical staff who were seen to lack understanding of the nursing role when managing delirium (Scholtz et al., 2016). Their ability to '*just walk away*' fostered resentment amongst nursing staff, creating a culture of division between medical and non-medical roles.

Nursing handover and conversation between colleagues facilitates the sharing of judgements of dysfunctional or deviant patient behaviour (Carveth, 1995). Subjective terms such as '*mad*', '*not a proper ICU patient'* , '*like a worm on a pin'* , and dismay at being '*dumped*' with a delirious patient were used by a minority of participants. Such descriptors further dehumanise the patient with delirium and show their perceived low-value by nurses. Critical care patients have reported memories of over-heard comments made about them by staff. This is experienced as distressing and upsetting, and adds to the feelings of loneliness associated with delirium (Freeman et al., 2021a; Van Rompaey et al., 2016).

Labelling theory (Becker, 1963) suggests that individuals may engage in 'resource guarding'. In this situation, a nurse may conserve or guard their time and attention in favour of 'easier' or 'less deviant' patients (Price, 2013). This was noted by a number of participants in the study. They described being allocated to a delirious patient as a lonely and isolating experience with minimal support from nursing or medical colleagues. Such isolation increased the stress these participants experienced and made the initiation of restraint more likely. Faced with the emotional labour of caring for a patient with delirium, nurses repress their own feelings, and engage in 'surface acting', to ensure any unprofessional feelings are not evident in their practice (Michaelsen, 2012). If delirious behaviour is prolonged, such as was attributed to the patient in Vignette 3, nurses can detach from the

patient physically and emotionally in order to cope with the prolonged impact of ‘The tyranny of the now’ (Michaelsen, 2012). Such behaviour might involve not being ‘present’ during interactions or using restraint to control the patient’s behaviour. The nursing ‘presence’ during periods of psychomotor agitation has been described as comforting by some discharged critical care patients (Freeman et al., 2021a). In addition, restraint was identified as an indicator of poor team cohesion and dropping standards of care by Langley et al. (2011). Therefore, the depersonalisation of staff through burnout can contribute to reduced patient-centred care.

7.3.4 Delirium is placed low on the perceived hierarchy of organ failure

Participants described how they perceived there to be a hierarchy of organ failure, with doctors considering delirium to be of lower importance than, for example, respiratory or cardiovascular failure. Whilst it is of course vital to treat life-threatening organ dysfunction when it occurs, there appeared to be a disparity between what medical and nursing staff viewed as important. The nursing experience of caring for a patient with psychomotor agitation was described as relentless in its repetition and caused considerable psychological and physical stress, whilst medical staff were observed to be ‘able to walk away’. This caused resentment and poor team cohesion (Scholtz et al., 2016).

Twenty years ago, intensivists were urged to consider delirium as the brain’s form of organ dysfunction (Ely et al., 2001b). However, delirium remains under-recognised by critical care nurses and doctors despite the availably of validated screening tools such as CAM-ICU (Selim and Ely, 2017). Current clinical guidance recommends that screening should be undertaken 8-12 hourly, or if there is a change in the patient’s condition (Devlin et al., 2018). However, the uptake of

delirium screening tools in practice remains patchy (Trogrlic et al., 2016) and the participants in the 'Think Aloud' study described inconsistent practice by nursing and medical colleagues. Where protocols existed, they were often modified by senior nursing and medical staff. This could lead to staff nurses experiencing frustration at the lack of a consistent approach to managing delirium. In addition, the lack of consistent approach and disregard for clinical protocols added to the perception that delirium was not seen as a form of organ dysfunction, rather an annoying complication of critical care admission.

Previous research has suggested that nurses perceive delirium as having a low priority amongst medical staff (Zamoscik et al., 2017). This was further emphasised by participants in this study. Vignettes 1 and 2 depicted self-ventilating patients who were agitated. Such patients are breathing without the assistance of an artificial airway and could therefore be seen to be lower acuity. Although both patients represented a nursing challenge due to their behaviour, it was suggested that medical staff would be more attentive towards the CPAP-dependent patient in Vignette 2, who was at higher risk of physiological deterioration. Participants believed that delirium and psychomotor agitation alone were perceived as a nursing responsibility, whilst other forms of organ failure are of greater interest to medical staff. This difference in experience and priorities caused some participants to express resentment towards their medical colleagues, who were able to walk away whilst participants were 'stuck' at the bedside dealing with challenging behaviour.

Participants felt that the nurse's experience of managing a patient with hyperactive delirium was downplayed by medical staff. Such resentment can erode team cohesion and promote divisions between medical and nursing staff (Palacios-Cena et al., 2016; Unoki et al., 2020). Poor collaborative working between nurses

and doctors was also linked to moral distress amongst nurses (McAndrew et al., 2018). Medical values were perceived to take priority and participants felt that nurses' contributions to decisions about pre-emptively or actively managing psychomotor agitation were disregarded. In turn, this is believed to contribute to reduced empowerment, job dissatisfaction and difficulties in providing high quality care (McAndrew et al., 2018; Choe et al., 2015).

7.4 Strengths and limitations

This section will discuss the strengths and limitations of the inductive pragmatic approach and research methods used for this study.

7.4.1 A qualitative pragmatic approach

This study was grounded in the pragmatic paradigm and used qualitative methods to explore critical care nurses' decision-making when managing hyperactive delirium. Pragmatism, alongside its strengths and limitations as a paradigm for healthcare research, is fully discussed in 3.3.2.3. Pragmatism will now be discussed with specific reference to this study.

Pragmatism proved a strong and appropriate foundation for this study. It guided the choice of research methods which were most suited to the question and topic under study. Pragmatism encourages a hybrid approach (Ormston et al., 2014) which was undertaken in this study as it drew on qualitative methods and decision-making theory to create an understanding of the complex decision-making processed undertaken by critical care nurses. This is a clear strength as binding the study to a single philosophical standpoint may have reduced the researcher's ability to draw on hybrid approaches and develop a fuller understanding of how and why

the decision to initiate restraint was made. In addition, pragmatic healthcare research aims to generate clinically actionable research (Allemang et al., 2021). The recommendations drawn from the results of this study are presented in 7.6.

Pragmatism does have some limitations. For example, the emphasis on using the right method to answer the question, and not adhering to a single methodological approach has the potential to create confusion and lack of consistency in complex studies (Kaushik and Walsh, 2019). However, this study was relatively simple, consisting only of an integrative literature review, one method of data collection and two analyses. A consistent study aim, the use of clear qualitative analytical approaches, such as thematic analysis (4.10) and reflexivity (4.9) ensured that the study did not lose focus and the researcher was able to maintain clarity of purpose.

7.4.2 Method and data collection

The study used a 'Think Aloud' approach as a method and data collection tool with audio-visual vignettes providing the stimulus for participants. A full discussion of the strengths and limitations of this method is provided in 3.7.3-5. The following section will discuss the strengths and limitations of the method in relation to this specific study.

Audio-visual vignettes featuring simulated patients were used as stimulus for participants to 'think aloud' and describe their decision-making processes. Although care was taken to ensure the vignettes were as true to life as possible, a minority of participants remarked on elements that they perceived as unrealistic. This disrupted participant decision making through breaking their immersion in the vignette therefore reducing the reliability of some of the findings. Additionally, the vignettes

had a linear structure. The scenario proceeded as filmed regardless of any decisions made. This was experienced by some participants as frustrating and again broke their immersion. These limitations may have been avoided if direct clinical observation had been undertaken. However, that approach risked disrupting clinical care and a remote method was deemed more pragmatic.

Think aloud relies on participants to disclose their decision-making processes and, as such, only conscious processes will be described to the researcher (Nisbett and Wilson, 1977). In addition, Jaspers et al. (2004) suggest that, when thinking aloud, participants are more likely to draw upon information stored in their working memory rather than long-term memories. When discussing sensitive topics, such as restraint, there is also the risk of social desirability bias reducing the quality of the data (Bergen and Labonté, 2020). These potential limitations are recognised. However, this study made efforts to mitigate these risks where possible. For example, the choice of audio-visual vignettes was intended to replicate the pressures of the clinical setting and push participants to make decisions rapidly, therefore reducing the likelihood of social desirability bias. This is discussed fully in 3.7.6. Most participants did not display obvious social desirability bias and were candid in their responses. This may be linked to the chosen data collection method or the presence of the researcher, herself a critical care nurse with a similar background to her participants. This shared experience may have contributed to their comfort and resulting candid responses (Eide and Kahn, 2008). In addition, the use of vignettes and remote data collection may have encouraged participants to draw on their long-term memories. The majority of participants drew on reflective modes of decision making (Chapter 5) and related the vignettes to their previous experiences.

Strengths of the study included its novel and innovative approach to the design and development of short video vignettes. A paper which described the approach was published and is linked in Appendix C (Teece et al., 2021). The vignettes were engaging to participants and elicited rich data. A further strength was the flexibility of the remote approach to data collection. Telephone interviews and internet-hosted vignettes offered flexibility to both researcher and participant. In addition, the vignettes were a novel and innovative data collection method which aimed to recreate the situations where clinical decision-making would occur without disrupting practice.

Data collection was undertaken by remote telephone interviews. The strengths and limitations of this approach to data collection were discussed previously (4.3.1). Telephone interviewed proved a pragmatic option, and were convenient for the participants in the sample, many of whom were undertaking shift work and had limited free time. The remote approach removed the need to travel to a location for the interview and facilitated easy rescheduling if necessary. A criticism of telephone interviews is the absence of non-verbal communication between interviewer and participant (Braun and Clarke, 2013). However, this proved to be a strength in this study. Given the sensitive topic, participants were very willing to discuss their experiences candidly. The remote approach may have led participants' to feel more relaxed and therefore disclose sensitive and candid details (Novick, 2008).

7.4.3 Sampling and recruitment

This study aimed to recruit participants whose experience was representative of nursing staff employed on critical care units to explore how they made management decisions when caring for patients with hyperactive delirium.

Snowballing via social media allowed participants to be sampled from across the United Kingdom. The strengths and limitations of social media recruitment are discussed in full in section 3.9.4 and will now be further discussed in specific relation to recruitment for this study.

Recruitment was undertaken via Twitter and Facebook under the hashtag #ICUrestraint and using the materials discussed in 4.5.4. Again, this was a pragmatic decision. Social media allows the free dissemination of materials across a wide range of the population (Arigo et al., 2018). Of the 30 participants, 11 were recruited via Twitter and 3 via Facebook. Recruitment via this method was found to be accessible and flexible. However, this approach lacks control over who the recruitment materials are seen by. For example, tweets or posts may not be seen by the intended audience or the resulting sample may lack diversity (Arigo et al., 2018). This study received no inappropriate enquiries, however, there were challenges in generating a diverse sample. These will now be discussed.

A sampling frame was developed which aimed to ensure roughly equal numbers of participants from each level of experience were recruited. However, the expert practitioners made up the largest group (*n*=13), followed by proficient nurses (*n*=11). Only 6 novice participants were recruited. To achieve this number, targeted recruitment advertisements were disseminated via social media and a short presentation about the study was given to final year student nurses. The reasons behind the reduced participation of newly-qualified or new-starters to critical care may include not being active on Twitter, feeling they had little to contribute to the study, or not finding the topic interesting.

A small sample size is not a limitation for this type of research. A range of nurses and practitioners (n=30) from different types of critical care units across the

UK were sampled, however, there is the possibility that results may not be replicated if the study was repeated with different participants.

Additionally, the majority of participants were drawn from general critical care units. Two nurses from cardiothoracic units were recruited and one trainee ACCP with a background in neurosurgical ICU. It is possible that recruitment of further participants from specialised critical care units may have changed the results of the study due to differences in practice and patient population.

7.5 Recommendations for further research

This section will present recommendations for future research projects focussing on nursing and patient perspectives towards restraint.

7.5.1 Further research on nurses' perspectives on restraint

Despite recent research interest regarding how and why critical care nurses make the decision to apply physical restraint (Freeman et al., 2021b; Via-Clavero et al., 2018), there remains a paucity of evidence regarding the use of both chemical and physical restraint. Critical care nurses have easy access to both forms of restraint and have been shown to be the main decision-makers when choosing to apply restraint. This study, in contrast to the studies cited above, was focussed on hyperactive delirium rather than general agitation. Future studies could explore whether decision-making is affected by the presence of a diagnosis of delirium rather than agitation. This would aim to identify whether a diagnosis of delirium has any impact on the way psychomotor agitation is managed clinically. Delirium has been demonstrated to have a lasting impact on patients' recovery from critical care (Salluh et al., 2015). Identified issues relating to delirium include higher mortality in

ICU and post-discharge, longer duration of mechanical ventilation, functional disability and impaired cognition (Salluh et al., 2015). In addition, patients who have experienced delirium are less likely to return to their previous employments (Griffiths et al., 2013) and frightening memories of critical care are associated with the development of PTSD (Burki, 2019). Further research could explore whether such factors were considered by nurses when managing acute episodes of psycho-motor agitation secondary to hyperactive delirium.

7.5.2 Further research on patients' recalled experience of delirium and restraint

Critical care has seen a significant shift in sedation practice over the past decade. The focus is on targeted light sedation, with the patient able to breathe spontaneously (Holm and Dreyer, 2017). This aims to avoid many of the physiological complications associated with prolonged mechanical ventilation and forms the basis of sedation management in critical care (Devlin et al., 2018). However, light sedation has led to increased patient awareness of critical care interventions (Roberts et al., 2019). An observational study found that patients who were lightly sedated whilst mechanically ventilated reported feeling afraid and struggling to communicate (Roberts et al., 2019).

Chemical and physical restraint appear to play roles in the memories of delirious patients and can impact negatively on their recovery (Svenningsen et al., 2016). Although patient memories of critical care delirium are well-researched, there are no studies which aim to specifically explore the role that physical and chemical restraint play in these memories. This could be due to a number of factors. Amnesia can result from the use of sedatives such as Propofol, and therefore patients may not remember their critical care admission and thus feel unable to participate in

research. In addition, survivors may feel unwilling to re-immerse themselves in the trauma of their critical care admission or may feel unable to discuss their memories in a research setting.

In response to this, a study designed around the use of sequential art (comics) is suggested. Comics have the ability to portray complex non-verbal information, with the message shared across words and pictures (McNicholl and Wysocki, 2019). As such, comics are increasingly seen as an inclusive medium for medical and patient education (Bruggemann et al., 2019). Graphic narratives offer new insights into the complexities of patient experience which can be difficult to put into words and encourage healthcare professionals to listen to these experiences in new ways (Green and Myers, 2010). Critical care survivors often have fragmented memories and may also have sensory and physical differences as a result of their illness (Jones, 2014; Hatch et al., 2018). The images may stimulate participants' memories and help them to focus on what they remember experiencing during periods of psychomotor agitation secondary to delirium. They may also help to uncover memories of restraint and produce meaningful data about the patient experience.

7.6 Recommendations for practice and clinical guideline development

The findings of this study indicate that greater clinical support and education is required to enable nurses to safely and effectively manage hyperactive delirium. Restraint use was shown to be inconsistent, although restraint was more frequent when opportunities for continuous vigilance were reduced, such as when a nurse was 'doubled up'. Nursing a patient with hyperactive delirium was recognised to

present both psychical and psychological challenges. The repetition was described as exhausting, and anxiety was generated by the fear of making a mistake through lack of time to think critically, or agitated behaviour causing the removal of medical devices. Supportive colleagues and a ‘good team’ were associated with reduced stress and anxiety amongst bedside nurses. Participants were aware of evidence around the therapeutic management of delirium and followed clinical guidance by making use of re-orientation, communication and attempting to mitigate the confusing nature of the critical care environment (NICE, 2019).

However, the findings of this study also highlighted several areas where practice and clinical guidelines could be further developed to improve the management of delirium and potentially reduce the use of types of restraint:

- A greater emphasis on collaborative decision-making between nursing and medical staff.
- A precise vocabulary to describe restraint.
- Continued support for clinical staff involved in caring for patients with delirium and a recognition of the particular challenges faced by nurses when managing hyperactive delirium.
- Increased awareness amongst nursing staff around how judgements and decisions are reached and support to develop critical thinking.

7.6.1 An emphasis on collaborative decision making

Participants expressed concern that psychomotor agitation was not proactively managed by doctors and carried less importance than other forms of organ dysfunction. This aligns with findings from other studies (Palacios-Cena et al., 2016; Zamoscik et al., 2017) Where nurses feel their viewpoints are consistently

devalued by medical staff, discontent and team cohesion can develop (McAndrew et al., 2018; Choe et al., 2015; Langley et al., 2011).

Guidance states that collaborative multi-disciplinary decision-making is central to providing high-quality critical care (Intensive Care Society, 2013). However, the critical care team is very large, and different groups may have different priorities (Ervin et al., 2018). Participants described their distress and resentment when medical staff were able to 'just walk away' from a nurse struggling to manage psychomotor agitation. The findings suggested that restraint is principally a nursing decision. Given the autonomous role of the majority of critical care nurses, and the presence of numerous PRN or existing continuous infusions of sedations available to them, this could potentially pose a safeguarding risk. In contrast to the practice described by participants, guidance states that physical restraint must only be applied with the consent of the senior medic on duty (Intensive Care Society, 2021). The most recent guidance from the ICS does emphasise the need for collaborative decision-making, which may help reduce the wide range of inconsistencies seen in practice. In addition, greater collaborative involvement in the management of delirium and pro-active planning for psychomotor agitation may further reduce the need for restraint use whilst also highlighting the specific challenges experienced by nurses when caring for patients with delirium.

7.6.2 A precise vocabulary to describe restraint

In contrast to mental health nurses, critical care nurses appeared to lack a precise language with which to describe their restrictive practice. In mental health areas, restraint is well-defined, has to be recorded by law, and is therefore a part of pre and post-registration training (NICE, 2015). Restraint is not covered explicitly in the Nursing and Midwifery Council's (NMC) adult nursing pre-registration

programme (NMC, 2018) and is not included in the post-registration national critical care competencies (Critical Care National Network Nurse Leads Forum, 2016).

The findings of this study demonstrate that participants experienced confusion as to what constitutes restraint and when it is clinically appropriate. This was further complicated by the lack of precise language to describe restraint in critical care, with restraint referred to as ‘sleep’, ‘mittens’, or ‘something’. The words used by participants almost infantilise restraint and indicate a deep-rooted discomfort with the notion of restraint. However, restraint is part of critical care practice. Education has been demonstrated to reduce the use of restraint in critical care areas (Hurlock-Chrostecki and Kielb, 2006) through supporting staff and developing protocols to reduce variations in practice. In addition, it is important that nurses have a clear vocabulary through which they can accurately describe their interventions. This is required by law as nurses are bound to document instances where patients have been deprived of liberty (Department of Health and Social Care, 2015; Lakatos, 2020b). The new ICS guidance focuses on physical restraint, but does also offer definitions of different types of restraint which critical care nurses may encounter (Intensive Care Society, 2021). However, for these definitions to become part of practice, it is necessary that restraint form an aspect of the pre- and post-registration nursing curriculum.

7.6.3 Clinical support and recognition of the challenge of nursing a patient with delirium

Participants described the psychological and physical exhaustion which could result from nursing a patient with hyperactive delirium. This was a result of the repetition of actions, such as moving a patient into an optimal position in the bed, replacing devices, and repeating phrases. In addition, some participants described

patients who had been combative and caused injury to nurses. A supportive team was associated by participants with reduced anxiety during a shift. Adequate staffing was also linked to avoiding restraint as it would enable vigilance to be maintained.

Critical care patient-to-nurse staffing ratios were described in detail in Chapter 1. The vignettes reflected these recommendations, for example, ventilated patients were nursed 1:1, but patients in single organ failure were 'doubled'. Delirium was not included as a form of organ failure when calculating patient acuity levels. This reflected the experience of the researcher and clinical guidance (Bray et al., 2010; Intensive Care Society, 2013). However, these ratios have been subject to review in order to manage the surge of critical care patients associated with the COVID-19 pandemic (UK Critical Care Nursing Alliance, 2020) in the UK and internationally. Ratios were reduced and critical care nurses were tasked with supporting non-critical care nurses to care for patients in their departments. This resulted in considerable psychological pressure on nurses (Alharbi et al., 2020).

The findings from the 'Think Aloud' study linked reduced staffing and the resulting fear of failing to be vigilant or making a mistake with the increased reliance on restraint. This in turn was associated with moral distress (Kälvemark et al., 2004; Choe et al., 2015) which could lead to burnout. Therefore, sustained clinical education and refreshed guidelines are warranted to ensure that restraint is not used inappropriately or to excess.

7.6.4 Increased awareness around how judgements and decisions are made

Critical care is a fast-paced setting, and some decisions carry a high risk inference. Because of this, it could be argued that critical care is not the ideal

environment for learning about critical thinking and clinical reasoning (Diamond-Fox and Bone, 2021). However, critical thinking skills are important as they help to avoid clinical error and enable staff to assess and regulate their thoughts and thus avoid bias (Hayes et al., 2017). To recognise bias in one's own thought, structured meta-cognition is required. This can be defined as thinking about thinking (Hayes et al., 2017). To engage in meta-cognition, it is necessary to have time and space. This can be difficult in the fast-paced critical care environment and almost impossible during the immediate management of acute psychomotor agitation. Hayes et al. (2017) proposed educational strategies to develop meta-cognitive skills in junior critical care doctors which are also applicable to critical care nurses (Table 37).

Intervention	**Explanation**
Step 1: Make the 'thinking process' explicit	Encourage to discuss the 'thinking process', including intuitive and reflective responses. Prompt to explore more analytical cognitive modes.
Step 2: Explore cognitive bias	Identify and discuss possible bias which may impact on the judgement.
Step 3: Develop inductive reasoning skills	Aim to avoid deductive reasoning, which is more liable to bias.
Step 4: Stimulate critical thinking	Encourage a questioning approach.
Step 5: Assess learning	Consolidate and evaluate.

Table 37: Educational strategies to improve decision-making (Hayes et al., 2017).

Developing awareness in nurses around how decisions are made would improve all areas of their clinical practice and enable them to provide objective rationales for their judgements and decisions (Thompson and Dowding, 2009a) This may in turn improve the process of collaborative multi-disciplinary decision-making. The majority of participants in the study readily offered rationales for their decisions. This was especially true of the expert group, many of whom were ACCPs.

Practitioners undertaking this role work in close collaboration with the medical and nursing teams and are involved in ward rounds and medical planning. This may have enabled them to develop greater skills in critical thinking and meta-cognition. However, critical care nurses at all levels of experience are involved in high-stakes decision-making and, as such, it is recommended that critical thinking and meta-cognition be included in post-registration critical care education.

Decision-making aids have been demonstrated to have the potential to reduce restraint use (Hurlock-Chrostecki and Kielb, 2006). Although protocols were described as inconsistently adhered to by senior nursing and medical staff, some participants found them useful as they enabled a systematic approach to psychomotor agitation management. A number of participants expressed a belief that a decision-support tool for restraint would be useful. Nurses appeared to find it difficult to objectively identify the point at which restraint becomes clinically appropriate and necessary (Freeman and Teece, 2017). Targeted sedation goals using tools such as RASS to avoid over-sedating patients are common in critical care and have been proven to improve physiological and psychological patient outcomes (Hughes et al., 2013). However, a similar objective clinical tool for physical restraint is not widely available. Hevener et al. (2016) developed a decision-wheel to guide staff when applying physical restrain. It included such factors as the patient's behaviour, devices in-situ and independence. The tool guided bedside nurses in their judgement of whether physical restraint was appropriate and was found to reduce restraint use by 32% on the unit it was trialled on (Hevener et al., 2016). The inconsistencies and uncertainties observed by participants in the 'Think Aloud' study suggest that the development of a similar tool for use across UK critical care units might be useful and appropriate.

7.7 Chapter summary

- Four main issues relating to critical care nurses' decision-making when initiating restraint were identified. Recommendations for future research and clinical guidance were drawn from these.

- Reduced opportunities for vigilance were associated with restraint. Nurses described a lack of space for critical thought and concern that they might make a mistake or neglect elements of their work whilst they were watching a patient with hyperactive delirium. A need for greater clinical support and provision of extra staff was identified.

- Restraint should be the 'last resort'. When participants felt compelled to initiate restraint through factors such as poor staffing, this could engender significant moral distress. Restraint was associated with depersonalisation and dehumanisation in both patients and staff. Participants reported psychological and physical exhaustion when managing a patient with hyperactive delirium over long shifts.

- A hierarchy of organ failure was identified. Delirium appeared to be of lower clinical importance than other forms of organ dysfunction despite the stress its management caused to nursing staff.

- There was a lack of awareness around the processes of judgment and decision-making alongside imprecise language to describe restraint. A need for greater education and clinical support was identified.

Chapter 8 Conclusions

This thesis aimed to explore how and why critical care nurses made the decision to initiate chemical or physical restraint when managing a patient with psychomotor agitation secondary to hyperactive delirium. Through an integrative review of previous studies in this area, and the undertaking of a further study and two analytical approaches, this thesis has reached an improved understanding of the extrinsic and intrinsic factors which influence nurses' decisions to initiate restraint.

This pragmatic qualitative study used an innovative remote method of data collection. The bespoke audio-visual vignettes developed by the researcher facilitated the study of complex clinical decision-making processes in an accessible simulated clinical environment. This data collection method could be further developed for use in future research studies and also may play a role in the remote delivery of clinical education.

This thesis presented two separate analytical approaches to the dataset. Firstly, the results were considered alongside the Cognitive Continuum Theory (Hamm, 1988; Standing, 2008). The majority of decision-making was based in either the intuitive or reflective modes. According to CCT, a 'correct' judgement is likely to arise if the mode of cognition is appropriate to the task. Caring for a patient with hyperactive delirium, although familiar to critical care nurses, is an unpredictable event. Therefore, intuitive or reflective modes could be said to be appropriate and lead to a 'correct' decision. However, these cognitive modes were more likely to lead to the decision to initiate restraint than more analytical modes. From this analysis, it was concluded that intuitive responses were more common when the

participant felt forced to make a rapid decision in the face of escalating agitation. More analytical cognitive modes were primarily used following handover, when agitation was depicted at its lowest level.

The second analysis was a reflexive thematic analysis of the interview transcripts. Five themes were identified. The themes explored factors which might influence nurses' decision-making, for example, the views held about restraint and delirium and the impact of handover. This chapter also explored the nursing experience of caring for a patient with hyperactive delirium. This was described as a relentless and draining experience, where the nurse lacked support from medical colleagues and felt the crushing responsibility of maintain vigilance at all times for fear for the patient compromising their safety. This was further complicated through the apparent assumption that delirium was primarily a nursing responsibility and inconsistent medical guidance and prescribing.

The results were drawn together to identify four main issues relating to the use of chemical or physical restraint in critical care. These issues included links between a lack of space and time for critical thought and the decision to initiate restraint and the moral discomfort this may cause to clinical staff. Links between burnout and restraint were also identified. Restraint may be indicative of nurse burnout as they no longer have the capacity to engage therapeutically with their patients and also indicates that patients have become dehumanised. Finally, delirium was seen as ranking low on a perceived 'hierarchy of organ failure'. The treatment of delirium appeared to be given less attention than other forms of organ dysfunction, leading to increased confusion and dissatisfaction amongst nursing staff.

This study has identified a need for further research into the role of restraint in critical care and the factors which influence its initiation. A number of recommendations for clinical practice and guideline development were made, alongside a need for the recognition of the impact of delirium as a form of organ dysfunction and its toll on the patient and nursing experience. Through greater support and collaborative decision-making, it may be possible to reduce the frequency of restraint use with this patient group, improving both the patient and nurse experience of critical care.

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Appendix A – Summary of studies included in the integrative review

Citation	Country	Aim	Sample characteristics	Data collection method	Results	Theme
Aitken et al. (2009)	Australia	To examine the decision making processes that nurses use when assessing and managing sedation.	Purposive sample of 7 expert ICU nurses.	Observation and 'think aloud'	Intervention increased assessment of agitation. 'Pulling at lines' cited as agitation. Recognition of impact of external factors and need to manage these.	Patient characteristics associated with restraint. Judgement & assessment
Bebenishty et al. (2010)	Israel, Switzerland, UK, Spain, Italy, France, Portugal, Finland, Greece	To examine physical restraint practices across European ICUs.	Convenience sample of 669 ICU patients (566 physically restrained) in 34 adult general ICUs.	Structured observation form	Restlessness and delirium most commonly recorded reasons for restraint.	Lack of standardised practice. Patient characteristics associated with restraint.

Choi & Song (2003)	South Korea	To investigate the pattern of use of physical restraints in an ICU.	Convenience sample of 52 ICU patients (23 physically restrained) and 29 nurses involved in restraint.	Questionnaire	Nurses moderately favourable to using physical restraint. Restless behaviour most significant indicator for restraint use.	Lack of standardised practice. Patient characteristics associated with restraint. Judgement & assessment
De Jonghe et al. (2013)	France	To characterise the perceived utilisation of physical restraint in mechanically ventilated intensive care patients.	Convenience sample of 121 intensivists.	Questionnaire	Agitation and awakening from sedation most significant indicators for physical restraint use. Frequently commenced without medical order. Considered an essential element of patient management.	Lack of standardised practice. Patient characteristics associated with restraint. Judgement & assessment
Dolan & Looby (2017)	USA	To describe nurses' determinants of initiation and discontinuation of restraints in surgical ICU pts.	Convenience sample of 13 ICU nurses.	Semi-structured interviews	Physical restraint is used to increase patient safety. 1:1 ratios reduce the need for restraint. Use of physical restraint can increase patient agitation.	The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment

Ertugrul et al (2021)	Turkey	To explore nurses' knowledge and attitudes towards physical restraint.	202 nurses across 3 ICUs	Pre-validated questionnaire	85% of nurses were the primary decision-maker. Various reasons for restraint (disorientation, workload, lack of training).	The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment
Fraser et al. (2000)	USA	To study the frequency, duration, severity, and treatment of agitation in patients in the ICU to determine if the elderly represent a distinct population.	Purposive sample of 130 ICU patients.	Retrospective review of patient charts	Delirium responsible for 19% of severe agitation. Wide range of behaviours cited as indicating agitation. Opiates, benzodiazepines and Haloperidol used to manage agitation.	Lack of standardised practice. Patient characteristics associated with restraint.
Freeman et al. (2016)	UK	To establish the experiences, attitudes and opinions of ICU nurses in relation to the application of physical restraint.	Convenience sample of 75 critical care nurses	Questionnaire	Staffing problems restrict the use of therapeutic management of agitation. Use of physical restraint seen as preferable to increasing sedation and enables the nurse to perform other tasks.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment

Freeman et al (2091)	UK	To gain insight into the views and opinions of the MDT regarding the management of agitation.	163 MDT participants (70% were nurses)	Online survey	Physical restraint policy is long and complex – chemical restraint is easier. Policy ignored in favour of personal judgement. Junior nurses assigned to agitated patients – expected to cope. Medics reluctant to restrain.	Lack of standardised practice. The struggle in practice. Judgement & assessment
Gu et al (2019)	China	To identify factors influencing physical restraint use.	312 patients across 3 ICUs	Prospective cross-sectional study	Most common time to initiate restraint was at the start of the evening shift. Lower staff levels were linked to restraint.	Lack of standardised practice.
Kandeel & Attia (2013)	Egypt	To investigate the practices of physical restraints among critical care nurses.	Convenience sample of 275 ICU patients and 153 ICU nurses	Observation form and structured questionnaire	Physical restraint is common in unsedated patients. Comfort is seen as low-value in managing agitation.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment.

Kydonaki et al. (2019)	Scotland	To understand challenges in optimising sedation in a Scottish ICU.	Purposive sample of 48 members of the ICU MDT	Focus groups	A lack of standardised drug of choice leads to clinical preferences and trial and error. Sedation levels are increased at night. Staff find it challenging to reduce sedation for agitated patients due to lack of staffing or a poor skill-mix.	Lack of standardised practice. Patient characteristics associated with restraint.
Langley et al. (2011)	South Africa	To arrive at a detailed description of the use of restraints in three intensive care units in a public, academic, tertiary level hospital	Convenience sample of 219 patients, 15 nurses, and 5 doctors.	Observational checklist and in-depth interviews.	Variations in protocols and poor awareness of guidance amongst staff. Use of physical restraint makes nursing care easier. Doctors not involved in the decision to restrain a patient.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment.
Lopetrone (2006)	Canada	To determine how nurses manage the care of patients experiencing post-operative delirium.	Purposive sample of 9 ICU nurses (first group) and 4 ICU nurses (second group)	Focus groups and questionnaire	Caring for delirious patients is emotionally and physically draining. Staff apply physical restraints to protect themselves and ensure patient safety. Need for support from medical staff.	The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment.

Luk et al. (2015)	Canada	To describe Canadian ICU nurses' decision-making and practices of physical restraint application and discontinuation.	Purposive sample of 141 ICU patients	Retrospective review of patient charts	Agitation cited as reason for physical restraint use. Commonly applied during night shift.	Lack of standardised practice. Patient characteristics associated with restraint. Judgement & assessment.
Luk et al (2014)	Canada	To describe patterns of physical restraint use in MV patients.	Purposive sample of 711 ICU patients (374 restrained)	Secondary analysis of prospective observational study.	Treatment factors (eg higher levels of drug use) associated more significantly with physical restraint use than patient factors.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint.
Martin & Mathisen (2005)	USA & Norway	To describe the relationship between patients' characteristics, environment and use of physical restraints in the United States and Norway.	Quota sample of 100 ICU patients (50 at each study site)	Observation of patients and calculation of acuity.	Physical restraint used in USA but not Norway. USA sample showed greater agitated behaviour.	Lack of standardised practice. Patient characteristics associated with restraint.
Micek, et al. (2005)	USA	To identify individuals with delirium defined by CAM-ICU, and to compare clinical interventions.	Purposive sample of 93 ICU patients	Observational study	Delirium associated with physical restraint use and continuous infusions of midazolam or fentanyl.	Patient characteristics associated with restraint. Judgement & assessment.

Palacios-Cena et al. (2016)	Spain	To explore the experiences of doctors and nurses caring for patients with delirium in the ICU and to describe the process of delirium management.	Purposive sample of 38 ICU professionals (19 medics & 19 nurses)	Focus groups	Delirium management causes workforce stress and conflict between nurses and medics. Shift-by-shift variations in treatment and indiscriminate use of physical restraint.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint.
Pan et al (2018)	China	To explore the relationship between physical restraint and delirium.	593 ICU patients observed over 12 months (447 restrained).	Nested case-control study	There is a reciprocal relations hip between delirium and restraint. Duration of restraint higher amongst delirious patients (p=<.001). 3x higher risk of delirium amongst restrained patients.	Patient characteristics associated with restraint.
Pisani et al. (2013)	USA	To determine the dosing patterns and total doses of fentanyl, lorazepam and haloperidol according to nursing shift in a cohort of older patients in a medical intensive care unit.	Purposive sample of 309 ICU patients (aged 60yrs and older)	Observational study	Doses of lorazepam and Haloperidol higher during the evening shift. Fentanyl, Lorazepam and Haloperidol commonly administered to delirious patients.	Lack of standardised practice.
Stinson (2016)	USA	To examine the relationships between registered nurses' clinical experience, their practice issues and their attitudes toward the use of physical restraints.	Convenience sample of 413 critical care nurses.	Online questionnaire	Weak correlation between length of time spent working in ICU and positive attitude towards physical restraint use.	Judgement & assessment.

Suliman et al. (2017)	Jordan	To investigate nurses' knowledge, attitude, and practice of physical restraint in Jordanian hospitals.	Convenience sample of 300 nurses.	Questionnaire	Staff lack knowledge of alternatives to physical restraint. Patient and family not involved in decision to restrain. Poor knowledge of correct indicators for restraint use.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment.
Svenningsen et al. (2013)	Denmark	To investigate the impact of fluctuating sedation levels on the incidence of delirium in ICU.	Purposive sample of 640 ICU patients.	Prospective observational cohort study.	Continuous Midazolam associated with a decrease in delirium +ve assessments. Any change in RASS is associated with delirium development.	Patient characteristics associated with restraint. Judgement & assessment.
Mac Sweeney et al. (2010)	UK	To describe the UK management of delirium by consultant intensivists. Additionally, knowledge and attitudes towards delirium were sought.	Convenience sample of 681 intensivists.	Questionnaire	Haloperidol is the first-line drug for hyperactive delirium. Intensivists agree that delirium requires active treatment.	The struggle in practice. Judgement & assessment.

Turgay et al. (2009)	Turkey	To determine intensive care nurses' reasons for the application and removal of physical restraint, and physical restraint patterns used in Turkish intensive care units.	Convenience sample of 190 ICU nurses.	Questionnaire	Patient safety cited as primary reason for application of physical restraint. Convenience cited as a further reason. Nurses apply restraint without a medical order.	Lack of standardised practice. Patient characteristics associated with restraint. Judgement & assessment.
van der Kooi et al. (2015)	Holland	To characterise the use of physical restraint in intensive care units.	Purposive sample of 379 ICU patients and their attending staff.	Observational study and structured questionnaire.	Delirium and inability to communicate associated with physical restraint use. Doctors lack knowledge of which patients are restrained. Physically restrained patients are also chemically restrained.	Lack of standardised practice. The struggle in practice. Patient characteristics associated with restraint. Judgement & assessment.
Via Clavero et al (2018)	Spain	To elicit critical care nurses' beliefs regarding physical restraint use.	26 nurses across 5 ICUs	Questionnaire	Nurses saw restraint as a means of ensuring patient safety. Nurses who disagreed with restraint did not feel able to change practice.	Lack of standardised practice. Judgement & assessment.

Appendix B - Summary of appraisal using the MMAT.

Appraisal of qualitative papers.

Author	Are there clear research questions or objectives	Does the collected data allow the question to be addressed?	Single or multi-centre?	1.1 Are the sources of data relevant to the research question?	1.2 Is the process for analysing data relevant to the research question?	1.3 Is appropriate consideration given to how the findings relate to the context?	1.4 Is appropriate consideration given to how findings relate to researchers' influence?	Ethical approval?
Aitken et al (2009)	3	3	Single-centre	Yes	Can't tell Thematic analysis, no excerpts given.	No. Minimal information about ICU context.	Can't tell.	Yes
Dolan & Looby (2017)	3	3	Single-centre	Yes	Yes	Yes	No	Yes
Freeman et al (2016)	3	3	2 ICUs in NW UK	Yes	Yes	Yes	Can't tell.	Yes
Langley et al (2011)	3	3	3 ICUs	Can't tell. Selection process unclear.	Yes	Yes	No Researchers' perspectives not evident.	Yes
Lopetrone (2006)	3	3	2 cardiovascular ICUs	Can't tell Rationale for asking for 5	Yes	No	Yes	Yes

				years experience not given.				
Palacios-Cena et al (2016)	3	3	5 ICUs in Madrid	No Purposive sample. Inclusion and exclusion criteria not given.	Yes	Yes	Can't tell. No medics in research team. Minimal reflexivity.	Yes

Appraisal of quantitative papers

Author	**Are there clear research questions or objectives?**	**Does the collected data allow the question to be addressed?**	**Single or multi-centre?**	**4.1 Is the sampling strategy relevant to address the quantitative research question?**	**4.2 Is the sample representative of the population understudy?**	**4.3 Are measurements appropriate (clear origin, or validity known, or standard instrument)?**	**4.4 Is there an acceptable response (60% or above)?**	**Ethical approval?**
Bebenishty et al (2010)	✓	✓	34 ICUs 9 countries in Europe	Yes	Can't tell. Extent to which unit practices represent country-wide practice unknown.	Yes	Can't tell. Data not provided on number of ICUs invited to participate.	Yes
Choi & Song (2003)	✓	✓	Single-centre	Yes	Can't tell. Single-centre study. Patient	Can't tell. No validated tool to assess	Can't tell.	Yes

					demographics not given.	agitation. Tools developed for study.	Response rate not given.	
De Jonghe et al (2013)	✓	✓	121 Dutch ICUs	Yes	Yes	Yes	Yes	Yes
Fraser (2000)	✓	✓	Single-centre	Yes Power calculation suggests a larger sample would be preferable.	Can't tell, Single-centre.	Yes. But potential subjective interpretation of SAS noted.	N/A	Yes
Freeman et al (2016)	3	3	2 ICUs	Yes	Yes	Yes	No 38.9% response rate.	Yes
Kandeel & Attia (2013)	✓	✓	11 ICUs	Yes. Convenience sample of ICU nurses (no details of how this was selected).	Yes.	Yes.	Can't tell. Response rate and % patients restrained not given.	Yes
Langley et al (2011)	3	3	3 ICUs	Yes	No	Yes	N/A	Yes
Luk et al (2015)	✓	✓	2 ICUs	Yes.	Yes.	Yes.	N/A	Yes
Luk et al (2014)	✓	✓	ICUs in 9 provinces	Yes	Yes	Yes	N/A	Yes

Martin & Mathisen (2005)	✓	✓	3 ICUs in USA 2 ICUs in Norway	Yes	Yes	Yes	N/A	Yes
Micek et al (2005)	✓	✓	Single-centre	Yes	Yes	Yes	N/A	Yes
Pisani et al (2013)	3	3	Single-centre	Yes	Yes	Can't tell. RASS not included in results, no data about reason for drug administration.	N/A	Yes
Stinson (2016)	3	3	413 critical care nurses from across the USA	Yes	No 88% of sample are 'expert' nurses. No inclusion/exclusion criteria given.	Yes	Can't tell. Response rate not described.	Anonymity assured, voluntary survey
Suliman et al (2017)	3	3	12 ICUs	Yes	Yes. Representative of Jordanian ICU population.	Yes	Yes	Yes
Svenningsen (2013)	3	3	3 Danish ICUs	Yes	Yes	Yes	N/A	Yes
Mac Sweeney et al (2010)	3	3	681 UK intensivists	Yes	Yes	Yes	No 52% response rate.	Yes
Turgay et al (2009)	3	3	7 hospitals in the Izmir region.	Yes	Yes Representative of Turkish ICU population.	Can't tell. Questionnaire not validated or piloted.	No. 40% response rate.	Yes

van der Kooi et al (2015)	3	3	25 Dutch ICUs	Yes	Yes Representative of Dutch ICU population.	Yes	Can't tell. Response rate amongst staff not given.	Yes

Appraisal of mixed-methods papers

Citation	5.1 Is the mixed methods research design relevant to address the qualitative and quantitative questions?	5.2 Is the integration of qualitative and quantitative data relevant to address the research question?	5.3 Is appropriate consideration given to the limitations associated with this integration?
Freeman et al (2016)	Yes	Yes	No. Divergence of results highlighted but not explored.
Langley et al (2011)	Yes	Can't tell. Results treated separately ?any integration.	No. Not discussed.

Appendix C – Publications associated with this thesis

Publications

Freeman, S., & Teece, A. (2017). Critical care nursing: caring for patients who are agitated. *Evidence-Based Nursing*, 20(4), 101–103. https://doi.org/10.1136/eb-2017-102782

Teece, A., Baker, J., & Smith, H. (2020). Identifying determinants for the application of physical or chemical restraint in the management of psychomotor agitation on the critical care unit. *Journal of Clinical Nursing*, 29(1-2), 5–19. https://doi.org/10.1111/jocn.15052

Teece, A., Baker, J., & Smith, H. (2021). Understanding the decision-making of critical care nurses when restraining a patient with psychomotor agitation secondary to hyperactive delirium: A “Think Aloud” study. *Journal of Clinical Nursing.* https://doi.org/10.1111/jocn.15889

Teece, A., Baker, J., & Smith, H. (2021). Using audio-visual vignettes to collect data remotely on complex clinical care: a practical insight. *Nurse Researcher*, 29(2), 41–48. https://doi.org/10.7748/nr.2021.e1769

Teece, A. (2022). Managing agitation secondary to hyperactive delirium in deteriorating patients. *Nursing Standard*, 37(1), 46–50. https://doi.org/10.7748/ns.2021.e11730

Blogs

Teece, A. & Freeman, S. (2017). Caring for agitated patients. 14 May. *Evidence-Based Nursing.* [Online]. [Accessed 16th June 2021]. Available from: https://blogs.bmj.com/ebn/2017/05/14/caring-for-agitated-patients/

Teece, A. (2017). The unpopular patient in the intensive care unit. 4 December. *Evidence-Based Nursing.* [Online]. [Accessed 16th June 2021]. Available from: https://stg-blogs.bmj.com/ebn/2017/12/04/the-unpopular-patient-in-the-intensive-care-unit/

Teece, A. (2019). Delusions in intensive care: How can healthcare professionals help? 13 March. *Mental Health Research Leeds.* [Online]. [Accessed 16th June 2021]. Available from: https://mentalhealthresearchleeds.co.uk/2019/03/13/delusions-in-intensive-care-how-can-healthcare-professionals-help/

Teece, A. (2019). Using audio-visual vignettes to explore how nurses make the decision to restraint delirious patients on the critical care unit. 30 July. *Mental Health Research Leeds.* [Online]. [Accessed 16th June 2021]. Available from: https://mentalhealthresearchleeds.co.uk/2019/07/30/icurestraint-audio-visual-vignettes/

Conference presentations & posters

Teece, A. (2019). *An exploration of factors impacting on the nurse's decision to restrain a delirious patient on the critical care unit.* European Delirium Association Annual Conference. 6 September, Edinburgh.

Teece, A. (2019). *Using audio-visual vignettes to explore how nurses make the decision to restrain a delirious patient on the critical care unit.* [Poster]. European Delirium Association Annual Conference. 6 September, Edinburgh.

Teece, A. (2021). *Understanding how critical care nurses make the decision to restrain a delirious patient: A 'Think Aloud' study.* British Association of Critical Care Nurses Annual Conference. 14 September, online.

This conference paper was awarded the prize for ‘Best Abstract’.

REVIEW

Journal of Clinical Nursing WILEY

Identifying determinants for the application of physical or chemical restraint in the management of psychomotor agitation on the critical care unit

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Funding information
The review was undertaken as part of a PhD study (AT) at the University of Leeds.

Abstract

Aims and objectives: To identify key determinants, which lead to the decision to apply physical or chemical restraint on the critical care unit.

Background: Psychomotor agitation and hyperactive delirium are frequently cited as clinical rationale for initiating chemical and physical restraint in critical care. Current restraint guidance is over a decade old, and wide variations in nursing and prescribing practice are evident. It is unclear whether restraint use is grounded in evidence-based practice or custom and culture.

Study design: Integrative review.

Method: Seven health sciences databases were searched to identify published and grey literature (1995–2019), with additional hand-searching. The systematic deselection process followed PRISMA guidance. Studies were included if they identified physical or chemical restraint as a method of agitation management in adult critical care units. Quality appraisal was undertaken using Mixed Methods Appraisal Tool. Data were extracted, and thematic analysis undertaken.

Results: A total of 23 studies were included. Four main themes were identified: the lack of standardised practice, patient characteristics associated with restraint use, the struggle in practice and the decision to apply restraint.

Conclusions: There are wide variations in restraint use despite the presence of international guidance. Nurses are the primary decision-makers in applying restraint and report that caring for delirious patients is physically and psychologically challenging. The decision to restrain can be influenced by the working environment, patient behaviours and clinical acuity. Enhanced clinical support and guidance for nurses caring for delirious patients is indicated.

Relevance to clinical practice: Delirium and agitation pose a potential threat to patient safety and the maintenance of life-preserving therapies. Restraint is viewed as one method of preserving patient safety. However, use appears to be influenced by previous adverse experiences and subjective patient descriptors, rather than robust evidence-based knowledge. The need for a precise language to describe restraint and quantify when it becomes necessary is indicated.

ORIGINAL ARTICLE

Journal of Clinical Nursing WILEY

Understanding the decision-making of critical care nurses when restraining a patient with psychomotor agitation secondary to hyperactive delirium: A 'Think Aloud' study.

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Abstract

Aims & Objectives: This study aimed to explore the decision-making processes undertaken by critical care nurses when considering restraint to manage a patient with psychomotor agitation secondary to hyperactive delirium.

Background: Psychomotor agitation is frequently cited as clinical rationale for initiating chemical or physical restraint. Despite the presence of clinical guidance for restraint in critical care, wide variations in nursing and prescribing practice are evident. Nurses are the primary decision makers when initiating restraint, but little is known about this process and influencing factors.

Design: A pragmatic qualitative approach was used to explore critical care nurses' decision-making processes.

Methods: A 'think aloud' approach was undertaken. Audio-visual vignettes featuring simulated patients were used as stimulus to elicit decision-making processes from thirty critical care nurses and practitioners. The COREQ checklist was followed.

Results: Five themes relating to restraint were identified: Intrinsic beliefs and aptitudes; Handover and labelling; Failure to maintain a consistent approach; Restraint might be used to replace vigilance; The tyranny of the now.

Conclusions: Restraint was more frequent when staffing ratios were reduced below 1:1 and opportunities for vigilance reduced. Participants described physical and psychological exhaustion when caring for a patient with delirium and how this might lead to restraint to create 'space' for respite. Variations in practice were evident and restraint use appears rooted in custom and culture rather than objective assessment.

Relevance to clinical practice: The lack of pre-emptive management for hyperactive delirium and reduced staffing ratios lead to the decision to restrain to preserve safety in acute agitation. The struggle to manage agitated behaviour is associated with nurse burnout and reduced engagement with therapeutic management methods, suggesting the need for psychological and educational support for clinical staff. Delirium is an important and debilitating form of organ dysfunction which should be collaboratively managed by the multi-disciplinary team.

Why you should read this article:

- To appreciate that audiovisual vignettes provide innovative and engaging ways to gather rich qualitative data
- To understand how they allow complex areas of practice to be explored without disrupting clinical care
- To gain an insight into the development and filming of six vignettes and their use in a qualitative research project

Using audiovisual vignettes to collect data remotely on complex clinical care: a practical insight

Angela Teece, John Baker, Helen Smith

Citation
Teece A, Baker J, Smith H (2021) Using audiovisual vignettes to collect data remotely on complex clinical care: a practical insight. Nurse Researcher. doi: 10.7748/nr.2021.e1769

Peer review
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Conflict of interest
None declared

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Abstract

Background Vignettes are regularly used in nursing research and education to explore complex clinical situations. However, paper-based vignettes lack clinical realism and do not fully recreate the pressures, sights and sounds of clinical settings, limiting their usefulness when studying complex decision-making processes.

Aim To discuss the approach taken by the authors in developing and implementing audiovisual vignettes to collect data remotely in a qualitative study.

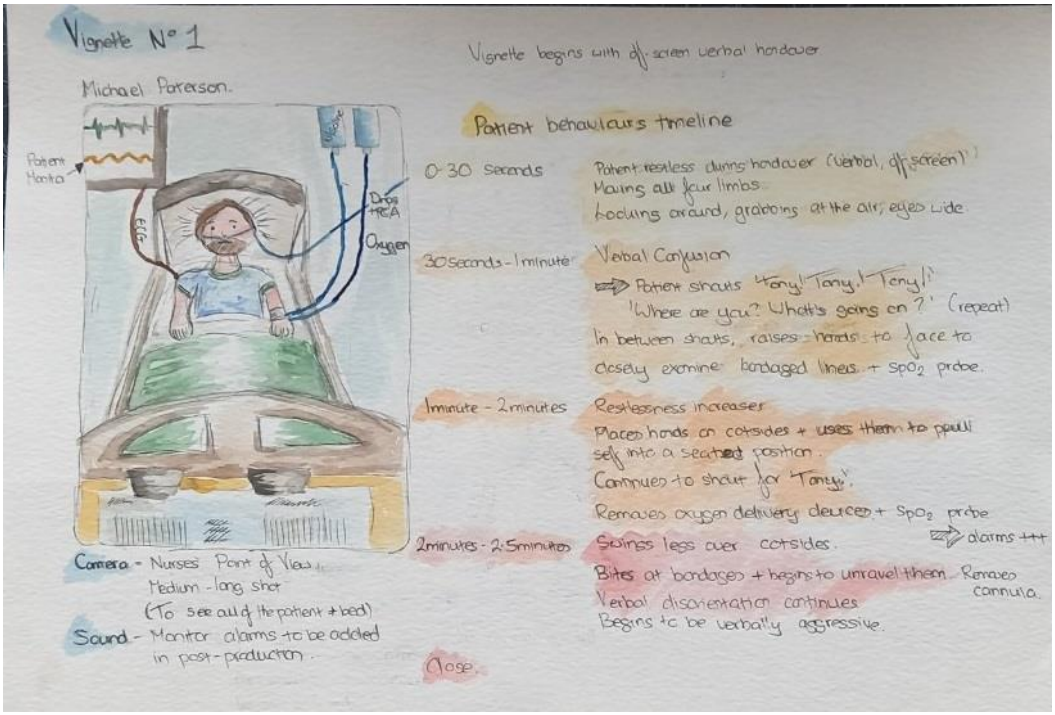
Discussion The authors describe how they created audiovisual vignettes for a qualitative 'Think Aloud' study exploring how critical care nurses decide whether to restrain agitated patients with varying degrees of psychomotor agitation. They discuss the practicalities of filming, editing and hosting, as well as the theoretical and clinical background that informed the creation of the vignettes.

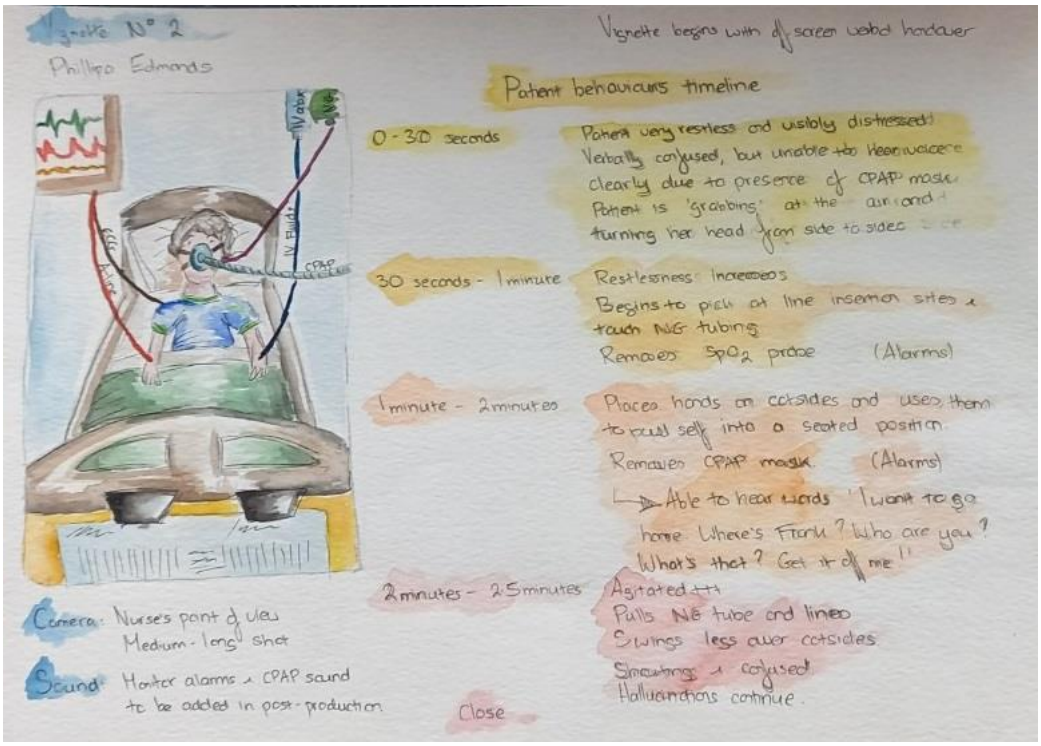
Conclusion Audiovisual vignettes are a cost- and time-effective way of remotely exploring decision-making in challenging environments. This innovative method assists in studying decision-making under simulated clinical pressures and captures data about how people make complex decisions.

Implications for practice Audiovisual vignettes are an innovative tool for collecting data and could also be used in educational settings and offer the opportunity to explore complex clinical decision making remotely. Clinical accuracy is essential for immersing participants and simulating an environment and its pressures. The method could be further enhanced by making vignettes responsive to participants' decisions.

Appendix D – Vignette storyboards

The vignettes can be viewed via my [YouTube channel.]





Vignette N° 3

Josh Simpson

Camera – Nurse's point of view
Medium - long shot
(To see all of patient + bed)

Sound – Monitor + ventilator alarms to be added in post-production)

Patient behaviours timeline

0-30 seconds – Patient is clearly restless, shuffling around in the bed. He is non-verbal, but constantly mouthing nonsensical phrases.
He removes his SpO_2 probe (alarms)

30 seconds - 1 minute – Remains restless.
Coughs, localises to trache site with hands.
Explores site, and holds suction tubing.
Kicks blankets off the bed.

1 minute - 2 minutes – Continues to hold suction tubing + begins to pull. Reaches for NG tube and picks at dressing.
Has shuffled down the bed + is slouched!

2 minutes - 25 minutes – Begins to disconnect trache tubing
Coughing +++

Close

Vignette N° 4

Roger Lakeland

Camera: Nurse's point of view
Medium - long shot

Sound: Monitor + ventilator sounds to be added in post-production

Patient behaviours timeline

0-30 Seconds – Patient is slightly restless, moving all limbs, not localising.
Eyes are open, making irregular breaths

30 Seconds - 1 minute – Restless. Coughing. Eyes wide. RR↑
Moves limbs with more purpose,
Raises hands to face.

1 minute - 2 minutes – More agitated.
Localises to suction tubing. Explores line insertion sites.
SpO_2 probe removed (alarms)

2 minutes - 25 minutes – Localises strongly to oral tube.
Coughs +++. Pulls CVC.
Moving limbs strongly.

Close

Vignette N° 5

Sarah Robinson

Camera: Nurse's point of view
Medium-long shot

Sound: Monitor + ventilator sounds and alarms

Patient behaviours timeline

0-30 seconds	Patient has eyes open, appears frightened. Moving head from side to side. Hands explore IV sites
30 seconds - 1 minute	Shakes head vigorously. Coughs. Moving legs.
1 minute - 2 minutes	Begins to localise to ETT and NG tube, Removes SpO_2 probe. Eyes wide, shaking head side to side.
2 minutes - 2.5 minutes	Localises strongly to ETT. Pulls out peripheral cannulae.

Close

Vignette N°6

Sharon Dobbs

Camera: Nurse's point of View
Medium-long shot

Sound: Monitor + ventilator sounds to be added in post-production.

Patient behaviours timeline

0-30 seconds	Patient is restless and highly vigilant. She is looking around. Eyes wide, breathing rapidly
30 seconds - 1minute	Restless and frightened. Picks at line insertion sites. Removes SpO_2 probe.
1 minute - 2 minutes	Begins to localise to trache site. Coughs +++ Sits self forward in bed and looks aroused.
2 minutes - 2.5 minutes	Pulls on suction tubing - coughs +++ Swings legs over bedsides

Close

Appendix E – Handover scripts

Vignette 1:

You are already caring for a level 2 patient (stable on CPAP hood +5/Hi-Flo, good ABGS, to wean to FM today). It's late morning on your second long day. Physio is seeing your patient, and she needs your help to get her out of bed. She hasn't been washed yet. The unit is very busy and your colleague has been asked to admit an unstable level 3 admission. Would you mind taking over the care of her patient too please?

Michelle Paterson (55) has been on the unit for 4 days following a motorcycle vs car RTA. She has fractured three ribs on her left side. Past medically, she is known to drink alcohol to excess and is a heavy smoker.

She was extubated on day 2, and is maintaining good sats on 3lts via nasal cannulae. Cardiovascularly stable, taking diet and fluids, and self-voiding on a commode. She's been sat out of bed.

Main issues are pain, she has a Morphine PCA, which she is using to excess. Pain review pending, but she had some extra boluses last night. Also, she needed Haloperidol overnight – she was verbally abusive to the staff, and was shouting for a drink at 3am, and waving her monitoring around. She tried kicking too, so they got the Dr to write her up for Haloperidol, and she settled after a couple of boluses. She's needed it again this morning, and I've left the syringe in the CD cupboard in case you want it. Pretty unpleasant woman, hopefully we can ward her soon.

Vignette 2:

You are waiting for a patient to return from theatre following elective orthopaedic surgery. The patient is only coming to the unit as they have multiple co-morbidities. They are expected to be an easy level 2 admission. It's mid-afternoon on your long-day. You have just discharged your patient and cleaned their bedspace.

I've just had to send a staff nurse home sick, would you mind taking over the care of her patient?

Phillipa Edmonds is a 74 year old lady, she's day 4 post-Hartmann's and end colectomy for Ca colon. She was extubated on day 2, but her chest is productive and her gases deteriorated, so last night she went onto CPAP via mask +7.5, FiO2 .55. Gases have been better, achieving PO2 around 9.5. She's still productive. Cardiovascularly stable, Norad off and CVC out. She's started some low-dose NG feed and seems to be absorbing. Stoma is pink and warm,and has begun to function. Good UO and apyrexial on IV antibiotics.

She's been increasingly confused over the past 24 hours. She was CAM-ICU +ve yesterday afternoon. RASS is between +1 and +2, she's restless and moving around the bed. It's difficult to hold a sustained conversation with her, and I suspect she is hallucinating. Intermittently, she gets more agitated and tried to swing her legs out of bed. She managed to get her CPAP off last night when her nurse went on break, so she definitely needs you to be vigilant.

Vignette 3:

You have come on duty for a long day, and are asked to care for Jack Simpson. Jack is 78, and has been on the unit for 23 days. Initially presented as a community

acquired pneumonia, on a background of COPD, T2DM and raised BMI. He failed a trial of NIV, and is now a slow wean via tarche. Perc trache inserted on day 14. He's currently weaning on PS 12/7, .35, chest very productive. Gases are acceptable. CVS stable, absorbing NGF, good UO. His wean is made difficult by his agitation. He seemed very quiet until about three days ago, when he became really restless, shuffling down the bed and pulling at his lines. He kept disconnecting from the vent last night and blew sputum all over one of the night staff. He screened as CAM-ICU +ve, so they started some Olanzipine. He needed Haloperidol bloluses last night, staff found him halfway out of bed with his NG out… He definitely needs watching, but be careful, he was kicking last night, and tries to bite when you go to suction him. I'm sure he knows what he's doing though.

Vignette 4:

You have just started your second long day. You are asked to care for Roger Lakeland, a 65 year old chap, who is day 5 post-emergency open AAA repair. Past medical history of HTN and smoking (patch in-situ). We're aiming to extubate today – he failed yesterday as he was very confused, but the doctors are really keen to pull the tube today. He's currently fully-ventilated on BiPAP 16/7.5 .4 but we're hoping to wean to PS once he begins breathing spontaneously. His BP is supported by a weaning dose of Norad, otherwise CVS stable. NG feed currently off, good UO. All sedations off. As you go to take bedside handover, Roger appears around RASS +1 in the bed.

Vignette 5:

It's the start of your first long day of two. Could you please take over the care of the lady in bed 4? It's Sarah Robinson again I'm afraid, our resident frequent flyer.

She's a 27 year old lady with numerous mental health issues, including DSH and multiple ICU admissions for ODs. Admitted this time for a poly-pharmacy OD including tricyclics – QT improving on her 12-lead ECG. She's currently ventilated on CPAP ASB 10/5 .35. ABGs are good. CVS stable, Phenylepherine weaned off but still attached. NG in-situ on free-drainage. No sedations on. She's waking slowly, but when we rolled her, she localised strongly to her tube and took a while to settle again. Doctors are keen to extubate today and get her back under her own team. As you approach Sarah, she appears restless, her eyes are wide open and staring.

Vignette 6:

It is early afternoon. Your patient, Sharon, failed a trial extubation yesterday due to agitation and a high sputum load. She has a perc trache on the unit this morning and now has her sedations off. She is beginning to wake up.

Sharon was admitted with a severe CAP on a background of COPD and smoking. She is currently ventilated on CPAP ASB 12/8 .45 with gases within her normal range. Her chest is very productive. CVS – she is in AF (normal for her) and is requiring a low-dose Norad infusion to maintain her MAP over 65mmhg. She was absorbing her NGF and this has been restarted. Previously CAM-ICU +ve on her hold yesterday, she has again scored +ve today. Sharon is hypervigilant and restless, moving repeatedly down the bed and not following instructions.

Appendix F – Topic guide

1. **Introduction**

- Introduce self and study topic (part of a PhD at the University of Leeds).
- Start recording now.
- Explain study aims and objectives and read through consent sheet.
- We will be watching three short videos on YouTube and talking about them.
- Estimated time the interview will take (30-45 minutes/ 'up to you')
- Questions?
- Happy to continue?

2. **Background**

Aim: To begin the interview, and get the participant talking freely. Find out contextual information about the participant's current role.

- What is your job role?
- How long have you worked in critical care?
- Have you completed a post-registration qualification in critical care?
- Did this include education on delirium and/or restraint?

3. **Are you ready to watch the first video?**

Aim: To check technology is working and participant is able to view the vignettes.

- WiFi available and working via suitable device (tablet/laptop/TV etc)
- URL correct – participant on the correct YouTube channel
- Direct participant to their first vignette (1-6)

4. **Post-handover**

Aim: To explore whether patient descriptors (subjective vs objective) and unit acuity/staffing ratio cause preconceptions which may affect management strategies.

- What was going through your mind as you received handover?
- Can you tell me any more about that?
- Would this influence your management of the patient?
- How?

- Could include:
    - Patient (PMH, presentation, level of care)
    - Descriptors
    - Staffing
    - Doubled/staffing ratio
    - Shift type
    - Unit culture/usual practices

5. At each pause point:

Aim: To explore whether specific patient behaviours and device interferences lead to the decision to restrain.

- What was going through your mind as you watched the patient?
- Can you tell me some more about that?
- What would you do?
- Can you explain your reasoning there?

Chemical restraint (bolus or start infusion)	**Non-pharm/therapeutic…**	Evidence based/protocol
Physical restraint (mitts, cuffs, tight sheets…)	Orientation, relatives, media	Unit custom and practice
	Touch & reassurance	Efficient
	Mobilisation	Staffing/safety
	Increased vigilance (RN or HCA/'special')	Tired
	Assistance from colleagues (nursing)	Peer pressure
	Seek medical advice/assistance	Previously effective
	'Let it ride' – watchful waiting	Education
	Nothing/ignore	Didn't know what else

Use chart as discussion prompts

6. After watching each/all vignettes:

Aim: To allow full discussion of interesting points noted during TA, and discussion of any management decisions not raised during TA.

- You didn't mention…. Why was that?
- Can you talk a bit more about that?
- Why did/would you choose to do *x* over *y*?
- Is there anything else you would like to mention?

7. In conclusion

Aim: To bring the interview to a close.

- Thank the participant for their time.
- The participant is welcome to contact the researcher to ask questions or add anything at a later date if they wish.

End recording.

Participant distress

Participants may become distressed (for example, the vignettes may remind them of a challenging clinical case).

- Acknowledge distress ('Are you okay? Would you like to stop the interview for a while?')
- Allow the participant to express themselves (recording paused if requested).
- 'Are you ready to continue the interview?'
- 'Back off' from topic if appropriate, and return later ('Would it be okay for you to tell me a bit more about…?')
- Refer to participant information sheet and suggested sources of continuing support.

Appendix G – Copy of participant consent form

Participant Identification Number:

INTERVIEW CONSENT FORM (Critical care nurses)

Title of Project: **Exploring critical care nurses' decision making when employing chemical or physical restraint to manage hyperactive delirium.**

1.	I confirm that I have read and understand the information sheet dated for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected. I can withdraw my data from the study up to the point of analysis.	☐
3.	I understand that relevant sections of the data collected during the study, may be looked at by individuals from the University of Leeds or from regulatory authorities where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	☐
4.	I agree to the use of digital recording during the interview.	☐
5.	I agree to the use of direct quotations from my interview in publications in peer-reviewed journals or conference presentations on the understanding that my real name or identifying details will never be used.	☐
6.	I understand that the information I provide will be kept confidential **unless** I disclose something which reveals that a person is at risk of harm or has been harmed in such a way that could be reduced if this information was reported. Furthermore, any potential disclosure would be discussed with me first.	☐
7.	I recognise that I can decline to answer particular questions without negative consequences.	☐
8.	I agree for the **anonymised** data collected from me to be stored in the Research Data Leeds Repository. This means it may be used in relevant future research and other genuine researchers will have access to this data and may use my words in publications, reports, webpages, and other research outputs.	☐
9.	I agree to take part in the above study.	☐
10.	I would like to be informed of the findings of this research and agree to my name and email / address being added to a mailing list that will be used solely for the purposes of disseminating the findings of this research.	☐

Appendix H – Participant information sheet

Participant Information Sheet

Exploring critical care nurses' decision making when employing chemical or physical restraint to manage hyperactive delirium.

You are invited to take part in this research study. Before you decide you should understand why this research is being undertaken, and what it would involve for you. Please ask if anything is not clear, and talk to others about the study if you wish.

What is the purpose of this study?

The use of chemical and physical restraint is common in critical care, however, clinical guidance is over a decade old and nurses have expressed concern over variations in practice, and the challenge of objectively quantifying the level of agitation at which restraint becomes appropriate.

This study aims to explore how nurses make decisions when choosing to apply physical and/or chemical restraint when managing a patient displaying psychomotor agitation and delirious behaviour.

Why have I been invited?

You have been invited to take part because you responded to an invitation issued via social media and you meet the inclusion criteria for the study. You will be a registered nurse working in critical care in the United Kingdom.

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. If you want to take part, you may wish to keep this information sheet in a safe place.

What will happen to me if I take part?

If you do decide to take part, you will be invited to take part in an interview which will last no more than an hour. It will be conducted by myself, a PhD student from the University of Leeds. I will ask you to describe how you would manage patients portrayed in a series of video clips, and then ask some questions regarding your experience of caring for patients with delirium and the use of restraint.

The interview will be at a time and date which is convenient to you. It can be carried out over the telephone. You will need to have access to the internet and YouTube. The URL will be provided at the start of the interview. You will be asked to pause the videos at identified points to allow discussion.

If you think you would like to be interviewed, please contact myself (Angela Teece a.m.teece@leeds.ac.uk) via email, providing your name, occupation, contact number and email. You will then be contacted to discuss your participation and consent, or, in the event of too many applicants, notified of this via email and thanked for your interest in the study.

Verbal consent will be requested at the beginning of the interview. After giving consent you are still free to withdraw at any time and without giving a reason. You are also able to decline to answer specific questions without giving a reason. Following the completion of the interview, your data in the form of the audio recording can be withdrawn from the study at your request up until it has been analysed (approximately 6-8 weeks after your interview).

The interviews will be digitally recorded. After the interview, the whole interview will be typed up by the researcher and an external transcription company, approved by the University. We do this to help us remember what people said and to make sure that all comments are available for the research.

What are the possible advantages and disadvantages and risks of taking part?

The information you provide might help improve the way critical care patients with delirium are managed in the future. Depending on your experiences, you may find talking about your experiences upsetting, if this is the case we will ensure you are provided with sources of support afterwards. These might include staff counselling services offered by the employing Trust, self-referral to your GP, or national support services such as The Samaritans (116 123).

Will my taking part in the study be kept confidential?

Yes, with exceptions. The exception to this would be if you share something with me that discloses that a person is at risk of harm, or has been harmed, in such a way that would be reduced if we were to disclose the information you have provided. In these cases I may be required to act on the information and report to my supervisor, but I would not do this without involving you in this process.

All personal information about you will be handled in confidence. Data will all be in electronic formats and will be stored on University of Leeds encrypted devices. The transcribed audio files will be used only for analysis and no one outside the project will be allowed access to the original recordings. I will keep these files for five years after the end of the study, but after that, they will be destroyed. Any identifying features that might be mentioned during the interview will be removed from the transcript.

I will keep your name and contact details confidential and will not pass this information to the University of Leeds. I will use this information as needed, to contact you about the research study, and to oversee the quality of the study. Certain individuals from the University of Leeds and regulatory organisations may look at your research records to check the accuracy of the research study. The University of Leeds will only receive information without any identifying information. The people who analyse the information will not be able to identify you and will not be able to find out your name or contact details.

The research team will keep identifiable information about you from this study for five years.

What if there is a problem?

If you have a concern about any aspect of this study you should contact **Angela Teece** on 0113 3431199, or by email a.m.teece@leeds.ac.uk

If they are unable to resolve your concerns, or you wish to make a complaint regarding the study, please contact **Professor John Baker** (principal supervisor) on 0113 3431271 or by email to j.baker@leeds.ac.uk.

What will happen to the results of the research study?

The results will be published as a series of academic papers and conference presentations. When results are written up, all personal details will be removed so that no-one will know who you are. Direct quotes from the interview may be used in publications in peer-reviewed journals and conference presentations, but pseudonyms will be used in place of actual names.

What will happen to the data generated by the study?

The University of Leeds has a policy of encouraging researchers to deposit research data in the University of Leeds Research Data Repository (known as Research Data Leeds). This allows data to be shared, reused and cited beyond the end of a project. Research Data Leeds holds deposited data for a minimum of 10 years. We will deposit ***fully anonymised*** interview transcripts to this repository ***only if you consent*** to this during the consent process. If you do not give consent, then your data will not be uploaded to the repository.

Who is organising and funding the research?

This study is organised and funded as part of a PhD at the University of Leeds.

The University of Leeds is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. The University of Leeds will keep

identifiable information about you until transcription. Identifying features will be removed from the transcripts and audio files deleted.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting governance-ethics@leeds.ac.uk.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by University of Leeds School of Healthcare Research Ethics Committee (Ref: HREC 18-003).

Thank you for taking time to read this information sheet

Appendix I Letters of favourable ethical review

The Secretariat
University of Leeds
Leeds, LS2 9JT
Tel: 0113 3431642
Email: FMHUniEthics@leeds.ac.uk

UNIVERSITY OF LEEDS

12 February 2019

Angela Teece
Lecturer in Adult Nursing & PGR
School of Healthcare
Faculty Medicine & Health
Rm 1.07 Baines Wing
University of Leeds
LEEDS LS2 9JT

Dear Angela

Ref no: **HREC 18-003**

Study Title: **Exploring critical care nurses' decision making when employing chemical or physical restraint to manage hyperactive delirium**

Thank you for submitting your documentation for the above project. Following review by the School of Healthcare Research Ethics Committee (SHREC). I can confirm a conditional favourable ethical opinion based on the documentation received at date of this letter and subject to the following condition which must be fulfilled prior to the study commencing:

- **The tick box in A8 should be unticked as participants are not being recruited by virtue of NHS employment**

The study documentation must be amended as required to meet the above condition and submitted for file and possible future audit. *Once you have addressed the conditions and submitted for file/future audit, you may commence the study and further confirmation of approval is not required.*

Please note, failure to comply with the above conditions will be considered a breach of ethics approval and may result in disciplinary action.

Document Received	*Version*	*Date Received*
EthicsReviewFormATv2Jan19	2.0	14/01/2019
AT Restraint Topic guideV2	2.0	14/01/2019
ATRestraintConsentFormV2Jan19	2.0	14/01/2019
ATRestraintParticipantInfoV2Jan19	2.0	14/01/2019
FieldworkAssessmentATrestraintV2	2.0	14/01/2019
HREC 18-003 AT Restraint Recruitment tweet	1.0	31/10/2018
HREC 18-003 AT Restraint Vignettes	1.0	31/10/2018
RE Delirium research email Programme Lead	1.0	31/10/2018

Please notify the committee if you intend to make any amendments to the original research as submitted at date of this approval. This includes recruitment methodology and all changes must be ethically approved prior to implementation. Please contact the Faculty Research Ethics Administrator for further information FMHUniEthics@leeds.ac.uk

Ethical approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The SHREC takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, risk assessments and other documents relating to the study. This should be

kept in your study file, and may be subject to an audit inspection. If your project is to be audited, you will be given at least 2 weeks notice.

It is our policy to remind everyone that it is your responsibility to comply with Health and Safety, Data Protection and any other legal and/or professional guidelines there may be.

The committee wishes you every success with your project.

Yours sincerely

Hconvey

Helen Convey
Chair, School of Healthcare Research Ethics Committee (SHREC)

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Miss Angela Teece
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Email: hra.approval@nhs.net
HCRW.approvals@wales.nhs.uk

26 June 2019

Dear Miss Teece

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**Exploring critical care nurses' decision making when employing chemical or physical restraint to manage hyperactive delirium.**
IRAS project ID:	**264614**
REC reference:	**19/HRA/3341**
Sponsor	**University of Leeds**

I am pleased to confirm that HRA and Health and Care Research Wales (HCRW) Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see IRAS Help for information on working with NHS/HSC organisations in Northern Ireland and Scotland.