

**Facilitators and barriers to extending prescribing authority to  
pharmacists in Nigeria: a mixed methods study**

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The candidate confirms that the work submitted is his 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 and 4 of the thesis included work that has been published in jointly authored publications. Details of the publications are as follows:

- Auta A, Maz J, Strickland-Hodge B. Perceived facilitators to change in hospital pharmacy practice in England. *International Journal of Clinical Pharmacy*. DOI:10.1007/s11096-015-0153-9 (online first article)
- Auta A, Strickland-Hodge B, Maz J, Alldred DP. Pharmacist prescribing in the United Kingdom and the implication for the Nigerian context. *West African Journal of Pharmacy*. 2015; 26(1): 54-61

In both publications, I was the primary author. I designed and conducted the studies on which the publications were based. The co-authors of these publications, Barry Strickland-Hodge, Julia Maz and David P. Alldred provided advice on the structure and content of the work.

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## Abstract

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**Background and aim:** In Nigeria, only medical doctors, dentists and some nurses in primary care facilities have the legal right to prescribe medicines. Patients' access to prescriptions can be seriously affected by the shortage of prescribers and waiting times in hospitals. This research was carried out to investigate the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria.

**Methods:** The research employed an exploratory sequential mixed methods design consisting of three studies: The first involved semi-structured interviews with 32 UK pharmacy staff to investigate the changes in the structure of pharmacy practice in order to identify lessons for the Nigerian context. The second was semi-structured interviews with 49 Nigerian stakeholders including policymakers, pharmacists, doctors and patient group representatives to explore their views on pharmacist prescribing in Nigeria. The third was a cross-sectional survey involving 775 Nigerian pharmacists.

**Results:** The UK study suggests that changes in the traditional structure of pharmacy including a shift in the focus of pharmacy training to a patient orientated one, specialisation in practice, the development of a clinical career route, enhanced working relationship with doctors and the utilisation of pharmacy technicians could benefit the development of pharmacists' clinical roles including prescribing. The two Nigerian studies showed a strong support for pharmacist prescribing especially by pharmacists and patient group representatives. The facilitators to pharmacist prescribing identified included pharmacists' expert medicine knowledge, the positive attitude of pharmacists towards extended clinical roles, a positive relationship between doctors and pharmacists in *some* teaching hospitals and the potential benefits associated with pharmacist prescribing including increasing patients' access to medicines. Barriers identified included lack of government support, medical opposition, pharmacists' lack of confidence to do clinical roles, inadequate pharmacists' skills in diagnosis and shortage of pharmacists.

**Conclusion:** This research concludes that a change in the traditional structure of pharmacy would be necessary for the development of pharmacist prescribing in Nigeria. The key areas for change are enumerated in the recommendations of this thesis.

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## List of abbreviations

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AIDS	Acquired Immune Deficiency Syndrome
APTUK	Association of Pharmacy Technicians, United Kingdom
B. Pharm	Bachelor of Pharmacy
CDTM	Collaborative Drug Therapy Management
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CMP	Clinical Management Plan
CPD	Continuing Professional Development
EU	European Union
FMoH	Federal Ministry of Health
GOPD	General Out-Patient Department
GP	General Practitioner
GPhC	General Pharmaceutical Council
GT	Grounded Theory
HIV	Human Immunodeficiency Virus
IPA	International Pharmaceutical Abstracts
NHREC	National Health Research Ethics Committee of Nigeria
NHS	National Health Service
NMP	Non-Medical Prescribing
PCN	Pharmacists' Council of Nigeria
PCNZ	Pharmacy Council of New Zealand
PCT	Primary Care Trust
Pharm D	Doctor of Pharmacy
PLP	Period of Learning in Practice

PSN	Pharmaceutical Society of Nigeria
RCT	Randomised Controlled Trial
SCT	Secondary Care Trust
SHREC	School of Healthcare Research Ethics Committee
SP	Supplementary Prescribing
UK	United Kingdom
UKCPA	United Kingdom Clinical Pharmacy Association
USA	United States of America
WAPCP	West African Postgraduate College of Pharmacists
WHO	World Health Organisation



## CHAPTER 1: INTRODUCTION

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### 1.1 How it all started

My interest in pharmacy practice research stems from my experience as a hospital pharmacist in the first year after qualification as a pharmacist in Nigeria. As a hospital pharmacist, my roles were limited. I was seen by patients and doctors as someone who had no contribution in patients' hospital journey other than to dispense medications according to the doctors' instructions. This left me dissatisfied as a pharmacist knowing that my skills were highly underutilised in the hospital environment. After a year of hospital practice, I moved to the University of Jos to take up a teaching and research post. My hospital experience influenced my research direction at the University as I became much more interested in researching into how pharmacists' roles can be enhanced in practice settings.

My journey to this thesis began in 2011 during the design of the cross-sectional survey that I and other researchers at the University of Jos conducted among 330 hospital and community pharmacists in north-central Nigeria. This survey explored their views on generic medicines substitution and potential generic medicine substitution authority for pharmacists in Nigeria (Auta et al., 2014a). The questionnaire used for the 2011 survey was designed based on the review of the literature. As the research team reviewed the literature the concept of pharmacist prescribing came to the fore. The research team explored this further by designing and conducting a pilot survey that sought patients' opinions on pharmacist prescribing in Nigeria. The pilot survey which included 432 clients of community pharmacists showed a high support (92.5%) for an extended clinical role for pharmacists in prescribing (Auta et al., 2014b). Therefore, my experience during the design of these two studies and the potential benefits associated with pharmacist prescribing in Nigeria informed my decision to pursue doctoral research that considered the facilitators and barriers to extending prescribing authority to pharmacists in Nigeria.

Prior to starting my PhD, I had little understanding of pharmacist prescribing and how it worked within the United Kingdom (UK) healthcare system. Hence, the design of this research including its methodology and objectives was predominantly informed by the review of the literature. The details of how the literature informed key aspects of this research are reported in subsequent chapters. For example, the objectives of the first empirical study conducted *“to investigate the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing in order to identify*

*lessons that might assist in the potential changes needed in Nigeria*” was based on the research gap identified in the literature review conducted in the first year of my PhD.

My background in pharmacy and previous research experience has mainly emphasised the quantitative paradigm. Therefore, I would describe my belief and research orientation prior to starting my PhD as positivism. I was introduced to other research paradigms including qualitative methodology during my Masters degree in Public Health at the University of Leeds and the research methods module (HECS5237M) I undertook in the first year of my PhD. During these periods, I increasingly became aware of the different approaches to research. These exposures challenged my initial positivist view point and provided the foundation to develop my understanding of research methodologies. From this, I was able to match research questions with appropriate methodologies. Therefore, my choice of a mixed methods design and the generic approach in the qualitative component of the mixed methods research conducted was mainly based on their appropriateness in meeting my research objectives (as discussed in chapter 3) and not on my previous research experience.

I employed a pragmatic world view in the research process to enable me to use elements of qualitative and quantitative research to meet my research objectives. Therefore, I employed a constructivist viewpoint in the qualitative component of my research to value multiple (subjective) perspectives of my research participants in order to gain a deeper understanding of the facilitators and barriers to extending pharmacists’ clinical roles to include prescribing (Creswell, 2013, Tashakkori and Teddlie, 1998). In the quantitative component of the research, I worked from a post-positivist perspective in order to pursue objectivity, measure variables and evaluate trends in my data (Creswell and Plano-Clark, 2011).

My interaction with the qualitative interviews conducted with UK participants (reported in chapter 4) was minimal because prior to this research, my experience of pharmacy practice in the UK was limited. It was mainly based on the knowledge gained during the literature review in the first year of my PhD. Therefore, data interpretation in the UK study was mainly supported by the literature. On the other hand, being a Nigerian pharmacist, I am, to a large extent, experienced with pharmacy practice in Nigeria. Therefore, this experience might have influenced key decisions made regarding the Nigerian qualitative study including study objectives and data interpretations reported in chapter 5. However, deliberate efforts were made as outlined in section 5.5 of chapter 5 to ensure the ‘trustworthiness’ of the research. In addition, my knowledge and experience of pharmacy practice in Nigeria enabled me to collect rich data and

produced better in-depth interpretations of the data obtained. For example, as a pharmacy lecturer in Nigeria, I was able to better understand and interpret (while cautious of my personal bias) issues raised by participants regarding the inadequacy of the Nigerian undergraduate programme to prepare pharmacists who are confident in clinical settings. The rich interpretations given concerning this issue in the research would have otherwise not have been provided if the study was undertaken by someone who is inexperienced of pharmacy education in Nigeria.

## **1.2 Research background and rationale**

To prescribe is to “authorize by means of a written prescription the supply of a medicine” (Department of Health, 1999 p.11). Prescribing to patients has traditionally been under the professional domain of doctors and dentists, until the introduction of non-medical prescribing (NMP) in some countries which allowed non-medical professionals including nurses, pharmacists, optometrists, radiographers and physiotherapists to prescribe medicines (Stewart et al., 2012, Kroezen et al., 2011). A number of countries have made legislation for NMP including the United States of America (USA), UK, Australia, New Zealand, Canada, Sweden, the Republic of Ireland, South Africa, Botswana, Kenya and Uganda (Bhanbhro et al., 2011). Nurse prescribing is the most popular form of NMP. Available data shows that Nurses have been authorised to prescribe in 22 countries (Bhanbhro et al., 2011). Pharmacists currently have legal authority to prescribe medicines in the USA, UK, Canada and New Zealand (PCNZ, 2013, Tonna et al., 2008). However, a 2009 global survey of hospital pharmacy practice revealed that hospital pharmacists in 20 countries are involved in the prescribing of medicines under certain local arrangements in emergency situations (Doloresco and Vermeulen, 2009). For instance in Ghana, Tanzania, Anguilla and Argentina, designated pharmacists are allowed to prescribe narcotic analgesics to cancer patients in an emergency (Cleary et al., 2013a, Cleary et al., 2013b).

There are different models of pharmacist prescribing including collaborative and independent models (Tonna et al., 2008, Emmerton et al., 2005). These models are discussed in chapter 2. Furthermore, the type of medicines pharmacists are allowed to prescribe differs across countries. For example, in the UK, pharmacists can prescribe any medicine within their area of competence except cocaine, dipipanone and diamorphine for treating addiction (Statutory Instrument, 2012), while in the US restrictions still exist in some states on pharmacist prescribing of narcotics (Hammond et al., 2003). Also in Canada, pharmacists are not legally allowed to prescribe controlled medicines including narcotics (Law et al., 2012, Steed, 2012).

Despite the challenges associated with the implementation of pharmacist prescribing including opposition from doctors and lack of evidence on its effectiveness (Nissen, 2014), it is gradually being accepted and implemented internationally. For example, pharmacist prescribing started in Canada in 2007 in the Alberta province and by 2012 all the provinces except Quebec had granted prescribing authority to pharmacists (Bacovsky, 2012). Furthermore, in 1997, the American College of Clinical Pharmacy reported that United States pharmacists were able to prescribe under the collaborative agreement in 16 states (Carmichael et al., 1997). In less than 10 years following this report, pharmacists were legally allowed to prescribe in 42 states (Barclay, 2005). The increase in the international recognition of pharmacist prescribing has been facilitated by the desire to ensure prompt patients' access to prescription medicines and better utilisation of pharmacists' skills (Nissen, 2014). Nevertheless, in many developing countries including Nigeria, where access to medicines has remained a public health challenge due to shortage of medical prescribers, pharmacist prescribing is yet to be recognised as an important strategy that would enhance access to medicines.

The legislation concerning prescribing of medicines in Nigeria states that:

*“In tertiary and secondary health care institutions, only duly qualified and licensed medical practitioners shall have the authority to prescribe drugs. At the primary health care level, government shall designate appropriate health care personnel to prescribe drugs; only qualified and licensed medical practitioners shall have the authority to prescribe drugs in the private sector” (FMoH and WHO, 2005 p.25).*

Hence, only medical doctors and dentists have the legal right to prescribe medicines to patients in Nigeria, except in primary health centres (PHCs). Since most PHCs lack doctors, prescribing is mostly done by nurses and community health workers using standing orders or protocols (Ehiri et al., 2005, FMoH, 2010a). However, prescribing by nurses and community health workers has been reported to be inappropriate for a number of reasons including lack of adherence to treatment guidelines and their inadequate knowledge of medicines (Babalola et al., 2011, Ehiri et al., 2005, Fagbule and Kalu, 1995). For example, prescription of antibiotics for the treatment of viral respiratory infections have been reported to be common among them (Ehiri et al., 2005, Fagbule and Kalu, 1995).

The general out-patient department (GOPD) of hospitals in Nigeria serve as the entry points for most patients seeking medical help because of the lack of doctors in PHCs (FMoH, 2007). These GOPDs function more or less like the general practitioner (GP) practices in the UK. Typically, a doctor in a GOPD in Nigeria has approximately 40 – 50

patient consultations per day because of the shortage of doctors (Umar et al., 2011, Ajayi, 2002). In addition, more than 50% of patients visiting GOPDs wait for between one to three hours to see a doctor (Oche and Adamu, 2014, Umar et al., 2011, Ajayi, 2002). As a result, access to medicines in Nigeria can be seriously affected by the shortage of medical prescribers (40 doctors per 100,000 people compared with 280 doctors per 100,000 people in the UK) including general practitioners and specialist physicians (World Bank, 2013) and long waiting times in hospitals (Ehiri et al., 2005, Ajayi, 2002). Thus, it is beyond doubt that the current prescribing arrangements in Nigeria do not sufficiently meet the needs of patients in terms of timely and convenient access to prescriptions. In addition, concerns exist in terms of the safety of prescribing by nurses and community health workers in Nigeria.

Pharmacists in Nigeria are highly educated professionals with expertise in medicines management. Their mode of training follows similar models in advanced countries including the UK (Alo, 2006). It consists of a five-year undergraduate professional programme followed by a one-year pre-registration work-based supervised training (Alo, 2006). In addition, many pharmacists in Nigeria are specialising as clinical pharmacists at various universities and the West African Postgraduate College of Pharmacists (WAPCP, 2012a). About two-thirds of the 482 Nigerian pharmacists who successfully completed the WAPCP fellowship programme as of 2011 were in the specialty of clinical pharmacy (WAPCP, 2012a). Despite the cost and high level of training of pharmacists in Nigeria, their expertise is not used effectively as their roles have not been expanded to a more clinical one. They mainly perform the traditional role of dispensing, which could be handled by suitably trained pharmacy technicians as in other countries such as the UK (Anto et al., 2013, Mullen, 2004).

Pharmacists in Nigeria have shown a willingness for expanded clinical roles including prescribing (Erhun et al., 2013, Oparah and Eferakeya, 2005). Therefore, extending prescribing roles to them would potentially increase patients' access to prescription medicines, reduce doctors' workload, promote efficient use of pharmacists' clinical skills and rational use of medicines. It would also enhance pharmacists' job satisfaction, improve recruitment and retention and increase their contribution to healthcare delivery in Nigeria.

### **1.3 Aim and objectives**

The aim of this research is to investigate the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria.

The objectives are:

- To review pharmacist prescribing in the UK including facilitators and barriers.
- To investigate the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing in order to identify lessons that might assist in the potential changes needed in Nigeria.
- To explore the views of stakeholders involved in prescribing and pharmacy practice about the barriers and facilitators to the extension of a prescribing role to pharmacists in Nigeria.
- To identify the potential changes that would be required in the structure of pharmacy practice for the development of pharmacist prescribing in Nigeria.
- To make practice and policy recommendations for pharmacist prescribing in Nigeria.

#### **1.4 Structure of this thesis**

There are seven chapters in this thesis. **Chapter 1** is this introduction. In **Chapter 2**, a review of pharmacist prescribing is presented. Chapter 2 is organised into three sections: an overview of international experience of pharmacist prescribing; a review of the current evidence in relation to the impact of pharmacist prescribing and a scoping review of the facilitators and barriers to pharmacist prescribing in the UK. **Chapter 3** of this thesis presents the research design. It describes the nature of qualitative and quantitative research and justifies the choice of a mixed methods design for the empirical investigations conducted.

**Chapter 4** presents the first empirical study conducted, which was a qualitative study involving semi-structured interviews with pharmacists and pharmacy technicians in the UK. This study was aimed at investigating the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing in order to identify lessons that might assist in the potential changes needed in Nigeria. The findings of the study reported in Chapter 4 were used to inform the qualitative study reported in Chapter 5. The study in **Chapter 5**, which involves semi-structured interviews with Nigerian stakeholders including pharmacists, doctors and patients was aimed at investigating the current structure of pharmacy practice in Nigeria in order to identify the potential changes needed for the development of pharmacist prescribing. The study also explored stakeholders' views on the extension of pharmacists' traditional role in Nigeria to include prescribing. The findings in chapter 5 were used to inform the design

of the cross sectional survey conducted with Nigerian pharmacists. This survey is reported in **Chapter 6**.

This thesis concludes with **Chapter 7** by presenting an integrated discussion of all the research findings in this thesis. The discussion was followed with practice and policy recommendations for the development of pharmacists' clinical roles to include prescribing in Nigeria.

### **1.5 Chapter summary**

This chapter provided the background, aim and objectives of the entire research work contained in this thesis. It clearly demonstrates that the present arrangements for prescribing of medicines do not sufficiently meet the needs of patients in terms of timely and convenient access to prescriptions. In addition, it recognised the potential for a prescribing role for pharmacists in Nigeria. These premises provided the basis for the investigations contained in subsequent chapters, in order to identify the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria.

## **CHAPTER 2: PHARMACIST PRESCRIBING: A REVIEW**

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### **2.1 Introduction**

This chapter presents a review of pharmacist prescribing. The chapter is structured into three sections. The first section discusses the adoption of pharmacist prescribing in some countries across the world including the USA and UK and highlights the model and level of prescribing authority accorded to pharmacists in these countries. Section 2.3 then discusses the evidence relating to the impact of pharmacist prescribing in terms of its effectiveness in improving clinical outcomes, benefits, clinical appropriateness and safety.

The third section of this chapter presents a scoping review of the facilitators and barriers to pharmacist prescribing in the UK in order to identify the nature of evidence available in empirical literature. The section describes the scoping review methodology including the process of identifying the research question, identifying relevant studies, study selection, charting of data, collating, summarising and reporting of evidence. The scoping review section then concludes with a summary of the nature of evidence identified and highlights key gaps in the existing literature.

### **2.2 Adoption of pharmacist prescribing across the world**

#### **2.2.1 United States of America**

Pharmacists in the United States of America (USA) were the first to gain prescribing authority. In 1972, a Health Manpower Pilot Project was introduced in California. This was to prepare non-medical students to be able to perform certain non-traditional roles including prescribing (Carmichael et al., 1997). This pilot project produced pharmacists, nurses and physician assistants who were competent to prescribe. As a result of the success of this project, the California Assembly Bill 717 was introduced in California in 1977 to grant prescribing authority to these non-medical professionals (Carmichael et al., 1997). Pharmacists' prescribing activity in the USA was first reported in 1977 among pharmacists working with the Indian Health Service who were prescribing for acute and chronic disease conditions in ambulatory care settings (Koch, 2000, Carmichael et al., 1997). The state of Washington became the second state (1979) to grant pharmacists limited prescribing authority in the USA and this was followed by Mississippi in 1980 (Koch, 2000, Carmichael et al., 1997). Presently, pharmacists are prescribing in 46 (out of 50) states of the USA (CDC, 2012, Roberts and Gainsbrugh, 2010). In addition, there are federal laws granting prescribing authority to pharmacists



working in federal institutions including armed forces and veterans' affairs (Koch, 2000).

Overall, two forms of prescribing exist in the USA, dependent and independent prescribing (Tonna et al., 2008, Emmerton et al., 2005). In the dependent model, a pharmacist works in collaboration with a physician (independent prescriber) who delegates prescribing roles to the pharmacist based on agreed guidelines or protocols (Emmerton et al., 2005). This form of prescribing is seen in Collaborative Drug Therapy Management (CDTM) agreements. In CDTM, the delegating physician and the pharmacist make decisions and share responsibility for the treatment of the patient based on agreed protocols, policies or procedures (Roberts and Gainsbrugh, 2010, Tonna et al., 2008). The physician diagnoses and makes initial treatment decisions while the pharmacist may select, initiate, monitor or adjust treatment within the limits of the agreement (Roberts and Gainsbrugh, 2010, Emmerton et al., 2005).

CDTM agreements are governed by individual state laws and therefore vary from one state to another in terms of their scope (CDC, 2012, Hammond et al., 2003). Pharmacists are allowed to initiate therapy in at least 21 states (CDC, 2012). In more than 36 states, CDTM can be practised in all patient care settings: hospitals, clinics and community pharmacies. However, in some states, it is restricted to hospitals and ambulatory care clinics (CDC, 2012). Furthermore, variations exist across states in the drugs included in CDTM. Legislation in most states allows the pharmacist in CDTM agreement to prescribe all medicines. However, restrictions exist in some states including Florida, Indiana, North and South Dakota regarding the prescribing of narcotics in CDTM (Hammond et al., 2003).

Similarly the educational/training requirement to engage in CDTM varies across the states. While some states require additional post-registration training and advanced certification, in others, no additional educational requirement is necessary (Hammond et al., 2003). For example, pharmacists in New Mexico must undergo additional training in diagnosis and physical assessment and pass a board approved competency test before they are certified to prescribe (Dole, 2012, Hammond et al., 2003). However, no additional training is required for Nebraska and Nevada (Hammond et al., 2003).

Independent prescribing authority is limited in the US. Pharmacists with independent prescribing authority in the US prescribe medicines without the supervision of a physician. Independent prescribing is mainly seen in federal institutions including the United States Army and the Indian Health Service (Tonna et al., 2008, Barclay, 2005).

However, state laws in Florida have now granted legal rights to pharmacist to prescribe independently from a limited formulary including anti-emetics and antidiarrhoeals (Tonna et al., 2008).

Limited data are available on the extent and scope of pharmacist prescribing in the US (CDC, 2012, Thomas et al., 2006). Data are not available on the number of pharmacists currently prescribing in the US. However, pharmacist prescribing has been reported in various areas. These areas included pain, anticoagulation, hypertension, lipid management, parenteral nutrition, asthma and smoking cessation (Dole, 2012, Ragan, 2012, Thomas et al., 2006). A 2003 survey of pharmacist collaborative drug therapy management in 327 US hospitals revealed that the common prescribing activities carried out by pharmacists were adjusting strength of medicines (86.7%), ordering laboratory investigations (84.2%) and modifying the frequency of medicine administration (81.6%) (Thomas et al., 2006).

### **2.2.2 United Kingdom**

The Health and Social Care Act, 2011 provided the legal framework for NMP in the UK. This was aimed at improving patients care while ensuring patient safety, promoting patients access to and choice of treatment/medicines and better use of the clinical skills of non-medical professionals including pharmacists (Department of Health, 2006b). It was also intended to promote better team working among National Health Service (NHS) staff (Department of Health, 2006b).

Two forms of pharmacist prescribing exist in the UK: supplementary prescribing introduced in 2003 and independent prescribing introduced in 2006 (Tonna et al., 2008). Supplementary prescribing involves a

*“voluntary partnership between an independent prescriber (a doctor or dentist) and a supplementary prescriber to implement an agreed patient-specific clinical management plan (CMP)” (Department of Health, 2005b p.8).*

In the independent prescribing model, the prescriber is

*“responsible and accountable for the assessment of patients with undiagnosed or diagnosed conditions and for decisions about the clinical management required, including prescribing” (Department of Health, 2006b p.2).*

Therefore, in the independent prescribing model, pharmacists are solely responsible for every prescribing decision made even though they work in collaboration with other members of the healthcare team (Nissen, 2011).

To qualify as a pharmacist independent prescriber (which now includes a qualification as a supplementary prescriber), a pharmacist must have at least 2 years post-registration experience in a patient-orientated environment, undergo study at university level equivalent to 26 days of full-time education and at least a 12-day period of learning in practice with a designated medical practitioner (Stewart et al., 2012). Studies investigating the training of supplementary and independent prescribers in the UK have reported positive views in terms of the appropriateness of knowledge and skills gained. The period of learning in practice was highly appreciated among pharmacists (Latter et al., 2010, Cooper et al., 2008d). New Zealand has adopted this model of training for its pharmacist prescribers (PCNZ, 2013). Also, an Australian qualitative study involving semi-structured interviews with 25 pharmacy stakeholders showed a strong support for adopting the UK training model in Australia when pharmacist prescribing is implemented (Kamarudin et al., 2013). Despite these positive reports on the UK training model, some pharmacists in the UK had reported that additional training on physical assessment and diagnosis are needed (Latter et al., 2010, Cooper et al., 2008d). This would be essential considering that pharmacist prescribers are increasingly adopting an independent prescribing role.

There are approximately 3200 registered pharmacist supplementary/independent prescribers in the UK (Phelps et al., 2014, Pharmaceutical Society of Northern Ireland, 2014). This represents about 6.5% of the approximately 49,000 practicing pharmacists in the UK (OECD, 2013). As mentioned in chapter 1, these prescribers are able to prescribe medicines for any condition within their clinical competence with the exception of some controlled drugs which include cocaine, dipipanone and diamorphine for treating addiction (Statutory Instrument, 2012). However, pharmacist prescribers usually prescribe in one specialised clinical area (Latter et al., 2010, Lloyd et al., 2010). As in the US, prescribing by pharmacists in the UK has been reported in many disease areas including critical care, pain, mental health, oncology, hypertension and anticoagulation (Mulholland, 2013, NPC, 2010, Guillaume et al., 2008). A recent survey of 1914 pharmacist prescribers in Great Britain revealed that the three most common areas of pharmacist prescribing were in antibiotics, pain management and cardiovascular diseases (Phelps et al., 2014). However, this survey revealed that the majority (64%) of pharmacist prescribers in Great Britain prescribe to 10 or fewer

patients in a typical week. This suggests that the degree of pharmacists' prescribing in the UK is still low.

### **2.2.3 Canada**

In Canada, pharmacy practice is regulated by provincial pharmacy regulatory bodies. Therefore variation in governance structure, legislation and scope of practice exists across provinces (Bacovsky, 2012, Law et al., 2012). Alberta became the first Canadian province to grant pharmacists prescribing authority as outlined in the Health Professions Act for Pharmacist Practice of 1 April, 2007 (Makowsky et al., 2013, Alberta College of Pharmacists, 2007b). This Act permitted pharmacists to prescribe schedule 1 drugs (which are prescription medicines) with the exception of narcotics and controlled drugs (MacLeod-Glover, 2011, Alberta College of Pharmacists, 2007b).

Prior to this time, various arrangements existed across some provinces and hospital facilities that enabled pharmacists to perform some prescribing functions. For example, a national survey of 620 hospitals in Canada revealed that a significant number of hospitals reported that pharmacists were involved in prescribing functions under a collaborative drug therapy programme. Pharmacists prescribing functions included performing therapeutic substitutions (7.4%), adjusting dosages or dosage form of medicines (55.0%), initiating (3.5%) and modifying (39.4%) treatment with a non-prescription medicine (Pearson et al., 2002). Furthermore, in 2006, an arrangement was made for pharmacists in Nova Scotia and Manitoba provinces to offer continued care prescriptions to patients. This enabled pharmacists in these provinces to extend the prescriptions of patients with long-term conditions (with the exception of narcotics and control substances) to ensure continuity of care. However, these pharmacists were also obliged to report such services offered to patients to the original prescriber by the next business day (Law et al., 2012).

Presently, pharmacists in 9 out of the 10 provinces and 1 out of the 3 territories of Canada have been granted prescribing rights (Canadian Pharmacists Association, 2014). Quebec is the only province awaiting legislative approval for pharmacist prescribing. However, pharmacists in this province can initiate or modify patient therapy based on a collaborative agreement with a doctor (Canadian Pharmacists Association, 2014). As in the USA, the level of prescribing authority varies across provinces (Canadian Pharmacists Association, 2014, Bacovsky, 2012). For instance, in Alberta, pharmacists can independently initiate a prescription drug therapy, while those in New Brunswick are only allowed to do that within a collaborative practice (Canadian Pharmacists Association, 2014).

Various forms of dependent (delegated) and independent prescribing exist in Canada. These are manifested through three different models: 'Initial access prescribing', 'prescription modification' and 'comprehensive medication management' (Pharmacist Prescribing Task Force, 2010). Initial access prescribing involves prescribing for minor illnesses and providing health promotion information for patients who choose to visit the pharmacist for prescription and advice. It also includes prescribing in emergency situations such as the provision of emergency contraception or extending prescription stop date for patients with chronic conditions (Alberta College of Pharmacist, 2012, Pharmacist Prescribing Task Force, 2010). Community pharmacists can independently perform initial access prescribing in 7 of the 10 provinces in Canada (Law et al., 2012).

Prescription modification is also referred to as adapting prescriptions. This is a dependent form of prescribing where pharmacists are allowed to perform therapeutic substitution or alter the dose, regimen, duration of therapy or formulation of a prescription written by another prescriber. This is done with the aim of improving therapeutic outcome or ensuring continuity of therapy (Guirguis et al., 2014, Pharmacist Prescribing Task Force, 2010). Comprehensive Medication Management is a collaborative form of prescribing and requires the pharmacist to be a member of a collaborative health team. In this model, the pharmacist prescriber initiates, monitors or modifies patient treatment after initial diagnosis has been made by a member of the collaborative team. Referral of the patients to the pharmacist is undertaken by a member of the collaborative team who made the initial diagnosis or upon request by the patient (Alberta College of Pharmacist, 2012).

Like the USA, the requirements to become a pharmacist prescriber differ across provinces. Generally, all registered pharmacists are allowed to prescribe in many provinces. However, a few provinces have some additional requirements. For example, all registered pharmacists in New Brunswick can initiate a therapy. However, in Alberta, this function is performed by pharmacists on the clinical register of the Alberta College of Pharmacy who have been approved to prescribe after application to the college (Pharmacist Prescribing Task Force, 2010).

There is paucity of data concerning the adoption of prescribing role by pharmacists in Canada. Available information showed that the prescribing role has not been adequately taken up by pharmacists. For example, as mentioned earlier, all pharmacists in Alberta are permitted to adapt prescriptions and prescribe in emergencies. However, additional prescribing authorization is needed to initiate therapy independently (Hughes et al., 2013, Bacovsky, 2012). This authorisation can

be obtained on application to the Alberta College of Pharmacists and following the successful evaluation of the applicant including the applicant's educational qualification and practice experience (Guirguis et al., 2014). As at February 2011 only 155 out of the 4300 practising pharmacists in Alberta have obtained additional prescribing authorisation (Bacovsky, 2012). A survey conducted among 500 hospital pharmacists in Alberta to explore their perspectives on taking on additional prescribing authorisation revealed the cumbersome nature of the application process and the concern about increased responsibilities and risks as barriers to adoption of additional prescribing authorisation (Hutchison et al., 2012). However, a recent report from the Alberta College of Pharmacist suggests that the trend in the uptake of additional prescribing authorisation is changing. Applications for additional prescribing authorisation have been increasing. The college received 257 applications in 2013 compared to 95 in 2005. The majority of these applicants were community (66%) and hospital (16%) pharmacists. As of February 2014, 435 pharmacists have received additional prescribing authorisation and this represent a 98% increase from the 2012 data of 220 (Alberta College of Pharmacist, 2014).

#### **2.2.4 New Zealand**

Prior to the introduction of pharmacist prescribing in New Zealand, other non-medical practitioners including nurses and optometrists were legally allowed to prescribe medicines (Wheeler et al., 2010). In 2007, the Pharmacy Council of New Zealand (PCNZ) made a proposal for designated prescribing authorisation for pharmacists. They sought feedback from various stakeholders on the appropriate prescribing model for New Zealand. Collaborative practice was identified by stakeholders (Wheeler et al., 2012). In this model, the pharmacist prescriber works in a multidisciplinary health team to initiate, alter or monitor a patient's prescription (Wheeler et al., 2012). Pharmacists in a collaborative practice model will be able to prescribe prescription medicines within their area of competence (Hoti et al., 2011).

The PCNZ made an application to the Health Workforce New Zealand, Ministry of Health in 2010 and by 2011, it was agreed in principle to approve prescribing authorisation for pharmacists (PCNZ, 2012). Hence, a pilot project was established and funded by the Health Workforce New Zealand. This project recruited 14 pharmacists (7 pharmacists each from primary and secondary care) to undertake a university based postgraduate course in pharmacist prescribing accredited by the PCNZ (Kamarudin et al., 2013, PCNZ, 2012). The course entails 600 hours (two semesters) of study and a practical component of 300 hours. In the practical component, pharmacists spent not

less than 150 hours (compared to the 90 hours in the UK) of supervised practice under a Designated Medical Practitioner as in the UK (PCNZ, 2011).

Following successful completion of the pilot project, the Medicines (Designated Pharmacist Prescriber) Regulation was introduced in July 2013 in New Zealand to enable pharmacists to act as prescribers (Legislative Instrument, 2013). This Act granted pharmacist prescribers the authority to prescribe prescription medicines with the exceptions of controlled drugs (Legislative Instrument, 2013). This act require the PCNZ to set competence and registration requirement for prescribers (PCNZ, 2013, Legislative Instrument, 2013). According to PCNZ, pharmacist prescribers must practice in a collaborative healthcare team and are able to adjust dosages of medicines, prescribe new ones and discontinue medicines if necessary in a defined practice area of the collaborative team in which they work (HWNZ, 2013, PCNZ, 2013).

In order to become a pharmacist prescriber in New Zealand, a pharmacist must possess a postgraduate diploma in clinical pharmacy (or equivalent) to enable them to meet the requirement to be admitted to the university based post-graduate certificate in prescribing. The pharmacists must also complete the prescribing course and work in a collaborative healthcare team to prescribe (HWNZ, 2013, PCNZ, 2013). As at August 2014, there were 16 pharmacist prescribers in New Zealand. About half of these prescribers work in primary care (Ministry of Health, 2014a). There is currently little information concerning these prescribers. Available data indicates that they are now prescribing in different clinical areas including pain management, infection, cardiovascular and paediatrics (Ministry of Health, 2014b).

### **2.2.5 Australia**

Pharmacy practice in Australia has undergone significant changes in recent years. Australian pharmacists now take on a number of advanced roles including medication reviews (Tan et al., 2012). They also work within collaborative healthcare teams to provide clinical pharmacy services to patients and participate in treatment decisions. Currently, there are provisions within the Australian laws for pharmacists to supply prescription-only medicines based on emergency supply or medication continuance (Hoti et al., 2011). In addition, many prescription medicines including Chloramphenicol eye drop and some proton-pump inhibitors have been re-scheduled to 'Pharmacist Only Medicine' (Pharmacy Guild of Australia, 2014). Despite these developments, Australian pharmacists are yet to be given prescribing authority over prescription only medicines. Australia has therefore been viewed by many authors to be lagging behind in the aspect of pharmacists prescribing (Kamarudin et al., 2013, Tonna et al., 2008).

There has been strong advocacy and support by stakeholders and professional groups including the Society of Hospital Pharmacists of Australia for expanded roles in prescribing (Kamarudin et al., 2013, Tonna et al., 2008). These stakeholders have argued that prescribing would utilise pharmacists' clinical skills and improve patients' access to medicines. Research has shown that the collaborative prescribing model was highly favoured among many stakeholders including Australian pharmacists and doctors. They viewed this model as a natural progression for hospital pharmacists since hospital pharmacists are already working within a collaborative healthcare team and contributing to prescribing decisions (Kamarudin et al., 2013, Hoti et al., 2010). However, these stakeholders have expressed the need for further training of pharmacists in the aspect of clinical examination, diagnosis and consultations. The UK training model for non-medical prescribers consisting of a university based learning and period of leaning in practice with a medical doctor was preferred (Kamarudin et al., 2013).

#### **2.2.6 South Africa**

In South Africa, pharmacists who obtained the Primary Care Drug Therapy Qualification were previously permitted to prescribe some medicines under schedule 3 and 4 of the Medicines and Related Substance Act. These medicines included those used in hypertension, diabetes and infectious diseases which were, at the time, only prescribed by medical doctors (Department of Health, 2012, SAPC, 2011). The permission came as a result of the application made by these pharmacists with the support of the South African Pharmacy Council in 1992 to grant prescribing role to them in order to fill the skill gap and meet patient needs in rural areas (SAPC, 2011, Gilbert, 1998).

This permission was granted under the Section 22A (15) of the Medicines and Related Substances Act 101 of 1965 of South Africa (Ward et al., 2014). However, it was suspended in 1998 (Gilbert, 1998). As of 1998, 66 pharmacists who had completed the Primary Care Drug Therapy Course had been issued the permit (Gilbert, 1998). A survey carried out among these pharmacists showed that about 70% of them had more than 100 patients per day. Beside their traditional pharmacy roles, the majority of them were involved in prescribing for acute illness, prescribing contraceptives and monitoring drug therapy for chronic conditions including hypertension and diabetes (Gilbert, 1998).

A recent document by the South African Pharmacy Council revealed that plans are on-going to review the scope of practice of pharmacists in South Africa (SAPC, 2011). This document proposes the 'Authorised Pharmacist Prescribers'. These prescribers



are expected to work within primary care to diagnose and prescribe for disease conditions listed in the South Africa's Primary Health Care Essential Medicine List and Standard Treatment Guidelines (SAPC, 2011). The Department of Health of South Africa is currently reviewing the proposed authorised pharmacist prescriber qualification and the re-instatement of the Section 22A (15) permit of the Medicines and Related Substances Act (Ward et al., 2014).

**Table 2-1: Summary of prescribing status in countries across the world**

<b>Country</b>	<b>Legal framework</b>	<b>Prescribing model</b>	<b>Current status</b>
USA	Varies across states. Pharmacist prescribing began in California following the California Assembly Bill 717 of 1977	Dependent and Independent prescribing	Ongoing in 46 (out of 50) states
UK	Health and Social Care Act, 2001.	Supplementary and Independent prescribing	Ongoing
South Africa	The Medicines and Related Substances Act 101 of 1965	Limited formulary prescribing	Suspended and under review
Canada	Varies across provinces. Pharmacist prescribing started in Alberta following the Health Professions Act for Pharmacist Practice of 1 April, 2007	Dependent and Independent prescribing	Ongoing in 9 (out of 10) provinces
New Zealand	The Medicines (Designated Pharmacist Prescriber) Regulation 2013	Collaborative prescribing	Ongoing
Australia	Under development	Collaborative prescribing proposed	Not yet legislated

### **2.3 Impact of Pharmacist Prescribing**

Research evidence on aspects of pharmacist prescribing is still emerging. Therefore, those demonstrating any improvement in the outcome to patient therapy due to pharmacist prescribing are very few (Bruhn et al., 2013, Charrois et al., 2011). In addition, these studies are limited in their methodologies and strength of evidence as they are usually single site studies with limited sample size and non-randomised controlled trials. For example, Bowron et al. (2011) conducted a retrospective non-randomised controlled study to compare the health outcomes of patients with type-2 diabetes managed by a pharmacist independent prescriber and a medical prescriber (serving as control) in a diabetic clinic in the UK. They looked at retrospective data of 50 patients for each type of prescriber and evaluated the patients' weight and metabolic parameters including their cholesterol level over a 2-year period. Even though these researchers concluded that there was no difference in the clinical outcomes achieved by patients managed by the pharmacist independent prescriber and the medical doctor based on their findings, their study was limited by its small sample size. In addition, research evidence based on a retrospective case control design is weak compared to those of a randomised controlled trial (Petticrew and Roberts, 2003, Hawker et al., 2002), as they may be subject to a number of confounding factors including those associated with the demographics of patients which were not controlled in the study.

However, Bruhn et al. (2013) conducted an exploratory randomised controlled trial (RCT) in the UK to compare the effectiveness of pharmacist medication review, with or without pharmacist prescribing, with standard care, for patients with chronic pain. The RCT involved 196 chronic pain patients (from six general practices) randomised into three study groups: pharmacist medication review with pharmacist prescribing (n=70); pharmacist medication review with feedback to the General Practitioner (GP) and no planned patient contact (n=63); and treatment as usual group (n=63). Patients in the pharmacist prescribing group and the pharmacist review group showed significant improvement in some clinical outcomes after six months of follow-up. For example, in comparison to baseline data, 47.7% of patients in the pharmacist prescribing group and 38.6% of patients in the review group showed a significant improvement in chronic pain grade than those in the treatment as usual group (31.3%) (Bruhn et al., 2013). However, the contribution of pharmacist prescribing alone remains unclear since patients in the pharmacist prescribing group had both pharmacist prescribing and medication review. But the findings suggest that pharmacist prescribers could be as

effective as GPs in prescribing for chronic non-cancer pain. Nevertheless, a larger trial that would result in more robust evidence is needed.

The predominant evidence on the impact of pharmacist prescribing is mainly qualitative. This relates to the experience of pharmacist prescribing reported by various stakeholders including patients, doctors and pharmacists. Findings from the literature were consistent across various stakeholders including doctors, pharmacists, patients, and policymakers in reporting an increase in patients' access to treatment as a result of NMP, and a perceived reduction in delays to appointments (Hacking and Taylor, 2010, Stewart et al., 2009a, Cooper et al., 2008a). Several qualitative and quantitative studies exploring patients' experience of pharmacist prescribing in the US and UK have reported positive benefits including pharmacists' approachability, better patient education and extended consultation time (McCann et al., 2015, Gonzalvo et al., 2012, Stewart et al., 2011, Stewart et al., 2009a). Despite these benefits, patients in some studies reported that they would prefer to consult a doctor for a prescription, especially for initial diagnosis or when their illness is considered serious (McCann et al., 2015, Stewart et al., 2009b).

Doctors have reported positive benefits of pharmacist prescribing in many qualitative studies in the UK. These benefits included comprehensive medication review, keeping doctors' medicine knowledge updated, and freeing doctors' time to allow for other specialised responsibilities (McCann et al., 2012, Weiss and Sutton, 2009, Blenkinsopp et al., 2008). However, some doctors have reported that pharmacist prescribing is likely to result in the deskilling of junior doctors (Lloyd and Hughes, 2007). There are assertions that NMP reduces doctors' workload; however, no research has clearly demonstrated this claim (Lloyd et al., 2010, Poonawala et al., 2007). What is usually reported in most studies is a shift or reorganisation of tasks and it is uncertain whether this shift has resulted in an overall reduction in doctors' workload. Furthermore, doctors' workload may be unaffected because nonmedical prescribing may be taking care of previously unmet need or has generated demand for care that was not previously there (Laurant et al., 2005).

Pharmacists in many empirical studies have also reported a positive impact on their role to include: enhanced job satisfaction; better use of their clinical skills; recognition of the pharmacists' role in patient care by other healthcare professionals; integration of pharmacists into the patient management team and more autonomy and responsibility in patient management (McCann et al., 2011, Lloyd et al., 2010, Stewart et al., 2009a, George et al., 2007b). A survey conducted among 105 qualified pharmacist prescribers

in Northern Ireland found that those who were prescribing, were more likely to report enhanced job satisfaction than those who had never prescribed (McCann et al., 2011).

Studies investigating the clinical appropriateness of prescribing decisions and safety of NMP are lacking. Many authors have argued that supplementary prescribing is likely to improve safe prescribing because it involves collaborative prescribing decisions between an independent and a supplementary prescriber (Blenkinsopp et al., 2008, Cooper et al., 2008a). In addition, the ability of non-medical prescribers to adhere strictly to guidelines or protocols was viewed positively in terms of promoting prescribing safety (Blenkinsopp et al., 2008). A randomised controlled trial was conducted in Australia to compare collaborative pharmacist prescribing with usual care in a surgical pre-admission clinic (Hale et al., 2013). The trial randomised 400 patients into intervention (n=200) and control (n=200) group. In the intervention arm, the pharmacist prescriber prepared a medication chart, made a plan for medication preoperatively and prescribed venous thromboembolism (VTE) prophylaxis while in the control arm, medication charts were generated by resident medical officers. The trial reported that there was statistically significant less unintended omissions of medications in the intervention arm (1.2%) compared to the control arm (31.5%). Also, prescribing errors were less in the intervention group (0.2%) compared with the control group (6.3%). VTE prophylaxes were considered to be appropriate in 93% of intervention patients and 90% of control patient. Although this was a single site study that involves only one pharmacist prescriber, the evidence suggests that collaborative/supplementary pharmacist prescribing could be clinically safe and appropriate.

Similarly, very little research has investigated the clinical appropriateness and safety of pharmacist independent prescribing. Latter et al. (2012) conducted a study to evaluate the appropriateness of prescribing decisions of nurse and pharmacist independent prescribers. They utilised 20 independent healthcare professionals including 10 medical doctors, 7 pharmacists and 3 nurses experienced in prescribing to rate 100 audio-recorded pharmacists' and nurses' consultations (in which a medication was prescribed) using a modified version of the Medication Appropriateness Index (MAI). The MAI was based on a number of criteria including indication, effectiveness, dosage, directions, practicality, drug-drug interaction, drug-disease interaction, duplication, duration and cost. The results showed that the highest average inappropriate ratings were in the aspects of correct directions (nurses 12%; pharmacists 11%) and cost of prescribed medicines (nurses 16%; pharmacists 22%). The authors concluded that the prescribing decisions of nurse and pharmacist independent prescribers were clinically

appropriate. However, this conclusion cannot be generalised as the consultations evaluated were purposefully sampled by the researchers. This sampling procedure can be prone to researchers' bias and lacks representativeness. In addition, the number of nurse and pharmacist prescribers' practice sites (n=9) evaluated was small. Therefore, more robust evidence is needed to demonstrate the appropriateness and safety of pharmacist independent prescribing.

#### 2.4 Scoping review of the facilitators and barriers to implementing pharmacist prescribing in the UK

The aim of a scoping review is to map rapidly the key concepts underpinning a specific subject of interest based on the existing literature (Arksey and O'Malley, 2005, Mays et al., 2001). This involves summarising a range of data to identify the nature and depth of evidence in a research area (Levac et al., 2010). Just like systematic reviews, scoping reviews can be conducted as a standalone project in their own right (Mays et al., 2001). However, they differ considerably from systematic reviews in many ways as enumerated in Table 2-2. Nevertheless, they both employ a rigorous and transparent procedure to fully identify and analyse research evidence (Pham et al., 2014).

**Table 2-2: Comparison of systematic and scoping reviews\***

<b>Systematic review</b>	<b>Scoping review</b>
Focussed research question with narrow parameters	Research question(s) often broad
Inclusion and exclusion criteria usually defined at outset	Inclusion and exclusion criteria can be developed <i>post hoc</i>
Quality filters often applied	Quality not an initial priority
Detailed data extraction	May or may not involve data extraction
Quantitative synthesis often performed	Synthesis more qualitative and typically not quantitative
Formally assesses the quality of studies and generates a conclusion relating to the focussed research question	Used to identify parameters and gaps in the literature

\*Adopted from Brien et al. (2010)

Scoping reviews are becoming more popular in healthcare including pharmacy practice (Grindrod et al., 2014, Brien et al., 2010). They are usually employed to: examine the extent, range and nature of research activity in a particular field of study; determine the value and potential cost of conducting a full systematic review; summarise and

disseminate research findings to policymakers, practitioners and other consumers; and identify research gaps in the existing literature (Arksey and O'Malley, 2005). Scoping reviews are particularly useful when a research area has not been extensively reviewed (Pham et al., 2014). Levac et al. (2010) added that they are useful in fields where research evidence is emerging and randomised controlled trials are lacking. This makes scoping reviews suitable for investigations in the area of pharmacist prescribing as research evidence is developing in this field and randomised controlled trials are limited (Bruhn et al., 2013, Cooper et al., 2008c). Furthermore, a literature search in Medline and Embase databases identified very few published reviews on pharmacist prescribing globally. The ones identified included those of Cooper et al. (2008c), Tonna et al. (2007), Emmerton et al. (2005) and Kay and Brien (2004). Only Cooper et al. (2008c), who thematically reviewed nurse and pharmacist supplementary prescribing in the UK, focussed on the barriers and facilitators associated with implementing supplementary prescribing. However, their review did not consider barriers associated with independent prescribing as it was just introduced in the UK when the review was done. In addition, the review included personal opinions and commentaries because at that time, empirical studies investigating non-medical prescribing were lacking. Therefore, the current scoping review is necessary to map the existing evidence on the barriers and facilitators to pharmacist prescribing including independent pharmacist prescribing in the UK.

#### **2.4.1 Review methods**

Methods of conducting scoping reviews vary across the literature (Pham et al., 2014). However, the methodological framework developed by Arksey and O'Malley (2005) is popular (Pham et al., 2014). A recent scoping review of 174 scoping reviews revealed that Arksey and O'Malley framework was used in about two-thirds of the reviews evaluated (Pham et al., 2014). The Arksey and O'Malley framework was employed to conduct the present scoping review because of its rigour and transparency (Levac et al., 2010). The Arksey and O'Malley framework consists of 5 main stages and an additional optional stage (see Table 2-3). The five main stages include: identifying the research question; identifying relevant studies; study selection; charting the data; and collating, summarising and reporting the results. These stages are briefly represented in the table below as described by Levac et al. (2010).

**Table 2-3: A summary of the Arksey and O'Malley framework**

Stage	Description
1. Identifying the research question	The research questions are broad in nature as they seek to provide breadth of coverage. Also, relevant aspects of the research question must be clearly defined as they have implications for search strategies.
2. Identifying relevant studies	This stage involves identifying the relevant studies and developing a decision plan for where to search, which term to use, which sources are to be searched, time span and language. Comprehensiveness and breadth is important in the search. Sources include electronic databases, reference lists, hand searching of key journals, and organisations and conferences. Breadth is important; however, practicalities of the search as well. Time, budget and personnel resources are potential limiting factors and decisions need to be made upfront about how these will impact the search.
3. Study selection	Study selection involves <i>post hoc</i> inclusion and exclusion criteria. These criteria are based on the specifics of the research question and on familiarity with the subject matter through reading the studies.
4. Charting the data	A data-charting form is developed and used to extract data from each study. A 'narrative review' or 'descriptive analytical' method is used to extract contextual or process oriented information from each study.
5. Collating, summarising and reporting results	An analytical framework or thematic construction is used to provide an overview of the breadth of the literature but not a synthesis. A numerical analysis of the extent and nature of studies using tables and charts is presented. A thematic analysis is then presented. Clarity and consistency are required when reporting results.
6. Consultation (optional)	Provides opportunities for consumer and stakeholder involvement to suggest additional references and provide insights beyond those in the literature.

\*Adopted from Arksey and O'Malley (2005)

#### 2.4.1.1 Identifying research question

As earlier highlighted in Table 2-3, research questions for scoping reviews are usually broad. Hence, drawing on the literature review initially conducted in the first year of my PhD, the research question for this review was defined as follows: what are the facilitators and barriers to pharmacist prescribing in the UK? This question will identify the range, extent and nature of facilitators and barriers to pharmacist prescribing in the UK. Facilitators in this review were defined as those factors that enable the development of pharmacist prescribing while barriers were considered as factors that hinder the development of pharmacist prescribing.

The rationale for the choice of this research question is explained as follows. Globally, pharmacy practice is changing. Pharmacists in many countries are seeking to undertake advanced roles including prescribing. The UK pharmacist prescribing training and practice model is increasingly becoming popular among countries considering pharmacist prescribing including Australia (Kamarudin et al., 2013). Therefore, an understanding of the factors that could facilitate pharmacist prescribing and the barriers that exist in developing such a role in the UK would be valuable for both policymakers and healthcare practitioners including pharmacists in many countries considering pharmacist prescribing including Nigeria.

Furthermore, despite legislative changes granting prescribing rights to pharmacists in the UK, the implementation and adoption of pharmacist prescribing is lagging behind (Courtenay et al., 2011a). As mentioned earlier, only about 6.5% of the practising pharmacists in the UK are prescribers (Phelps et al., 2014, Pharmaceutical Society of Northern Ireland, 2014). In addition, research has shown that not all pharmacists who qualified as prescribers in the UK are fully utilising their prescribing qualification (Phelps et al., 2014, Courtenay et al., 2011a). A quarter of all qualified prescribers in Great Britain have never prescribed (Phelps et al., 2014). Therefore, if pharmacist prescribing is to be widely adopted in the UK, an understanding of the factors that facilitate or hinder its implementation in clinical practice is necessary. This would help in developing strategies to enhance the implementation of pharmacist prescribing in the UK, as well as the wider world.

#### **2.4.1.2 Identifying relevant studies**

The essence of conducting a scoping review in a particular area is to be as comprehensive as possible in identifying primary studies that would answer the review question (Arksey and O'Malley, 2005). In this review, this was achieved through the following:

- Electronic database literature search
- Electronic search of key journals
- Electronic search of key organisations
- Electronic search of UK theses
- Science Citation Index and searching of literature from the reference lists of articles

A comprehensive list of search terms including pharmacist prescribing, supplementary prescribing, independent prescribing and non-medical prescribing (see Appendix 1)



was developed and discussed with my supervisors. Since the aim was to obtain a comprehensive coverage of the literature in the research area, search terms were kept broad. The electronic databases searched were Medline, Embase, International Pharmaceutical Abstracts (IPA), PsycINFO and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The search strategies employed vary across databases. However, different search strategies including the use of truncation; AND/OR in combining searches; and adjacency operator were employed. An example of the literature search conducted in the Embase database is represented in Appendix 1.

Electronic searches were also conducted in key pharmacy practice journals including the International Journal of Pharmacy Practice and Pharmaceutical Journal. The website of the Department of Health UK and the United Kingdom Clinical Pharmacy Association were also searched for relevant grey literature. In addition, an electronic search of UK theses was conducted through the British Library Electronic Theses Online Service. Finally, a Science Citation Index search was carried out in Google Scholar. This was done by looking up articles that have cited the articles selected for this review. In addition, the bibliographies of selected studies were also checked for any relevant study.

#### **2.4.1.3 Study selection**

The inclusion/exclusion criteria used for this review were determined before the literature search was conducted. These criteria were informed by the previous literature review conducted in the first year of my PhD study. A study was considered eligible if it included:

- A primary collection of data in the UK whether published or unpublished, and
- The findings of the study related to the barriers and/or facilitators to extending prescribing authority to pharmacists, OR
- The barriers and/or facilitators to implementing pharmacists' prescribing practice.

Research investigating both nurse and pharmacist prescribing that met the above criteria were included. Overall, all studies included in the review were conducted between 1990 and 2015 and reported in the English language.

The criteria employed to exclude studies from the review were:

- Empirical research considering facilitators and barriers to delivering pharmacy clinical services other than pharmacist prescribing. For example, medication reviews.
- Empirical research considering Nurse or other allied healthcare professionals prescribing.
- Review articles, case reports, personal opinions and commentaries

These inclusion and exclusion criteria were applied to all the citations retrieved during the literature search by reading the titles and abstracts of all citations. In instances where the relevance of the study was unclear on reading the abstract, the full article was read to determine its eligibility. Where more than one publication presented the same data for example a conference report and a peer-reviewed journal publication of a single study, the most recent publication or the one with a detailed description of the methods and findings was considered. However, if the findings were complementary, both reports were included. Furthermore, all studies that met the inclusion criteria were included in the review irrespective of their study design. The included and excluded articles including the rationale for inclusion/exclusion were discussed with my supervisors.

#### **2.4.1.4 Charting of data**

Using a descriptive analytical procedure, all key relevant data from individual articles selected were extracted and entered into a table created in Microsoft Word. The data extracted include authors, year of publication, research setting, aim of the study, study population, study methods, prescribing model considered, and main outcome of interest (barriers and facilitators to pharmacist prescribing).

#### **2.4.1.5 Collating, summarizing and reporting results**

This stage of the review began by importing charted data into Nvivo 10 qualitative software for data management and coding. The data on main outcome of interest were thematically coded to generate a list of themes relating to the facilitators and barriers to pharmacist prescribing. Coding was carried out using both *a priori* (codes generated based on initial review carried out in the first year of my PhD) and inductive codes (developed as data coding progressed). The themes generated were defined and organised into categories (see Table 2-4). Furthermore, basic numerical analyses were conducted to assess the nature and distribution of the studies included and the themes generated from the review.

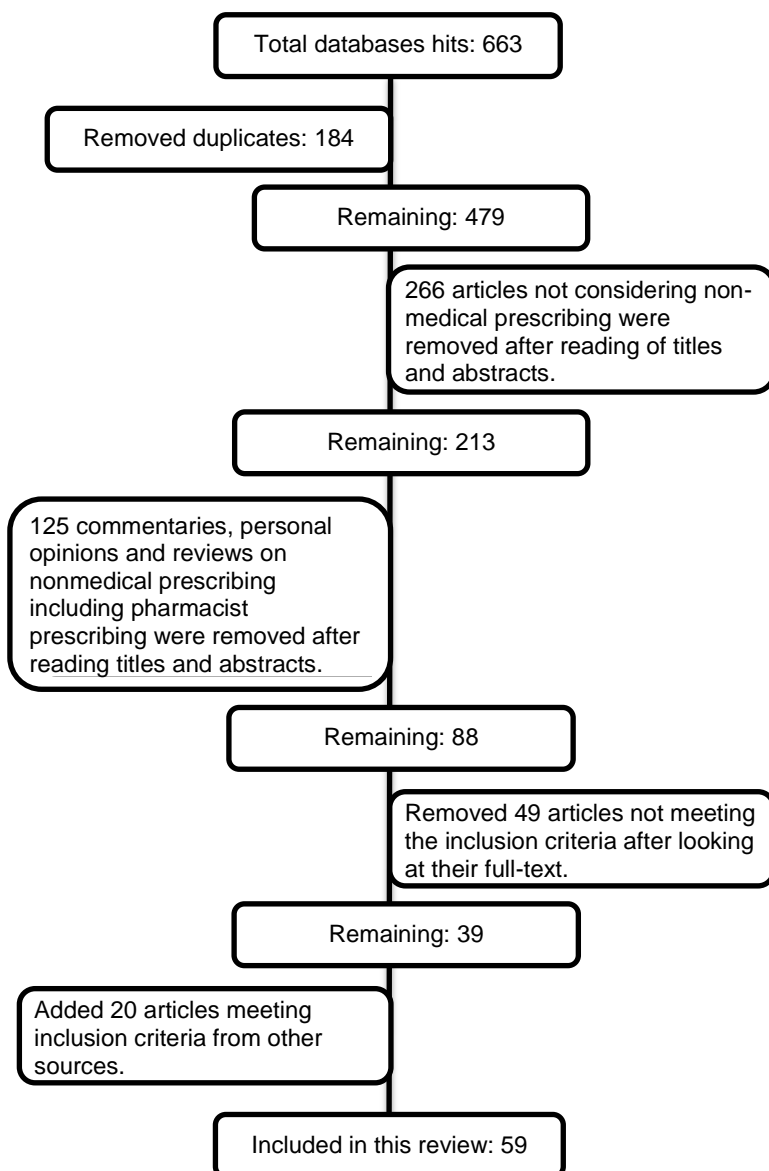
## **2.4.2 Results**

### **2.4.2.1 Studies included**

A total of 663 articles were initially identified from the database searches: Embase (332 hits), Medline (162 hits), IPA (80 hits), PsychInfo (22 hits) and CINAHL (67 hits) (see Figure 2-1). Following this, 184 duplicates were removed. Titles and abstracts of the remaining 479 articles were screened and 266 articles not considering non-medical prescribing were excluded. From the remaining 213 articles that reported on non-medical prescribing, 125 were removed because they did not meet the inclusion criteria. These included commentaries, personal opinions, editorials and reviews, as well as articles on pharmacist prescribing in other countries. Finally, 88 full-text articles were retrieved including published (71) and grey literature (17). Among these, 42 met the inclusion criteria but 3 were excluded because they were presented in more than one publication. Therefore, 39 articles including 35 published and 4 grey articles were retained from the electronic databases search.

Furthermore, the search on the British Library Electronic Theses Online Service gave 47 records, 7 of which met the inclusion criteria but only 3 were included because the remaining 4 had published their key findings in peer-reviewed journals and had already been considered. Two (2) research reports on the Department of Health website were included. Also, additional 8 conference articles were included from the International Journal of Pharmacy Practice (6) and the United Kingdom Clinical Pharmacy Association (2) website. Two (2) articles were identified through the Science citation index while 5 were identified through checking of the reference lists of articles. Therefore, the search from sources outside the databases yielded additional 20 articles including 1 published and 19 grey literature articles.

Overall, 59 articles: 36 published (see reference number 1-35 and 56 in Appendix 2) and 23 grey articles (reference number 36-55 and 57-59 in Appendix 2) were included. A summary of the article selection process is represented in Figure 2-1.



**Figure 2-1: Flow chart of the articles selection process.**

#### **2.4.2.2 Characteristics of included studies**

Most articles included in this review reported original studies conducted primarily in England (n=23; 39.0%), this was followed by Scotland (n=11; 18.6%), then Northern Ireland (n=8; 13.6%) and Wales (n=3; 5.1%). The remaining 14 (23.7%) studies were conducted in more than one country, either in countries within Great Britain or the UK. About half of the articles included primarily reported quantitative findings (n=29; 49.1%) while 44.1% (n=26) reported qualitative findings. Mixed methods studies account for 6.8% (n=4) of the included studies. All the quantitative studies were cross-sectional studies using questionnaires as the data collection tool. Sample sizes in these surveys

ranged from 19 to 5000 while the response rates ranged from 22.3% to 82.2% (see Appendix 2). The qualitative studies predominantly employed a generic qualitative approach to their enquiry with the exception of a few that employed either a case study (n=4) or grounded theory (n=1) approach. The sample sizes for the qualitative studies ranged from 7 to 117.

About three-quarters of the included studies (n=43, 72.9%) reported on the perception of pharmacists including pharmacist prescribers. Fifteen (25.4%) studies reported on the perceptions of doctors including GPs and mentors of pharmacist prescribers, 8 (13.6%) included nurses' perceptions, 15 (25.4%) included patients' perceptions and 9 (15.3%) included the perception of other stakeholders including service commissioners.

Three (5.1%) of the included studies investigated pharmacist prescribing prior to the extension of prescribing rights to UK pharmacists in 2003. Of the remaining 56 studies investigating pharmacist prescribing following the extension of prescribing rights to UK pharmacists, 7 solely investigated independent pharmacist prescribing.

#### **2.4.2.3 Barriers and facilitators to pharmacist prescribing**

Table 2-4 presents the facilitators and barriers to pharmacist prescribing identified in this review. For each theme presented in the table, the reference number of the article (rather than its citation) where the theme was identified is reported. This is because of the large number of reference associated with many of the themes identified as citing the references using the reference style of this thesis would require more space. In addition, presenting the themes in this manner would facilitate ease of reading.

In order of frequency, the most commonly reported facilitators to pharmacist prescribing were pharmacists' willingness/motivation to be prescribers (n=10), pharmacists' clinical experience prior to prescribing (n=9), pharmacists' education and training (n=9), relationship with the medical doctors (n=9), patients' acceptance (n=8), access to support from peers and mentors (n=8), and team approach to prescribing (n=7). On the other hand, the barriers commonly cited were lack of organisational strategy and support (n=21), lack of funding (n=16), lack of time (n=16), pharmacists' inadequate skills in diagnosis (n=12), access to patients' medical records (n=12), lack of awareness of pharmacist prescribing among other healthcare professionals (n=12) and patients (n=9), inadequate infrastructure including IT systems (n=11), shortage of pharmacists (n=10) and lack of medical support (n=10).

**Table 2-4: Perceived facilitators and barriers to pharmacist prescribing**

Theme	Facilitators (number of studies in which factor was identified) [reference number]	Barriers (number of studies in which factor was identified) [reference number]
<b>Legislation/policy</b>		
Legislation	4 [1, 2, 46, 57]	0
Legislative restrictions	0	3 [6, 7, 35]
<b>Pharmacy factors</b>		
Pharmacists' willingness/motivation to be prescribers	10 [3, 7, 9, 29, 30, 34, 39, 42, 53, 56]	2 [2, 56]
Pharmacists' confidence to prescribe medicines	2 [9, 53]	0
Professional isolation	0	1 [38]
Community pharmacists' commercial image	0	5 [1, 13, 15, 19, 42]
Community pharmacies accessibility	3 [14, 15, 27]	0
Pharmacists' education/training	9 [2, 3, 14, 24, 30, 36, 40, 54, 57]	0
Pharmacists' clinical skills in diagnosis	1 [9]	12 [2, 3, 17-20, 22, 26, 30, 40, 53, 56]
Pharmacists' clinical experience prior to prescribing	9 [2, 7, 17, 26, 31, 33, 38, 44, 49]	0
Specialisation in practice	4 [7, 13, 17, 57]	0
Pharmacists' competence in managing comorbidity	0	1 [22]
Team approach to prescribing	7 [2, 15, 18, 20-22, 33]	0
<b>Awareness of pharmacist prescribing</b>		
Public/Patient awareness	0	8 [3, 4, 14, 19, 22, 26, 27, 50]
Healthcare professionals awareness	3 [9, 24, 34]	12 [1, 3, 4, 11, 15, 18, 20, 38-41, 43]
<b>Patient factors</b>		
Patient acceptance	8 [19, 23, 25, 27-29, 39, 50]	0
Patient preference for medical prescribing	0	7 [4, 19, 22, 23, 25, 28, 50]
<b>Medical factors</b>		
Medical support	2 [4, 16]	10 [1, 2, 9, 15, 18, 21, 26, 30, 35, 38]
Relationship with medical doctors	9 [5, 13, 17, 29, 35, 38, 41, 42, 54]	6 [3, 5, 12, 13, 15, 17]
Medical control over pharmacist prescribing	0	4 [1, 4, 29, 33]
Shortage of medical doctors	1 [31]	0
<b>Organisational factors</b>		
Infrastructure	1 [3]	11 [3, 7, 8, 11, 14, 18, 20, 29, 37, 38, 45]
Challenges with Clinical Management Plan	0	9 [3, 7, 8, 11, 18, 20, 30-32]
Funding	3 [38, 42, 49]	16 [7, 8, 11, 13, 18, 20, 26, 32, 35, 37, 42, 44-46, 49, 52]
Access to patients' medical records	0	12 [3, 6, 7, 14, 19, 20, 32, 34, 38, 52, 54, 59]
Time	2 [16, 49]	16 [5, 10, 12, 13, 16, 18, 32, 37, 38, 46, 48, 49, 52-54, 56]
Organisational strategies/support	4 [3, 5, 16, 38]	21 [3, 5-8, 10, 16, 18, 24, 29, 32, 35, 37-39, 42, 44, 45, 47, 51, 59]
Administrative delays	0	6 [3, 5, 7, 8, 31, 37]
Support network for prescribers	8 [3, 16, 24, 35, 36, 39, 44, 49]	7 [5, 10, 12, 26, 45-47]
Access to CPD	0	6 [3, 6, 26, 36, 38, 58]
Remuneration	0	4 [5, 10, 12, 32]
Change of role/job	0	6 [6, 8, 11, 35, 37, 51]
Availability/Shortage of pharmacy staff	1 [13]	10 [7, 8, 11, 13, 18, 31, 36, 38, 46, 56]

### 2.4.3 Legislation/policy

In many countries including the UK, there is legislation governing the prescribing of medicines including the healthcare professionals that are legally allowed to prescribe

medicines (Department of Health, 1999). The legislative change (Health and Social Care Act, 2001) following the recommendations of the Crown reports (Department of Health, 1999, Department of Health, 1998) enabled non-medical professionals including pharmacists to prescribe first as supplementary prescribers then as independent prescribers (Cooper et al., 2008b). Prior to the legislative change contained in the Health and Social Care Act, 2001, district nurses and health visitors were permitted to prescribe a limited range of medicines following the amendment of the Medicines Act in 1992 (Act of Parliament, 1992). The legislative change extending prescribing authority to healthcare professionals other than doctors and dentists was driven by the need to increase patients' access to medicines and to promote the utilisation of the skills of these professionals (Department of Health, 2005b). However, some general practitioners in focus groups conducted by Blenkinsopp et al. (2008) perceived NMP as politically motivated. They reported that it was part of government's agenda to weaken the power that medical doctors have over healthcare delivery in the UK (Blenkinsopp et al., 2008).

Although legislative change was a major facilitator of pharmacist prescribing in the UK, it was rarely recognised in the empirical literature examined. This was because the majority of the included studies were conducted after NMP was authorised and the studies were mainly focussed on the implementation of pharmacist prescribing. However, one study reported on the impact of legislation in expanding the scope of practice of a pharmacist prescriber (Mulholland, 2013). The study which was a cross-sectional survey conducted among 45 members of the Neonatal and Paediatric Pharmacists Group found that two pharmacist prescribers were prescribing controlled medicines (Mulholland, 2013). This was as a result of the legislative change in 2012 that allowed non-medical prescribers to prescribe controlled medicines (Statutory Instrument, 2012). Prior to this legislative change, the findings of three different studies in England revealed that legislative restriction on the prescribing of controlled drugs was a barrier to pharmacist prescribing of narcotics (Courtenay et al., 2012, Dawoud et al., 2011, Baqir et al., 2010).

#### **2.4.4 Pharmacy factors**

Despite concerns that pharmacists' reluctance to take on new roles could be a barrier to pharmacist prescribing as expressed by participants including pharmacists in some early studies (Buckley et al., 2006, Child et al., 1998), analysis of data obtained from the included studies in this review revealed that pharmacists' willingness and motivation to take on a prescribing role was a major facilitator to pharmacist

prescribing. Research evidence on the implementation of both supplementary and independent pharmacist prescribing in practice settings has shown that it has been largely driven by individual pharmacists' enthusiasm rather than organisational drive (Dawoud et al., 2011, Latter et al., 2010, Cooper et al., 2008a, Tann et al., 2008). For example, a qualitative study involving focus groups with pharmacist supplementary prescribers and general practitioners in two Primary Care Trusts (PCTs) in England revealed that pharmacist prescribing in these PCTs was mostly implemented as a result of pharmacists' initiatives rather than a strategic plan and development of the trusts (Tann et al., 2008).

A cross-sectional survey of the views of 418 newly qualified pharmacists in Great Britain revealed that 86.4% of them were willing to become prescribers (McIntosh et al., 2012a). Other previous surveys showed similar findings among non-prescribing pharmacists including Shrestha et al. (2011), George et al. (2006b), and Child et al. (1998) where 64.3% (9/14), 80.2% (174/217) and 95.5% (64/67), respectively were happy to be prescribers. In addition, the majority of these pharmacists were confident in their ability to take on a prescribing role including independent prescribing (Shrestha et al., 2011, George et al., 2006b). However, these non-prescribing pharmacists showed concerns for additional training particularly in the area of clinical diagnosis prior to prescribing.

Furthermore, there is evidence to suggest that non-prescribing pharmacists in acute care settings are more willing to take on independent than supplementary prescribing roles because of the difficulty associated with implementing supplementary prescribing including the development of individual CMP in acute care settings (Tonna et al., 2010). However, further research evidence is needed to establish this claim.

Facilitators and barriers related to community pharmacy practice including accessibility of community pharmacies, community pharmacists' isolation and business image were also identified. Three studies made reference to community pharmacies accessibility (Hobson et al., 2010, Stewart et al., 2009b, Hughes and McCann, 2003). Of these three studies, two explored public/patients' opinion on pharmacist prescribing in England and Scotland (Hobson et al., 2010, Stewart et al., 2009b). Participants in these studies acknowledged the convenience and accessibility of community pharmacies in terms of its location and opening hours. They saw these as potential factors that could enhance the acceptance of community pharmacist prescribing. This view was earlier on expressed by community pharmacists in Northern Ireland in a qualitative study (Hughes and McCann, 2003). However, concerns were expressed on



community pharmacies lack of privacy and facilities including space to provide prescribing services. In addition, the relative isolation of community pharmacists affects their relationship with GPs and access to patients' medical records which are essential in pharmacist prescribing (Dapar, 2012). These are further discussed in section 2.4.7 and 2.4.8. Furthermore, GPs and patients in many studies have reported that the commercial nature of community pharmacies could lead to a conflict of interest in prescribing by community pharmacists (MacLure et al., 2013, Blenkinsopp et al., 2008, Hughes and McCann, 2003). Nevertheless, no research evidence has established this claim.

Advances in pharmacy education and training with increasing integration of clinical pharmacy practice at both the undergraduate and postgraduate levels was also an important facilitator to pharmacist prescribing in the UK (Department of Health, 1999). In many of the studies reviewed, pharmacists' expert knowledge of medicines was acknowledged as a potential facilitator to pharmacist prescribing by various stakeholders including patients, pharmacists, nurses and doctors (Adigwe, 2012, Hobson et al., 2010, Tonna et al., 2010, Jones and Western, 2009, Cooper et al., 2008a, Buckley et al., 2006). Furthermore, two studies revealed that pharmacists' with postgraduate qualifications were more likely to take on a prescribing role than those without postgraduate qualifications (Stewart et al., 2007, While et al., 2004). Thus, confirming the claim that advancement in clinical pharmacy education is a potential facilitator to prescribing.

Similarly, pharmacists' prior clinical experience was also viewed as a key facilitator to pharmacist prescribing. In many of the studies conducted to explore pharmacists' views on supplementary prescribing, hospital and community pharmacists viewed supplementary prescribing as a logical progression of their existing role because of their involvement in patient care (Dapar, 2012, Dawoud et al., 2011, Weiss and Sutton, 2009, Lloyd and Hughes, 2007, Tully et al., 2007, Buckley et al., 2006). Some doctors also held similar views because of pharmacists' influences on their prescribing (Lloyd and Hughes, 2007). Studies exploring the transition of pharmacist supplementary prescribers to independent prescribers revealed pharmacists' prior supplementary prescribing experience as a facilitator to independent prescribing (Rees, 2013, MacLure et al., 2011, Stewart et al., 2009a).

Pharmacists' long-term experience and specialisation in a clinical area emerged as a facilitator to pharmacist supplementary prescribing (Dawoud et al., 2011, Lloyd and Hughes, 2007, Hobson and Sewell, 2006, Department of Health, 1999). The cross-

sectional survey conducted among 414 pharmacists to explore the implementation of supplementary prescribing in primary and secondary care trusts in England revealed that pharmacists within Secondary Care Trusts (SCTs) were intending to be supplementary prescribers in their areas of specialty (Hobson and Sewell, 2006). Similarly, a Northern Irish study that involved focus groups with 47 intending pharmacist supplementary prescribers and semi-structured interviews with 35 medical mentors indicated that supplementary prescribing would be easier to implement in hospital pharmacy settings because of pharmacists' specialisation (Lloyd and Hughes, 2007).

Despite the aforementioned facilitators relating to pharmacists' clinical knowledge and experience, pharmacists' inadequate skills in diagnosis and inability to manage patients with co-morbidities were commonly cited as barriers to pharmacist prescribing (Latter et al., 2010, Tonna et al., 2010, Lloyd and Hughes, 2007). Pharmacists' inadequate skills in diagnosis was particularly identified as a barrier to independent prescribing since in supplementary prescribing, diagnostic decisions rest on the independent prescriber which is usually a doctor (Tonna et al., 2010, Lloyd and Hughes, 2007).

Similarly, the review has shown that pharmacist independent prescribers were usually reluctant to prescribe without a diagnosis (McCann et al., 2011, Tonna et al., 2010). According to Tonna et al. (2010), they are usually confident to prescribe when a diagnosis has been established by a medical prescriber. This lack of confidence in prescribing for undiagnosed conditions could be due to pharmacists' limited training and experience in diagnosis. Therefore, on many occasions, a team approach to pharmacist prescribing including independent pharmacist prescribing has been advocated (McCann et al., 2012, McCann et al., 2011, Tonna et al., 2010, Weiss and Sutton, 2009). This enables other members of the healthcare team to provide prescribing support including diagnosis to the pharmacist prescriber. However, the lack of confidence of independent prescribers in prescribing for undiagnosed conditions still represents an unmet training need for these prescribers. Thus, since prescribing is now a part of pharmacists' domain, introducing the principles of diagnosis including differential diagnosis at the undergraduate level would be helpful.

#### **2.4.5 Awareness of pharmacist prescribing**

This review revealed a general lack of awareness and understanding of pharmacist prescribing among patients. Of the 15 studies that explored patients' opinions on pharmacist prescribing, 8 investigated patients' awareness of pharmacist prescribing including McCann et al. (2015), MacLure et al. (2013), Park et al. (2013), Cooper et al.

(2012), Hobson et al. (2010), Stewart et al. (2009a), Stewart et al. (2009b) and Cooper et al. (2008a). In all of these 8 studies, the authors identified patients' lack of awareness as a barrier to pharmacist prescribing implementation. For example, Cooper et al. (2008a) explored the views of various stakeholders including patient group representatives on the implementation of nurse and pharmacist supplementary prescribing in the UK, using semi-structured interviews. These researchers found that patients were largely unaware of supplementary prescribing and the findings of their study suggest that it was introduced without adequate patient awareness. Other qualitative studies appear to confirm this finding. Cooper et al. (2012) found that patients lacked understanding of who supplementary prescribers were, often assuming they were doctors. Also, McCann et al. (2015) reported that patients lacked awareness that pharmacists could prescribe prior to attending a pharmacist prescriber's clinic. However, a cross-sectional survey of 1728 members of the public in Scotland found that 56.6% were aware that trained non-medical professionals could prescribe medicines (Stewart et al., 2009b). Respondents' awareness was found to be associated with increasing age, having a health professional in their immediate family, self-rated general health and a higher education level. Nevertheless, these authors emphasised the need for public engagement prior to the development of any new service.

Similarly, a widespread lack of awareness and understanding of pharmacist prescribing was reported among doctors particularly non-mentors of supplementary prescribers. Some doctors including GPs showed a lack of: awareness of the pharmacists' role as a prescriber (Cooper et al., 2008a, George et al., 2007b, Lloyd et al., 2005a); and understanding between the different models of pharmacist prescribing (Blenkinsopp et al., 2008). For example, in the survey of 115 Junior and Senior House Officers of nine hospitals in Northern Ireland, to explore their opinion on the introduction of supplementary prescribing, 68.1% were unaware of the role of a supplementary prescribing pharmacist (Lloyd et al., 2005a). However, most of the studies reporting doctors' unawareness of pharmacist prescribing were conducted shortly after the introduction of pharmacist prescribing. Furthermore, mentors of pharmacist supplementary prescribers have argued that this unawareness seen among doctors not directly linked to pharmacist prescribing could be due to the low level of the implementation of pharmacist prescribing (Lloyd et al., 2010). This explanation could be justifiable as an early survey conducted among 205 nurses in Northern Ireland also revealed a high level of unawareness (80%) of pharmacist prescribing among respondents (Lloyd et al., 2005b). Therefore, given the importance of doctors in the

development of pharmacist prescribing, there is a need for current research that would investigate the awareness of pharmacist prescribing among doctors and ways to improve it.

On the other hand, studies investigating pharmacist prescribing among pharmacists have commonly reported a high level of awareness. In the cross-sectional survey conducted by Stewart et al. (2007) among 2371 pharmacists in Great Britain, nearly all (97.7%) the respondents who were practising in patient care settings were aware of pharmacist supplementary prescribing. In a more recent cross-sectional survey involving 418 newly registered pharmacists in Great Britain, 79.5% of respondents reported that they were aware of non-medical prescribing (McIntosh et al., 2012a). However, the majority of them lacked knowledge regarding the legal aspect and scope of non-medical prescribing (McIntosh et al., 2012a). According to the authors, these findings highlight the need for the incorporation of the teaching of non-medical prescribing including its legal aspects and scope in the undergraduate curriculum.

#### **2.4.6 Patient Factors**

One of the policy objectives of non-medical prescribing is to 'increase patient choice in accessing medicines' (Department of Health, 2006b p.35). All the studies reviewed that explored patients' views and experiences of pharmacist prescribing showed positive findings in terms of patients' acceptance and satisfaction (Stewart et al., 2009b, Stewart et al., 2008). About two-thirds of the 1728 members of the Scottish general public who participated in a survey that explored their views on non-medical prescribing, agreed that pharmacists should have a prescribing role (Stewart et al., 2009b). Also, Stewart et al. (2008) surveyed 103 patients of pharmacist supplementary prescribers in primary and secondary care settings to explore their experience of prescribing by pharmacists. The results revealed that more than three quarters of the patients were satisfied with their consultation experience and about 70% would recommend seeing a pharmacist prescriber to others (Stewart et al., 2008). Other similar studies including Stewart et al. (2011) and Latter et al. (2010) also indicated a high level of patient satisfaction with pharmacist prescribing.

However, patients demonstrated certain reservations in many studies and these could be barriers to pharmacist prescribing. In some cases, patients preferred a limited form of prescribing for pharmacists (MacLure et al., 2013). Some patients have also reported that they would prefer to consult a doctor over pharmacists when they considered their illness to be serious (Cooper et al., 2012, Stewart et al., 2011, Hobson et al., 2010). However, patients' preferences for medical prescribing could have been

influenced by their perceptions of doctors' clinical training and experience (Cooper et al., 2012, Hobson et al., 2010). Many patients considered pharmacists to be less well-trained and experienced than doctors in terms of clinical assessment and diagnosis which they considered as important elements of prescribing (Hobson et al., 2010). In addition, MacLure et al. (2013) reported patient preference for a medical prescriber could also be as a result of the positive influence medical prescribing has had over the years (MacLure et al., 2013). Hence, this notion is likely to change overtime as more patients become exposed to pharmacist prescribing. This is because the majority of patients (55%) who had experienced pharmacist independent prescribing reported in a survey in England that there was no difference in terms of safety and quality of care provided by independent pharmacist prescribers and their doctors (Latter et al., 2010).

#### **2.4.7 Medical factors**

The opposition from the medical profession was a recurrent theme from the literature as a barrier to allowing pharmacists to be supplementary and independent prescribers in the UK (Buckley et al., 2006, Hughes and McCann, 2003). However, research evidence has shown that medical practitioners' support especially from mentors of supplementary prescribers played a significant role in developing and legitimising supplementary prescribing in practice settings (Lim et al., 2013, Cooper et al., 2012). For example, Lim et al. (2013) reported that medical doctors who acted as initial Designated Medical Practitioners (DMPs) were strong advocates for the implementation of non-medical prescribing including pharmacist prescribing in some hospitals. Cooper et al. (2012) also reported that in addition to referring patients to supplementary prescribers, medical mentors were essential in underwriting supplementary prescribers' credentials and clinical competence.

Furthermore, many studies have demonstrated that an excellent working relationship between doctors and pharmacists is a facilitator to implementing pharmacist prescribing (Courtenay et al., 2011a, George et al., 2008, Lloyd and Hughes, 2007, Hobson and Sewell, 2006). For instance, pharmacists who had an existing working relationship with the medical team identified a medical mentor more easily than those without a close working relationship with doctors (George et al., 2008, Lloyd and Hughes, 2007, Hobson and Sewell, 2006). Therefore, many reports indicated that it was easier for hospital pharmacists who work within medical teams to identify medical mentors than for community pharmacists who practise in isolation (Lloyd and Hughes, 2007, Hobson and Sewell, 2006).

Medical control of pharmacist prescribing was an important theme that emerged from this review (Cooper et al., 2012, Weiss and Sutton, 2009, Blenkinsopp et al., 2008, Tann et al., 2008). As mentioned earlier, a supplementary prescriber works in partnership with an independent prescriber (a doctor or dentist) to implement an agreed patient-specific Clinical Management Plan (CMP). A widespread view held by many pharmacists including supplementary pharmacist prescribers is that this model of prescribing is limited and restrictive (Cooper et al., 2008a, Lloyd and Hughes, 2007). However, many doctors view this in good light as it helps them to maintain control over the prescribing process (Lloyd and Hughes, 2007). Furthermore, research has shown that supplementary prescribing does not pose a threat to medical control (Cooper et al., 2012, Blenkinsopp et al., 2008). Cooper et al. (2012) conducted a qualitative case study to explore whether supplementary nurse and pharmacist prescribing represented a challenge to medical authority. The case study involved 77 observations of supplementary prescribing consultations and interviews with 11 doctors and 28 patients at ten case study sites in primary and secondary settings in England. The study revealed that continued medical authority was maintained in 5 key areas including patients' and supplementary prescribers' perception of doctors as being hierarchically superior; delegation of routine prescribing tasks to supplementary prescribers and doctors' knowledge claim over diagnosis. Therefore, this continued medical authority supported by supplementary prescribing could account for why it is usually favoured by medical doctors more than independent prescribing which is likely to constitute a significant threat to medical authority (Lloyd et al., 2010, Blenkinsopp et al., 2008). However, other reasons have been cited for doctors lack of support for independent prescribing including professional boundary encroachment, and inadequate skills of pharmacists in clinical examination and diagnosis as previously discussed (Lloyd et al., 2010, Stewart et al., 2009a, Blenkinsopp et al., 2008, Lloyd and Hughes, 2007).

One study reported on the shortage of medical doctors as a facilitator to pharmacist prescribing (Tully et al., 2007). This facilitator was mentioned by a pharmacist who participated in the qualitative interview aimed to investigate pharmacists' views and experience before and after registration as supplementary prescribers in England. The pharmacist reported that changes in junior doctors working hours was responsible for the organisational support he gained to be a prescriber (Tully et al., 2007). This could be linked to the European Union Working Time Directives which limits doctors' weekly working hours, initially to 58 hours (in August, 2004), and then to 48 hours by 2009 (Council of the European Commission, 1993). This could have necessitated role

extension including prescribing to non-medical professionals in the UK in order to maintain service delivery.

#### **2.4.8 Organisational factors**

Barriers to the implementation of pharmacist prescribing reported in many studies were mainly organisational. Some early barriers included: (i) inadequate funding for training and setting up prescribing services; (ii) lack of organisational recognition and policies to support NMP in some trusts; (iii) administrative delays including delays in registering as a supplementary prescriber and in getting prescription pads; (iv) inadequate infrastructure including access to appropriate information technology; (v) lack of access to patient records; (vi) lack of remuneration for mentors; (vii) lack of time; (viii) shortage of pharmacy staff; (ix) inadequate support from colleagues; (x) lack of access to appropriate continuing professional development (CPD) and (xi) paperwork and restriction due to the creation of the patient-specific CMP (Lloyd et al., 2010, George et al., 2008, George et al., 2007b, George et al., 2006a).

Very few studies have reported on the prescribing experience of pharmacist independent prescribers. The recent General Pharmaceutical Council (GPhC) registrant survey revealed that a quarter of pharmacist independent prescribers had never prescribed since their annotation (Phelps et al., 2014). The barriers to independent prescribing identified in this review were largely organisational. Latter et al. (2010) conducted a national survey to evaluate nurse and pharmacist independent prescribing in England. Common reasons given by respondents of the survey for delays in initiating independent prescribing after qualification were mainly organisational including absence of policies within trusts for NMP, IT issues, and delays in getting prescription pads. A similar study in Wales involving 128 pharmacist independent prescribers reported lack of time and funding as barriers to independent prescribing (Rees, 2013). Furthermore, other studies investigating pharmacists' transition from supplementary to independent prescribing have identified a number of barriers. These barriers were again largely organisational including lack of organisational strategy and support, lack of time, funding constraints and lack of support from colleagues (MacLure et al., 2011, Sutton et al., 2010).

Generally, recent research evidence suggests that many of the early barriers to pharmacist prescribing still persist despite many years since the introduction of pharmacist prescribing in the UK (McIntosh et al., 2015, Phelps et al., 2014, Adigwe, 2012). For example, Adigwe (2012) investigated non-medical prescribing in non-malignant chronic pain using a grounded theory approach and found that issues

around access to appropriate CPD that meet the needs of pharmacist prescribers and 'second checking' were limiting pharmacist prescribing. Also, Phelps et al. (2014) identified a number of barriers including change in job specification and lack of organisational recognition and strategy.

The literature also revealed that the implementation of pharmacist prescribing in community pharmacies is poor in comparison to other pharmacy practice settings. For example, a questionnaire survey conducted in Great Britain among 401 pharmacists to explore their early experience as supplementary prescribers revealed that respondents in other practice settings including hospital and primary care medical practice were three times more likely to prescribe than those in community pharmacy settings (George et al., 2006a). Other studies also showed similar findings. For example, the survey conducted by Winstanley (2009) among 293 pharmacists who qualified as prescribers found that almost 60% of GP practice-based pharmacists as against 25% of community pharmacists were using their prescribing qualification. Barriers identified in this review that were predominantly associated with prescribing in community pharmacy settings included difficulty in accessing patients' medical records, lack of privacy, lack of funding and poor working relationships with GPs (Dapar, 2012, Hobson et al., 2010, George et al., 2006a, Hughes and McCann, 2003).

The organisational facilitators of pharmacist prescribing identified were often the opposite of the barriers mentioned earlier. For example, Adigwe (2012) and Cooper et al. (2008a) identified support from networks of fellow prescribers as a facilitator to pharmacist prescribing. Also, some studies have shown that pharmacist prescribing thrives in Trusts where strategic policies exist for the development of non-medical prescribing (Courtenay et al., 2011a, Latter et al., 2010). Courtenay et al. (2011a) reported that in Trusts where such policies exist, careful considerations are given to the process of the development of NMP including workforce planning, training, clinical and professional support.

## **2.5 Chapter summary**

This chapter has provided an international overview of pharmacist prescribing. It reveals that pharmacist prescribing is increasingly being adopted in countries across the world irrespective of the challenges associated with developing such role. This chapter also shows that several potential benefits are associated with pharmacist prescribing including promoting patients' access to care and improving treatment outcomes, freeing doctors' time to enable them to deal with complex cases, promoting efficient use of pharmacists' clinical skills and enhancing pharmacists' job satisfaction.



However, more robust evidence is needed to demonstrate: the effectiveness of pharmacist prescribing in improving clinical outcomes in patients; and the clinical appropriateness and safety of pharmacist prescribing.

Using the scoping methodology, this chapter has uncovered the nature of evidence relating to the facilitators and barriers to pharmacist prescribing in the UK. The review showed that the available evidence is predominantly based on stakeholders' perceptions which are primarily self-reported data. These forms of data are prone to respondents' bias. However, the consistency across many studies in identifying several of the facilitators and barriers further substantiate the evidence.

Many of the barriers to the implementation of pharmacist prescribing in the UK were organisational including inadequate funding, inadequate infrastructure, lack of dedicated time for prescribing, lack of access to patients' medical records by community pharmacists, lack of organisational strategy and support. Other non-organisational barriers were also common including pharmacists' inadequate skills in diagnosis, lack of medical support for independent prescribing and lack of public awareness of pharmacist prescribing. Therefore, targeted interventions designed to overcome the barriers identified in this review would be needed in order to enhance the implementation of pharmacist prescribing in the UK.

This review has identified a number of gaps in the literature which would require further investigation. The review showed that there is paucity of data concerning what stakeholders including pharmacist prescribers are doing to resolve many of the barriers associated with the implementation of pharmacist prescribing in practice settings. Therefore, qualitative studies employing grounded theory approaches would be needed to provide insightful data into what stakeholders are constantly doing to overcome barriers associated with pharmacist prescribing in practice settings. In addition, not many studies investigated the barriers associated with pharmacist independent prescribing. More research evidence is needed in this area. The review also shows that a team approach to pharmacist independent prescribing appears to be a successful approach to it in practice. This claim would need to be further explored in research.

Furthermore, the literature shows that the implementation of pharmacist prescribing in the UK was aided by the changes that occurred in the structure of pharmacy practice (especially within the hospital setting) prior to the introduction of pharmacy prescribing (Cooper et al., 2008b, Lloyd and Hughes, 2007, Mullen, 2004, Andalo, 2002). This is because on many occasions, references were made to the clinical knowledge and experience of pharmacists prior to the introduction of pharmacist prescribing as

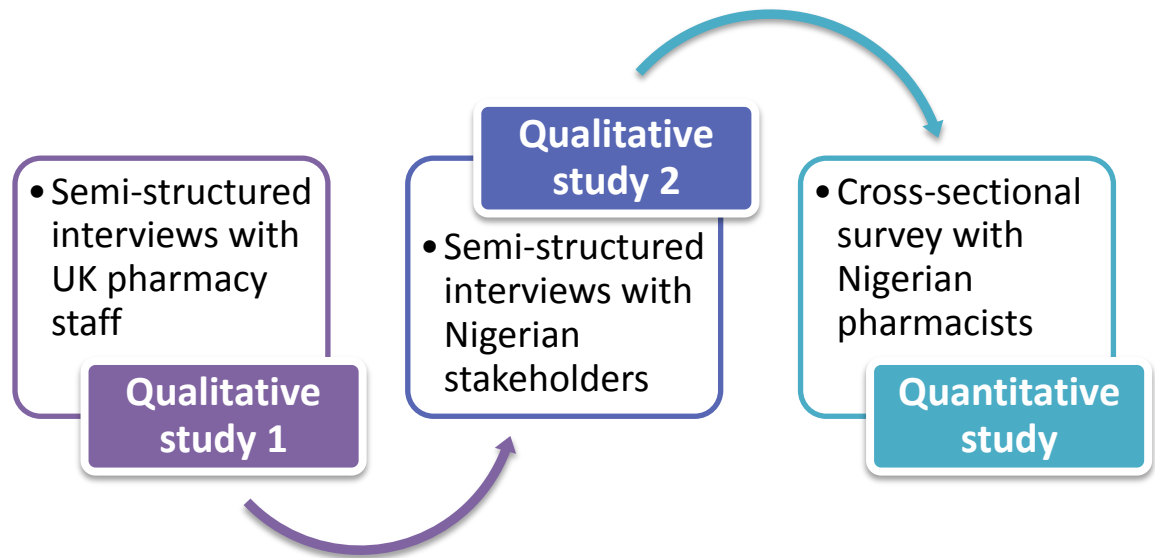
facilitators. For example, as mentioned earlier, early pharmacist supplementary prescribers in the qualitative study reported by Lloyd and Hughes (2007), argued that supplementary prescribing would be well supported within hospital pharmacy because of the existing pharmacists' specialisation in different clinical areas within hospitals. This specialisation was as a result of the development in clinical pharmacy training and practice which began in the 1970s and 1980s following the introduction of ward pharmacy (Child and Cooke, 2003). Therefore, as part of this PhD project, the changes that occurred in the structure of pharmacy practice prior to prescribing would be investigated in order to identify lessons that can be learned for the Nigerian context.

Finally, this review has some limitations. Unlike a systematic review, the methodological quality of the primary research articles included in this review was not assessed. Hence, it is possible that some research papers with low methodological quality were included. Also, grey literature was included which is likely to impact on the quality of evidence presented. However, research evidence in the field of pharmacist prescribing is still emerging and the inclusion of grey literature provided more comprehensive information for the review. Furthermore, being able to establish that some facilitators and barriers to pharmacist prescribing were consistent across many studies enhanced the validity of this review (Gravel et al., 2006). Finally, the literature search was largely conducted using electronic databases. Therefore, it is possible that some eligible articles that were not indexed on the databases searched were excluded.

The next chapter of this thesis will discuss the methodology and research design employed in the empirical studies conducted.

## Chapter 3: Research methodology

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## CHAPTER 3: RESEARCH METHODOLOGY

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### 3.1 Introduction

This chapter presents the theoretical framework underpinning the research contained in this thesis and justifies the chosen research design. It begins by presenting an overview of qualitative and quantitative research and states the elements that define these research methodologies. It also justifies the choice of a generic approach (not underpinned by any theoretical perspectives) in the qualitative component of the mixed methods research employed in this project. Chapter 3 goes on to discuss mixed methods research including the rationale for the choice of an exploratory sequential mixed methods design. The chapter concludes by presenting the interpretive position assumed by the researcher.

### 3.2 Nature of qualitative research

Qualitative research is a process of enquiry that traditionally emanates from the social sciences including anthropology, sociology and psychology but in recent times, it has been used increasingly in other disciplines including health sciences (Tonna and Edwards, 2013, Merriam, 1998). Various descriptions of what constitute qualitative research exist in the literature. For example, Merriam (2009 p.13) stated that:

*“qualitative researchers are interested in understanding the meaning people have constructed, that is how people make sense of their world and the experiences they have in the world”*

This definition focussed mainly on the purpose of qualitative research. However, Denzin and Lincoln (2011) definition concentrated on the context of data collection. They define qualitative research as an:

*“interpretive, material practice designed to transform the world into a series of representations, including fieldnotes, interviews, conversations, photographs, recordings, and memos in order to make the world visible” (Denzin and Lincoln, 2011 p.3).*

Despite these variable definitions, qualitative researchers often seek to understand a phenomenon from the perspective of the participants and the meaning and interpretations participants give to their experience (Creswell, 2013, Denzin and Lincoln, 2011, Hennink et al., 2011, Holloway and Wheeler, 2010). This form of inquiry is conducted in the natural setting of the study participants to enable researchers to understand how participants' behaviour and experience have been influenced by the context in which they live which could be social, economic, cultural or physical

(Hennink et al., 2011, Lincoln and Guba, 1985). Therefore, this research approach is focussed on understanding people's subjective experience.

As a result of the importance of qualitative research in exploring people's experience, behaviour and emotions, and in understanding a phenomenon from the participants' perspectives (Holloway and Wheeler, 2010), pharmacy practice researchers are increasingly employing qualitative research to understand complex social problems (Smith, 2002, Smith, 1998). For example, Hughes and McCann (2003) employed focus groups to explore the barriers to the inter-professional relationship between community pharmacists and general practitioners, and the extension of prescribing authority to pharmacists in the UK.

Qualitative research involves a wide range of philosophies and approaches and has been variously classified and described in the literature (Creswell, 2013, Hennink et al., 2011, Merriam, 2002). Creswell (2013) identified five approaches to qualitative inquiry namely the narrative, phenomenology, grounded theory, ethnography and case study. However, a number of other approaches exist including autoethnography, participatory action research and conversational analysis (Creswell, 2013, Denzin and Lincoln, 2008). This section will present a brief overview of the five qualitative approaches identified by Creswell (2013) and justify the choice of a generic approach in the present study.

In Narrative research, stories of lived and told experience of individuals are collected and linked chronologically by the researcher. Data are mainly collected through interviews and other forms of data collection including observations, documents, and pictures (Creswell, 2013). Narrative approaches are increasingly being employed in medicine and health to understand the patients' illness journey (Stenhouse, 2014, Hurwitz et al., 2004). However, they are still uncommon in pharmacy practice research (Bissell et al., 2006). The recent commentary by Dowse (2015) on patient-centred care in pharmacy using an illness narrative, demonstrates the importance of using a narrative approach to understand patients' medication journey in chronic conditions.

Ethnography involves studying a culture-sharing group to enable an understanding of their patterns of values, beliefs, behaviours and language (Creswell, 2013). Data are usually collected in ethnography through interviews, observations, symbols, artefacts, and other sources (Creswell, 2013). For example, De Oliveira and Shoemaker (2006) conducted an ethnographic study in six clinics and one community pharmacy in Minnesota for 8 months. The study which included 14 participants including pharmacists, employed participant observation, in-depth interviews, focus groups and

analysis of documents as techniques of data collection. An ethnographic approach was taken by these researchers in order to understand the culture of pharmaceutical care provision by pharmacists.

On the other hand, qualitative researchers generally employed a phenomenological approach to understand the essence of a 'lived experience' of a phenomenon for several individuals (Creswell, 2013). Therefore, some authors have argued that phenomenology is a philosophical approach that underpins all qualitative research because all qualitative research is conducted to uncover how people make sense of their experience (Hourigan and Edgar, 2014, Merriam, 2009). Participants in phenomenological studies are individuals who have experienced the phenomenon being investigated. In phenomenological studies, data are primarily collected through interviews. However, other sources of data including observations, poems, and documents have been used (Hourigan and Edgar, 2014, Creswell, 2013).

A number of pharmacy practice researchers including Makwosky et al. (2009) and De Oliveira and Shoemaker (2006) have employed a phenomenological approach in their qualitative inquiry. A good research question for a phenomenological study would have been: "what does it mean to be a pharmacist prescriber?" Or "what is the nature of the experience of pharmacist prescribing?" However, Nigerian participants have no experience of pharmacist prescribing. Furthermore, phenomenology mostly employs unstructured interviews to allow the study participants to describe the meaning of their experience with a phenomenon. This form of interview is usually driven by the interviewee (Holloway and Wheeler, 2010, Smith et al., 2011). Hence, the specific objectives of this study are not likely to be achieved by this approach.

Grounded theory employs an iterative process of data collection and analysis to inductively generate theory for a process or an action through the data collected from participants who have experienced the process (Creswell, 2013, Strauss and Corbin, 1998). There are at least three different approaches in grounded theory including the Glaser's approach, Strauss and Corbin's approach and constructivist grounded theory (Mills et al., 2008, Charmaz, 2006, Strauss and Corbin, 1998, Glaser and Strauss, 1967). Details of these approaches are beyond the scope of this section of the thesis. However, despite these different approaches, a key defining feature of grounded theory is the development or discovery of a theory or theories that are grounded in the data (Creswell, 2013). Hence, a grounded theory design is particularly useful where no theory exists to explain an action or process in a topic area (Creswell, 2013, Cooper and Endacott, 2007). A number of pharmacy practice researchers including Adigwe et

al. (2013) and Benson et al. (2009) have employed the principles of grounded theory in their qualitative investigations. A grounded theory (GT) approach would have been appropriate for the qualitative component of this research if the aim was to generate a theory. However, generating a theory was not the explicit aim of this research as a number of theories or models of role expansion and practice change exist and have been used to explain human behaviour towards role expansion in pharmacy (Roberts et al., 2008, Guirguis and Chewning, 2005, Roberts et al., 2003, Adamcik et al., 1986). Although a GT approach would help in identifying barriers to pharmacist prescribing by looking at the concerns of stakeholders as they view allowing pharmacists to prescribe, this approach would however, fail to identify potential changes needed (i.e. what can be done?) for the development of pharmacist prescribing in Nigeria. This is because GT is one of sociological action and looks at documented behaviour of study participants; for example, what people do to resolve their concerns rather than what can be done (Strauss and Corbin, 1998, Glaser and Strauss, 1967). Since prescribing is not currently implemented in Nigeria, applying a grounded theory approach to answer this research question was considered inappropriate.

In case study research, the researcher conducts a real life in-depth study of a case (an individual, small group of persons, or organisation) or multiple cases through observations, interviews, documents, reports and other data sources (Creswell, 2013). The unit of analysis in this type of study is the case(s) being investigated. Case studies therefore result in an in-depth understanding of the case(s) being studied in their natural settings (Creswell, 2013, Yin, 2009). Many pharmacy practice researchers including Cooper et al. (2012) and Stewart et al. (2009a) have used the case study approach in their qualitative inquiry. However, the present research was not intended to study pharmacists in practice settings as this could not sufficiently address the research aim.

In view of the limitations associated with the approaches described above, a generic approach to inquiry in the qualitative component of the present research was considered appropriate. A generic qualitative research approach seeks to “discover and understand a phenomenon, a process, or the perspectives and world views of the people involved” (Merriam, 1998 p.11) rather than lay emphasis on philosophical underpinnings (Caelli et al., 2003). Generic approaches have also been referred to as qualitative description and interpretative description in the literature (Cooper and Endacott, 2007, Sandelowski, 2000b, Thorne et al., 1997). Many qualitative research studies in pharmacy practice including Kamarudin et al. (2013), Lloyd et al. (2010) and Blenkinsopp et al. (2008) were not underpinned by any of the established strategies of

inquiry. Researchers employ a generic approach in their studies for practical reasons such as an inability to find a specific approach that fits the study, making the research aim a priority over a philosophical stance, and a desire to accurately represent participants' views (Smith et al., 2011, Cooper and Endacott, 2007). These practical reasons lie behind the choice of a generic approach in the qualitative component of the present research.

### **3.3 Nature of quantitative research**

Quantitative research involves the collection of numerical data which are usually analysed statistically in order to explain a phenomenon (Muijs, 2010). Quantitative research is employed to test theories/hypotheses and to study relationships between variables (Creswell, 2009). Quantitative research designs are generally classified into experimental, quasi-experimental and non-experimental research designs (Muijs, 2010, Miller and Salkind, 2002). The difference between these quantitative research designs is in the degree of control the researcher has over the study (McBurney and White, 2007).

In an experimental study, the researcher has major control over the conditions of the study. This includes the manipulation of a set of independent variables to produce systematic changes in the outcome or dependent variables (Polgar and Thomas, 2008, McBurney and White, 2007). Within experimental designs, all variables, other than the independent variables, are controlled in order to prevent bias or any influence on the research outcome. In addition, study units are assigned into treatment groups in a random design (Polgar and Thomas, 2008). Experimental designs are regarded to produce a higher levels of research evidence than quasi-experimental and non-experimental designs (Petticrew and Roberts, 2003, Hawker et al., 2002). An example of an experimental design is the randomised controlled trial (Polgar and Thomas, 2008).

On the other hand, quasi-experimental design differs from experimental design in that treatments are not assigned randomly into groups. An example of a quasi-experimental design is the time series design (Polgar and Thomas, 2008). In non-experimental design, the researcher does not have complete control over the conditions of the study (McBurney and White, 2007). Non-experimental research studies are necessary because not all variables (for example gender, and age) are subject to experimental manipulation (Polgar and Thomas, 2008). Examples of non-experimental research designs are surveys and observational research (McBurney and White, 2007).



Surveys are employed to “provide a quantitative description of trends, attitudes, or opinions of a population by studying a sample of the population and making generalisations or claims about the population” (Creswell, 2009 p.153). Surveys can be cross-sectional, in which data are collected at one point in time (Creswell, 2009), or longitudinal, in which data are collected over time on multiple occasions from the same sample of the population (Lynn, 2009). Four types of data collection methods are identifiable in surveys including self-administered questionnaires, interviews, structured record reviews and structured observations (Creswell, 2009). Surveys are widely used in pharmacy practice research to evaluate people’s attitude or opinion regarding a phenomenon. For example, Stewart et al. (2008) conducted a survey among 180 patients to explore their opinion on pharmacist supplementary prescribing in Scotland. One of the studies contained in this thesis employed a cross-sectional survey to explore the views of pharmacists on the barriers and facilitators to pharmacist prescribing in Nigeria.

### **3.4 Why take a mixed methods approach?**

Mixed methods research is becoming increasingly popular as a third research approach in addition to the existing qualitative and quantitative research approaches (Johnson et al., 2007). Mixed methods research has been used by researchers in various fields including social sciences, education and medicine (Morse and Niehaus, 2009). However, a number of controversies have been raised regarding mixed methods and what constitutes mixed methods research. These controversies include the evolving definitions of mixed methods, the paradigm debate (can paradigms be mixed?), advantages of mixed methods over mono-methods and the choice of appropriate designs from an array of designs available in the literature (Creswell, 2011).

Existing definitions of mixed methods research emphasise different aspects of the research process including methods, philosophy and research design (Creswell and Plano-Clark, 2011, Creswell and Tashakkori, 2007). For example, the definition of Greene et al. (1989) focussed on the ‘research method’ by defining mixed methods research as “those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular inquiry paradigm” (Greene et al., 1989 p.256). However, Johnson et al. (2007) reviewed 19 different definitions of mixed methods research and concluded that it is a

*“type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis and inference techniques) for the broad purposes of breadth and depth of understanding and corroboration” (Johnson et al., 2007 p.123).*

Despite these evolving definitions, the major defining characteristics of a mixed methods study is that it involves qualitative and quantitative research and data are derived from combinations of qualitative and quantitative methods. However, some researchers including Morse and Niehaus (2009) and Christ (2010) have advanced the view that mixed methods study may contain multiple qualitative approaches. This thesis will work with the definition of Johnson et al. (2007) as it intends to combine elements of qualitative and quantitative research including viewpoints, methods and analysis to develop an in-depth understanding of the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria.

There are many reasons why researchers employ mixed methods. Greene et al. (1989) classified these reasons into five: triangulation, complementarity, development, initiation and expansion. However, Bryman (2006) expanded on this list when he reviewed 232 social science articles in order to investigate how quantitative and qualitative research are combined in practice. Bryman (2006) advanced a number of reasons for employing mixed method research including to obtain a comprehensive picture of the enquiry, enhance validity of findings, offset the weaknesses and draw on the strengths associated with each method, generate and test hypotheses. Other authors including Collins et al. (2006) have also outlined a number of reasons for conducting mixed methods research including to enhance interpretation of findings and facilitate thickness and richness of data.

Historically, triangulation has been employed in qualitative social research. In qualitative research it involves the use of multiple forms of qualitative research methods to investigate a phenomenon in order to have an in-depth understanding of the issues being investigated (Denzin, 2012). The concept of triangulation has been extended beyond multiple methods to also include multiple data sets collected at different times or from different sources (data triangulation), using multiple theoretical approaches to study a phenomenon (theoretical triangulation) and the use of multiple investigators with different theoretical or methodological orientation (investigator triangulation) to investigate a phenomenon in a single study (Brannen, 2003, Flick et al., 2012). In mixed methods research, triangulation “seeks convergence,

corroboration, correspondence of results from the different methods” (Greene et al., 1989). The different methods used in mixed methods triangulation to investigate a phenomenon usually have offsetting biases which help in enhancing the credibility and validity of the research findings (Greene, 2007). This involves the combination of different research methods for instance qualitative interviews and questionnaire surveys to answer the research questions. Therefore the combination of different methods in a single study is a strategy that adds to rigor, richness of data and depth of inquiry (Denzin, 2012). The use of triangulation in mixed methods research was illustrated in a Mexican study to investigate the barriers to over-the-counter syringe purchase among injecting drug users. The research which employed a sequential mixed methods design nested within a longitudinal study consisting of initial in-depth interviews with 20 injecting drug users (Strathdee et al., 2005) followed by a cross-sectional quantitative survey of 627 injecting drug users in order to validate the findings of the qualitative study through triangulation (Pollini et al., 2010). The authors reported that the quantitative findings support the findings of their qualitative study and provided detailed evidence of the barriers to syringe access by injecting drug users. In the present study, qualitative interviews and questionnaire surveys with Nigerian participants would be employed to triangulate their perceptions on the facilitators and barriers to pharmacist prescribing in Nigeria.

Mixed methods design was also employed in this research for the purpose of development. Development ‘seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementation, as well as measurement decisions’ (Greene et al., 1989 p.259). These forms of mixed methods research are usually implemented sequentially in order for the preceding method to inform the next one. It also enables the researcher to increase the validity of their findings by capitalising on the inherent method’s strength (Greene et al., 1989). For example, Smith et al. (2013) conducted a national study in Australia using a mixed methods design to explore the current rural and remote pharmacist workforce, to identify the barriers and drivers influencing rural and remote pharmacy practice. The study conducted involved two phases. The first was a qualitative phase which included semi-structured interviews (n = 83) and focus group discussions (n = 143) with stakeholders including pharmacists and pharmacy educators with interest in rural and remote pharmacy. The second was a quantitative phase which was a survey conducted among 3300 registered Australian pharmacists practicing in non-urban locations. In the study, findings of the qualitative phase were used to develop a 45-item questionnaire for the quantitative phase (survey). This

provided data that were generalizable to the study population thereby increasing the validity of the study. Similarly, in the current research, development was achieved by using the results of previous findings to inform the development of subsequent studies including their objectives and data gathering methods. For example, the findings of the qualitative interviews conducted with Nigerian stakeholders were used to develop the questionnaire used for the cross-sectional survey conducted as illustrated in Figure 3-1.

Furthermore, the use of multiple methods enable researchers to 'attack a research problem with an arsenal of methods that have non-overlapping weaknesses in addition to their complementary strengths' (Brewer and Hunter, 1989 p.17). Therefore, the combination of the qualitative and quantitative methods in the present research will enable the researcher to capitalise on the inherent strengths of each method included in the research design (Morse and Niehaus, 2009, Greene et al., 1989), provide comprehensive understanding and capture nuances of the facilitators and barriers to extending pharmacists' clinical role to include prescribing (De-Lisle, 2011). In addition, the combination of qualitative and quantitative methods will make the findings transferable and generalizable. The sequential nature of the mixed methods design (as seen in section 3.5) will increase the validity of the results by verifying the findings from previous study using a different perspective.

### **3.5 Typologies of mixed methods designs**

Various classifications of mixed methods designs exist in the literature (Creswell and Plano-Clark, 2011, Morse and Niehaus, 2009). Many mixed methods researchers including Tashakkori and Teddlie (1998), Leech and Onwuegbuzie (2009), Morse and Niehaus (2009) and (Creswell and Plano-Clark, 2011) have advanced a number of classifications of mixed methods designs based on certain criteria. These include the number of strands or phases, degrees of mixing, timing, relative importance of mixed methods strands and theoretical perspectives (Teddlie and Tashakkori, 2008). While some researchers argued that a specific number of designs should be identified for mixed methods research, others are of the view that designs cannot be prescriptive and predetermined (as in quantitative research). This is because changes are likely to be made to the design and/or data collection methods during the study (Teddlie and Tashakkori, 2011). Therefore, mixed methods design can be fixed, in which the researcher predetermines the quantitative and qualitative methods to be included during the research design or emergent, in which a second method is added to the

design as the research progresses because the research question couldn't be sufficiently answered by the initial method (Creswell and Plano-Clark, 2011).

Creswell and Plano-Clark (2011) identified six major mixed methods designs including convergent parallel, explanatory sequential, exploratory sequential, embedded, transformative and multiphase design. A detailed discussion on these designs is beyond the scope of this thesis. However, the design of the research contained in this thesis matches Creswell and Plano-Clark (2011) description of the exploratory sequential mixed methods design.

Exploratory sequential mixed methods design involves two distinct phases, a qualitative and quantitative phase which are implemented sequentially. In this design, the researcher implements the qualitative phase of the study initially by collecting and analysing qualitative data and using the findings to inform the quantitative phase of the research (Creswell and Plano-Clark, 2011). The initial qualitative phase is employed to explore the phenomenon being investigated before building this into the quantitative phase (Creswell and Plano-Clark, 2011). Usually, precedence is given to the qualitative phase (exploratory phase) as this phase of the research will predominantly answer the research question(s) (Creswell and Plano-Clark, 2011, Morgan, 1998). The quantitative strand plays a supplementary role and may function to test or generalise the findings obtained in the qualitative phase of the research (Creswell and Plano-Clark, 2011).

Exploratory sequential mixed methods design was exemplified in the research protocol reported by Mbuagbaw et al. (2013) to investigate community ownership of a text message programme to improve adherence to antiretroviral therapy and provider-client communication. The study consists of a qualitative phase which will involve focus group discussions with people living with HIV at the Yaounde Central Hospital in Cameroon; and a quantitative phase which will involve a cross-sectional survey conducted among HIV patients attending the hospital to enable generalisation of findings. The two strands will be implemented successively and priority will be given to the qualitative component of the study. Findings from the qualitative aspect of the study are expected to be used to develop the survey instrument.

Similarly, the research contained in this thesis has two distinct phases, a qualitative phase (exploratory phase) and a quantitative phase (see Figure 3-1). The exploratory phase consists of two qualitative studies while the quantitative phase consists of a single quantitative study. All the studies were conducted sequentially. The first study (qualitative study 1) was conducted in the UK to investigate the changes in the

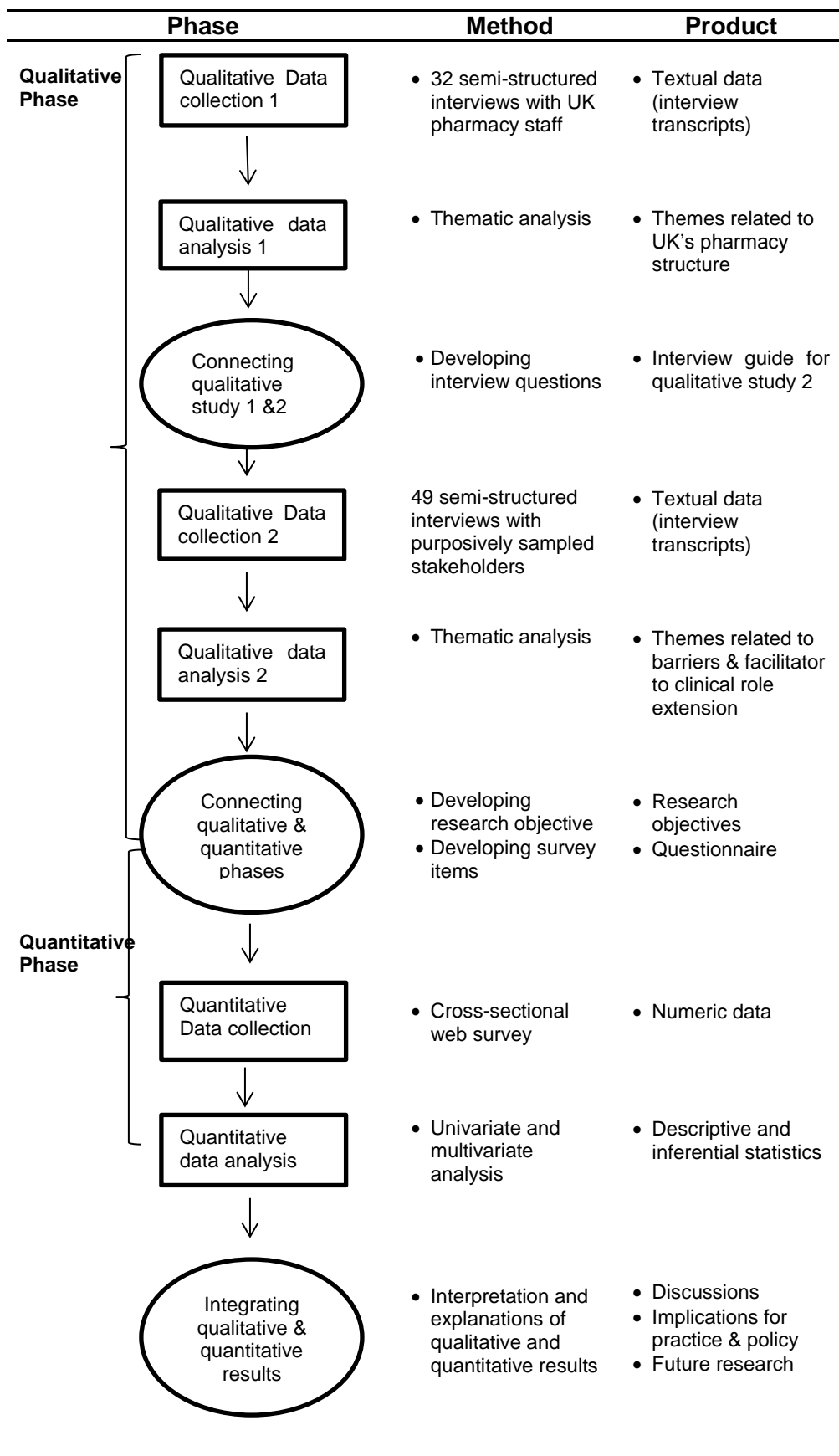
professional structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing. The study involved semi-structured interviews with pharmacy staff and findings from this study were used to inform the next study (qualitative study 2) conducted with Nigerian participants. Qualitative study 2, investigated the professional structure of pharmacy practice in Nigeria and the facilitators and barriers to extending pharmacists' clinical roles to include prescribing. This study also involved semi-structured interviews with various stakeholders including doctors, pharmacists, policymakers and patient group representatives in Nigeria. The findings from qualitative study 2 was used to inform (develop an instrument) the quantitative study which was an online cross-sectional survey conducted among Nigerian pharmacists.

A key consideration in mixed methods research is the relative importance or weighting of the quantitative or qualitative methods in answering the research questions (Creswell and Plano-Clark, 2011). Three comparative weightings are possible in mixed methods research. First, where both strands are equally weighted (equal priority) in terms of answering the research question. Second, where the quantitative strand primarily address the research questions (quantitative priority) and third where the qualitative strand primarily address the research objectives (qualitative priority) (Creswell and Plano-Clark, 2011).

In a quantitative priority mixed methods research, the qualitative strand plays a supplementary role and the possible role of the qualitative strand may include generation of theories or hypotheses that may be tested with the quantitative strand, development of the quantitative research instrument and enhancement including interpretation and clarification of the quantitative data (Brannen, 2003). On the other hand in studies with qualitative priority (quantitative strand play a supplementary role), the quantitative strands are likely to function to: provide contextual data for in-depth qualitative study; to test theories or hypotheses generated by qualitative work; and point to the nature of participants (sampling) to be involved in the primary qualitative work (Brannen, 2003). In the mixed methods design of this research, priority was given to the qualitative phase because the two qualitative studies conducted, primarily answered the research questions and provided an in-depth understanding to the barriers and facilitators to extending pharmacists' clinical roles to include prescribing in Nigeria. The quantitative study conducted played a supplementary role and was used to test and generalise the views of pharmacists on the barriers and facilitators to extending their clinical roles to include prescribing.

Furthermore, the degree to which the qualitative and quantitative components of the study interact is important in mixed methods design. The interaction could be independent or interactive (Creswell and Plano-Clark, 2011). In independent interaction, the qualitative and quantitative components including research questions, data collection method and analysis are kept separate. In independent strands, interactions only occur at the point of the general interpretation of findings and conclusion (Creswell and Plano-Clark, 2011). In interactive strands, the qualitative and quantitative components of the study interact at various points prior to the final interpretation of the findings. The interaction could be at the point of development where the data from one component is used to inform and develop the other component, or at the point of data analysis where the data set from one strand is transformed into data type of the second strand then analysed together (Creswell and Plano-Clark, 2011, Morse and Niehaus, 2009).

In the present research design, the qualitative and the quantitative components were interactive as illustrated in Figure 3-1. The research questions and design of the quantitative method (cross-sectional survey) depended on the findings of the qualitative phase. The qualitative and quantitative strands were connected by using the results of the qualitative interviews with Nigerian stakeholders to shape data collection in the survey by determining the research question and data collection instrument (questionnaire). In addition, the integration of the overall qualitative and quantitative findings occurred during the integrated discussion presented in chapter 7 of this thesis.



**Figure 3-1: Overview of the exploratory sequential mixed methods research design**



### **3.6 Interpretive Paradigm**

Researchers bring into their research certain principles that inform their ontological, epistemological and methodological positions (Creswell, 2013). Such sets of basic beliefs that guide researchers' actions are referred to as paradigms or interpretive frameworks (Creswell, 2013, Denzin and Lincoln, 2011). Several interpretive frameworks exist including positivism, postpositivism, interpretivism, constructivism, feminism, hermeneutics and pragmatism (Creswell, 2013, Denzin and Lincoln, 2011). A comparison of the four commonly used paradigms in social and behavioural sciences as outlined by Tashakkori and Teddlie (1998) is presented in Appendix 3.

However, Creswell and Plano-Clark (2011) argued that four different paradigms are likely to guide mixed methods research: postpositivism, constructivism, pragmatism and the participatory paradigm. A postpositivist world view is usually associated with quantitative research while the constructivist view is aligned to qualitative research (Creswell and Plano-Clark, 2011, Doyle et al., 2009). Creswell and Plano-Clark (2011) suggested that a combination of paradigms can be used in mixed methods research. However, there are still debates in the literature as to whether two paradigms can be mixed in a study (Creswell, 2011, Sandelowski, 2000a). Critics have argued that qualitative and quantitative research are linked with different paradigms which are not compatible (Creswell and Tashakkori, 2007, Sandelowski, 2000a). For example, a constructivist view of multiple and co-constructed reality is incompatible with the positivist view of singular and objective reality (Sandelowski, 2000a)

Many mixed methods researchers including Tashakkori and Teddlie (1998) and Johnson and Onwuegbuzie (2004) have suggested that pragmatism should be the philosophical partner of mixed methods research. Pragmatism philosophy "advanced the notion that the consequences are more important than the process and therefore the end justifies the means" (Doyle et al., 2009 p.176). Hence, a pragmatic researcher is concerned with 'what works' to answer the research question rather than aligning to a methodological position (Creswell, 2009, Teddlie and Tashakkori, 2008). Tashakkori and Teddlie (1998) argued that researchers should be more interested in rigorous investigation of the research problem rather than the methodologies or paradigms that underpin the research. Therefore, pragmatism represents a flexible world view in terms of its methods, logic and epistemology when compared with the extreme and opposing views held by the positivists (including postpositivists) and the constructivists (Creswell, 2009, Teddlie and Tashakkori, 2008, Tashakkori and Teddlie, 1998). For example, a pragmatist may be both objective and subjective in epistemological orientation in

answering a research question during a study (Tashakkori and Teddlie, 1998). Hence the pragmatists are able to employ both qualitative and quantitative methodologies in their approach to inquiry depending on the research questions. This research will therefore adopt the pragmatic world view because this will allow different research methods that can answer the research question to be used and also fit well with the generic qualitative approach to inquiry of this study.

### **3.7 Chapter summary**

This chapter discussed the mixed methods design upon which the studies presented in the next three chapters are based. It provided the rationale for the choice of a mixed methods design and justified its appropriateness in meeting the overall objectives of this research. Chapter 4 will discuss the first qualitative study conducted in the UK including its methods and findings.

## Chapter 4: UK qualitative study

	Phase	Method	Product
Qualitative Phase	Qualitative Data collection 1	<ul style="list-style-type: none"> <li>• 32 semi-structured interviews with UK pharmacy staff</li> </ul>	<ul style="list-style-type: none"> <li>• Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 1	<ul style="list-style-type: none"> <li>• Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Themes related to UK's pharmacy structure</li> </ul>
	Connecting qualitative study 1 & 2	<ul style="list-style-type: none"> <li>• Developing interview questions</li> </ul>	<ul style="list-style-type: none"> <li>• Interview guide for qualitative study 2</li> </ul>
	Qualitative Data collection 2	<ul style="list-style-type: none"> <li>• 49 semi-structured interviews with purposively sampled stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 2	<ul style="list-style-type: none"> <li>• Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Themes related to barriers &amp; facilitator to clinical role extension</li> </ul>
	Connecting qualitative & quantitative phases	<ul style="list-style-type: none"> <li>• Developing research objective</li> <li>• Developing survey items</li> </ul>	<ul style="list-style-type: none"> <li>• Research objectives</li> <li>• Questionnaire</li> </ul>
Quantitative Phase	Quantitative Data collection	<ul style="list-style-type: none"> <li>• Cross-sectional web survey</li> </ul>	<ul style="list-style-type: none"> <li>• Numeric data</li> </ul>
	Quantitative data analysis	<ul style="list-style-type: none"> <li>• Univariate and multivariate analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive and inferential statistics</li> </ul>
	Integrating qualitative & quantitative results	<ul style="list-style-type: none"> <li>• Interpretation and explanations of qualitative and quantitative results</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions</li> <li>• Implications for practice &amp; policy</li> <li>• Future research</li> </ul>

## CHAPTER 4: INVESTIGATING CHANGES IN THE STRUCTURE OF PHARMACY PRACTICE IN THE UNITED KINGDOM

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### 4.1 Introduction

As stated in the previous chapter, this research uses an exploratory sequential mixed methods design consisting of three studies: two qualitative and one quantitative study. This chapter describes the first qualitative study which was conducted in the UK. The chapter begins with a brief background on why this study is necessary, followed by the study objectives. The next aspect of the chapter outlines the specific methods used to address the objectives. This is then followed by the presentation of the study findings and a concluding summary.

Traditionally, pharmacists' roles have been associated with stock control, dispensing of medicines prescribed by doctors and offering advice about medicines to patients and other healthcare professionals. However, in some countries including the UK, USA, Canada, Australia and New Zealand, their roles have been expanded significantly. Pharmacists in these countries now take on roles such as medication reviews, collaborative drug therapy management and prescribing in order to optimise patients' therapy and improve therapeutic outcomes (Doloresco and Vermeulen, 2009, Tonna et al., 2008).

Globally, pharmacists are highly educated professionals with expertise in medicines management (Doloresco and Vermeulen, 2009, Anderson, 2002). In most European countries, pharmacists' basic education consists of a 4-year masters level undergraduate education with a significant clinical component (Van Mil and Schulz, 2006). Even though there are diversities in pharmacy education in Africa and Asia, many institutions in these continents run Bachelor of Pharmacy programmes which are similar to the training model in Europe. A number of institutions also run the Doctor of Pharmacy programme (Pharm D.) which has extended clinical components (Basak and Sathyanarayana, 2010, Alo, 2006). Despite pharmacists' high level of training, their expertise is often not utilised effectively in many settings including Nigeria as indicated earlier in chapter 1 (Erah, 2003). Their roles are still limited to dispensing which could be handled by suitably trained pharmacy technicians as in for example, the UK (Doloresco and Vermeulen, 2009). Therefore, advances in pharmacy education and medical practice require that pharmacists who are experts in medicines management take an active role in patient care.

In the UK, hospital pharmacists have expanded their roles beyond the dispensary, initially with the introduction of ward pharmacy and medicines information, which were followed by the provision of clinical pharmacy services including reviewing patients' medications, monitoring patients' therapy and contributing to doctors' prescribing (Child and Cooke, 2003). Today, hospital pharmacists are directly involved in patient care working as specialists among healthcare teams in different clinical areas with some acting as prescribers of medicines either as independent (autonomous) or supplementary prescribers (Stewart et al., 2012). There is evidence from the literature that the current roles of pharmacists in the UK, including prescribing, are supported by the changes that occurred in the professional structure of pharmacy including changes in education and training (Hudson et al., 2007, Lloyd and Hughes, 2007, Mullen, 2004, Andalo, 2002).

However, empirical research primarily exploring pharmacy staff views on changes in the structure of pharmacy practice that have enabled and supported pharmacists' clinical roles including prescribing is lacking. This study therefore investigated the changes in the structure of pharmacy practice in the UK in order to identify lessons that might assist in the potential changes needed in Nigeria.

## **4.2 Objectives**

The aim of the study was to investigate the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing in order to identify lessons that might assist in the potential changes needed in Nigeria.

The specific objectives were:

- To investigate the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing.
- To identify the barriers and facilitators to the changes in pharmacy practice in the UK.

## **4.3 Methods**

### **4.3.1 Ethics**

Ethical approval for this study was obtained from the School of Healthcare Research Ethics Committee (SHREC) (Ref no: SHREC/RP/344) (see Appendix 4). The main ethical issues associated with this research were those of autonomy and informed consent, anonymity of participants and confidentiality in handling of data and data protection.

#### **4.3.1.1 Autonomy and informed consent**

One of the basic principles that underpin social research ethics is that of obtaining informed consent from participants and respecting their autonomy by giving them the opportunity to freely and independently decide if they wish to participate in the study. In addition, they can withdraw their consent at any point without any consequence to them (Hammersley and Traianou, 2012). In this study, a participant information sheet (see Appendix 5) containing information on the purpose of the research, the participant's involvement, and how the information obtained from participants would be handled and managed, was emailed to each prospective participant. They were given the opportunity to make further enquiries about the research and were allowed to make a free, independent and voluntary informed choice to participate in the study.

All participants who agreed to participate in this study signed a written consent form (see Appendix 6). Consent forms were either sent in advance for participants to sign and return (for those whose interviews were conducted over the telephone) or it was signed at the beginning of the interviews in case of participants who had their interviews face-to-face. No participant objected to the content of the consent form or withdrew his/her consent.

#### **4.3.1.2 Confidentiality and anonymity**

Ways of protecting participants' confidentiality were explicitly stated in the information sheet and discussed with participants prior to their participation in this research. Information collected from participants were treated and handled in strict confidence. Anonymity was maintained by assigning codes to all participants and referring to them by their profession for example P11, Pharmacist. All personal identifiable data were excluded from interview transcripts and from this report even when detailed data was being reported. For example, to protect the identity of participants, I used 'XXX' to substitute for names of hospital or places when direct quotations were used.

Electronic data including audio-records of interviews and transcripts were kept in a password protected M-drive of the University and hard copies of documents of the research were kept under lock and key in filing cabinets in the post-graduate suite of the School of Healthcare, University of Leeds. Only my supervisors had access to the transcripts (all personal identifiable data were excluded) for the purpose of analysis and participants were informed about this prior to their participation in the study.

#### **4.3.1.3 Data protection**

Information obtained from participants were handled in line with the principles of the UK's Data Protection Act of 1998 including keeping data safe and secure, processed fairly and for the purpose of which it was collected, and not be kept for longer than necessary (British Parliament, 1998).

All interviews, recorded with the digital voice recorder, were uploaded and stored immediately in a password protected M-drive of the University of Leeds. Each recorded interview was erased immediately after each upload. All transcripts were digitised using the University computer. Digitised records of transcripts will be held in the password protected university secure network for a period of five years. All other research documents including consent forms were kept under lock and key in a cabinet in the postgraduate suite (access to the suite is password protected) in the University at all times.

#### **4.3.1.4 Risks to participants or researcher**

A risk assessment in line with the University of Leeds policy was carried out prior to the start of this study. There were no known significant risks including physical, emotional and financial risks to participants except for the time involved as a result of participating in the study. Risks to participants associated with breach of anonymity, confidentiality and data security were prevented as outlined above.

The risk to the researcher was minimised by conducting all interviews except one at the University of Leeds or at the place of practice of participants which were NHS facilities. All interviews were conducted during the day time and on working days. One interview was conducted at a participant's home and all control measures as outlined in the lone working risk assessment form completed were taken including providing my supervisor with the itinerary of my visit for the interview.

#### **4.3.2 Study setting**

This study was conducted in the United Kingdom and participants were recruited from England and Scotland. Healthcare in England and Scotland is mainly provided by the National Health Service (NHS). Pharmacy practice in Great Britain is regulated by the General Pharmaceutical Council while the Royal Pharmaceutical Society serves as the professional body. There are currently about 49,000 practising pharmacists (78 per 100,000 people) in the UK (OECD, 2013). There are approximately 22,000 pharmacy technicians in Great Britain (Phelps et al., 2014). Pharmacists and pharmacy

technicians work in various settings including hospitals, primary care trusts, community pharmacies, pharmaceutical industries and academia. In Great Britain, 64% of pharmacists and 52% of pharmacy technicians primarily work in community pharmacies while 22% of pharmacists and 38% of pharmacy technicians work in hospitals (Phelps et al., 2014).

#### **4.3.3 Recruitment and sampling strategy**

This research recruited pharmacists and pharmacy technicians who qualified between the 1970s and 1990s as participants. The rationale for the choice of pharmacy staff who qualified within this period was because significant changes in pharmacy practice in the UK occurred during this period. Therefore, these pharmacy staff would be able to report their experiences of pharmacy practice and the changes they have seen since they qualified. Those excluded from the study were:

- Pharmacy staff who qualified after the 1990s.
- Pharmacists who qualified prior to the 2000s but never practiced in the UK until the 2000s
- Pharmacy staff who had no experience of community or hospital pharmacy practice in the UK even if they qualified before the 2000s.

All pharmacists (n=312) who were part of the Royal Pharmaceutical Society Virtual network of Prescribing and Medicines Management (which is moderated by one of my supervisors) and pharmacists (n=30) who attended the prescribing course at the University of Leeds were sent a generic email by my supervisor in October 2013. This email asked them if they were interested in participating in a research that was looking at 'role development' in pharmacy. The contact details of those that indicated that they qualified between the 1970s and 1990s and were interested in the research were forwarded to me. I then emailed them the participant information sheet to assist them in their decision to participate in the study. Those that replied to say they wished to participate in the study were contacted and an arrangement was made for an interview at a location and time that was convenient to the participants.

Eight (8) participants were recruited from the initial contact made. A snowball sampling strategy was employed to recruit other participants. In this strategy, participants who had been interviewed were asked if they knew other pharmacy colleagues who may be relevant to this research and if they were willing to forward the general email they received to these colleagues. Those who were contacted through this means replied to indicate their interest. This referral system continued until data saturation was



achieved; that is no new themes emerged from the data (further explained in section 4.3.4). The snowball strategy was effective as a further 24 participants were recruited.

#### **4.3.4 Sample size**

There are no simple rules for sample size determination in qualitative research (Patton, 1990). Sample size is usually dependent on data or theoretical saturation (Holloway and Wheeler, 2010, Strauss and Corbin, 1998). Data saturation is reached when no new information is emerging from newly sampled participants while for theoretical saturation to be achieved, sampling is continued until no new concepts or theoretical insights can be obtained from the data (Holloway and Wheeler, 2010, Lincoln and Guba, 1985). Usually, sample sizes are between 4 and 40 participants. However, a sample size of 6 - 8 and 14 - 20 participants may be adequate for homogenous and heterogeneous groups, respectively (Holloway and Wheeler, 2010). In the present study, recruitment of participants continued until data saturation was reached. At this point, interview data did not yield any new code. Therefore, no new concept relevant to the development of new themes emerged from the data. A total of 32 participants were recruited in this qualitative study.

#### **4.3.5 Data collection method**

There are various methods of data collection in qualitative research including interviews, focus groups, observations, documents and audio-visual materials (Creswell, 2009). Interviews are the most common form of data collection technique in qualitative research including those in the area of pharmacy practice (Smith, 1998). The use of interviews in this research would enable me to gather data from participants' subjective experiences and views on the changes in the structure of pharmacy practice in the UK that would otherwise have been inaccessible through review of historical accounts contained in published documents.

Interviews involve skilful questioning by the researcher to obtain information from the respondent on his experience, perception and feelings (Holloway and Wheeler, 2010). Interviews are either conducted one-on-one or in a group. Three types of interviews are identifiable in the literature including the unstructured interview, the semi-structured interview and the structured interview (Bryman, 2012, Holloway and Wheeler, 2010). Structured interviews are conducted using an interview schedule containing list of questions in a pre-defined order which is strictly followed (Hardon et al., 2004). In this type of interview, the respondent has minimal control over the interview and the researcher is unable to collect information which are not covered in the interview

schedule (Hardon et al., 2004). Therefore, data collected using this form of interview is usually limited (Britten, 1995). Hence, they are less commonly employed in qualitative studies because most qualitative studies are intended to gain in-depth understanding of the phenomenon. On the other hand, unstructured interview starts with a general question on the topic area and subsequent questioning is dependent on the interviewee's response (Holloway and Wheeler, 2010, Britten, 1995). This form of interview is usually driven by the interviewee as the researcher's control over the interview is minimal (Holloway and Wheeler, 2010, Corbin and Morse, 2003). The interviewee therefore determines what would be included in the interview; the order and amount of information gathered during the interview (Corbin and Morse, 2003). Hence, this form of interview would be unsuitable for researchers who want to meet specific objectives in their study. Therefore, using this form of interview was considered inappropriate for this study because it intends to investigate specific aspects of the structure of pharmacy in the UK including education, career structure and the roles of pharmacy technicians. However, unstructured interviews are commonly employed in grounded theory to uncover hidden perspectives of a phenomenon as they represent a valuable 'methods of discovery' (Duffy et al., 2004, Glaus et al., 1996).

Semi-structured interviews are based on a list of questions or defined topics to be covered usually referred to as an interview guide (Bryman, 2012, Hardon et al., 2004). They are flexible as the order in which questions are asked may not be the same for all participants. However, the use of an interview guide ensures that core issues are covered during the interview (Holloway and Wheeler, 2010, Hardon et al., 2004). Therefore, this form of interviewing technique is commonly used by qualitative researchers as the researcher has significant control over the interview process and allows the researcher to address specific areas of the study. Hence, this research employed semi-structured interviews to explore the phenomena under investigation. This form of interview will allow the specific objectives of this study to be investigated using an interview guide. A common pitfall associated with semi-structured interview is that it is difficult to obtain valuable data from participants if appropriate questions are not asked by the interviewer (Corbin and Morse, 2003). This was taken care of in this study by designing a suitable interview guide containing list of questions and prompts which was reviewed by my supervisors (see section 4.3.6 for details on the interview guide). In addition, the findings of the pilot study conducted (reported in section 4.3.7) were suggestive of the ability of the interview guide to generate relevant data.

Interviews are conducted either face-to face, via the telephone or the internet involving the use of emails, chat boxes, and Skype (Hanna, 2012, Opdenakker, 2006). In

telephone interviews, communication between the researcher and the interviewee is occurring in real time as with face-to-face interviews. However, telephone interviews differ from face-to-face interviews in that the researcher is unable to observe any non-verbal communication (since the researcher and the interviewee are not present in the same place). Also, rapport between the researcher and interviewee is less compared to face-to-face interview (Cooper et al., 2008a, Opdenakker, 2006). In research where non-verbal response and rapport are less important, telephone interviews are as effective as face-to-face-interviews (Holt, 2010, Opdenakker, 2006). The current research combined both face-to-face and telephone interviews to enable the interviewing of participant across many locations in the UK. Semi-structured, in-depth interviews were conducted from October, 2013 to February, 2014.

#### 4.3.6 Interview guide

An interview guide (Table 4-1) was developed based on the review of the literature. The initial section of the interview guide contained questions about participants' practice experience including how long they have been practising as pharmacists/pharmacy technicians and their current and previous roles. This section of the interview guide was to: enable me develop rapport with the participants; understand the changes they may have seen over time and how their roles have evolved over time; and their involvement in the development of clinical pharmacy services within their practice settings. Other aspects covered in the interview guide were participants' perception of: the changes they have seen introduced in pharmacy practice in the UK; facilitators and barriers to implementing these changes; advantages and disadvantages associated with these changes; and how pharmacist prescribing can be introduced in other countries.

This interview guide was pilot tested. Details of the pilot test including its findings are reported in section 4.3.7

**Table 4-1: Draft interview guide used for the pilot interviews conducted with UK pharmacy staff**

<b>Areas covered by the interview</b>
<p><b>Preamble</b></p> <p>Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the changes in the professional structure of pharmacy in the UK prior to the introduction of pharmacist prescribing. This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point in time. All information obtained from you will be kept confidential.</p>

Are you happy for me to record the interview?

### **Key interview questions**

1. May I ask how long you have been a practising pharmacist/pharmacy technician?
  - *This will help me decide which changes they may have seen introduced*
2. Can you tell me something about the roles you have had in your career?
  - *If in senior management they may have been responsible for change and know what it was like prior to the change*
3. In your opinion, what changes have occurred in the structure of pharmacy in the UK since you registered?
  - *If prompting is needed, mention changes in the roles of technicians, salary changes following Noel Hall report (only useful if they have been registered for some years. May want to mention some of the extended roles such as prescribing at this stage.*
4. What advantages and disadvantages do you think are associated with these changes?
  - *This should help consider barriers and facilitators and if the interviewee is in favour of change or not.*
5. In your opinion, how have these changes affected pharmacy staff roles (expansion or erosion)?
  - *Need to ensure the word roles is stressed but may also want to consider activities of the different staff groups*
6. What do you think were the facilitators for change?
  - *May need to explain what facilitators mean at this stage and keep this definition the same for all interviews. May need some examples as prompts such as influential individuals, need for change, need to keep professionals interested*
7. Were there any barriers to the change process? If they were, how were they overcome?
  - *May need to have some examples ready such as money, other professional groups, other pharmacists or pharmacy technicians.*
8. If you were considering introducing pharmacist prescribing in another country, how would you go about it.
  - *If they talk about countries such as the US then guide onto Africa and Nigeria if possible although accept they may have no experience.*

**Thank you for taking part in this interview**

#### **4.3.7 Pilot interviews**

Pilot interviews were conducted to: test and refine the draft interview guide; evaluate the researcher's ability to engage in a qualitative interview; and the practicability of using a telephone interview. Two pilot interviews were conducted with a pharmacist and a pharmacy technician. The interviews entailed one telephone interview and a face to face interview. The pilot interviews were recorded using an audio digital recording device (Roland R-05 Portable MP3 Recorder). In the case of the telephone interview, an Olympus (TP-8) telephone pick-up microphone was used in conjunction with the audio digital recording device to record the interview. The pilot interviews were transcribed verbatim

The pilot interviews were considered during a supervision meeting and that provided both the researcher and the supervisors the opportunity to reflect on the interview process. The following observations were made on the pilot interviews conducted:

- The interview guide adequately covered the relevant topic area and desired responses were obtained from the participants. Participants' responses to the questions asked showed they had a clear understanding of the questions.
- The participants had little or no experience of pharmacy practice in developing countries including Nigeria. Hence they were unable to give an appropriate response when asked to comment on how they would go about introducing pharmacist prescribing in a country like Nigeria. This question was substituted with "what lessons are there for other countries to learn from the UK experience".
- Less exploratory prompts were used by the researcher. Therefore, additional prompts were introduced into the interview guide to elicit further details from participants and ensure that participants were asked to comment on all relevant areas.
- The telephone interview conducted was as effective as the face-to-face interview and the inability of the telephone interview to capture non-verbal communication did not affect the study.
- The duration of the interviews were acceptable as both types of interview lasted about an hour

Overall, there were no major changes to the structure and content of the interview guide except for those highlighted above. Hence, the pilot interviews were also included in the study. The final interview guide used for this study is included as an appendix in this report (see Appendix 7).

#### **4.3.8 Interview process**

Once a prospective participant agreed to participate in the study, arrangements were made for an interview, which was either a face-to-face interview for those participants in West Yorkshire or a telephone interview for participants outside of the West Yorkshire region. As mentioned earlier, telephone interviews were employed to enable the interviewing of participants across many locations in the UK. For face-to-face interviews, a convenient location and time was agreed by the researcher and participant. Face to face interviews were largely conducted at either the participant's place of work or the University of Leeds to minimise risk to the researcher. For interviews done over the telephone, participants gave the researcher a convenient telephone number (either work or home), a date and a time to call them for the interview.

At the design stage of this research, it was anticipated that about 30 interviews would be sufficient to reach data saturation based on the review of the literature (Holloway and Wheeler, 2010, Glaser, 1978). Therefore, semi-structured interviews were conducted in this research until data saturation was achieved, when further interviews did not yield any new theme. Thirty two (32) interviews were conducted in all. This therefore confirms other accounts suggesting that about 20-50 interviews are needed to achieve data saturation (Holloway and Wheeler, 2010, Glaser, 1978).

At the beginning of each interview, the researcher created a relaxed atmosphere for the interview by engaging with the participants in a brief informal discussion. Participants were told the purpose of the interview, how long the interview was expected to last and assured of confidential handling of any information obtained from them. Permission was also sought from participants to record the interviews conducted. No participants objected to the record of his/her interview. Interviews were recorded using an audio digital recording device as described in section 4.3.7.

An attempt was made by the researcher to complete all interviews within the duration of an hour. In situation where an hour was exceeded, permission was sought from participants to continue the interview if possible. These participants were allowed to freely accept to continue the interview or not. In addition, apologies were offered for exceeding the agreed duration of the interview. Only three interviews exceeded an hour.

#### **4.3.9 Data analysis**

There are many methods of analysing qualitative data. Smith and Firth (2011) categorised these methods into three: methods that consider the use and meaning of language such as discourse and conversational analysis; methods used in developing theory such as the constant comparative method employed in grounded theory; and methods used to describe and interpret participants' views such as content and thematic analysis.

A variety of methods of data analysis can be used in generic qualitative research (Cooper and Endacott, 2007). Sandelowski (2000b) suggested that qualitative content or thematic analysis are the preferred methods for a generic qualitative study. On the other hand, she also suggested that since generic qualitative studies may have some tones of the traditional qualitative methodological approach, data analysis methods that are specific to the traditional approaches may be employed. For example, the constant comparative method of analysis may be employed in generic qualitative studies without generating a theory (Sandelowski, 2000b). However, for this research, thematic analysis was used to analyse the data and the rationale for the choice of this analytical method is explained below.

All analytical methods in qualitative research involve the generation of themes (Miles et al., 2014, Smith and Firth, 2011). Thematic analysis is a "data reduction and analysis strategy by which data are segmented, categorised, summarised, and reconstructed in a way that captures the important concepts within a data set" (Ayres, 2008 p.867). Therefore, thematic analysis is a versatile technique of data analysis and this makes it fit for a variety of data including that of this research. Other authors have identified other applications of thematic analysis which are relevant to this study including: (i) it produce a detail description of the data sets (ii) It is appropriate for large data sets and (ii) interpretation within the context of thematic analysis is usually grounded in the data (Guest et al., 2012, Braun and Clarke, 2006). In addition, thematic analysis is relatively easy to learn and do. Therefore, it is suitable for a novice qualitative researcher (Braun and Clarke, 2006). Hence, thematic analysis was considered appropriate for analysing the data collected. However, thematic analysis has been criticized for its lack of depth, and the fragmentation of the data. This can lead to the loss of context in which the data was taken and misconstruction of meanings (Smith and Firth, 2011). But a number of measures were taken to build rigour into the analysis conducted and these are discussed in section 4.3.10.

The thematic analysis conducted in this study progressed in six different stages as described by Braun and Clarke (2006). These stages are discussed below.

#### **4.3.9.1 Stage 1: Data familiarisation**

Familiarisation with the data in this study began at the point of data collection (interview). All interviews were conducted by me and during each interview notes were taken of potential ideas which were brought into the analysis. Immersion into the data was achieved by repeated listening to the individual recordings of the interviews, transcribing and re-reading of individual transcripts.

Transcription involves transforming the verbal research data into written data and this has been described as a crucial step in qualitative data analysis (Kowal and O'Connell, 2014). I transcribed all the interviews myself and after each transcription, the transcript was cross-checked against the audio recording for accuracy. All interviews were transcribed verbatim. Transcription was aided by the DSS Player Transcription Module software. The transcribing of the interviews together with re-reading of the transcripts prior to coding helped me to develop more depth and breadth in the understanding of the data collected. During the reading of the transcripts, potential ideas and themes were noted.

#### **4.3.9.2 Stage 2: Generating initial codes**

Data management in this research was assisted by the use of NVivo 10 software. This software was used to facilitate the coding of portions of the interview transcripts. A code in this context is “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of the interview transcripts” (Saldana, 2012 p.3). Coding results in labelling of statements under one or more concepts thereby reducing the entire data set (Flick, 2014).

The coding process began while data collection was ongoing as suggested by many qualitative researchers including Miles et al. (2014). Coding was done in this study by selecting a portion of the interview transcript and assigning a word or phrase to capture the meaning of the text selected. The portion of text selected and coded could be a phrase or sentence(s) as seen in the excerpt below from one of the interviews conducted, in which the participant was discussing on the advantages of the changes in UK pharmacy structure.



<sup>1</sup>Well, at least the advantages are that in a sense they are bringing us closer to the other healthcare professionals like doctors and nurses for instance. So, we are working more closely with the other healthcare professions in a way we didn't before and <sup>2</sup>in special care as well. So, as pharmacists become more specialised, <sup>3</sup>we are making more use of technicians now. So, <sup>4</sup>it has resulted in the change of the skill mix really. I mean, <sup>5</sup>pharmacists are becoming less involved in dispensing now and supply and are more involved in advice and areas like prescribing. I think that's far one of the big advantages, <sup>6</sup>then a more satisfying career is one of course.

<sup>1</sup>CLOSE WORKING WITH OTHER PRACTITIONERS

<sup>2</sup>SPECIALISATION

<sup>3</sup>UTILISING TECHNICIANS

<sup>4</sup>CHANGE IN SKILL MIX

<sup>5</sup>TASKS SHIFT

<sup>6</sup>“SATISFYING CAREER”

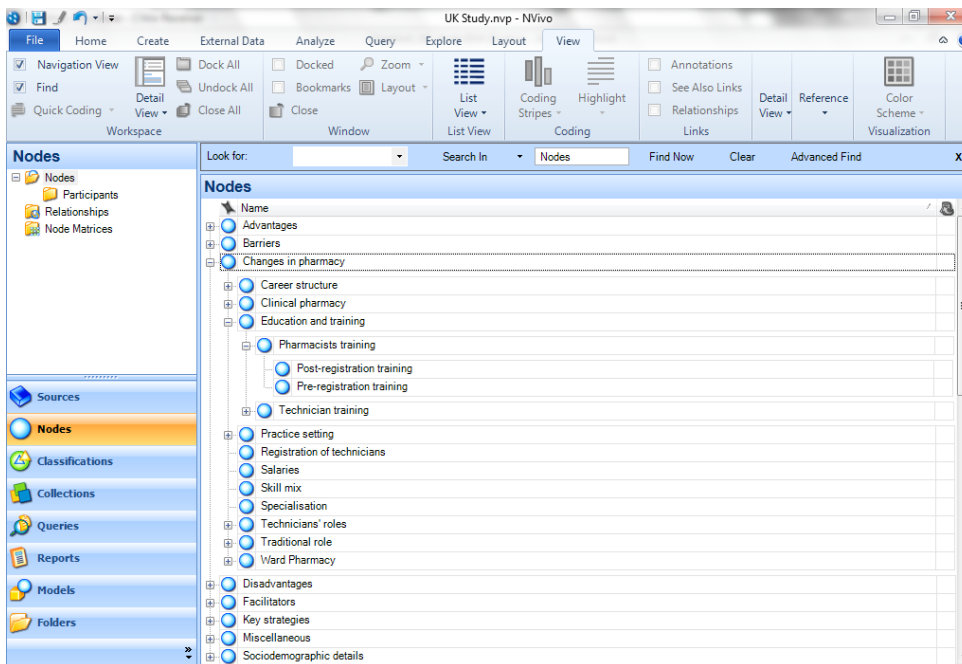
Coding was carried out both deductively (using codes derived from the literature, research objectives and interview guide) and inductively (data driven) as the researcher worked systematically through the data. In-vivo codes (coding with terms used by participants) were also assigned to the data in some cases. For instance in the excerpt above, a portion of the transcript was labelled “satisfying career” and placed in quotation marks to indicate in-vivo coding.

Initially, eight interview transcripts were coded and a list of codes were generated which form the coding structure. The coding structure generated was discussed with my supervisors at a supervision meeting. This coding structure was applied to subsequent transcripts; additional codes were generated and the coding structure was also refined as the analysis progressed.

#### **4.3.9.3 Stage 3: Searching for themes**

Stage 3 began with searching for patterns within the data and combining codes into related categories. During this stage, references on individual codes were examined and comparisons of data across cases were carried out. In addition, relationships between codes were examined and similar codes were brought together to form categories. For examples, codes labelled pharmacists' pre-registration training and post-registration training were brought together to form a category called pharmacists' training. This category later became a subcategory under education and training of pharmacy staff as seen in the screenshot below. The development of categories was iterative and the viability of each item under a category was constantly reviewed against the category. The use of memos in Nvivo to note ideas was valuable in the development of categories. Mind mapping (see Appendix 8) was carried out at this stage to help show relationships and organise codes into categories and potential themes. Some categories identified such as barriers to pharmacy practice change

emerged as themes while others were combined to form potential themes. At the end of this stage, references associated with each potential theme and subthemes were gathered together and further examined.



**Figure 4-1: Screen shot showing categories generated**

#### 4.3.9.4 Stage 4: Reviewing themes

Stage 4 of the analysis began with the examination of potential themes and subthemes. According to Braun and Clarke (2006) reviewing potential themes involves two levels: examining each theme in relation to its fit to the coded data (level 1) and to the entire data set (level 2) to ensure that the themes identified accurately represent the data set as a whole. In this research, reviewing themes took place on two occasions. In the first, I reviewed the identified themes for appropriateness with the data set during the analysis as suggested above. In addition, each theme and sub-theme identified was reviewed with respect to its importance to the research question. The first review yielded six potential themes and their subthemes as shown below.

**Table 4-2: Potential themes and subthemes identified during analysis**

<p><b>Theme 1: Development of Clinical Pharmacy Practice</b></p> <ul style="list-style-type: none"> <li>• Hospital versus community pharmacy practice</li> <li>• Changes in hospital pharmacists' roles</li> <li>• Changes in pharmacists' education and training</li> <li>• Changes in hospital pharmacists' career structure</li> </ul>
<p><b>Theme 2: Development of the technician workforce</b></p> <ul style="list-style-type: none"> <li>• Shift in technicians roles</li> <li>• Training of Pharmacy Technicians</li> <li>• Professionalization of Technicians</li> </ul>

<p><b>Theme 3: Drivers for change</b></p> <ul style="list-style-type: none"> <li>• Safety in the use of medicines</li> <li>• Complexity of medicines</li> <li>• Pharmacists' education and training</li> <li>• Agents of change</li> <li>• Acceptance by Doctors</li> <li>• Government policies and legislation</li> <li>• Growing demand for healthcare</li> </ul>
<p><b>Theme 4: Barriers to change</b></p> <ul style="list-style-type: none"> <li>• The medical profession</li> <li>• Professional attitude</li> <li>• Regulatory and legal constraints</li> <li>• Organisational barriers</li> </ul>
<p><b>Theme 5: Benefits of clinical role extension</b></p> <ul style="list-style-type: none"> <li>• Benefits to the patients</li> <li>• Benefits to the health system</li> </ul>
<p><b>Theme 6: Lessons for other contexts</b></p> <ul style="list-style-type: none"> <li>• Developing a credible practitioner</li> <li>• Development of the technician workforce</li> <li>• Developing a relationship with the medical profession</li> <li>• Engaging the legislators</li> <li>• Change leaders</li> </ul>

A second review of the identified themes was carried out with my supervisors. As a result of this review, some subthemes and themes were merged. For example, theme 1 and 2 which were mainly descriptive accounts of the changes that occurred in pharmacy practice in the UK were merged with theme 3 which centred on drivers for change. In addition, some subthemes were refined which involved renaming, splitting or combining them. For example, the sub-theme 'benefits to the health system' under theme 5 was divided into 'benefits to pharmacy staff' and 'economic benefits' to make it more specific.

#### **4.3.9.5 Stage 5: Defining and naming themes**

Following the review of the identified themes, a descriptive name for each theme was decided upon. An operational definition that captured and explained the meaning of each theme was developed and analysis of the data was presented within the scope of each theme.

#### **4.3.9.6 Stage 6: Producing the report**

This involved producing a report of the analysis of the research data and linking the analysis with the research objectives and the literature to produce a coherent report. The analysis of the interview data is presented in the result section of this report (section 4.4).

#### **4.3.10 Demonstrating rigour**

Qualitative research is usually criticized for lacking rigour especially by those of a quantitative background (Mays and Pope, 1995). This is because the concepts of validity and reliability as viewed by qualitative researchers differ greatly from the opinion held by quantitative researchers (Seale and Silverman, 1997). Quantitative researchers view validity in terms of the ability of an instrument to measure what it is supposed to measure and reliability in terms of the ability of the study to produce the same findings when it is repeated under similar conditions (Holloway and Wheeler, 2010, Merriam, 1998). This perception of validity and reliability is held by quantitative researchers because they view research as a process of objective discovery of a single reality known as 'the truth' (Leitch et al., 2009). However, qualitative researchers believe that there are multiple and changing realities and human behaviour is never static (Merriam, 1998). Therefore, the quality of qualitative research cannot be determined by following set formulae as in quantitative research (Mays and Pope, 1995, Buchanan, 1992). Hence, the concepts of trustworthiness and authenticity are usually used in qualitative research rather than validity and reliability (Holloway and Wheeler, 2010, Merriam, 1998, Seale and Silverman, 1997, Lincoln and Guba, 1985).

Even though many qualitative researchers argued that it is difficult to achieve a comprehensive approach for assessing the quality of a qualitative research (Leitch et al., 2009, Morse et al., 2008), the quality criteria described by Lincoln and Guba (1985) are commonly employed by qualitative researchers. Lincoln and Guba (1985) use four criteria to demonstrate trustworthiness in qualitative research: credibility, transferability, dependability and confirmability and these terms are similar to the traditional terms of internal validity, external validity, reliability and objectivity respectively, used in quantitative research.

Credibility considers how congruent research findings are with reality (Merriam, 1998). This can be achieved through prolonged engagement in research, persistent observation, triangulation, negative case analysis, peer review and member checking (Merriam, 1998, Lincoln and Guba, 1985). A number of strategies including member checking; reviewing of the research including its findings by my supervisors, and triangulation were employed in this research to establish credibility. Firstly, this study used a digital voice recorder whose output is of high audio quality to record all interviews; and the researcher carried out the transcription and also checked transcripts against their recordings to ensure that information obtained from participants are accurately converted into textual data. These activities in themselves

add to the credibility of the study. Secondly, member checking was carried out. The analysed data and its interpretation were taken back to two (a pharmacist and a pharmacy technician selected by convenience) study participants. Feedback was sought from them on how well the data and interpretations represented the changes that occurred in pharmacy practice in the UK and any other comments they may have concerning the findings of the study. These participants agreed with the findings and its' interpretation. However, one of the participants noted a strategy for practice change that was omitted in the report; that is, identifying gaps where pharmacists' could fill to enhance doctors' role in patient care. This comment was considered in relation to the entire data set and that resulted in the development of a sub-theme 'seizing the opportunity' under the 'strategy for change' theme reported in section 4.4.6. Thirdly, peer-reviewing of the research process including the development of themes and interpretations by my supervisors (discussed in section 4.3.9.4) and the discussions with a pharmacy practice researcher (who was in hospital practice when these changes were occurring) outside my supervisory team also adds to the credibility of this study. Fourthly, triangulation which involve the use of multiple sources to confirm emerging findings (Merriam, 1998), was employed in this study. As reported in chapter 3, triangulation can be by data sources which can include persons, time and places; by data collection methods; by researchers or by theory (Miles et al., 2014, Merriam, 1998). Triangulation by data sources was used. The study recruited both pharmacists and pharmacy technicians (triangulation by persons) and participants across many regions in the UK (triangulation by place) in order to gain understanding on the changes that occurred in pharmacy practice in the UK from different sources. Convergent views were obtained from participants (irrespective of their profession or location) on many of the issues explored in this study including changes in pharmacy staff roles in the UK.

Transferability deals with the extent to which the findings in a study can be applied to other settings. This entails a detailed description of the research process and context to enable others to understand the similarity of their context to the research context. This enables them to see if the research is transferable to their context (Holloway and Wheeler, 2010, Merriam, 1998). Therefore, a detailed account of how this study was conducted including research setting, methods, what informed the choice of a particular method, process of interviews and data analysis was maintained in this report. This is to enable other readers to ascertain whether the findings of this study can be transferable to their context.

Dependability involves demonstrating that the research findings are consistent and could be repeated. This can be achieved through an audit trail by reporting in detail the research methods, procedures and all decisions made by the researcher(s) during the study (Holloway and Wheeler, 2010, Merriam, 1998). Similarly, detailed accounts of the research method including procedures involved and decisions made were maintained in this report.

In confirmability, the researcher ensures that the findings of the research are a representation of the participants' experiences and views and not the researcher's prior assumptions and preconception (Holloway and Wheeler, 2010, Shenton, 2004). This can be achieved through an audit trail to enable readers to follow up how themes and interpretations were generated and be able to link these with data sources (Holloway and Wheeler, 2010). Other means of achieving confirmability are triangulation and reflexivity (Lincoln and Guba, 1985). The findings in this study were described in detail and supporting quotes from participants were used to enable the readers of this report to ascertain whether the account presented reflected the participants' views. In addition, a reflexive account of my interaction with this study was given in the introductory chapter of this thesis.

## **4.4 Results**

### **4.4.1 Demographics**

Thirty two (32) participants (consisting of 26 pharmacists and 6 pharmacy technicians) were interviewed. Thirteen (13) interviews were conducted face-to-face while the remaining nineteen (19) were via the telephone. The interviews conducted lasted between 30 - 80 minutes, with an average interview time of 45 minutes. All those who participated in the study had worked in hospital pharmacy at one point in their career throughout the 1970s – 1990s, while 8 participants had worked in a community pharmacy either in a full-time or part time position. Three (3) of the pharmacists who participated in this study were retired, two of them were chief pharmacists of district hospitals and the third participant was a district pharmaceutical officer under the old hospital pharmacy structure. Table 4-3 shows details of the characteristics of participants interviewed.

Among the 26 pharmacists interviewed, 13 were primarily in clinical service areas either as managers or clinical pharmacists. Seven (7) of these pharmacists had prescribing as a part of their roles.

**Table 4-3: Demographic details of participants interviewed**

<b>Characteristics</b>	<b>Number of participants</b>
<b>Gender</b>	
Male	14
Female	18
<b>Profession</b>	
Pharmacy Technician	6
Pharmacist	26
<b>Period of qualification</b>	
1970s	16
1980s	12
1990s	4
<b>Participants' location</b>	
East of England	4
East Midlands	3
London	1
North East	1
North West	2
South East	1
West Midlands	1
Yorkshire and Humber	15
Scotland	4
<b>Participants' practice setting</b>	
Hospital	15
Primary care	7
Education/Training	6
Leadership	1
Retired	3
<b>Participants' current role</b>	
Director of pharmacy/Chief pharmacist	5
Consultant pharmacist	1
Service manager	5
Lead pharmacy staff	5
Senior clinical pharmacist	1
Senior technician	1
Practice pharmacist	5
Pharmacy lecturer	5
Leadership	1
Retired	3

**Table 4-4: Themes and sub-themes from analysis**

<b>Theme</b>	<b>Subtheme</b>
4.4.2 Redefining the pharmacists' professional role	
4.4.3 Drivers for pharmacy practice change	4.4.3.1 Safe use of medicines 4.4.3.2 Government policies and legislations 4.4.3.3 Pharmacists' education and training 4.4.3.4 Specialisation 4.4.3.5 The role of pharmacy technicians 4.4.3.6 Economic driver 4.4.3.7 Professional relationship with doctors 4.4.3.8 Shortage of medical doctors 4.4.3.9 The role of leading individuals and professional associations
4.4.4 Barriers to pharmacy practice change	4.4.4.1 The Medical Profession 4.4.4.2 Professional attitude of pharmacy staff 4.4.4.3 Legislative and policy constraints 4.4.4.4 Professional Isolation 4.4.4.5 Organisational barriers
4.4.5 Benefits of clinical role extension	4.4.5.1 Benefits to the patients 4.4.5.2 Benefits to pharmacy staff 4.4.5.3 Economic benefits
4.4.6 Strategies for achieving pharmacy practice change	4.4.6.1 Developing a credible pharmacy practitioner 4.4.6.2 Freeing-up pharmacists to do extended role 4.4.6.3 Seizing the opportunity 4.4.6.4 Developing a relationship with the medical profession 4.4.6.5 Leading individuals and professional associations



#### 4.4.2 Redefining the pharmacists' professional role

Redefining pharmacists' professional role emerged as an overarching theme in this research. It revealed that hospital pharmacists in the UK have succeeded in assuming roles which are significantly different from those carried out by pharmacists in the past, which were mainly supply functions. They have expanded their roles significantly over the years and are now working at a highly specialised and advanced level clinically. In addition, many hospital pharmacists interviewed viewed themselves as clinicians contributing to patient care.

Pharmacists and pharmacy technicians interviewed in this study described how they saw the roles of the hospital pharmacists evolve from a purely supply function to a clinical one from the 1970s. This change in hospital pharmacists' roles initially began with the introduction of ward pharmacy which was followed by the development of clinical pharmacy services as pharmacists' knowledge and skills advanced.

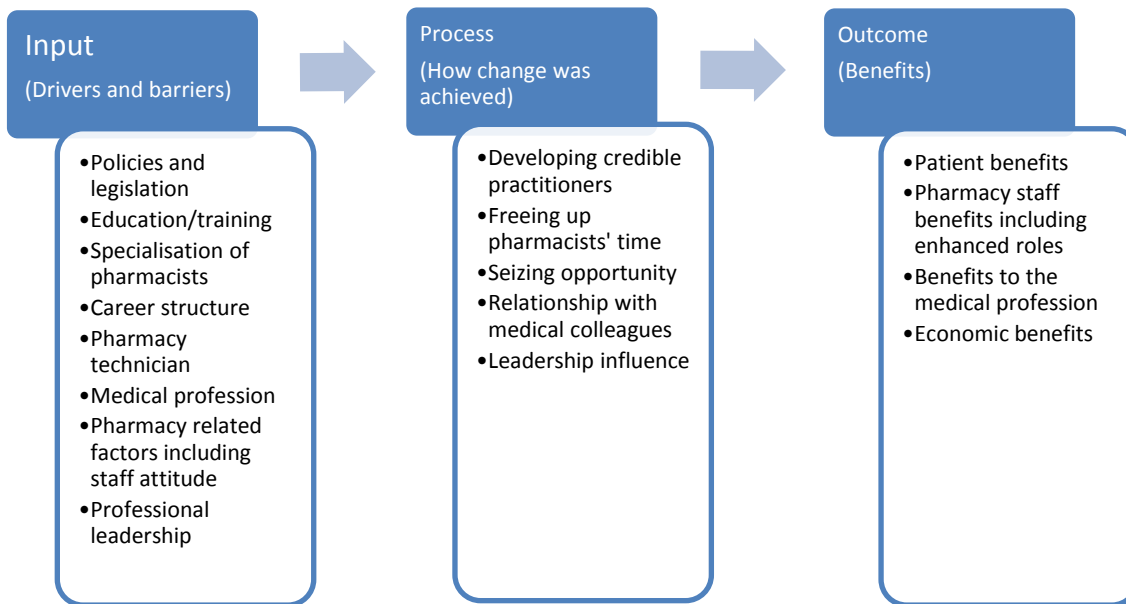
*"In the 1970s we started getting more clinically involved, we started working on the wards alongside nurses and doctors and other specialists." (P01, Pharmacist)*

Participants' commonly observed that although hospital pharmacists in the UK developed their clinical roles as early as the 1970s, the clinical roles of community pharmacists are just evolving.

*"Starting from the hospital side, it changed fairly quickly in the 1970s; we got much more clinically involved in hospital and of course that has now started to happen in the community pharmacy as well now but that has taken obviously longer, and it is happening at a later stage really." (P01, Pharmacist)*

*"... it has taken much longer and clinical pharmacy is still in it's infancy in community pharmacy."(P04, Pharmacist)*

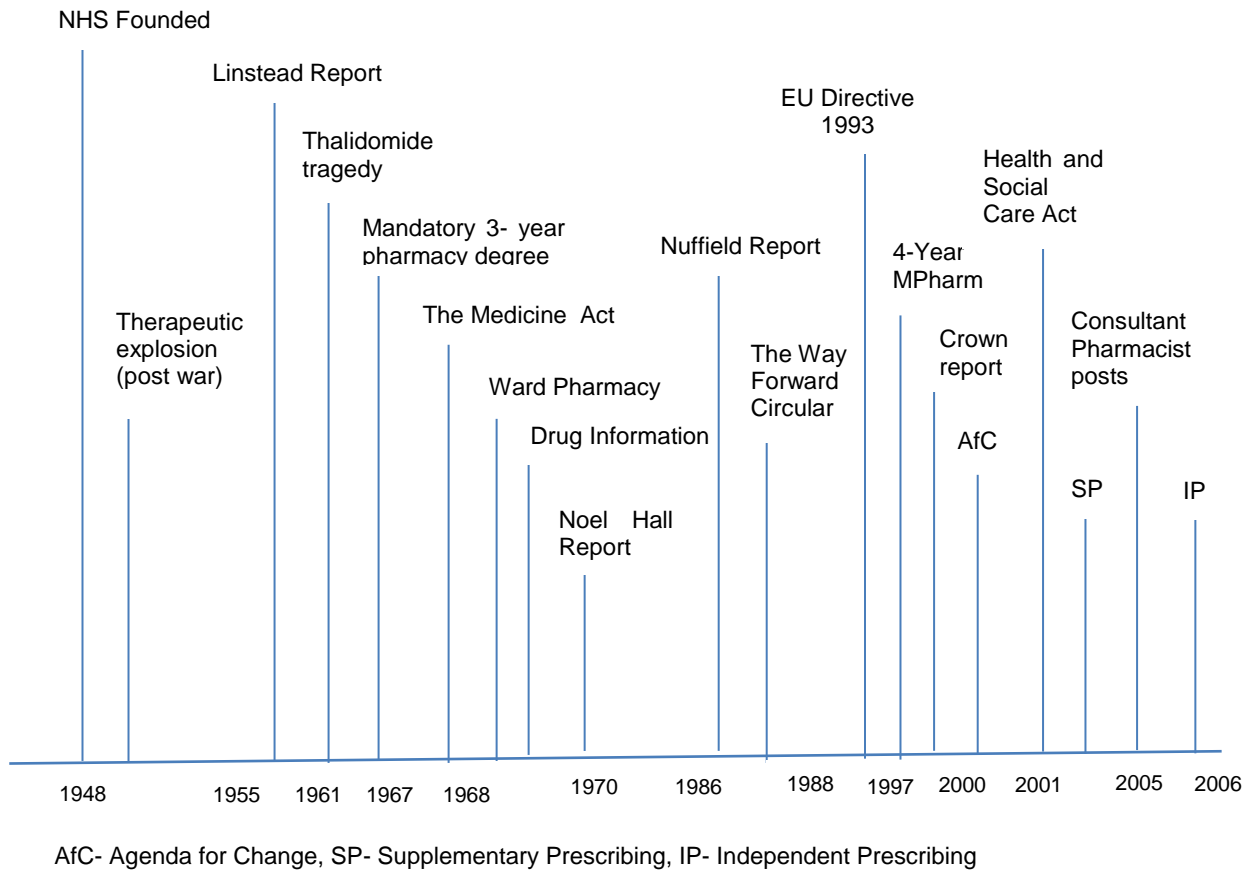
Analysis of the interview data identified a number of drivers and barriers to the development of pharmacists' clinical roles in both hospital and community pharmacy settings which are discussed in subsequent sections of these results. Overall, four major themes (see Table 4-4 above) including drivers, barriers, benefits and strategies for developing clinical pharmacy practice were identified. These themes fit into the input (drivers and barriers), process (strategies) and outcome (benefits) model (Ilgen et al., 2005). This is illustrated in Figure 4-2.



**Figure 4-2: Relationship of identified themes with the Input-Process-Outcome model**

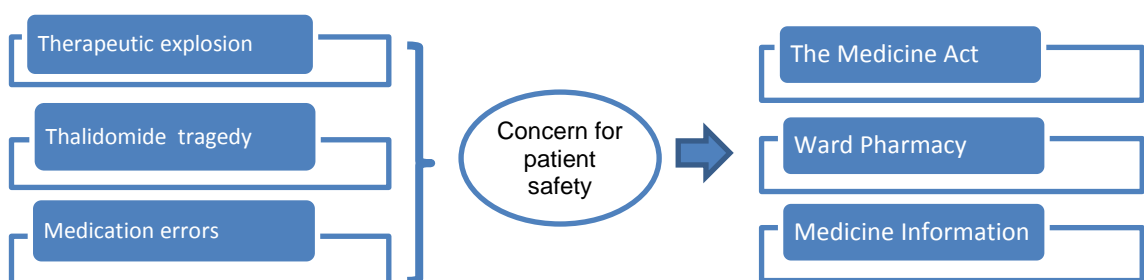
#### **4.4.3 Drivers for change**

This category considered the factors that enabled hospital pharmacists in the UK to develop their clinical roles. Nine factors were identified which facilitated the development of clinical pharmacy practice: concern for safe use of medicines; government policies and legislation; economic drivers; pharmacists' education and training; specialisation; professional relationships with doctors; shortage of medical doctors; the influence of leading individuals and professional bodies; and the development of pharmacy technicians' roles. These factors are discussed in relation to the timeline of events (outlined in Figure 4-3) that had influenced pharmacy practice in the UK.



**Figure 4-3: Timeline of some key events in the UK**

#### 4.4.3.1 Safe use of medicines



**Figure 4-4: Medicine related events that led to the development of pharmacists' roles**

At the establishment of the NHS in 1948, there were few potent medicines available in clinical practice. The National Formulary of 1949 following the establishment of the NHS contained about 400 entries and many of these were formulae for the preparation of medicines (Bond and Clarke, 2007). The period between 1940 and 1975 was described by Le Fanu (1999) as the golden age of drug discovery. This author reported

that over 100 new medicines were being registered each year in the pharmacopoeia in the 1960s.

Therefore, many participants in the current research observed that over time, medicines became the mainstay in the treatment of many conditions. In addition, many new potent and complex medicines that demanded detailed monitoring were introduced into clinical practice.

*“When I first started one of the most common surgical procedures was for stomach ulcers because there were no medicines for stomach ulcers, then cimetidine came and then other drugs.” (P07, Pharmacist)*

*“I think probably the other driver was the sort of pharmaceutical explosion, the therapeutic explosion, the range of drugs that became available from the 60s onwards.” (P11, Pharmacist)*

Participants also noted that the tragedy associated with the use of thalidomide in 1961 brought to light the dangers associated with the use of the increasing numbers of new and potent medicines within the NHS. As a result, the Medicine Act was enacted in 1968 to regulate the sale, supply and production of medicines. Within the same period, there were reports of medication prescribing and administration errors on the hospital wards because of the increasing numbers of medicines available and the complexity of treatments (Crooks et al., 1965, Vere, 1965).

It was a usual practice in the UK for hospital pharmacies to supply commonly used medicines to wards as ward stocks which are managed and administered to patients by nurses. These ward stocks were potential sources of medication errors (Taxis et al., 1999). Other reports have indicated that not all prescriptions for medicine items included in the ward stock at that time were reviewed by pharmacists prior to administration because of pharmacists' absence on the wards (Stone and Curtis, 2002, Calder and Barnett, 1967). In addition, some pharmacists interviewed in the current study, reported that even when they dispensed prescribed medicines themselves, in many cases they were unable to make informed decisions on the appropriateness of the prescribed medicines because they lacked access to patients' clinical data at that time.

*“...you are all trying to second guess the right medicines, the right dose for the patient...” (P24, Pharmacist)*

Although several distribution systems were developed in the 1960s to prevent prescribing and administration errors including the unit dose dispensing system and ward pharmacy which originated from the United States and the UK respectively

(Leckie and Clansey, 1968, Barker and Heller, 1964); ward pharmacy was perceived to be the most effective method within hospitals in the UK. This was acknowledged in the Noel Hall report.

*“We are aware that several schemes are being developed which seek to eliminate errors in the prescribing and administration of drugs and it is not yet clear which system will prove to be the most efficient and economical. But we consider that the development of ward pharmacy and of systems based on the principles of ward pharmacy is to be commended and will be a major factor in the future development of the service.” (DHSS, 1970 p.9)*

Therefore, many participants perceived that the need to ensure a safe supply of medicines in the wards was the drive for the development of ward pharmacy.

*“...there was a recognition that medicine use on wards wasn't perfect and pharmacists being the expert in medicines could contribute to something around that.” (P18, Pharmacist)*

However, participants' description of ward pharmacy indicated that it largely included coordinating the supply of medicines to inpatients and stock control.

*“...we started to develop work outside of the dispensary and we took a group of services to the ward and that was called ward pharmacy initially.” (P24, Pharmacist)*

*“I remember when I was newly qualified in XXX, I remember going to a ward and my job was really almost like top-up the amount of drugs that were on the ward. It wasn't really directed at patient any way.” (P32, Pharmacist)*

Ward pharmacy services were initially reported on hospital wards in Aberdeen and London in the 1960s (Calder and Barnett, 1967). However, many participants in the current study noted that it was not popular in many hospitals until the 1970s and the early 1980s because its introduction was locally driven. Their reports indicated that ward pharmacy services were easily adopted in larger hospitals like the teaching hospitals with more resources including staffing. Furthermore, in the early days of ward pharmacy only a few pharmacists were able to visit hospital wards. These pharmacists were usually on the wards for a limited time because there weren't enough pharmacists to free them up to spend more time on the wards.

*“The structure was such that the amount of time you can spend on the ward was limited because there was still quite an important as you said a dispensing role or a supply role in the pharmacy.” (P07, Pharmacist)*

However, as the number of hospital pharmacists increased and pharmacy technicians were developed to take up some traditional roles of pharmacists (discussed in section 4.4.3.5), that freed pharmacists up to be more involved in ward activities including participating in ward rounds with doctors.

Participants reported that ward-based prescription charts were also introduced in the early days of ward pharmacy as a measure to minimise medication errors and pharmacists took advantage of this opportunity to enhance their contribution to patient care.

*“...we were going and looking at the inpatient charts and annotating them with, ‘with food’, ‘take before meal’, putting extra instructions, clarifying dosages and writing on the prescription chart at that point.” (P17, Pharmacist)*

Some participants also perceived that because these charts were usually kept on the wards it made pharmacists, including those who did not have a positive attitude towards ward pharmacy, to regularly visit the wards in order to monitor the charts.

*“We designed our medication prescribing administration chart, which means that they never left the ward. So, in order for the pharmacists to exercise their professional responsibility to the issue of medication patients were receiving, we had to go on the ward.” (P26, Pharmacist)*

However, a few pharmacists pointed out that at that time, pharmacists had less influence on doctors prescribing. These pharmacists associated it with pharmacists' inadequate clinical knowledge at that time. This is because, the undergraduate pharmacy course had less clinical component and many hospital pharmacists had no postgraduate training in clinical pharmacy.

*“I think my opinion is that at that point, pharmacists generally weren't sufficiently clinically qualified to be able to really do that.” (P04, Pharmacist)*

Despite the perceived inadequate clinical knowledge, some pharmacists reported that their presence on the wards enabled them to identify inappropriate use of medicines.

*“Once we got onto the wards, we picked up so many potential errors in the prescribing...” (P17, Pharmacist)*

In addition, pharmacist expert knowledge of medicines was utilised especially by junior doctors who became dependent on them for prescribing advice and to minimise risks associated with their prescriptions.

*“I think it’s kind of a natural progression from dosing advice about medicines, to the doctors come and say I got a patient with A, B, C and so and so is wrong with them, can you advise what we could prescribe?” (P14, Pharmacist)*

*“We eventually got more pharmacists and we were able to spend more time on the wards advising doctors and talking to patients about their medicines.” (P17, Pharmacist)*

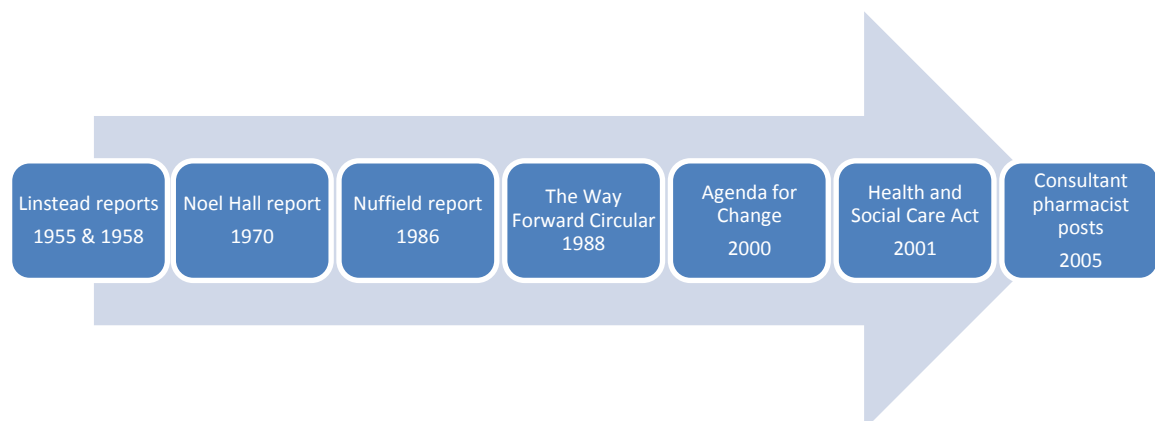
The increasing number of new and potent medicines and the concern for medication safety also led to the establishment of drug information services within local hospitals which later became an area of specialisation in pharmacy

*“...drug information started back in the 70s. We had the drug information centre back in the 70s.” (P14, Pharmacist)*

Overall, pharmacists observed that their role in minimising risks associated with medicines on the wards was a major factor contributing to their acceptance and integration into the ward team. In addition, the pharmacists interviewed believed that doctors appreciated their role because it was difficult for them to keep up to date with all the developments regarding medicines given the increasing number of new and potent medicines introduced into the clinical practice.

#### **4.4.3.2 Government policies and legislations**

Since the inception of the NHS, there were several government reports and policy documents that were published. These included the Linstead reports (1955 and 1958), Noel Hall report (1970), the Nuffield report (1986) and the Department of Health’s 1998 circular on the way forward for hospital pharmaceutical services.



**Figure 4-5: Some government documents linked to the development of clinical pharmacy practice in the UK**

Many participants in this study perceived that some of these reports had a significant impact on the development of clinical pharmacy practice in the UK.

Although, the Linstead reports of 1955 and 1958 were the initial reports that considered the hospital pharmaceutical services, the recommendations of these reports were not implemented by government (Anderson, 2005a). The Noel Hall committee was set up in 1968 to advise the government on how best the hospital pharmaceutical services were to be organised to make efficient use of pharmacy staff and recommend a suitable career structure for staff including pharmacists and pharmacy technicians (DHSS, 1970).

The Noel Hall report recommended the organisation of hospital pharmaceutical services into area and regional units in order to provide a better career structure for hospital pharmacists and promote the use of pharmacists' skills. The report also recommended that pharmacists should perform roles that were appropriate to their professional training and suggested that hospital pharmacists have an important advisory role and should work alongside other clinical staff to ensure safe and cost effective use of medicines (DHSS, 1970).

Many participants in this study saw the Noel Hall report as the initial government document that led to a significant change in hospital pharmacy practice.

*"The Noel Hall report was sort of a kick off to getting the things going."  
(P17, Pharmacist)*

The pharmacists interviewed in the current study reported that prior to the recommendations and implementation of the Noel Hall report in the 1970s, hospital pharmacy practice was not attractive to newly qualified pharmacists. This was because the career structure was flat and did not provide the opportunity for young pharmacists to move up the career scale so easily. In addition, remuneration was poor compared to community pharmacy practice or the industry. Therefore, many participants perceived that this had an effect on staff recruitment and retention.

*"As at the time I joined hospital pharmacy there were certainly difficulties with recruitment and the career structure was very limited. So, people looking for long term career were not necessarily looking to hospital pharmacy." (P11, Pharmacist)*

The findings of this study indicate that those pharmacists who joined and remained in the hospital service in the 1970s did so because they wanted to work in an environment where they perceived their professional skills would be utilised.



*“I moved into hospital pharmacy [from community pharmacy] because I wanted to do a more clinical job. I wanted to do some work that was more clinically related to the care of patients with medicines.” (P15, Pharmacist)*

*“I saw that as being more professional than going into retail. The hospital was more where you could sort of practise your profession more.” (P28, Pharmacist)*

However, with the reorganisation of the hospital pharmacy services and improved grading structure for pharmacy staff following the Noel Hall's recommendations, the career structure of hospital pharmacists became better and that made hospital pharmacists' jobs more attractive. Participants reported that regional and area pharmaceutical service posts were established and chief pharmacists of some hospitals became regional and area pharmacists thereby creating an opportunity for those in lower grades of the career structure to move upward.

*“...because Noel Hall came in and a number of senior people were promoted to a regional and area posts which created vacancies for principal pharmacists, you were able to get promotion to staff pharmacist very early on and on top of that remuneration started to improve as well and so it became much more attractive.” (P11, Pharmacist)*

*“...a lot of relatively young pharmacists were made staff pharmacists. So, I see that as a big boost to their career.” (P28, Pharmacist)*

Some participants perceived that these developments had positive effect on recruitment and retention of experienced pharmacists.

*“...there was a change, the salaries of hospital pharmacists went up quite significantly and mine did as a result of that re-grading and I think that probably had an impact on the development of clinical pharmacy because pharmacists who had a significant clinical role could earn a salary which was more aligned to their expertise.” (P07, Pharmacist)*

The Nuffield report of 1986 which considered the structure of pharmacy in the UK was also another major government initiative that moved clinical pharmacy practice forward. The Nuffield report was the first government document to officially recognise clinical pharmacy and made recommendations that pharmacists have a role in patient care and that clinical pharmacy should be practiced by hospital pharmacists (Nuffield Foundation, 1986). The recommendations of the Nuffield report resulted in a circular published by the Department of Health in 1988 entitled the 'Way Forward for Hospital Pharmaceutical Services' (Department of Health, 1988). Many clinical pharmacists

interviewed saw this document as a major driver for clinical pharmacy development in the UK.

*“And also there have been a lot of national things, there was a report of.., I think it was in 1988, before I qualified which talked about why we should have clinical pharmacy.” (P31, Pharmacist)*

*There was a landmark event in 1988, the government issued a health circular to all hospitals, it was called the way forward. (P32, Pharmacist)*

According to these pharmacists, the government through this circular spelt out certain functions that hospital pharmacists could do to contribute to patient care including contributing to prescribing decisions. In addition, the government urged every hospital to develop clinical pharmacy services. These pharmacists reported that as a result of this document the post of clinical service managers was created in some hospitals to manage clinical pharmacy services.

Furthermore, the recommendations of the Nuffield report provided clinical pharmacists with the opportunity to grow into senior positions while maintaining their specialist functions, though they couldn't get to the top of the grade without moving into managerial roles (Nuffield Foundation, 1986). However, pharmacists reported that the implementation of the Agenda for Change grading structure in the 2000s (about 30 years after Noel Hall) which recognised advanced level practitioners and the subsequent introduction of the consultant pharmacist post in 2005 (Department of Health, 2005a), provided a clinical career pathway for hospital pharmacists. Therefore, specialist clinical pharmacists now move to the top of their career grade within their specialty.

*“...the career structure now reflects a very clear opportunity to specialise and sub-specialise at the unit here, whereas at one time, you know you are in a position where it sort of led into the management route really as opposed to specialised into clinical level” (P04, Pharmacist)*

However, some pharmacists interviewed expressed concern over the present consultant pharmacist model as it does not provide as many specialist clinical pharmacists the opportunity to get to the post. This is because only a few posts are currently available.

*“If you want to go to the top, you have to go down one of the other routes. You won't get to the top as a clinical pharmacist. There is a new post called consultant pharmacists... that is where we are all*

*trying to get now but there are not very many of that post yet.” (P27, Pharmacist)*

*“I think in my own hospital I have a large number of pharmacists who would be capable of practising as pharmacist consultants but we don’t have the post available for them to go into.” (P15, Pharmacist)*

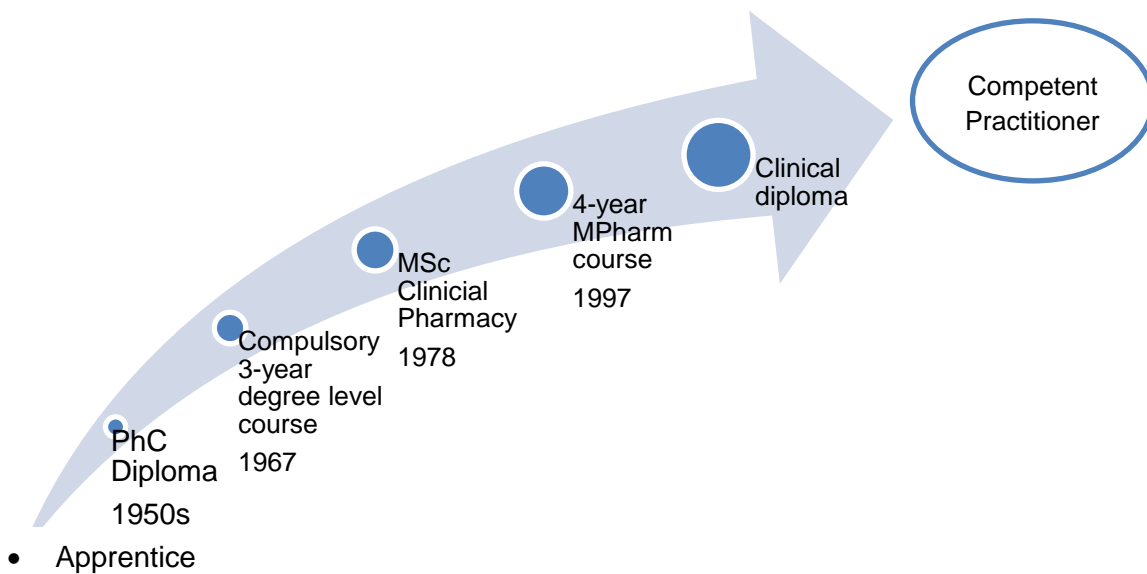
This study revealed that major obstacle to increasing the current number of consultant pharmacist posts were around funding. Not many hospitals especially the smaller ones would be able to sponsor the consultant pharmacist post. Since the posts are developed locally, some participants believed that up to now, some chief pharmacists don’t really know where consultant pharmacists fit in within their context. In addition, a participant noted that even when the posts are created, they are usually created in specialties where the hospital management perceived it would be of a great impact in service delivery.

*“If I want to move up to the next grading in my job, there is just two ways of going really. One is to become managerial and the other one is to go into the role of consultant grade but in this organisation that is not an easy partway to take. Because, the posts are tend to be appointed on a sort of... to do with the bigger service. So, we have the microbiology, haematology, elderly care type role and most of these posts are created because there is a strategic demand in the service.” (P30, Pharmacist)*

Participants also noted that there have been other recent drivers from the government that have impacted on clinical pharmacy practice. For example they mentioned that the recommendations of the ‘A Spoonful of Sugar’ publication in 2001 (The Audit Commission, 2001), enabled chief pharmacists to be elevated as clinical directors and be part of hospitals’ board of directors advising the board on the development of clinical pharmacy services. Participants also talked about the legislative change outlined in the Health and Social Care Act of 2001 that enabled pharmacists to become prescribers, initially as supplementary prescribers in 2003, then as independent prescribers in 2006. However, some participants felt that the success of the initial extension of prescribing rights to nurses was a major driver to extending such rights to pharmacists and other allied health professionals.

*“Nurses had already got a foot in the door in 1992 and that was a facilitator. You mustn’t forget that, nurse prescribing, was a facilitator to pharmacist prescribing because it was seen to be acceptable.” (P08, Pharmacist)*

#### 4.4.3.3 Pharmacists' education and training



**Figure 4-6: Developments in pharmacy training programme in the UK**

Prior to the 1970s individuals with the druggist or pharmaceutical chemist certificates who studied at a diploma level were allowed to register and practice as pharmacists. However, these certifications were gradually phased out. By 1967, all pharmacy programmes available in the country were awarded a degree status and as a result all individuals seeking registration as pharmacists in the UK after December 1970 were graduates (DHSS, 1970). Pharmacists' training therefore consisted of a 3-year undergraduate degree followed by a year of pre-registration training in practice. Despite this development in pharmacists' training, the participants I interviewed who qualified in the 1970s and 1980s reported that their undergraduate degree was predominantly science based and does not prepare them for clinical practice.

*"I got into my day one in pharmacy in the dispensary at XXX hospital and I thought, 'I don't know'. I felt completely at sea because my training had been very scientific, a little bit of application to practice." (P17, Pharmacist)*

*"My first job was here in XXX and I found it challenging, my undergraduate course hadn't prepared me clinically for working in the clinical role. It was an old fashion course, quite theoretical and at that time, there was no placement or exposure to patients at all." (P07, Pharmacist)*

Several factors were likely to have contributed to the strong scientific or theoretical bias of the pharmacy programme. First, pharmacists were still viewed as manufacturers or compounders of medicines; hence pharmacists' training was tailored toward making it more relevant to drug manufacturing and possibly research. In addition, many

individuals who trained the initial cohorts of pharmacists were either not pharmacists or were academic pharmacists who were not practising and unlike now, practitioners were not usually involved in teaching. Therefore, it was difficult to link learning and practice. However, with increasing developments in hospital pharmacy practice as a result of the introduction of ward pharmacy and subsequently clinical pharmacy, more clinical contents were increasingly added to the undergraduate course and some participants reported that teacher practitioners and clinical rotations in practice settings were introduced in order to bridge the gap between training and practice.

*“I became the first teacher practitioner at XXX University. At the University I had to put in place a number of clinical modules within the undergraduate curriculum.” (P32, Pharmacist)*

Participants also noted that postgraduate programmes in clinical pharmacy were established to address many of the shortcomings of pharmacists’ clinical knowledge and skills. The initial masters’ programme in clinical pharmacy was established in Manchester in 1978, other universities including London and Bradford also developed their programmes subsequently (Calvert, 1999). The initial cohort of pharmacists who undertook the course were taught mainly by medical consultants because there were no clinical pharmacists at that time to do so.

*“I undertook a masters’ in clinical pharmacy and this was brand new... Initially we were taught by medical staff.” (P24, Pharmacist)*

*“I got the opportunity to do one of the first master’s degree in clinical pharmacy. At that time that course was taught mainly by consultant medical staff with a little bit of pharmacy staff for the pharmacokinetics and pharmacology but a lot of input from consultant medical staff.” (P32, Pharmacist)*

These initial cohorts of hospital pharmacists were instrumental in the training of other pharmacists as many of them served as teacher practitioners teaching other pharmacists enrolled in the masters programme, thereby resulting in the training of more pharmacists.

Although the postgraduate programme in clinical pharmacy was introduced, participants reported that not many hospital pharmacists did the course at that time because it wasn’t a requirement for clinical pharmacy practice or career progression within the hospital.

*“When I first started, not everybody had the diploma,... some people went on to do a masters of what was called clinical pharmacy but there weren’t many people taken on to do that.” (P17, Pharmacist)*

In spite of these developments in training, pharmacists were still performing roles that were below their level of training. Pharmacists interviewed in this study acknowledged that their skills were underutilised and that resulted in dissatisfaction among pharmacists regarding their job roles.

*“I do think it was about the pharmacists realising that putting tablets in bottles and checking prescriptions is not the role of the pharmacist. You don’t need a degree to do that.” (P17, Pharmacist)*

This perception of underutilisation of pharmacists’ skills was put forward strongly by the younger pharmacists I interviewed because they perceived they were more highly trained than their older colleagues and could not continue with the traditional roles their older colleagues were performing. In an interview with a pharmacist who graduated in the 1990s, he exclaimed:

*“I didn’t do a pharmacy degree to do the counting tablet role! I did it because I wanted to do clinical pharmacy, I wanted to be on the ward, I wanted to be influencing doctors prescribing, I wanted to be counselling patients on their medicines, I wanted to make sure that the medicines were being used in a safe way providing my expertise” (P18, Pharmacist)*

Participants noted that pharmacists’ perception of their professional role beyond dispensing came as a result of a change in the orientation of pharmacy education. This was a significant driver for the adoption of new clinical roles by younger pharmacists.

In 1997, the undergraduate programme was converted to a four-year Master of Pharmacy course (Anderson, 2005b). Even though the undergraduate degree has changed to a four-year first degree-masters level with more clinical contents added to the course, many pharmacists were of the opinion that the undergraduate pharmacy degree was still not sufficient for clinical pharmacy practice in the hospital.

*“I think the undergraduate course has changed in some places and they are out in practice more. But still, when they come out of the university, they are still clueless; they still don’t really know what to do...” (P27, Pharmacist)*

Currently, every pharmacist who goes into hospital pharmacy practice is expected to do a clinical diploma as part of his or her training. The clinical diploma is in principle a pre-requisite to attaining a senior clinical pharmacist role in the hospital.

*“Now, every hospital pharmacist who goes into the junior level will do a clinical diploma, otherwise all the job specifications high up will say,*

*you need to have a clinical diploma or masters before you can get those jobs.” (P17, Pharmacist)*

Pharmacists acknowledged that the postgraduate clinical pharmacy programmes have enabled hospital pharmacists to develop more breadth and depth in their clinical knowledge and skills. They added that this has helped to push clinical pharmacy significantly as many hospital pharmacists can now communicate at the same level with doctors and other clinical staff.

*“...those diplomas have been an important part of arming pharmacists with the clinical abilities...” (P07, Pharmacist)*

*“I think doing that masters gave me a lot of confidence to take on that clinical role really.” (P16, Pharmacist)*

*“I listen to the younger clinical pharmacists now they are almost like doctors with their understanding of various conditions and the treatment of those conditions.” (P28, Pharmacist)*

On the other hand, participants observed that community pharmacists had not been able to develop their clinical practice because not many of them had done the clinical diploma which they perceived would have enabled community pharmacists to enhance their clinical competence.

*“The practitioners [community pharmacists] themselves don’t have the necessary knowledge of therapeutics so they can’t relate to GPs in the same way that hospital practitioners can. Because there is no requirement for any postgraduate qualification, their knowledge base is often lacking in terms of the ability to influence practice...” (P04, Pharmacist)*

Overall, the changes that have occurred within the educational structure of pharmacists in the UK have resulted in producing competent practitioners who now work in advanced level clinically and are specialists within different clinical areas.

#### **4.4.3.4 Specialisation**

As hospital pharmacists developed more depth in their clinical knowledge and skills through postgraduate training, more services were developed on the wards. Therefore, pharmacists became much more involved in patient facing roles including participating in consultant ward rounds and prescribing decision making; and providing medicine advice to doctors, nurses and patients. Participants saw this as the beginning of clinical pharmacy. Further developments in clinical pharmacy practice and training resulted in specialisation and sub-specialisation in different clinical areas.

*“Obviously, as pharmacists have become more confident and developed more breadth and depth in their knowledge, you started to see more specialisation and sub-specialisation within clinical pharmacy.” (P04, Pharmacist)*

*“There was one area that we started to have a much stronger role in, in that we had the aseptic lead for pharmacists, we use to go on the consultant ward rounds with the surgical team and she will do the advising for the prescribing of total parenteral nutrition.” (P17, Pharmacist)*

Pharmacists reported that they began to organise their practice and the training of basic grade pharmacists around specialist clinical areas including oncology, surgery, clinical nutrition, nephrology, gastroenterology, endocrinology, neurology and respiratory medicine.

*“So, my two training years when I was newly qualified involved moving round lots of specialties such as paediatric, surgery, general medicines, respiratory, care of the elderly and doing those probably for 3-6 months depending on the specialty. After that, I then specialised in care of the elderly.” (P18, Pharmacist)*

Pharmacists acknowledged that being able to specialise in an area enabled them to develop more depth in their clinical practice and influence clinical decision making in that specialty which helped to push clinical pharmacy practice forward. Participants who were pharmacist prescribers noted that because they were specialist in an area, it was easier for them to develop prescribing role in that area.

#### **4.4.3.5 The role of pharmacy technicians**

Participants observed that pharmacy technicians played an important role in the development of clinical pharmacy especially within hospital pharmacy practice. They acknowledged that the development of pharmacy technicians to take on roles previously undertaken by pharmacists freed up pharmacists to develop more clinical roles.

*“In the hospital, the technicians freed up pharmacists time to actually be more visible on the ward and have more impact in terms of prescribing advice especially with the junior doctors.” (P06, Pharmacist)*

*“You can’t do clinical role at the bench checking prescriptions. So I think, the emergence of pharmacy technicians as a profession in this country was a huge step for pharmacists to get out there and do this role.” (P18, Pharmacist)*



The creation of the senior pharmacy technician posts which began to happen in the 1970s following the recommendations of Noel Hall report was seen by technicians as the initial major shift in technicians' roles. This enabled technicians in senior post to take over some supervisory roles from pharmacists. Participants in this study who were senior technicians reported taking over the day to day running of the dispensary and management of staff to free their pharmacists up for other roles.

*"I can remember my first job as a senior technician, I can remember going to the pharmacist and saying to her, "is it all right if I authorise people's annual leave?" because it seems a bit silly you doing it" and then it was like... all right then." (P03, Pharmacy Technician)*

Because there were shortages of hospital pharmacists even after the implementation of the Noel Hall report (Nuffield Foundation, 1986), senior technicians sometimes performed roles that were not formally recognised as technicians' roles to free-up the pharmacists for other roles.

*"I became a senior technician in 1977 and at that time I was doing the checking of prescriptions." (P10, Pharmacy Technician)*

*"...my senior technician was an accuracy checker when I first started but she didn't do a qualification for it. She just did it..." (P02, Pharmacy Technician)*

Although pharmacy technicians in the UK work under the supervision of pharmacists, those in senior roles have increasingly taken over staff supervision and some managerial roles as pharmacists continue to develop their roles clinically. Participants reported that presently technicians are involved in senior management posts in some trusts which gives them enhanced status and some degree of autonomy.

*"From my lead role in acute services, I have a senior management team of 4 individuals, two of these individuals are pharmacy technicians, and they are at that top level. One of them looks after the purchasing and distribution of medicines across hospitals and clinics. The other one looks after medicines management and operations. They are at the top of their profession, both are managerial." (P26, Pharmacist)*

Also, pharmacy technicians in the UK, who undergo an accredited checking pharmacy technician course, now perform final accuracy check of dispensed medicines of prescriptions that have been clinically validated by pharmacists. Many participants saw this as a major step in the development of the role of the technicians and freeing up of pharmacists' time for other advanced clinical roles.

*“The next biggest change that I saw was the change to technicians starting to do accuracy check and I think that was a huge step...” (P03, Pharmacy Technician)*

*“One of the key things that enabled the pharmacists to spend more time on the ward was the technician checking policy.” (P17, Pharmacist)*

Pharmacists and pharmacy technicians reported that the current career structure has enabled technicians to specialise in clinical areas including medicine management and clinical trials. Clinical pharmacists observed that their roles in the wards were supported by medicine management technicians working in the wards. Technicians in medicines management roles perform medication history taking, medicine reconciliation and work in specialist clinics.

*“...the pharmacy technician will do medicine reconciliation, they will look at patients own drugs to see if they are fit for purpose, fit for use and take medication histories and counsel patients on taking medicines.” (P22, Pharmacy Technician)*

*“They [pharmacy technicians] are now spending a lot more time based in the clinical area with patients and teaching patients how to use their medicines and making sure that prescribing is correct on admission by taking drug histories.” (P15, Pharmacist)*

Although participants noted that the training of trainee pharmacy technicians has now been standardised following technicians’ mandatory registration with the General Pharmaceutical Council, variation in post-registration training of pharmacy technicians still exists nationally. Many participants expressed concern on the absence of a national framework for technicians’ post-registration training.

*“...there isn’t anything formally in the country, everybody does it locally.” (P29, Pharmacist)*

*“Post registration training is done locally. I think we probably need to get some standardisation into that...” (P15, Pharmacist)*

Pharmacists observed that the post-registration training of technicians need to be well coordinated and a national framework is needed giving technicians’ increasing level of involvement in medicines management roles and the reliance of pharmacists on them.

#### **4.4.3.6 Economic driver**

This study revealed that a major factor driving policy change and recommendations made by for example the Noel Hall and Nuffield inquiry reports was the drive for cost-effective use of healthcare budgets.

*“...cost-efficiency in the NHS could be seen as the bottom line to all of these [government policies]. The cost driver is a huge motivation behind those initiatives.” (P02, Pharmacy Technician)*

Participants observed that as many new and expensive medicines were introduced into clinical practice, spending on medicines became increasingly high. Therefore, there was a recognition within the National Health Service that drug budgets needed better management.

*“The drug budgets [spend on medicines] increasingly grew as new medicines came out. So, new medicines, more expensive medicines...people knew that pharmacists could help in choosing the cheapest drugs that would work in a particular situation.” (P07, Pharmacist)*

This study revealed that a number of strategies that supported the development of clinical pharmacy were used by hospitals to minimise drug spending. These included supporting the development of hospital drug and therapeutics committees and the increased participation of pharmacists in purchasing and prescribing decisions of medicines. Hospital drug and therapeutics committees were responsible for preparing and maintaining hospital formularies which regulate prescribing and minimise drug expenditure. The use of formularies to minimise spending on drugs was supported by the Department of Health’s circular on the ‘Way Forward for Hospital Pharmaceutical Services’ in 1988 (Department of Health, 1988). Participants perceived that the involvement of clinical pharmacists in drug and therapeutic committees and the presence of pharmacists on the ward to advise doctors on the cost-effective choice of medicines have resulted in cost savings. Some primary care pharmacists interviewed noted that primary care pharmacist posts were developed as a result of government initiative to ensure adequate management of drug budgets within primary care facilities.

*“Then, because of the financial side, because of the opportunity to save money if you manage the medicines more appropriately, people began to realise that you could employ a pharmacist to do that...” (P05, Pharmacist)*

Therefore some general practices employed pharmacists to work closely with general practitioners to manage their prescribing budgets. However such savings in medicine costs may not always be the best practice for patient benefit. It could also be a barrier to pharmacists’ clinical involvement since much emphasis is likely to be placed in minimising prescribing cost with such arrangements.

Pharmacists and pharmacy technicians also perceived that asking technicians to do some of the roles that were previously undertaken by pharmacists was also a way of saving costs on labour because it is cheaper to get the job done with technicians. A pharmacist noted:

*“I think you could argue in the old days that we were paid too much to dispense because a technician could dispense, it’s a learning process, you don’t need a high level of education to do dispensing.” (P07, Pharmacist)*

Some participants believed that cost saving on healthcare budget was a major driver for the promotion of skill mix among pharmacy staff as well as the extension of prescribing rights to other healthcare professionals because it will cost more for doctors to do the roles that can be handled by other professions. Although some participants consider cost saving as an important factor in tasks shifting among healthcare professionals including the extension of prescribing rights to non-medical professionals, it is usually inconspicuous in policy documents as part of the reasons for role extension.

#### **4.4.3.7 Professional relationship with doctors**

Pharmacists reported that their movement to the wards made them visible in the wards and led to the development of a relationship which increased over time with doctors and other members of the ward team.

Pharmacists reported that when they started visiting the wards and attending consultant ward rounds, they were visiting wards where the consultants were enthusiastic and had good rapport with them.

*“When we started off the ward pharmacy back in the 70s, the wards we went into first were the ones that the consultants and the nursing staff were very supportive of pharmacy. So we were looking at professionals who were supportive of pharmacy, who have had a good experience in their dealings with pharmacists.” (P14, Pharmacist)*

A pharmacist who was newly employed in a hospital in the early days of clinical pharmacy reported how he was able to do clinical work on the ward as a result of the rapport his chief pharmacists had with the medical staff.

*“...XXX who was the chief pharmacist there [name of a hospital] had excellent working relationships with the medical staff in the hospital and so I routinely spent most of my week working clinically with medical consultants...” (P32, Pharmacist)*

Pharmacists felt that over time, these consultants who saw the benefits of the pharmacists being on the wards were instrumental in recommending them to their other colleagues.

*“...and you know, incrementally the medical profession started to get the message that there was something valuable in having pharmacists on wards and supporting ward rounds...” (P04, Pharmacist)*

This study revealed that in the 1970s and 1980s, prescribing to patients on the wards was largely done by junior doctors with a varying degree of supervision from their senior colleagues. Therefore, pharmacists reported that as they became a credible source of information and advice around medicines they were accepted by doctors especially the junior doctors who were relying on their expert medicine knowledge and advice on the wards.

*“...we will do chart reviews and look for problems with medicines and work with junior doctors to formulate solutions around problems found with medicines.” (P19, Pharmacist).*

Hospital pharmacists reported that they are now well accepted by medical consultants because many consultants now in practice have had positive experience of pharmacists' contribution to patient care when they were junior doctors.

*“...but as the junior doctors are now becoming senior doctors, they were there at the beginning, they have seen us become more clinical and we supported them a lot through their training. Now, particularly the younger end of the consultants really sees pharmacists as a supporting force.” (P27, Pharmacist)*

*“Those junior staff [junior doctors] back in the 1980s learn their medicine with the pharmacist present on the wards and those junior staff are now consultants and senior medical staff and so they expect pharmacists to be there because they know what pharmacists can do” (P32, Pharmacist)*

In addition, some participants noted that there is now a lot of multidisciplinary work and learning involving doctors, pharmacists and other members of the health team going on in the country and that has helped to strengthen relationship within the health team.

*“...some of the younger doctors coming along were very used to pharmacists being around them and they train with them and they work with them. So they don't really have that culture problem.” (P09, Pharmacist)*

Participants also observed that the involvement of the pharmacists in the multidisciplinary drug and therapeutics committee led to among other benefits, a better

working relationship between doctors and pharmacists. Prior to that, participants perceived that doctors saw pharmacists' roles on the wards as being policing in nature and that created a barrier in their relationships.

*"In the old days when I first qualified, I think we were seen a bit like the police because we were traditionally trying to save money or to say don't prescribe that because it cost too much" (P27, Pharmacist)*

But as doctors gain more understanding of pharmacists' contributions to the drugs and therapeutics committee, it gave them a different perspective. This understanding has also helped hospital pharmacists and doctors to work together towards implementing hospitals' prescribing policies for improved patient care.

#### **4.4.3.8 Shortage of medical doctors**

Many participants commented on the inability of doctors in the UK to meet the huge demand for healthcare due to the growing medical needs of an aging population and the impact of chronic diseases on the health system.

*"We also got this massive aging population, they want accessible care round the clock and there was a big issue with the number of medics available." (P02, Pharmacy Technician)*

These participants perceived that because doctors were unable to meet up with the demand for healthcare provision, certain roles previously undertaken by doctors were extended to other healthcare professionals including nurses and pharmacists in order to free them up for more specialised tasks.

*"If you look at the increase in patient numbers, you need doctors to do what doctors do and you have to free up some of their time..." (P06, Pharmacist)*

Furthermore, with the introduction of the European Union (EU) Working Time Directive in 1993 which limited doctors working hours (Council of the European Commission, 1993), tasks shifting and role extension to nurses and pharmacists was considered a valuable strategy to make up for the time that would be lost as a result of the this EU Directive.

*"So, there were the things like the EU directive saying doctors can't work so many hours. So you got less doctors available to prescribe. Suddenly they will need..." (P08, Pharmacist)*

Hence, some participants perceived that this facilitated role extension to other healthcare professionals including the extension of prescribing rights to pharmacists in order to maintain service delivery.

#### **4.4.3.9 The role of leading individuals and professional associations**

Participants described key individuals using various terms including leading individuals, forward thinking pharmacists, role models and champions of change who had different perspectives of pharmacists' professional roles. These key individuals were either chief pharmacists or other principal pharmacy staff. They were perceived as having a clearer vision of the pharmacists' clinical role with consequently less dispensary based work. These individuals were able to communicate this vision to pharmacy and medical staff to facilitate practice change.

*"XXX hospital has been at the fore front of clinical pharmacy ever since it started and that was because of one or two chief pharmacists who pushed it forward. So it was individuals really who made the difference." (P07, Pharmacist)*

A number of pharmacists perceived that these leading individuals were influenced by the development of clinical pharmacy practice in the US.

*"The chief pharmacist there did a lot of work with the hospitals in Chicago US and he kept bringing back ideas from Chicago and they were much more dynamic in Chicago with their clinical pharmacy. So he was bringing ideas back to England and we were testing things out for the first time." (P19, Pharmacist)*

Some participants interviewed saw themselves as being instrumental in advancing the role of pharmacy staff.

*"I was one of the people who helped in my hospital to advance the role of the pharmacy technicians. So when I saw a really good pharmacy technician who I saw could take on responsibility, we would nurture them to take on more management role." (P17, Pharmacist)*

A participant in this study who was a chief pharmacist described how they came together as chief pharmacists in a region and formed various committees with a view to developing pharmacists' clinical roles in the region.

*"I worked with colleagues in the region and set up a committee for education and started to organise the education across the whole of the region and then everybody took part in the diploma and then we looked at how we look forward to more specialist people and we developed the doctorate [professional doctorate] programme for a*

*small number of people to then lead clinical work for the future.” (P24, Pharmacist)*

Participants also noted that organisations such as the Guild of Hospital Pharmacists, the United Kingdom Clinical Pharmacy Association (UKCPA) and the Association of Pharmacy Technicians UK (APTUK) were able to influence pharmacy practice. These organisations were instrumental in educating their members on extended roles for pharmacy staff, supporting the training pharmacy staff and lobbying the government.

*“Well, I suppose I will have to give it to organisation like that Association of Pharmacy Technicians UK. Those pharmacy technicians who have been active members of the association have lobbied, campaigned, encouraged training and supported pharmacy technicians in taking on more extended roles.” (P02, Pharmacy Technician)*

*“Some key organisations also helped. One of those was the United Kingdom Clinical Pharmacy Association and they came together as a body within the country as a group of like-minded clinical pharmacists who ran conferences. They help to develop clinical pharmacy by having an organisation that people can belong to, to share ideas and I think that was quite key as well.” (P17, Pharmacist)*

Some hospital pharmacists observed that there have been some recent national drivers from the Royal Pharmaceutical Society. However, they felt that the Royal Pharmaceutical Society of Great Britain which was then the professional and regulatory body for pharmacists was not proactive toward extended clinical roles for hospital pharmacists in the early days.

*“Before as hospital pharmacists, we didn’t feel properly represented by the Royal Pharmaceutical Society, we thought they were focussed very much on community and we didn’t feel like they understood what we did...” (P31, Pharmacist)*

*“We had to use UKCPA to do that because at that time the Pharmaceutical Society was not engaged with that at all, they were more engaged with other aspect of the profession and not in clinical practice, they only came to recognise clinical practice much later on.” (P32, Pharmacist)*

This may be because at that time there were significantly more community pharmacists than were hospital pharmacists. For example in 1985, hospital pharmacists constituted about 16% while community pharmacists constituted about 74% of the approximately 35,000 registered pharmacists in Great Britain (Nuffield Foundation, 1986). The society was therefore more likely to be concerned about the development of community



pharmacy practice rather than hospital pharmacy practice. However, these participants acknowledged that this is no longer the case now and perceived that the separation of the regulatory function from the Royal Pharmaceutical Society has enabled the society to concentrate on developing pharmacists' professional roles. For example, a participant noted that the Royal pharmaceutical Society Faculty, through its' advanced pharmacy framework, supports professional development by giving its members the opportunity to recognise skills that are appropriate to their level of practice. This has the potential to make pharmacists more aspirational for advanced practice.

**Theme summary:** As reported earlier, this theme has identified nine drivers for pharmacy practice change in the UK. These drivers were the need for safe use of medicines, government policies and legislations, pharmacists' education and training, specialisation in practice, the role of pharmacy technicians, economic drivers, professional relationships with doctors, shortage of medical doctors and the influence of leading individuals and professional associations. These drivers were primarily linked to the changes in hospital pharmacy practice in the UK. Overall, the drive from government policies and legislations represents a major facilitator and appears to have had an effect on other drivers identified. This suggests that nothing could have been achieved without government support. In addition, the expansion of the training of pharmacy staff including technicians has resulted in developing credible practitioners to take on extended clinical roles.

#### **4.4.4 Barriers to pharmacy practice change**

This theme reported the challenges that pharmacists encountered in achieving extended clinical roles in the UK. According to Birenbaum (1982) the process of changing professional roles comes with a number of challenges from both members of the professional group and those outside the profession who held preconceived views about the role and social identity of the profession. Therefore, many pharmacists interviewed observed that the medical profession as well as pharmacists themselves were major barriers to extending their clinical roles. Other sub-themes identified as barriers included legal and regulatory constraints, pharmacists' professional isolation and organisational challenges. These barriers are presented below.

##### **4.4.4.1 The Medical Profession**

Pharmacists commonly reported that there was initial opposition from medical doctors (especially the consultants) to the extension of pharmacists' clinical roles. They reported that in the 1970s, hospital wards were traditionally seen as places in which

pharmacists did not have a role. Therefore, their presence on the wards was subject to challenge by the medical staff. Pharmacists also reported that initially, the medical profession was uncertain as to the clinical roles of pharmacists and as a result were concerned about professional boundary encroachment.

*“One of the common statement when I was a younger pharmacist was that you are trying to be a doctor and I maintain right from the beginning that if we work properly, then the doctor makes the diagnosis and the plan, the pharmacist can then deliver the medicine and that plan, and how to use the medicine.”. (P24, Pharmacist)*

However, as pharmacists increased their presence on the wards and made valuable contributions to patient care, the medical profession began to appreciate pharmacists’ contribution.

*“...incrementally the medical profession started to get the message that there was something valuable in having pharmacists on wards and supporting ward rounds and doing all these things which traditionally had been done badly.” (P04, Pharmacist)*

Furthermore, pharmacists reported that similar resistance was shown by doctors to extension of prescribing rights to pharmacists. However, they were swift to mention that such resistance is rare now in the hospitals because doctors now appreciate the benefits of a pharmacist prescriber.

*“The doctors I have worked with were generally pro-pharmacy and could see that pharmacists could also do, in some circumstances, the routine prescribing and then the doctors can concentrate on more complex cases that needed their attention.” (P18, Pharmacist)*

However, some pharmacists mentioned that many doctors are still reluctant to support community pharmacists in developing their prescribing role.

*“We have had no difficulties in the hospitals getting a doctor to mentor our prescribing students. In the community..., community pharmacists have had real difficulties getting independent prescribers to mentor them, to supervise them.” (P08, Pharmacist)*

This may be as a result of the poor working relationships between general practitioners and community pharmacists.

#### **4.4.4.2 Professional attitude of pharmacy staff**

Although pharmacists generally reported that many pharmacists were enthusiastic in taking up extended clinical roles, some pharmacists observed that there were

pharmacists who were reluctant to do so. This was because of the increased responsibility and risks associated with it.

*“...some pharmacists may not want to go down this route and don’t want to change their role. Some prefer doing the traditional role...”  
(P01, Pharmacist)*

*“Pharmacists themselves were part of the barriers and they still are in community pharmacy, I would say. Some hospital pharmacists were hesitant about becoming clinical, they were scared, they didn’t really have confidence and would like the safety of the pharmacy where they can dispense.” (P07, Pharmacist)*

Some pharmacy technicians also made similar reports about pharmacy technicians’ attitude towards taking up extended roles.

*“... like I said, you get this really highly motivated, ambitious workforce but we also have those people who don’t want to do that but just want to deliver the medicines and do that role.” (P03, Pharmacy Technician)*

*“When I started in in the 1970s, people that we started at the same time as me came into the profession with a different attitude that it was perhaps just the job, it was not a career, it was not a profession, it was a job and so professionalism isn’t something they were aspiring to.”  
(P22, Pharmacy Technician)*

Many pharmacists and pharmacy technicians reported that some pharmacists felt threatened by pharmacy technicians taking on extended roles especially the accuracy checking and some managerial roles because of the fear of role erosion.

*“I did hear in several occasions, pharmacists talking or in the pharmaceutical journal about pharmacy technicians taking over and there won’t be any need for pharmacists because pharmacy technicians are taking over.” (P22, Pharmacy Technician)*

*“I think sometimes pharmacists are fearful that pharmacy technicians are going to take some of the roles that were traditionally pharmacists’. But the flip side to that is about pharmacy technicians taking on some of these roles to liberate the pharmacists to actually take on more clinical role and more patient facing role.” (P21, Pharmacy Technician)*

However, many pharmacy technicians generally reported that they have been well supported by pharmacists to develop their roles. Though, they noted that the fear of role erosion is still a problem in community pharmacy. In addition, a pharmacy technician alleged that this may account for the reason why community pharmacists were reluctant to embrace the role of the accredited checking pharmacy technician.

*“Community pharmacies adopted that framework little less than hospitals. So, they were started to have accuracy checking technicians within pharmacies but in terms of the culture and the acceptance of having technicians as checkers, it did take in fact 10 years for a degree of acceptance.” (P02, Pharmacy Technicians)*

However, community pharmacists’ reluctance to accept the role of the accredited checking pharmacy technicians may have to do with the fear of taking legal responsibility in case of an error made by a technician as further highlighted in section 4.4.4.3.

#### **4.4.4.3 Legislative and policy constraints**

Participants including pharmacists and pharmacy technicians mentioned that certain policies and regulations were barriers to role extension. Some participants noted that the Medicine Act of 1968 which required community pharmacists to be in personal control of the pharmacy, supervising every aspect of dispensing might have affected community pharmacists’ clinical role development. They reported that it could explain why community pharmacists were usually tied to the dispensing bench.

*“Community pharmacists are a little bit restricted in their activity by the Medicine Act. For example, they have to be in personal control of the pharmacy, supervising dispensing. Within hospital, we were not quite subjected to that.” (P32, Pharmacist)*

Also, other participants interviewed associated the delay in the development of clinical roles among community pharmacists to the remuneration model (dispensing-based remuneration) of community pharmacies which is predominantly linked to supply functions.

*“The business model relies on prescription volume, they get paid to dispense prescriptions and that is what they concentrate on.” (P19, Pharmacist)*

*“It is primarily because the remuneration system is wrong. So, you get paid for dispensing a prescription, you don’t get paid for talking to a patient.” (P07, Pharmacist)*

Because community pharmacy has historically been founded on a business model, it was difficult for it to consider developing roles that were non-remunerated or without financial incentives.

On the other hand, hospital pharmacists noted that even when they were contributing to prescription writing and in principle writing the prescriptions themselves and asking

the doctors to sign, they couldn't prescribe because the law did not allow them to do so.

*"When I used to work in the hospital, we couldn't prescribe. So we would write the prescription and get the doctor to sign it. So, I would work out all the doses, write the prescription and then I would put it on the doctors' notes and they would sign it. You know I was doing the prescribing but at that point pharmacists couldn't prescribe which wasn't satisfactory." (P17, Pharmacist)*

A pharmacy technician also made a similar observation. This technician reported that certain policy documents, like the responsible pharmacist regulation which put a limit on what other pharmacy staff can do, affects the development of the roles of technicians.

*I write the procedures for this department for the Trust, I authorise them but in the eyes of the GPhC, I can't do that because I am not the responsible pharmacist." (P03, Pharmacy Technician)*

Also, some pharmacy technicians perceived that the lack of registration of technicians until recently, affected the development of the technician workforce especially in community pharmacies. They believed that some pharmacists were reluctant to give technicians additional responsibilities because they were not registered and considered them not accountable.

*"...pharmacists have been fearful that if they delegate a role, an activity to a pharmacy technician and something happens and there is an error, the pharmacist will be accountable for it." (P21, Pharmacy Technician)*

Pharmacy technicians reported that being registered with the General Pharmaceutical Council made them accountable for their roles and they perceived that pharmacists now consider them accountable and responsible for the increased role.

#### **4.4.4.4 Professional Isolation**

Up to the early 1970s, it was unusual for pharmacists to be present on the hospital wards. They were mainly found in the dispensary performing their core functions of compounding, dispensing and offering medicine advice to patients and staff. In addition, some pharmacists reported that communication between them and ward staff including doctors and nurses was poor at that time. This was mostly done on the telephone and on most occasions it involved querying a prescription. Thus, hospital pharmacists were professionally isolated from other clinical staff. Therefore, those outside the pharmacy profession did not understand pharmacists' professional clinical

roles. However, the increased work on wards and the work in medical information units have removed hospital pharmacists from being professionally isolated and gave them an identity that other professions could see.

On the other hand, some participants reported that community pharmacists are still professionally isolated from other healthcare professions.

*“I found it [community pharmacy practice] quite professionally isolating, you didn’t really have much opportunity to speak to GPs. If you did, you are just querying a dose of a prescription or just trying to facilitate the supply of medication to a patient.” (P28, Pharmacist)*

This is because community pharmacists mostly work in isolation from other healthcare professionals. Therefore, it is difficult for them to establish a good working relationship with other clinicians including general practitioners who can support their clinical roles.

*“I think secondly, the commercial basis on which community pharmacies operate and its relative isolation from GP practices, I know in some areas they could be of close location...but in a vast majority, there is clear physical separation between GP practices and community pharmacies. That doesn’t help in terms of building the necessary relationships.” (P04, Pharmacist)*

Furthermore, some participants noted that pharmacist prescribing is still lagging behind in community practice because many community pharmacists don’t have a good rapport with general practitioners who will act as their mentors.

*“It is more difficult for community pharmacists because they need to get a GP to mentor them but the GP doesn’t directly benefit from it. So, you got to have a good relationship with the local GP before he can accept to mentor you” (P05, Pharmacist)*

Also, unlike hospital pharmacists who work with other pharmacists in larger departments, most community pharmacists work in smaller units and in relative isolation. As a result there is little opportunity for interaction with other pharmacist colleagues.

*“If you go into hospital practice as a junior pharmacist, you are mentored from day one, whereas as a community pharmacist, you are generally on your own. So, you don’t get this day to day mentoring.” (P05, Pharmacist)*

In addition about a quarter of community pharmacists in Great Britain work as locums (Phelps et al., 2014). Such working arrangements do not provide an opportunity for

professional mentorship, networking, communication and commitment to professionalism.

However, many hospital pharmacists interviewed observed that they were able to embrace and show positive attitudes towards clinical roles because they were working alongside other pharmacists who they referred to as role models or champions of extended clinical roles. In addition, hospital pharmacists interviewed stated that being members of the Guild of Hospital Pharmacists and the United Kingdom Clinical Pharmacists Association (also open to community pharmacists) provided them with a forum where they networked with other members of the profession across the country to promote clinical pharmacy services in their hospitals.

#### **4.4.4.5 Organisational barriers**

Other barriers mentioned by participants were mainly organisational. One key issue that was predominantly mentioned by pharmacists was staffing. Pharmacists pointed out that in the early days of ward pharmacy, they couldn't visit all the wards because there were not sufficient numbers of hospital pharmacists to do that. In addition, the time they spent on the ward was limited because they had other roles in the dispensary which they considered as important.

*“You still have some pharmacists saying I cannot take on any more extended roles because I haven't got enough time in a day to do what I am already doing.” (P06, Pharmacist)*

*“So, if all the pharmacists had spent a lot of time on the ward, the dispensing wouldn't have been done.” (P07, Pharmacist)*

Participants noted that even though several measures were taken to resolve the increase workload on pharmacists, staffing issues continued to be a barrier to clinical role extension. Some hospital pharmacists observed that the shortage of pharmacists was still a barrier to being permitted to go on prescribing courses. This is because they would need a replacement to take time out of work to do the course.

*“There is still a barrier in getting everybody to be a prescriber because 6 months of training is a big time commitment and to go to those study days, you have to be out of work. So we lose staff, so we can't let everybody go at once.” (P27, Pharmacist).*

Other barriers mentioned by participants included funding issues especially for training of staff, remuneration for extended roles, lack of research evidence demonstrating the effectiveness of some of the extended roles, and the absence of a national framework to support some extended roles.

**Theme summary:** This theme has identified five categories of barriers that impeded on the development of clinical pharmacy practice in the UK. These barriers were the opposition from the medical profession; professional attitude of pharmacists and pharmacy technicians towards extended roles; legislative and policy constraints; professional isolation of pharmacists especially community pharmacists; and organisational barriers including inadequate number of pharmacy staff which was commonly noted by participants. However, many of these barriers were surmounted especially within hospital pharmacy practice. For example, hospital pharmacists now work closely with their medical colleagues who support their roles. In addition, hospital pharmacists now show positive attitudes towards a clinical role and many of them now work as clinical pharmacists contributing to patient care.

#### **4.4.5 Benefits of clinical role extension**

This theme presented the perceived benefits of clinical role extension identified by participants. Three categories of benefits were identified: patients' benefits, pharmacy staff benefits and economic benefits.

##### **4.4.5.1 Benefits to the patients**

Many pharmacists viewed the patients' benefits as the primary benefits of extended clinical roles. They reported that they are now using their knowledge and skills to enhance patients experience and care.

*"It has enabled the pharmacists to use their clinical knowledge to the benefit of the patients...." (P14, Pharmacist)*

Similarly, some pharmacy technicians also reiterated this view.

*"It is all about improving things for patients and everything we do in pharmacy is about improving the patient experience." (P22, Pharmacy Technician)*

Pharmacists reported that as a result of their presence and increase clinical activities on the wards, patients get the best use of their medicines and patient safety was improved. Pharmacists described how they were able to advise both doctors and patients on appropriate use of medicines and also how their expert knowledge on medicines were utilised to avert adverse events of medicines and these have helped to improve patient care.

*"A lot of patients ask questions about their medicines, they want to know what they've got, they want to know what the drugs you are giving them are going to do and specialist pharmacists do know that*



*and are able to interact efficiently and effectively with patients.” (P06, Female, Pharmacist, 1980s)*

*“... because you are there [on the ward], you are used as an information resource to deal with issues that the ward is trying to deal with.” (P24, Pharmacist).*

A pharmacist described how he ran an anticoagulant clinic in the early 1980s with the agreement of the medical director and hospital management and was able to demonstrate that anticoagulant therapy could be made safer by tailoring the drugs to individual patients. The pharmacist reported that as a result of this service, the safe use of warfarin was improved.

*“At the time I took over the anticoagulant clinic, I think it was about 300 patients and by the time I finished with it, we were looking after two and a half thousand patients. That was because people could see that by managing service as opposed to just prescribing, the patients had somebody that they could come to and talk about their medicines but also everybody was monitored, everybody was followed up. At the end the safety profile of warfarin in particular improved immensely.” (P24, Pharmacist).*

Pharmacists also mentioned that taking on extended roles including prescribing, have contributed to the seamless services experienced by patients in the hospital. Pharmacists who were prescribers talked about how patients need not wait now for doctors to adjust doses or add medicines which were missing on their prescriptions in areas where there was a pharmacist prescriber.

*“It means that they are now getting their medicine promptly and in a correct manner and one would hope less potential for error.” (P23, Pharmacist).*

Pharmacists interviewed also perceived that the incidence of drug related problems and hospitalisation due to medication error have reduced due to pharmacists' involvement in the wards and in prescribing.

#### **4.4.5.2 Benefits to pharmacy staff**

Both pharmacists and pharmacy technicians mentioned a number of benefits that were linked to them. Pharmacists now view themselves as an indispensable part of the ward team.

*“If I think about where we are now, if pharmacists stop doing what they are doing on the ward, then the system would fall down completely but*

*in those days, if we stop what we were doing on the ward, things would have probably kept going okay.” (P07, Pharmacist).*

Pharmacists reported that assuming a clinical role has helped them build a good working relationship with other members of the health care team including doctors and nurses who now appreciate their contributions to patient care. They reported that pharmacists and doctors now work together to optimise patient care.

*“We are working more closely with the other healthcare professions in a way we didn’t before and in special care as well.” (P01, Pharmacist).*

They acknowledged that the extension of prescribing rights to the pharmacists has empowered them to take higher level of responsibility in patient care with enhanced status and autonomy.

*“Instead of having to go and see the doctor to get the signature, the pharmacist can have responsibility which comes with accountability to do those extended roles and I see that as exciting and I see that as motivating...” (P23, Pharmacist)*

*“A lot of the time going to ask a junior doctor that have been qualified for 3 months, who knew a fraction of what you knew about medicines, asking them to prescribe and take responsibility doesn’t make sense really.” (P18, Pharmacist)*

Participants perceived that using the clinical skills of the pharmacists, especially in prescribing, has increased the capacity of the health system by complementing the demand for medical care and freeing doctors up to enable them do more specialised tasks.

*“If you are in a hospital with high cases of hepatitis or HIV, and you have a shortage of medics for example, then a specialised HIV pharmacist can do an awful lot work freeing up the medics to do the diagnosing.” (P06, Pharmacist)*

Pharmacists and pharmacy technicians admitted that they are now doing more interesting and satisfying jobs that are appropriate to their training.

*“I would have been fed up if I spent a lot of time counting or being in a dispensary, that just wouldn’t suit me. So, I feel personally more satisfied in my job because I have got this ability to work clinically.” (P27, Pharmacist).*

Pharmacists mentioned that they now have a career structure which produces practitioners working at a very advanced level and thereby contributing to safe and effective management of medicines. Pharmacists pointed out that the clinical career

pathway in the hospitals offered clinical pharmacists the opportunity to move to the top of the pay scale without moving into the management route. Similarly, pharmacy technician also reiterated that they now have a more satisfying career as a result of the various career options now available for them.

*“If they do want to progress, there are other options with lots of different career choices now for pharmacy technicians. I often say to my students, there’s never been a better time to come into the profession because there is so much choice.” (P22, Pharmacy Technician).*

*“There is so much more diversity in terms of careers that are there for us because back in the 70s, 80s, you would have been a dispensary technician or an aseptic or technical services technician... whereas now, there is a multiple range of pathways that you can follow in terms of career.” (P02, Pharmacy Technician)*

Furthermore, many technicians pointed out that they now have an enhanced status and are able to take more responsibilities because they are now a regulated profession.

*“When I first started, pharmacy technicians were very much tied to the dispensing bench, they didn’t do any kind of specialised roles, they didn’t do medicines management and now with the voluntary registration and subsequently statutory registration, pharmacy technicians have become registered health care professionals themselves and have been able to take that kind of responsibility.” (P20, Pharmacy Technician)*

These technicians perceived that their registration with the General Pharmaceutical Council could be responsible for their increased recognition and involvement in medicines management roles and work in specialist clinics.

#### **4.4.5.3 Economic benefits**

Participants reported that there were economic benefits associated with the pharmacist taking on extended clinical roles. Many participants felt that pharmacists’ involvement in formulary management through the Drug and Therapeutics Committees had resulted in effective management of drug budgets and medicines.

*“...pharmacists have been able in hospitals to save money on drug budgets by using drug and therapeutics committees” (P07, Pharmacist)*

They observed that pharmacists were able to use their expert knowledge on drugs to advise medical prescribers on cost-effective treatments.

Some participants perceived that having the pharmacy technicians do the dispensing role including final accuracy check (rather than the pharmacists) and the pharmacists doing the clinical roles ensures appropriate and cost-effective use of the skill mix within pharmacy staff.

*“...but the advantages are job satisfaction, it is cheaper to get the job done by pharmacy technicians...” (P02, Pharmacy Technician)*

*“If you want to develop your pharmacists’ roles, you either double your pharmacists workforce which is going to cost you a fortune or you grow around it group of technical staff.” (P03, Pharmacy Technician)*

*“I think you could argue in the old days that we were paid too much to dispense because a technician could dispense, it’s a learning process, you don’t need a high level of education to do dispensing.” (P07, Pharmacist)*

Some participants observed that having the pharmacist perform the core function of dispensing medicines did not provide value for money because pharmacy technicians who are paid less are able to do this role.

**Theme summary:** Of the three categories of benefits identified by this theme, patients’ benefits were viewed by participants as the primary benefits of advanced clinical roles. They acknowledged the opportunity that extended roles has accorded them to use their knowledge and skills to enhance patient care. Also, other benefits such as enhanced: responsibility and status, career structure and job satisfaction for pharmacy staff were widely appreciated. In addition, the economic benefits associated with pharmacists’ involvement in medicines management and the use of pharmacy skill mix was highlighted.

#### **4.4.6 Strategies for achieving pharmacy practice change**

Participants of this study described a number of approaches to achieving practice change based on their experience in the UK. These included developing credible pharmacy practitioners, freeing-up pharmacists’ time, seizing the opportunity for extended roles, developing a relationship with the medical profession and the role of leading individuals and professional bodies.

##### **4.4.6.1 Developing a credible pharmacy practitioner**

Participants stressed that what the UK has done over the past 40 years was to develop credible practitioners within the hospitals by providing them with the appropriate education and training opportunities for future clinical roles. Hence, they pointed out

that any country considering extending the clinical role of its pharmacists must develop credible practitioners who are able to take on clinical roles.

*“I think the key was creating practitioners who are credible and who had the right skills set and right knowledge set to be able to convince, particularly senior doctors, that we could talk to them in the same language around prescribing and medicine usage and so on.” (P04, Pharmacist)*

*“There were changes within the training of pharmacy technicians which has enabled a more highly skilled workforce.” (P03, Pharmacist)*

Participants mentioned that developing a credible practitioner is much more dependent on the robustness of the training offered to practitioners. They reported that the training needs of pharmacists and their support staff must be identified vis-à-vis the future clinical roles that are anticipated. Participants also advised that both the basic and on-going education of pharmacy staff should be considered.

*“I think there is got to be some investment in education because you are asking them to take on new skill set.” (P02, Pharmacy Technician)*

*“I think it is about thinking wider but making sure that everybody has suitable education before they go out and try and do things. So you need to have good clinical education before you can go out to provide clinical advice.” (P27, Pharmacist)”*

Participants observed that having a structure that allows pharmacists to develop clinically and specialise within different clinical areas while progressing up the career ladder would help in developing credible practitioners.

*“To really position your country’s pharmacy services if you can get a structure in place which really allows everybody to move forward, then the benefit to the patient is good but also the credibility of the pharmacy services is higher.” (P24, Male, Pharmacist, 1970s)*

Participants maintained that being able to specialise in post-registration training and practice would result in the development of competent practitioners.

#### **4.4.6.2 Freeing-up pharmacists to do extended role**

The development of pharmacy technicians to take on some of the traditional roles of pharmacists especially the supply functions emerged as a key strategy in freeing-up pharmacists to do extended clinical roles. Many participants I interviewed observed that pharmacists cannot extend their clinical roles beyond the dispensary as long as their role is mainly linked to supply functions.

*“...this can't happen without the development of the technicians...”  
(P07, Pharmacist)*

*“You have got to have the means by which you can develop a group of support staff like pharmacy technicians who can take responsibilities for managing the supply side because none of these is possible while pharmacists maintain such a strong responsibility for supply.” (P04, Pharmacist)*

Overall, both pharmacists and pharmacy technicians maintained that if pharmacists wish to extend their clinical roles, they must be willing to develop the technicians to take over their supply roles in order to free them up.

#### **4.4.6.3 Seizing the opportunity**

A number of participants interviewed reported on how they identified gaps in clinical practice that pharmacists or pharmacy technicians could fill and took advantage of that opportunity to expand their roles. For example some pharmacists reported that the increased incidence of medication administration errors on the wards provided the opportunity to design ward-based prescription charts which facilitated the movement of pharmacists onto the wards to monitor those charts.

A pharmacist stated how they took advantage of the national strike action by pathology staff working in the haematology unit to establish one of the first pharmacist-led anticoagulant clinics in the UK.

*“So, XXX [pharmacist's name] and I said to the medical consultant, “well, we can help you with that, we can help you look at some of the patients for you”. So we had patients coming to us for anticoagulation where we had to adjust the doses of warfarin and established what was in effect one of the first pharmacist-led anticoagulant clinic in the country.” (P32, Pharmacist)*

This participant added that because the clinic they ran was successful, several pharmacist-led anticoagulant clinics were established in the country and that became an extended services provided by pharmacists.

Similarly, a pharmacy technician interviewed reported how they intended to take advantage of their current training and skills in aseptic services to push for role extension in that area.

*“You know we are just in the middle of doing some work in aseptics because with aseptic production, only the pharmacist can release the product at the end, by law. So, we are starting to push those boundaries to say actually if this person has the skills and done the*

*training..., we want to challenge that because the pharmacist costs a lot of money.” (P03, Pharmacy Technician)*

Therefore many participants interviewed reported that if pharmacists wish to expand their clinical roles, they must identify gaps in clinical practice particularly in the aspect of medicine use where they have specialised skills, and take advantage of that to develop their practice.

#### **4.4.6.4 Developing a relationship with the medical profession**

Pharmacists observed that having a good relationship with the medical profession is very important for clinical role development. They argue that without the support of the medical doctors, it is unlikely that pharmacists could expand their roles clinically.

*“I think you have to establish good working relationship between pharmacists and senior clinical staff, divisional directors, clinical directors, medical directors.” (P29, Pharmacist)*

*“...without them [doctors] supporting and saying yes, you won't get anywhere. So, you have to get them on board either generally or as individuals, you have to make good relationships with the doctors.” (P27, Pharmacist)*

Pharmacists also added that the pharmacy profession also needs to enlighten the medical profession to have a better understanding on the roles of a clinical pharmacist, and how clinical pharmacists have contributed to patient care in other countries such as the UK.

*“One thing that is really helpful is getting the medical profession to understand the experience of their medical colleagues in other countries that have got clinical pharmacists.” (P29, Pharmacist)*

Some pharmacists stated that the participation of pharmacists in ward activities (including ward rounds) and inter-professional education are important ways of building credible relationships with the doctors. Pharmacist prescribers acknowledged that the relationship they had with the medical doctors while working on wards was instrumental in helping them get a medical doctor as a mentor for their training as prescribers and in also developing their prescribing role.

#### **4.4.6.5 Leading individuals and professional associations**

According to Birenbaum (1982) professionalization is led by leading individuals who are willing to take risks to bring about the envisioned social and legal support. He referred to these leading individuals as elite groups of the profession which could either be

leaders of the profession or other influential individuals who are advancing new roles. Many participants discussed that it is important to have key individuals who are forward thinking and would push for clinical role extension either at the local or national level and also engage with people in government.

*“You need some key people who are champions to make that change within the particular areas you want to make that change.” (P17, Pharmacist)*

*“I think having people at the top of the profession who had this vision of pharmacists doing more clinical work and less pill counting, that is what has pushed it forward.” (P27, Pharmacist)*

Participants also pointed out the need to have professional associations at the national level that will push and lobby for clinical role extension.

*“I think if you wanted to get it quickly changed, I think you need a central drive and the best way to do that is through your professional organisations and particularly if they could talk to the other professions like the medical and the nursing professions...” (P31, Pharmacist)*

*“I think you need to engage with the politicians, because they make the laws...” (P06, Pharmacist)*

Participants noted that these leading individuals and professional bodies must engage with the legislators and other political office holders because some extended roles would require legislation and the intervention of the government.

**Theme summary:** The four strategies discussed above were drawn as the lessons learnt from the UK experience. Developing credible practitioners was considered an important strategy that must be achieved for change to happen. This is dependent on the nature and quality of clinical training available to pharmacy practitioners because no extended role can be successfully implemented without competent practitioners to take on the role. The development of pharmacy technicians to take over some of the traditional roles of pharmacists in order to free pharmacists up for advanced roles and the support of the medical profession were highly valued among participants interviewed. In addition, this theme underscored the importance of having key individuals at both local and national level who will lobby and push for change in pharmacy practice.

#### **4.5 Study strengths and limitations**

The strength of this study is in its design, including its methods, data analysis and steps taken to ensure rigour. The study only included participants who were in practice



when significant changes in pharmacy professional structure were made. Some participants in this study were directly linked with the change process and their accounts were invaluable in understanding how pharmacists were able to develop their clinical roles in the UK. The rigorous application of qualitative methods enables an in-depth understanding of the barriers and facilitators to pharmacy practice change and the use of both face-to-face and telephone interviews enabled the researcher to draw from the experience of participants across many settings in the UK. The detailed description of context and findings presented in this study will enhance its transferability in other contexts. Also, being a non-UK pharmacist and a pragmatic researcher, helped to minimise my personal bias in the research.

Certain limitations were associated with this study. First, being a qualitative study, the findings cannot be statistically generalised. However, statistical generalisation is not the goal of qualitative research. Transferability and theoretical generalisation have been adopted in qualitative research (Seale, 1999). Therefore, certain concepts from the findings of this study could be transferable to other contexts including Nigeria. For example, the development of pharmacy technicians or other category of pharmacists' support staff, to do some of the traditional roles of pharmacists could be crucial in freeing up pharmacists time to do extended clinical roles in many countries including Nigeria. Secondly, the snowballing strategy used in the recruitment of participants, was unable to recruit participants from Northern Ireland and Wales, which could be a limitation to the findings of this study. In addition, participants were mostly recruited from England. Therefore, this report mainly centred on changes in pharmacy practice observed in England. Thirdly, it is possible that participants in this study had difficulties recalling events that happened in the earlier years of their practice. However, this was not explicitly shown. Finally, many of the participants interviewed showed a lack of understanding of the structure of pharmacy practice in Nigeria. Therefore, they were unable to comment on what lessons that could be learned in Nigeria.

#### **4.6 Chapter summary**

The present study revealed that hospital pharmacists in the UK have successfully redefined their roles and are now working at advanced levels clinically including in many cases, a prescribing role. Their current clinical roles have been supported by changes that occurred in the structure of pharmacy practice including: a shift in the focus of pharmacy training to a patient orientated one; specialisation in practice; the development of a career route that recognised advanced pharmacy practitioners; enhanced working relationship with doctors and the development of pharmacy

technicians to take on some roles previously undertaken by pharmacists in order to free-up pharmacists for advanced roles. These changes were driven by an appropriate policy environment. However, the development of the clinical roles of community pharmacists in the UK have been delayed and this was associated to the remuneration model of community pharmacists which is predominantly linked to supply functions; inability of community pharmacists to engage in post-registration clinical training, although this is no longer the case; legislation; professional isolation and poor relationships with general practitioners.

Many of the drivers identified including government policies, enhanced education, task shifting to pharmacists' support staff, relationship with medical doctors and leadership are fairly well known and have been linked to the development of clinical pharmacy practice in hospitals in some countries including Australia and China (Penm et al., 2015a, Penm et al., 2014). The findings of the present study adds to the international literature by suggesting that within hospital pharmacy practice, a clinical career pathway that allows progression within clinical specialty could sustain and support the development of pharmacists' clinical roles. This is because a clinical career route has the potential to make pharmacists aspirational and motivate them to develop clinical competencies that are needed for advanced practice in order to progress up the career ladder. In addition, it also promotes the retention of experienced clinical staff who wish to use their expertise to enhance patient care rather than to move into managerial roles where their clinical expertise would be untapped.

Therefore, since changes in the professional structure of pharmacy were linked to the development of pharmacists' clinical roles in the present study, the next study, will employ a qualitative design to investigate the professional structure of pharmacy in Nigeria with a view of identifying the potential changes that would be required for the development of pharmacists' clinical roles to include prescribing. Hence, the design of the next study reported in chapter 5 would be informed by the findings of the present study. Furthermore, the implications of the findings of this chapter to the Nigerian context are discussed in chapter 7.

## Chapter 5: Nigerian qualitative study

	Phase	Method	Product
Qualitative Phase	Qualitative Data collection 1	<ul style="list-style-type: none"> <li>32 semi-structured interviews with UK pharmacy staff</li> </ul>	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 1	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to UK's pharmacy structure</li> </ul>
	Connecting qualitative study 1 & 2	<ul style="list-style-type: none"> <li>Developing interview questions</li> </ul>	<ul style="list-style-type: none"> <li>Interview guide for qualitative study 2</li> </ul>
	Qualitative Data collection 2	<ul style="list-style-type: none"> <li>49 semi-structured interviews with purposively sampled stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 2	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to barriers &amp; facilitator to clinical role extension</li> </ul>
	Connecting qualitative & quantitative phases	<ul style="list-style-type: none"> <li>Developing research objective</li> <li>Developing survey items</li> </ul>	<ul style="list-style-type: none"> <li>Research objectives</li> <li>Questionnaire</li> </ul>
Quantitative Phase	Quantitative Data collection	<ul style="list-style-type: none"> <li>Cross-sectional web survey</li> </ul>	<ul style="list-style-type: none"> <li>Numeric data</li> </ul>
	Quantitative data analysis	<ul style="list-style-type: none"> <li>Univariate and multivariate analysis</li> </ul>	<ul style="list-style-type: none"> <li>Descriptive and inferential statistics</li> </ul>
	Integrating qualitative & quantitative results	<ul style="list-style-type: none"> <li>Interpretation and explanations of qualitative and quantitative results</li> </ul>	<ul style="list-style-type: none"> <li>Discussions</li> <li>Implications for practice &amp; policy</li> <li>Future research</li> </ul>

## **CHAPTER 5: EXPLORING THE FACILITATORS AND BARRIERS TO EXTENDING PHARMACISTS' CLINICAL ROLES TO INCLUDE PRESCRIBING IN NIGERIA**

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### **5.1 Introduction**

This chapter presents the report of the second qualitative study conducted as part of the sequential mixed methods research outlined earlier in chapter two. The chapter begins with a brief background to the study including the qualitative findings in chapter 4 that informed this study. It then provides the specific objectives of the study. The objectives are then followed by the methods employed to address them including data collection methods and analysis. The chapter concludes with a presentation of the study findings and the measures taken to ensure 'trustworthiness' in the study conducted.

In Nigeria, a shift from the traditional pharmacists' role of dispensing and compounding of medications began in the 1980s with the introduction of drug information services and unit dose dispensing systems in some hospitals (Erah, 2003). Following these developments, clinical pharmacy courses were made mandatory in the undergraduate pharmacy curriculum in 1990 (Brown and Ogun, 1998). More than two decades after this, clinical pharmacy practice is still underdeveloped. In many hospitals and community pharmacies, pharmacists' roles are still limited to dispensing of medications and inventory control (Auta et al., 2014b). For example, a questionnaire survey conducted among 119 pharmacists including hospital and community pharmacists in a Nigerian city that assessed the application of 52 suggested pharmaceutical care practice standards, found that only 18.2% of the respondents were applying such standards in their practice (Erah and Nwazuoke, 2002). More recently, a questionnaire survey conducted among 105 pharmacists including those in hospital and community practice in a state in Nigeria revealed that none of the respondents had fully implemented the concept of pharmaceutical care into their practice. Of the 47 hospital pharmacists that participated in the study; only 2 (4.3%) reported that they participated on ward rounds with other members of the healthcare team (Suleiman and Onaney, 2011).

Many empirical studies have identified a number of challenges associated with the development of clinical pharmacy practice in Nigeria. These challenges include opposition from doctors, inadequate infrastructure, shortage of pharmacy staff, inadequate clinical education, and lack of access to patient clinical data (Oqua et al.,

2013, Oparah and Eferakeya, 2005, Erah and Nwazuoke, 2002). However, these studies were quantitative and therefore, do not provide a comprehensive, in-depth understanding of the barriers to clinical pharmacy practice in Nigeria. In addition, the findings they presented were from the perspectives of pharmacists only. Therefore, the studies did not capture the perspectives of the various stakeholders involved in the development of clinical pharmacy practice in Nigeria including doctors and policymakers. This necessitated this study to explore the facilitators and barriers to extending pharmacists' clinical roles from the perspectives of various stakeholders.

The findings of the study reported in chapter 4, revealed that changes in the structure of pharmacy practice in the UK including education, career structure and development of pharmacy technicians were associated with the development of pharmacists' roles including the potential for pharmacist prescribing. Therefore, these findings informed the objectives and design of the present study.

## **5.2 Objectives**

This study was designed to investigate the facilitators and barriers to extending the clinical role of pharmacists to include prescribing in Nigeria.

The specific objectives were:

- To investigate the current structure of pharmacy practice in Nigeria in order to identify the potential changes needed for the development of pharmacist prescribing.
- To explore the views of stakeholders involved in prescribing, pharmacy training and practice on the facilitators and barriers to making prescribing a part of the clinical roles of pharmacists in Nigeria.

## **5.3 Methods**

### **5.3.1 Ethics**

Ethical approval for this study was obtained in two stages. Initially, the School of Healthcare Research Ethics Committee (SHREC) (Ref no: SHREC/RP/436) reviewed and granted ethical clearance to the project as a prerequisite for ethics application in Nigeria (Appendix 9). Following this approval, an ethics application was tendered in Nigeria to the Plateau State Specialist Hospital Health Research Ethics Committee. The application received a favourable approval (PSSH/ADM/ETH.CO/2014/0025) and permission was given to conduct the study (Appendix 10).

As with the previous study conducted in the UK, the main ethical issues associated with this research were those of obtaining informed consent from participants, anonymity of participants, confidentiality in handling data and data protection. Participant information sheets (see Appendix 11) were provided to prospective participants to enable them to make an informed decision about participating in the study. Participants were also given the opportunity to make further enquiries about the research. Those who agreed to participate were sent a written consent form through their email addresses and requested to sign and return electronically (Appendix 12). Participants who were unable to sign the consent form electronically gave a verbal consent and were recorded with an audio-digital recorder.

Anonymity of the participants was maintained by assigning codes (known only to the researcher) to all participants. In addition, all personal identifiable data were excluded from interview transcripts and the thesis report. Electronic data, including audio-records of interviews and transcripts, were kept in a password protected M-drive of the University. Hard copies of research documents were kept in locked filing cabinets in the post-graduate suite of the School of Healthcare, University of Leeds

### **5.3.2 Study setting**

This study was conducted with Nigerian participants. Nigeria has a population of about 169 million with a landmass of 923, 678 square kilometres which is about 4 times the size of the UK (World Bank, 2014, NPC and ICF MACRO, 2009). The health system in Nigeria is decentralised into 3 levels namely primary, secondary and tertiary levels in accordance with the 3 tiered system of government in the country: the federal, state and local government (World Bank, 2005). The Federal Government through the Federal Ministry of Health (FMOH) is responsible for the management of the tertiary level. Policy formulation, planning, and provision of technical assistance to the secondary level takes place at the tertiary level (WHO, 2002, FMOH, 2010b).

Pharmacy practice in Nigeria is regulated by the Pharmacists' Council of Nigeria (PCN). There are about 17,000 fully registered pharmacists representing 10 pharmacists per 100,000 people in Nigeria (PCN, 2014b), compared to the UK with about 49,000 practicing pharmacists (78 per 100,000 people) (OECD, 2013). Data on the number of pharmacy technicians in Nigeria is lacking because their registration with the Pharmacists' council has not yet been made mandatory for practice. However, in 2007, it was estimated that there were about 5,500 pharmacy technicians (AHWO, 2008).

This research was initially designed to involve both telephone and face-to-face interviews. Face-to-face interviews were to be conducted with participants identified in the cities of Jos and Abuja located in north-central Nigeria while those outside these cities were to be interviewed via the telephone. However, because of the heightened insecurity in the country including a series of bomb blasts in Jos and Abuja at the period of the research (BBC, 2014a, BBC, 2014b, BBC, 2014c); travelling to Nigeria to conduct face-to-face interview was considered inappropriate. Following a risk assessment with my supervisors, we agreed to only conduct telephone interviews from the UK with Nigerian participants.

### **5.3.3 Recruitment and sampling strategy**

This research recruited various stakeholders including pharmacists, doctors, pharmacy technicians, academics, policymakers at the state and federal ministry of health, and patient group representatives. These stakeholders were considered suitable as participants for this research because they were associated with pharmacy practice and/or prescribing in Nigeria.

Purposive sampling was carried out aiming for maximum variation in order to obtain a range of perspectives (mix of stakeholders, practice and geographical settings). Generic recruitment emails were sent to 134 prospective participants. These were heads of pharmacy and medical departments in some secondary and tertiary hospitals; leaders of professional pharmacy and medical associations including the Nigerian Association of Hospital and Administrative Pharmacists, Nigerian Association Pharmacist in Academia, Pharmaceutical Society of Nigeria, Association of Community Pharmacists of Nigeria, National Association of Pharmaceutical Technologists and Pharmacy Technicians of Nigeria, Nigerian Medical Association, Medical and Dental Consultants Association of Nigeria, and National Association of Resident Doctors. Other prospective participants contacted were directors of pharmaceutical and medical departments at the State and Federal Ministry of Health; and representatives of the Network of People Living with HIV and AIDS in Nigeria and the Diabetes Association of Nigeria. Those that responded to the email and indicated an interest in receiving further information about the research were sent the information sheet of the study to help them make informed decisions to participate in the research. All those who accepted the invitation to participate in the study were contacted and arrangements were made for telephone interviews at a time convenient to the participants. A total of 49 stakeholders participated in the study.

#### 5.3.4 Interview guide

The draft interview guides (Appendix 13) used for this study were developed based on the findings of the qualitative study conducted in the UK (reported in chapter 4). The findings of the UK study revealed that changes in the professional structure of pharmacy were linked to the development of pharmacists' clinical roles. Therefore, among other things, the interview guide explored stakeholders' opinions on the structure of pharmacy practice in Nigeria in order to identify areas for change.

Three different interview guides (containing similar items) were used in this study to ensure that participants were interviewed in accordance with their experience. These guides were designed for pharmacy staff including pharmacists and pharmacy technicians; doctors; and policymakers/patient representatives. The interview guide developed for each group of participants has two sections. The first section pertains to the structure of pharmacy practice in Nigeria, while the second concerns stakeholders' views on granting prescribing rights to pharmacists in Nigeria including potential facilitators and barriers.

#### 5.3.5 Pilot interviews

Four pilot interviews were conducted to test and refine the draft interview guides. The four participants interviewed were two pharmacists, a doctor and policymaker in Nigeria. The pilot interviews were conducted over the telephone, audio-recorded and transcribed verbatim.

These pilot interviews were reviewed during a supervision meeting and the following observations were made:

- The pilot interviews conducted with the two pharmacists all lasted beyond an hour. It was observed that removal of the question that asked about pharmacists' career progression to date could result in a significant reduction of the interview time. This question was therefore removed from the interview guide.
- Some participants considered pharmacist prescribing to include counter prescribing of over-the-counter medicines. Therefore it was necessary to include an introductory paragraph in the interview guide that explains pharmacist prescribing from the perspective of this research. Hence, the statement below was included in the interview guide:

*“By prescribing, we mean granting pharmacists the legal right to prescribe ‘Prescription Only Medicines’ as currently practised by*



*doctors in Nigerian hospitals. This differs from counter prescribing or the supply of over the counter medicines as currently practised by community pharmacists in response to patients' complaints or symptoms."*

- A number of participants were not aware of the different models of pharmacist prescribing. Therefore, a working definition of the two broad models of pharmacist prescribing i.e. collaborative and independent prescribing were included in the interview guide to help participants discuss the type of pharmacist prescribing model they would support in Nigeria.

*In collaborative prescribing, the pharmacist prescribes in partnership with a doctor where the doctor makes the initial diagnosis and treatment decisions, while the pharmacist may continue therapy' adjust doses, change therapy or discontinue a medication within an agreed plan. In independent prescribing; the pharmacist is responsible and accountable for his or her prescribing decisions including clinical assessment, diagnosis (where applicable) and management of the patient.*

- The interview guide adequately covered the relevant topic area and participants responded appropriately to the questions asked.

The pilot interviews conducted were included in the study because there were no major changes to the structure and content of the interview guide following the pilot. The final interview guide used in the main study is presented in Appendix 14.

### **5.3.6 Interview process**

In-depth, semi-structured telephone interviews were conducted with Nigerian participants between April to June 2014.

At the start of each interview, the researcher created a relaxed atmosphere for the interview by engaging with the participants in a brief informal discussion. As with the previous qualitative interviews conducted in the UK, participants were told the purpose of the interview, how long the interview was expected to last, and assured of confidential handling of any information obtained from them. Permission was also sought from participants to record the interviews. No participant objected to the recording of his/her interview. Interviews were recorded using an audio digital recording device (Roland R-05 Portable MP3 Recorder) with the help of an Olympus (TP-8)

telephone pick-up microphone which helps transmit the conversation from the telephone to the recording device.

An attempt was made by the researcher to complete all interviews within an hour. Where this was exceeded, permission was sought from participants to continue the interview and they were allowed to freely accept or decline to continue. In addition, apologies were offered for exceeding the agreed duration of the interview. Only two interviews in the main study exceeded an hour. At the end of each interview the researcher showed gratitude to participants for participating in the study and for their time and contributions. The interviews conducted lasted between 20 minutes to 70 minutes.

At the design stage of this research, it was anticipated that about 40 interviews would be sufficient to reach data saturation. However, 49 semi-structured interviews were conducted in all. Data saturation was achieved when further interviews did not yield any new thematic information and this was perceived to be reached at about the 35<sup>th</sup> interview. However, further interviews were carried out with the remaining participants as they had previously agreed to be interviewed. Demographic details of the participants interviewed are outlined in the results section of this chapter.

### **5.3.7 Data analysis**

Interview data obtained were analysed using thematic analysis in the manner outlined by Braun and Clarke (2006) and reported in chapter 4 of this thesis. The analysis proceeded in iterative stages of data familiarisation, generation of codes, searching, reviewing, defining and naming of themes. Data management was aided by the use of Nvivo 10 software which facilitated the organisation of the data into codes, categories and potential themes.

As with the previous qualitative study reported in chapter 4, familiarisation with the data began at the point of data collection (interview) since all telephone interviews were conducted by the researcher. Transcription of interviews and cross-checking of transcripts against audio recordings were also carried out by the researcher. All interviews were transcribed verbatim. Immersion into the data was achieved by repeated listening to the individual recordings of the interviews, transcribing and re-reading individual transcripts. In addition, initial ideas including potential codes were noted and taken into the analysis.

Initially, five transcripts were coded. Data coding was both deductive (using codes derived from the literature, research objectives and interview guide) and inductive (data

driven). The coding process was also iterative with constant refinement of codes. The codes generated from the initial transcripts were applied to other transcripts. Additional codes also emerged from the data.

In the next stage of the analysis, the codes developed were grouped into categories by looking at relationships between them and searching for patterns within the data. This process was also iterative and led to the development of potential themes. The potential themes identified were organised in line with the objectives of the study into larger themes with sub-themes (see Table 5-1). The sub-themes identified were basically themes within a theme. The identified themes were initially reviewed in relation to the research questions and a second review of the identified themes was carried out by my supervisors.

## **5.4 Results**

### **5.4.1 Demographics**

The demographics of the stakeholders interviewed showed a mix of participants in terms of their professional backgrounds, practice settings and geographical locations. The forty nine (49) stakeholders interviewed comprised 20 pharmacists, 9 doctors, 11 policymakers, 6 pharmacy technicians and 3 patient group representatives. These participants were drawn from the six geopolitical regions of Nigeria: north-east (5), north-west (6), north-central (29), south-east (1), south-west (5), and south-south (3).

The 11 policymakers interviewed were from the federal (5) and state (6) level. Four (4) of the policymakers interviewed had medical backgrounds while seven (7) had pharmacy backgrounds. The 20 pharmacists who participated in this study included 4 academics, 5 community pharmacists and 11 hospital pharmacists; while the 9 doctors were 4 consultants, 3 residents, and 2 general practitioners. The pharmacists interviewed had from 5 to 37 years of experience while the doctors had from 10 to 37 years of experience. The majority of the health care professionals interviewed including doctors, pharmacists and pharmacy technicians worked in secondary and tertiary facilities located in urban centres. However, 8 participants were practising in secondary hospitals located in rural centres.

The subsequent sections of the results presents the themes identified from the analysis of the data.

**Table 5-1: Themes and sub-themes identified from analysis**

<b>Research objective</b>	<b>Theme</b>	<b>Sub-theme</b>
To investigate the current structure of pharmacy practice in Nigeria	5.4.2 Pharmacists' professional identity	5.4.2.1 Pharmacists as underutilised professionals 5.4.2.2 Pharmacists as custodians of medicines 5.4.2.3 Pharmacists' as dispensers of medicines 5.4.2.4 Pharmacists as medicines advisers 5.4.2.5 Pharmacists as clinical practitioners 5.4.2.6 The business image of pharmacy
	5.4.3 Pharmacy professional structure	5.4.3.1 Confidence 5.4.3.2 Specialisation and career structure 5.4.3.3 Shortage of pharmacy staff 5.4.3.4 Utilisation of pharmacy technicians 5.4.3.5 Medical dominance and opposition 5.4.3.6 Collaboration with doctors 5.4.3.7 Lack of policies to support clinical pharmacy practice 5.4.3.8 Regulation
To explore the views of stakeholders on the facilitators and barriers to pharmacist prescribing	5.4.4 Views on prescribing	5.4.4.1 Prescribing a logical role for pharmacists 5.4.4.2 Pharmacist prescribing: a threat to doctors' role 5.4.4.3 Pharmacists' competence in prescribing 5.4.4.4 Collaborative prescribing as an appropriate model 5.4.4.5 Potential benefits of pharmacist prescribing 5.4.4.6 Potential facilitators and barriers to pharmacist prescribing

## 5.4.2 Pharmacists' professional identity

This theme relates to how various stakeholders characterised pharmacists in relation to who they are and what they do. It also includes pharmacists' self-perception of who they are. Overall, pharmacists' identities were largely described through the roles they took on. Analysis of the interview data revealed six 'identities' of pharmacists: underutilised professionals, custodians of medicines, dispensers, medicines advisers, clinical practitioners and business men. Many non-pharmacy stakeholders interviewed saw pharmacists' role as mainly supply-based. In addition, community pharmacists' roles were viewed as commercial in nature. However, many pharmacists interviewed viewed themselves as clinicians.

### 5.4.2.1 Pharmacists as underutilised professionals

Pharmacists were generally seen by all stakeholders interviewed as highly educated professionals whose skills are underutilised within their current scope of practice.

*"I think the pharmacist is one of the most highly trained personnel in the health sector but least utilised" P25, Hospital Pharmacist.*

*"They [pharmacists] have not yet optimised their functions in the health system." P30, Policymaker & medical doctor*

*"When we were in the medical school, I used to look at pharmacists as learned colleagues, but now in practice, their roles are so few." P34, Resident Doctor*

These views were commonly reported by participants because pharmacists' roles in Nigeria are limited to medicine handling and supply as would be seen in subsequent subthemes. Therefore, many pharmacists felt overeducated for their present roles. They perceived that a role extension would promote the utilisation of their skills as would be discussed in section 5.4.4.5.

*"...you have so much knowledge but you find yourself in a situation where you are not being able to use it." P04, Hospital Pharmacist*

*"So, what is the difference between a pharmacist and a patent medicine vendor in Nigeria? What is the essence of going to the University and qualifying as a pharmacist to do the same thing as a patent medicine vendor? P07, Community Pharmacist*

The last participants' comment indicates that community pharmacists also hold the same perspective of being overeducated for their present scope of practice. They considered their roles not to be too different from those of patent medicine vendors. In Nigeria, patent medicine vendors are individuals with no formal pharmacy education

who are licenced to sell specific over-the-counter medicines in their original packs in order to fill the gap created by inadequately skilled professionals needed for medicine supply (PCN, 2013).

#### **5.4.2.2 Pharmacists as custodians of medicines**

Many participants noted that traditionally, pharmacists' training has been centred on medicines. Therefore, pharmacists were viewed as the professionals responsible for keeping and handling of medicines.

*“A pharmacist is the health professional trained to handle and dispense drugs.” P02, General Practitioner*

Some pharmacists including those in hospital and community pharmacy practice also saw themselves as the experts in the handling of medicines. They referred to themselves as 'custodians of medicines'.

*“The pharmacist being the sole custodian of medicines is an important personnel. In fact now in Nigeria, there cannot be any existing hospital without a pharmacist in it.” P3, Hospital Pharmacist*

*“A pharmacist in Nigeria is a pharmacist like every other one in the world. He is an expert or a custodian of drugs.” P08, Community Pharmacist*

Such a label on the pharmacist as custodian of medicines is restrictive in terms of role expansion because pharmacists with such views will always see their core roles as product orientated. However, many pharmacists reported that their expertise is beyond medicine handling and supply. They therefore view themselves as experts in all aspects of medicines including its use in patient care.

*“The doctors have decided not to know what we can contribute in patient care, they just look at us as drug experts that are just trained to handle drugs like procurement, and dispensing and that is all.” P25, Hospital Pharmacist*

Further discussions on pharmacists' role in patient care are presented in section 5.4.2.5.

#### **5.4.2.3 Pharmacists' as dispensers of medicines**

Community and hospital pharmacists' description of their day to day job role during the interview revealed that they were mainly involved in dispensing of medications.

*What we basically do is prescription screening and dispensing. We do counselling as well. P25, Hospital Pharmacist*

*"We dispense medications, we attend to minor complains and where we have to do referrals, we do referrals. And of course the business side, managing the place, managing the accounts and all that." P23, Community pharmacist*

Hence, many stakeholders interviewed including doctors, patient group representatives and policymakers viewed pharmacists as dispensers of medicines.

*"They are the professionals when it comes to drug dispensing." P28, Medical Consultant*

*"A pharmacist is a trained professional that deals with the aspect of drug dispensing in the hospital but I have also found out that they are beginning to counsel patients regarding how the drugs relate to their health circumstances." P38, Patient group representative*

Many doctors believed that dispensing is the core function of pharmacists. Therefore they did not see pharmacists' role beyond the dispensary and as a result considered pharmacists' involvement in clinical activities including participation in ward round with doctors as unusual.

*"No, I don't do ward rounds with pharmacists because it is not in the curriculum to do ward rounds with pharmacists but if peradventure in the course of the ward rounds, I need to clarify something from the pharmacist I will call the pharmacist to come and give his or her own input." P10, Medical Consultant*

Therefore, these doctors would want pharmacists to further develop their roles in dispensing and other medicine supply functions rather than extending into clinical roles.

*"I think it is all about improving on the existing roles they have, I don't think they need to add any more roles to what they are already doing." P28, Medical Consultant*

*"They should be more involved in compounding a lot of drugs in the hospital. They should also do more by educating patients on the proper way of taking drugs." P29, Resident Doctor*

A policymaker with a medical background also held a similar view.

*"Dispensing of drugs is not what everybody can do; you need someone who has been trained in that. I want pharmacists to concentrate on that area of specialisation to support the doctors in their practice." P33, Policymaker*

This perception held by these doctors showed a great unawareness among doctors of pharmacists' professional roles in patient care. Pharmacists interviewed observed that

doctors' perception of their roles as being product focussed has been a barrier to them extending their clinical roles.

*"This is a bit of a challenge to most of the teaching and specialist hospitals in Nigeria because the medical doctors have refused to come to terms with the fact that the pharmacist has an input especially as regards patients' therapy in the hospital wards." P31, Policymaker & Pharmacist*

In contrast, a few doctors saw pharmacists' role beyond dispensing and would like to have pharmacists contribute to decision making concerning patients' therapy and influence their prescribing as well.

*"If I want to prescribe say Haloperidol and while trying to reach that decision with my resident doctors or other consultants during ward rounds, I would also like to have input from the pharmacist saying X, Y, Z pharmacokinetics, why not choose Risperidone,... that kind of contribution, not only doctors' input." P14, Medical Consultant*

#### **5.4.2.4 Pharmacists as medicines advisers**

Apart from dispensing, a major role played by pharmacists in both community and hospital pharmacy is advising patients and healthcare professionals on the use of medicines. Generally, participants including non-pharmacists viewed provision of medicines information and advice as a preserved area for pharmacists because of pharmacists' knowledge of medicines.

*"...a pharmacist is an authority on drugs; he should give advice on any drugs." P08, Community Pharmacist*

*"...you will want to ask questions about patient medications, if there are issues and they are the ones [pharmacists] to give you the information that you need." P29, Resident Doctor*

Hospital pharmacists reported that they counsel patients on their medicines and this mostly occurs at the point of dispensing of medications to patients.

*"Yes, the pharmacist does the dispensing because it is at that point the patient counselling takes place." P03, Hospital Pharmacist*

*"The basic thing we do is dispense drugs to patients, then advise them on the use of the drugs." P11, Hospital Pharmacist*

However, some participants noted that the opportunity to adequately counsel patients depends on the time the pharmacist has. They noted that in busy periods, patient counselling hardly takes place.



*“...the waiting time for patients to get their drugs is much, let alone pharmacists having time to interact with the patients and counsel them.” P14, Medical Consultant*

Many doctors also reported that hospital pharmacists were resourceful in providing medicine information and advice to them.

*“They give advice to doctors, sometimes before doctors prescribe and sometimes when the patients take their prescriptions to the pharmacy. The pharmacist may want to get back to the doctor to review dosages or duration of medication that the patient has on the prescription.” P14, Medical Consultant*

*“Once in a while, when I need certain clarification on a medicine, I also do call them.” P28, Medical Consultant*

However, analysis of the interview data showed that the medicine information sought by doctors were mainly product-based. They consisted mainly of information related to the formulation, strength and dosage of medicines rather than information on the clinical application of medicines.

#### **5.4.2.5 Pharmacists as clinical practitioners**

Not many non-pharmacist participants including doctors identified pharmacists as clinical practitioners. Many doctors did not see the pharmacists' role to directly encompass patient care. A medical doctor interviewed considered hospital pharmacy practice as a secondary role for pharmacists.

*“I think pharmacists should more or less be in places where they can actually produce the drugs. I know those jobs are not available in our country probably that is why we find them in the hospitals.” P21. Resident Doctor*

Although clinical pharmacy practice is evolving in Nigeria, some pharmacists particularly those in tertiary hospitals saw themselves as clinical practitioners. They viewed clinical pharmacists' roles to include direct involvement in patient care. This encompasses applying pharmacists' medicine knowledge to identify medicine therapy problems, monitoring patient therapy, participating in prescribing decisions and counselling patients.

*“As clinical pharmacists, we go on ward rounds. We have designated days for pharmacists' rounds and 'grand' rounds. During these rounds we ensure that potential and actual drug therapy problems are identified and tackled. We collaborate with the physicians in ensuring that patients get the best drugs for their various ailments. We also act*

*as drug information resources for the prescribers.” P03, Hospital Pharmacist*

*“We in the hospitals are clinicians because we get involved in checking prescriptions including drug-drug interactions. We also go on a clinical ward rounds to ascertain whether patients are responding to drugs.” P05, Hospital Pharmacist*

*“What I do during ward round is to determine what medicines will be fit for the patient, advise the doctor on what to prescribe, determine any drug interactions and try to find out if the patient had been on any herbal remedy before coming to the hospital since we are in a rural location. I also advise patients on their medicines and what to do when they experience any unwanted effect from their medicines.” P04, Hospital Pharmacist*

Some community pharmacists interviewed reported that they undertook some clinical work in their practice including counselling patients about their medicines, identifying drug therapy problems, performing some physical examination and treating minor illnesses. Many pharmacists argued that community pharmacists have a better environment for clinical pharmacy practice than hospital pharmacists. This is because they are independent practices and enjoy some degree of autonomy from those factors that pharmacists considered were militating against the development of clinical pharmacy in hospital settings including medical opposition. In addition, they reported that many patients had confidence in community pharmacists and regularly consulted them.

*“In community pharmacies, pharmacists have so many opportunities to perform their clinical functions. They don't have to get permission from the physician to go near the patient. Clinical means at the side of the patient, the patient doesn't have to be on the bed but as long as you are monitoring the patient therapy you are doing your clinical pharmacy function.” P22, Policymaker & Pharmacist*

*“Now in Nigeria, some international agencies have advocated and succeeded in making community pharmacies centres for HIV testing and DOTS [directly observed treatment, short-course] provider in tuberculosis management. You know that all these things are clinical functions.” P23; Community Pharmacist*

However, participants including community pharmacists noted that effective collaboration between doctors and community pharmacists are needed to effectively develop pharmacists' clinical roles.

#### 5.4.2.6 The business image of pharmacy

Participants noted that pharmacy in many contexts is seen as a business rather than a profession because medicines are seen by many, including pharmacists, as articles of commerce.

*“Well, pharmacy deals with drugs and people look at it as a source of commerce. So, the public look at the pharmacist as a health professional theoretical but in practice sees pharmacy as a trade.”*  
P39, Policymaker

*“...they look at drugs as articles of trade”* P16, Academic & Community Pharmacist

*“...some people erroneously look at the role of pharmacists in community pharmacies to be just buying and selling”* P31, Policymaker & pharmacist

Therefore, community pharmacists were seen as business men by some doctors interviewed.

*“I would say that pharmacists in Nigeria basically are... they are shop sellers of medication basically. A few of them are into academic but majority are into opening up of pharmacy outlets and selling medications.”* P17 Medical doctor

*“It is worst with community pharmacists, like in where I live, when they open their pharmacy store, they are just like business owners”* P15 Medical consultant

This identity tended to influence doctors' views on the potential for community pharmacists to be involved in clinical roles including prescribing. Further views of participants on the commercial nature of community pharmacists and the potential impact on pharmacist prescribing are presented in 5.4.4.6. However, a general practitioner (GP) noted that many community pharmacists lack the clinical knowledge and skills to be involved in direct patient care. This GP reported that community pharmacists had lost touch with professional pharmacy practice as a result of their long term engagement with the business aspect of their practice. Hence, this GP saw this as a barrier to clinical role extension

*“The pharmacists that have gone into business, they have forgotten all their stuff already, their only concern is how to make money. So that is another barrier.”* P02, General practitioner

Even though the business image of pharmacy was strongly linked to community pharmacy practice, a comment from a medical doctor suggests an underlying commercial interest among some hospital pharmacists.

*“They [hospital pharmacists] prefer to be at the counter where they can give drugs and collect cash, instead of being on the wards where they can put in their expertise on the management of patients.” P34, medical doctor*

Commercial interest in hospital pharmacy practice is likely in Nigeria. This is because many hospital pharmacies are run on drug revolving funds. Drug revolving funds are cost recovery schemes intended to ensure a steady supply of essential medicines. Based on my experience as a hospital pharmacist in Nigeria, there is a tendency for pharmacists to focus on revenue generation and profit making when managing medicines under the drug revolving funds scheme. Therefore, it is unsurprising that some hospital pharmacists could prioritise revenue generation over clinical practice.

**Theme summary:** This theme revealed six major identities of pharmacists in Nigeria. Pharmacists were seen as underutilised professionals, custodians of medicines, dispensers, medicine advisers, clinical practitioners and business men. Overall, stakeholders’ perceptions of pharmacists’ professional identity influenced their views on pharmacists’ potential roles. Many doctors viewed hospital and community pharmacists’ roles to be product focussed and would like them to develop in that direction. However, some doctors and pharmacists viewed pharmacists’ roles to encompass the provision of clinical pharmacy services including participating in prescribing decisions. Nevertheless, the business nature of community pharmacy practice was considered a barrier to the provision of clinical pharmacy services.

### **5.4.3 Pharmacy professional structure**

This theme presents participants views on the current structure of pharmacy practice in Nigeria. Eight sub-themes were linked to this theme: pharmacists’ confidence in performing clinical roles; specialisation and career structure; shortage of pharmacy staff; utilisation of pharmacy technicians; medical dominance and opposition; collaboration with doctors; lack of policies to support clinical pharmacy practice and regulation. These sub-themes are presented below.

#### **5.4.3.1 Confidence**

Pharmacists’ confidence to engage in clinical activities at the ward level emerged as a sub-theme. Many participants including doctors and pharmacists observed that a major

barrier to pharmacists participating in clinical roles is the lack of confidence in their clinical knowledge and the practical application of their knowledge in clinical settings.

*“...some of them [pharmacists] are not confident enough to actually go out on rounds with medical doctors.” P09, Hospital Pharmacist*

*“Most pharmacists are very timid, they are not feeling confident enough to face the ward and to collaborate appropriately with the health team.” P22, Policymaker & Pharmacist*

Participants observed that unlike the pharmacists' traditional role of dispensing, many pharmacists feel underprepared for clinical roles and this was associated to pharmacists' training.

*“They [pharmacists] are not confident enough which again I want to attribute to the training. I think if the training is adequate in that respect, their confidence in participation in such activities like ward rounds will also increase.” P14, Medical consultant*

*“You know pharmaceutical care is all about collaboration. Many of them [pharmacists] are shy; many of them are not yet prepared to face the 'ground round'. They are not prepared to do rounds with resident doctors or even house officers.” P16, Pharmacist*

The under-preparedness of pharmacists for clinical roles was also obvious from their response to interview questions investigating their clinical involvement in patient care

*“You know, pharmaceutical care services are about sound knowledge... We don't want a situation where we join them [doctors] on a ward round and the pharmacists are not well prepared.” P05, Hospital Pharmacist in a tertiary facility*

*“...on our own part [pharmacists], we were not so willing to join doctors on ward rounds, may be because of the fear of not being able to contribute meaningfully when they ask us for contributions.” P11. Hospital Pharmacist*

A number of pharmacists argued that even though the curriculum of the Bachelor of Pharmacy (B. Pharm) programme run by majority of the universities has been expanded with a more clinical component added to it, it does not produce practitioners who are confident enough to apply their knowledge in clinical settings. Many pharmacists observed that the Doctor of Pharmacy (Pharm D) programme which is currently being run by a university in Nigeria produce more confident practitioners who are able to apply their knowledge in clinical settings than the B Pharm programme. This is because a greater proportion of the time in training is spent in clinical practice

settings during the Pharm D training programme which helps to build confidence among those enrolled in the programme.

*“Our B. Pharm programme is actually deficient in clinical areas but Pharm D addresses those areas. So, all the universities that are offering pharmacy courses should embrace the Pharm D programme.” P05, Hospital Pharmacist*

*“Apart from those that have gone for Pharm D training or those that have obtained fellowship of the West African Postgraduate College of Pharmacists in clinical pharmacy, the truth is that pharmacists are not confident enough to go into the wards, by that I mean they don’t have the clinical knowledge base.” P22, Policymaker & Pharmacist*

The second participant’s quote above also suggests that pharmacists with post registration clinical training were confident in clinical settings.

Participants observed that pharmacists’ confidence in clinical settings can be enhanced by making the undergraduate training programme more patient orientated with significant experiential learning similar to the medical training.

*“Medical students are trained with patients and they graduate and become residents with patients but that is not the case with pharmacy students. So, there is a need to correct this anomaly with regards to pharmacists’ clinical training.” P16, Academic pharmacist*

Furthermore, a structured practice-based post-registration clinical training programme was considered essential to enhance pharmacists’ confidence.

#### **5.4.3.2 Specialisation and career structure**

In Nigeria, hospital and community pharmacists are generalists in their practice. Specialisation in different clinical areas is lacking. Many participants observed that specialisation would result in the development of competent pharmacists. They mentioned that it would enable pharmacists to develop more depth in their clinical knowledge and skills in specific areas and as a result enhance their contribution in patient care.

*“The problem with pharmacy practice is that pharmacists are jack of all trades, master of none. But specialisation creates a niche and you become more knowledgeable.” P16, Academic Pharmacist*

*“Specialisation makes a whole lot of difference. Like I said, I have worked with one that was specially trained in paediatrics; she was able to look for proper references for us. But right now, I am working with those that are not exactly expert in the field, we do have problems and*

*sometimes we are the ones that have to point out to them the newer teachings. You see when you specialise in a certain field; you will be able to overcome that gap, especially in terms of knowledge.” P28, Medical consultant*

Participants also observed that the present career structure in the country does not support the development of competent clinical practitioners. Hospital pharmacists reported that their current career structure consists of a single route which increasingly becomes managerial in nature as they progressed up the career ladder.

*“...what we are saying is that there should be a two-way approach to this. For those who want to rise along the rank and may be become an assistant director, there should be that career pathway for them. For those who want to specialise in clinical areas, there should be a pathway too for them. That is how I feel the structure in the hospital should be designed but for now, we don't have such structure on ground.” P05, Hospital Pharmacist*

*“The present career pathway leads to a managerial function, it does not encourage pharmacists to develop clinically and the promotion from one cadre to another is based on the number of years of experience and not the specialist skills of the pharmacist.” P03, Hospital Pharmacists*

*“I am a strong advocate of specialisation and reaching to consultancy cadre. I will really want to see a more diverse clinical role for the pharmacist rather than just aspiring to be the director of pharmaceutical services and end up in administration.” P31, Policymaker and Pharmacist*

Furthermore, a participant also reported that clinical mentorship for junior pharmacists is a challenge in Nigeria.

*“In addition, there are fewer mentors in clinical pharmacy in Nigeria.” P16, Pharmacist*

Therefore, a clinical career pathway could serve as a route for mentoring of junior pharmacists who would want to go down the clinical route.

#### **5.4.3.3 Shortage of pharmacy staff**

The shortage of pharmacy staff particularly pharmacists were commonly mentioned by participants. Many participants believed that this had impacted significantly on the development of pharmacists' clinical roles in Nigeria. Overall, all stakeholders interviewed including doctors, pharmacists and policymakers reported that there are inadequate numbers of pharmacists in the country.

*“For now, we don't have enough pharmacists, that is one of the biggest challenges we are having. In Nigeria we have on record over 12,000 pharmacists but the question is how many of these are really practising.” P32, Policymaker*

*“Yes, we have a challenge of staffing. As far as we are concerned, we cannot match the population of the patients.” P35, Policymaker*

Participants associated the inadequate number of pharmacists in the country to a number of factors. These included inadequate number of pharmacists' training institutions; challenges in recruitment and retention of experienced pharmacists; poor remuneration and migration of pharmacists to other countries for better practice environment and condition of service.

*“We don't have enough [pharmacists] in the service, we have so many to employ but no political will from government.” P32, Policymaker*

*“You know there are a lot of opportunities outside the government for pharmacists. So, very few pharmacists will want to remain with the government like some of us are now. Coupled with the condition of service and remuneration in the public sector, most pharmacists will prefer to take up non-governmental organisation work and other private endeavours.” P35, Policymaker*

Furthermore, a wide geographical gap exists in the distribution of pharmacists across the country. Many pharmacists who work in community and hospital practice prefer to work in urban centres. Hence, participants reported that many secondary facilities located in semi urban or rural locations have few pharmacists or none in some cases. For example, one of the participants I interviewed who is a medical doctor and works in a 100 bed size secondary hospital located in a rural area, reported that in the hospital where he practiced, there is no pharmacist available. The pharmacy unit is being managed by pharmacy technicians. The shortage of pharmacists was also reiterated all through the interviews by pharmacists.

*“Like I told you we have shortage of pharmacists in XXX state. There are some rural hospitals that don't have pharmacists at all, they only work with technicians.” P04, Hospital Pharmacist*

Participants observed that the number of pharmacists available in Nigerian hospitals could among other things account for the wide variation on the adoption of clinical pharmacy services seen across hospitals. In tertiary facilities where the staff strength is high, pharmacists have been able to extend their roles beyond the dispensary.

*“But quite a number of teaching hospitals have now imbibed the idea of pharmacists being involved in the ward. I think it has helped by the*



*fact that teaching hospitals have more pharmacists available. So, I think is the availability of manpower to carry through even the traditional pharmacy responsibilities and to also go to the wards.” P26, Academic Pharmacist*

Concerns were raised by all stakeholders on the impact of the number of pharmacists on pharmacists' ability to take on extended clinical roles. Stakeholders view the shortage of pharmacists as a potential barrier to extending the clinical roles of pharmacists to include prescribing.

*“Yes! Manpower is also a barrier, we don't have enough pharmacists. You will see a pharmacist having many patients waiting for him, to add another responsibility to him will require more hands.” P02, General Practitioner*

*“Of course, inadequate staff is one of the barriers. Definitely when you have very few pharmacists, they may not have time to do other additional roles apart from their dispensing and may be drug distribution. But if you want to have pharmacists do additional roles, then the issue of staffing should be addressed too.” P05, Hospital Pharmacist*

Similarly, some participants also expressed concern on the number of pharmacy technicians available in the country. They attributed that to limited training institutions and enrolment of trainee technicians. These participants observed that the lack of support to increase the number of pharmacy technicians has been aggravated by pharmacists' fear of 'role erosion'. Many pharmacists believed that training more pharmacy technicians would lead to pharmacists' dispensing role taken over by technicians.

*“Even though pharmacy technicians as a cadre exist throughout the world as a middle cadre technical assisting group, assisting pharmacists, in Nigeria, the pharmacists' council is restricting the numbers that schools are allowed to train.” P22, Policymaker & pharmacists*

*“Also, the student intake has been small which is an indication that they don't like us to be more in the society, probably our profession is a threat to pharmacists. That is how I see it.” P44, Pharmacy technician*

Furthermore, participants also reported that because the numbers of pharmacy staff are inadequate, many unqualified personnel including patent medicine vendors have been integrated into the country's drug distribution channel. However, this has a great consequence on safe supply of medicines.

*“You know right now in Nigeria, the role the pharmacist should do in the society is being played by patent medicine vendors.” P17, General Practitioner*

*“In the hundreds of health centres that we have, we don’t have pharmacists. Now what should make up for that is the pharmacy technician but other non-pharmacy related junior cadre workers have taken over their functions. P22, Policymaker and Pharmacist*

Many participants observed that the involvement of non-pharmacy trained personnel in drug supply in Nigeria is currently a threat to pharmacy practice. Many of these personnel are involved in the supply of medicines outside their prescribed jurisdiction because of the poor regulatory system in the country.

*“You see, people open premises, they call it PPMV premises- patent and propriety medicines vendors’ premises but they will be selling all sorts of medicines. So, you can see that the Nigerian pharmacist cannot thrive in such an environment and the government is politically weary, they cannot enforce the law.” P12, Community Pharmacist*

Overall, all stakeholders observed that if pharmacists’ roles are to be extended, concerns about the inadequate number of pharmacy staff must be handled.

#### **5.4.3.4 Utilisation of pharmacy technicians**

In order to free up pharmacists’ time to undertake new roles, pharmacy technicians would be needed to fulfil some traditional roles of pharmacists. Therefore, the interviews conducted explored participants’ views on the current and potential roles for pharmacy technicians. The study revealed that there is currently no national framework in place to ensure the effective use of the skill mix within pharmacy. While there are defined roles for pharmacists which include dispensing and the overall management of pharmacy units, the utilisation of pharmacy technicians depended on some factors. These include the ratio of pharmacist-to-pharmacy technician within a facility and the discretion of their supervising pharmacists.

*“Technicians work directly under the pharmacist and do things that the pharmacist feels should be delegated to a junior staff to do. So... like ensuring that the out of stock drugs are compiled and when prescriptions come, they arrange the drugs and all of that for the pharmacists to counsel and dispense.” P03, Hospital Pharmacists*

*“Pharmacy technicians work with the pharmacist to do the counting of the drugs and they work based on instructions given to them by the pharmacist.” P09, Hospital Pharmacist*

Therefore, in hospitals with many pharmacists like the teaching hospitals, technicians' roles are usually limited. On the other hand, in facilities where there are insufficient numbers of pharmacists, pharmacy technicians are utilised to handle dispensing of medicines. They sometimes share responsibilities with the pharmacists by engaging in roles that are not formally recognised as theirs such as validating prescriptions and the final accuracy checks of dispensed medicines.

*“There are times we have evening shift, we may assign them [pharmacy technicians] to the evening shift to be in charge of the pharmacy because the patient population is less at that time compared to the morning shift.” P01, Hospital Pharmacist*

The senior pharmacy technicians were also involved in the overall management of the dispensary in hospital facilities where there are no pharmacists.

*“When there was no pharmacist in the hospital, I was the one managing the pharmacy for about 3 years but when we had one, he took over from me.” P42, Pharmacy Technician*

However, policymakers reported that technicians are only utilised in such manner in order to fill the gap created as a result of inadequate number of pharmacists in the country.

*“Yes, for now, most of our hospitals are even engaging the supporting staff, the pharmacy technicians, who are greater in number.” P35, Policymaker & Pharmacist*

*There are a lot of things they [pharmacy technicians] are doing that are not supposed to be done by them; it is because of this problem of manpower. P36, Policymaker & Medical Doctor*

When pharmacists opinion were sought during the interviews on allowing pharmacy technicians to take over some traditional roles of pharmacists including dispensing in order to free-up pharmacists time to be involved in other advanced roles, there were split of opinions. Although, all stakeholders interviewed acknowledged that the use of pharmacy technicians in dispensing role will free-up pharmacists for extended clinical roles and promote optimal use of the pharmacy workforce in Nigeria, some pharmacists had reservations regarding engaging technicians as dispensers. Major concerns of these pharmacists were that of the competence of technicians to handle drug dispensing, safe supply of medicines and pharmacists' role erosion.

*“The supply process is complicated and the technicians don't have this requisite training that will enable them to handle this complicated process.” P03, Hospital Pharmacist*

*“No! You see... like I said earlier, even just to dispense drugs, if you just allow less qualified people to do that, there are instances they make a lot of mistakes. What I am saying is that if we have more pharmacists we can do some of these roles. P27, Policymaker and pharmacist*

Many pharmacy technicians interviewed also reported that pharmacists are threatened by their involvement in dispensing.

*“Truly speaking, there is always rancour, permit me to use that word. Pharmacists are not too comfortable with us... We cannot take over their jobs, it is not even possible. Technicians have diploma equivalent and pharmacists do a degree which takes 5 years. So I don't see the reason why they should be afraid.” P44, Pharmacy Technician*

Some pharmacists in this study viewed the control they have over medicine supply as a major reason for their professionalism and fear losing their professional status if medicine supply process is being handled by pharmacy technicians.

*By giving them [pharmacy technicians] more rights, you are killing the pharmacy profession and bringing them up. P08, Community Pharmacist*

*Unfortunately, pharmacists are beginning to see them [pharmacy technicians] as opponents, which is unfortunate. You know it is not everything pharmaceutical you must do. There are some non-technical things; you can ask the technicians to handle that. P32, Policymaker*

Pharmacy technicians' account also confirm the fears held (losing their professionalism) by these pharmacists

*“They will hardly allow you manage the dispensary for them to go to the wards because they believe that there are certain things that they feel they should be the ones to control.” P41, Pharmacy Technician*

*“They are afraid that if we are giving the chance to work in this way [managing the dispensary], we will overtake their duties as pharmacists. I don't know why they are feeling that we are going to compete with them. But we as technicians, we respect them as our bosses.” P46 Pharmacy Technician*

Furthermore, a pharmacy technician interviewed believed that pharmacists' increasing involvement in dispensing reduces their professional relevance and status given the vast amount of knowledge and skills they have.

*In fact, most pharmacists are seen as not relevant in our hospitals. The doctor sees them as just ordinary dispensers. They see them as*

*people that give drugs- take these two tablets three times a day. They don't regard pharmacy as a profession" P42, Pharmacy Technician*

However, a number of pharmacists felt that utilising pharmacy technicians in dispensing will free them up for other specialised tasks.

*If these ones [pharmacy technicians] are involved in dispensing, bringing the drugs, dispensing while the pharmacist does patient counselling, therapeutic drug monitoring and other duties, it will be better for pharmacists. P16, Academic Pharmacist*

*I believe that dispensing should be things that technicians should be doing. I feel the pharmacist should be more involved in direct patient care. You know, go to the ward and provide services to patients in the ward. But right now pharmacists are involved in the packing of drugs, counting of drugs and all that I believe those things should be left for the technicians, which will now allow a pharmacist to have more time to render pharmaceutical care services to patients. P05, Hospital Pharmacist*

Also, many pharmacists interviewed commonly cited competencies issues as reasons for non-utilisation of pharmacy technicians. However, this study revealed that there is currently no framework for further training of pharmacy technicians to enhance their competence.

*"The training we received at the colleges of health technology to some extent prepares us for work in the hospital but we are asking that after training as technicians, they should allow us to proceed, like to a degree level. That will help us so much." P41, Pharmacy technicians*

*"In fact there is no provision for further training. There is a programme we learnt they were putting together at XXX. So we have been waiting because some of us have the zeal to study." P44, Pharmacy Technicians*

The comments in the last quote showed a willingness, among pharmacy technicians, to be further trained. This view was commonly expressed by pharmacy technicians interviewed. Therefore having a structure for post-registration training of pharmacy technicians would enhance their skills and competencies. Developing pharmacy technicians to take on some of the traditional roles of pharmacists would free pharmacists up for other specialised roles.

#### **5.4.3.5 Medical dominance and opposition**

Medical control over the health sector was a prominent theme that emerged from this study. Interviews with many stakeholders including doctors, pharmacists, policymakers

and patient group representatives revealed that the medical profession in Nigeria has had a longstanding control over the health system. Participants spoke of medical control over the administrative structures of the health system at the national, state and institutional levels. They also spoke of medical control over access to patients in hospitals and in determining the roles of other healthcare professionals in patient care.

Unlike in the UK where the NHS is under general management, in Nigeria, the health sector is mainly managed by health professionals. Participants noted that at the national, state and institutional level, the medical profession has enjoyed significant control of administrative structures by taken over key positions within health ministries, departments and hospitals.

*“They [doctors] feel that they have control over the health sector because the minister of health is a medical doctor, minister of state is a doctor and permanent secretary a doctor too.” P08, Community Pharmacist*

*“In Nigeria you know, the medical doctor thinks he is all in all and should always be the overall boss. So they see the pharmacist as an opponent or an enemy in a supposedly teamwork [laughs]. P12, Community Pharmacist*

Participants noted that medical control of key positions in the health sector has resulted into professional conflicts between the medical profession and other health professionals. This has had negative impact on the relationship between doctors and other healthcare professionals in Nigeria.

*“...the area of problem is the leadership tussle, every one of them [referring to non-doctors] want to be on the driving seat, which is not possible.” P36, Policymaker & Medical doctor*

Participants who were not doctors also felt that medical dominance has been a barrier to policy development and implementation In Nigeria. They argued that the medical profession has majority of membership in most decision making bodies in the health sector. Therefore any policy that does not favour them or tend to challenge their existing control of the health sector is usually resisted by doctors.

*“I have had cause to present memoranda during XXX council. I can say categorically the attack, if I may use the word, or the response from the medical practitioners that form the bulk of the members of the council have been bad. Simply because they look at us as trying to go into their own ‘preserved area’.” P31, Policymaker & Pharmacist*

*“...lots of things have come up. Memos have been presented at the highest level of healthcare decision in Nigeria. I have participated as XXX for some few years now. I know that when memos are presented on these issues, they are passed and approved; the problem is implementation. The policy decision makers at the hospital level are mainly doctors. Therefore, they are not willing to implement things that they think are threats to their own practice.” P32, Policymaker*

Therefore many pharmacists felt that this will also be a barrier to the introduction of pharmacist prescribing in Nigeria, since pharmacist prescribing will challenge the existing practice where prescribing is seen as a doctors' role.

*“If you tell Nigerian doctors to relinquish what they see as their birth right to another professional, there will be serious opposition” Hospital P03, Pharmacist*

Hospital pharmacists also observed that the participation of pharmacists in patient care at the ward level has been resisted by doctors. They reported that doctors believe that the care of patients in the hospitals is solely under their responsibility and allowing other health professionals to be directly involved in patient care would undermine their control over patient care.

*“The products of the West African Postgraduate College of Pharmacists are finding it difficult to actually practice because the doctors feel that they have gone to read clinical pharmacy to take over the clinics; that is their perception which in the real sense is not.” P25, Hospital Pharmacist*

*“...the doctors are claiming they are the owners of the patients and that the pharmacist is an intruder [laughs].” P12, Community Pharmacist*

A policymaker with a medical background also pointed this out as a barrier to collaborative practice in patient care in Nigeria.

*“You know, the doctor is naturally a selfish person especially when it comes to patient care. The doctor wants to take the credit at the end of the day, I diagnose it, I treated it, I did this... So, there is this feeling that if you work collaboratively, who takes the credit at the end of the day?” P34, Policymaker & Medical doctor*

This shows that doctors view collaborative practice as a threat to their dominance in patient care and would want to maintain their self-worth even if it is not to the best interest of the patient and the health system.

*“A physician or doctor in Nigeria feels that the way things were in the early nineteenth century, they should still remain like that.” P03, Hospital Pharmacist*

Overall, many pharmacists maintained that achieving professional autonomy in terms of pharmacists’ ability to control its administrative structures, negotiate its roles and remuneration is essential for clinical role extension.

*“We are discovering ourselves and taking that full independence from the so called domineering forces [referring to doctors] in the health profession. So, we have come a long way and I think we had become independent and we are trying to discover those things we are supposed to do. P32, Pharmacist & Policymaker*

*“The actualisation and implementation of clinical pharmacy practice is well over due in Nigeria, but we need to be more political as pharmacists to be able to penetrate the government and lobby for the enabling laws” P07, Community Pharmacist*

*“Pharmacists don’t have enough political strength to make clinical pharmacy practice a reality in Nigeria. I think more pharmacists should delve into politics in order for us to canvass for our own rights within the health sector.” P13, Hospital Pharmacist*

These participants believed that having more pharmacists in government will facilitate pharmacists’ ability to negotiate their roles.

#### **5.4.3.6 Collaboration with doctors**

This study also revealed that collaborative working relationships between doctors and pharmacists in patient care is lacking in many hospitals in Nigeria. Even though the doctors and pharmacists interviewed showed positive views towards collaborative practice in patient care as shown in the quotes below, they mainly work autonomously.

*“I can’t do without them [doctors]. Collaboration is the key, not competition. I will really love to collaborate with doctors.” P23, Community Pharmacist*

*“For me, I look forward to the time where my practice will be so holistic that even basic day to day clinical decisions about prescribing, changing of medication, dosage adjustment would be done in such a way that I have useful inputs from pharmacists around me.” P14, Medical Consultant*

Participants observed that pharmacists in many hospitals work in isolation from doctors and are not integrated into the health team.



*“...most of the time they [pharmacists] are just far removed in their department, no interactions with doctors at all.” P15 Medical Consultant*

*“Actually, I don’t go on ward rounds with the doctors. The ward rounds are like meant for the doctors and the nurses. The pharmacist stays in his pharmacy and waits for the patient to come for the dispensing of drug. That has been the tradition.” P06, Hospital Pharmacist in a secondary facility*

Hence, professional communication between doctors and hospital pharmacists is minimal. Communication from doctors to pharmacist is usually through a written prescription communicated to the pharmacist for dispensing of patients’ medications. Both doctors and pharmacists observed that communication from pharmacists to doctors mainly occurs when the pharmacist is either querying or seeking clarification of a prescription from the doctor; or when the doctor is requesting information about a medicine.

*“Most often it is one way traffic but on few occasions they communicate back to you about your prescribing. Sometimes if there is any issue, probably with the prescription in terms of dosage or issues like that, they can write on the prescription paper and return it to you. I think largely, the interaction has been one way.” P15, Medical consultant*

*“...once they [pharmacists] feel that there is contraindication in a prescription, they always communicate either by coming in person or giving a phone call. Once in a while, when I need certain clarification, I also do call them.” P28, Medical consultant*

Such working relationships as described by these participants, where communication between healthcare professionals is minimal, could lead to fragmentation of care. Participants noted that the patients are the ones at a disadvantage because they don’t get the best form of care.

*“Interdisciplinary collaboration does not exist currently in Nigeria. They [referring to doctors and pharmacists] fight for positions instead of fighting for excellence in patient care. The patients greatly suffer because there is no collaboration in the system.” P30, Policymaker & medical doctor*

*“In the early days of my practice as a pharmacist, practitioners have respect for one another irrespective of their categories because everybody had a particular role to play. But now, a lot of ego, people are not ready to take correction and learn from one another. That is just the problem and the patient suffers for it.” P33, Policymaker*

Pharmacists argued that medical doctors consider their (the pharmacists) direct involvement in patient care as an encroachment into doctors' territory because doctors' hold stereotype views concerning them. They reported that doctors see pharmacists' roles as mainly supply based.

*"They feel we are over-stepping our boundary, as in, we are trying to do their own job. They feel the job of the pharmacist is just to stay in the pharmacy and dispense drugs." P11, Hospital Pharmacist*

Some doctors interviewed confirm doctors' stereotype views about pharmacists' role in patient care. They reported that they have not been able to work collaboratively with pharmacists because they believe that pharmacists' role should be within the pharmacy where they dispense medicines to patients.

*"...because we also feel that they should just be at the pharmacy. So we don't work collaboratively together." P34, Resident Doctor*

However, some participants' comments revealed that in some teaching hospitals, pharmacists were working collaboratively with doctors within multidisciplinary healthcare team.

*In my hospital, we go on ward rounds with doctors; we collaborate with them in ensuring that patients get the best drugs for their various ailments. We also act as drug information resource for the prescribers. P03, Hospital Pharmacist*

*"In many hospitals, the pharmacist is not part of the clinical team except in some very few teaching hospitals." P06, Hospital Pharmacist*

*"If you go to XXX teaching hospital, you will find out that the pharmacists are working together with doctors as members of the health team. They are playing an active role in patient care. In fact, the doctors are relying on them now." P32, Policymaker*

On the other hand, participants observed that there is currently no collaboration between community pharmacists and medical doctors including those working as general practitioners at the primary care level.

*"....collaboration is the key, not competition but unfortunately it is frustrating working with some of them because they don't even give you that feedback from the referral form sent to them." P23, Community pharmacist*

*"We discovered that they have dispensing doctors. So, some prescriptions don't come to the community pharmacy again and so*

*pharmacists have to deploy a survival strategy.” P16, Academic & Community Pharmacist*

Hence, from the comments of the participants above, competition rather than collaboration exists between many private general practices and community pharmacies since both practices were established on a business model.

Other barriers to effective collaboration between doctors and pharmacists were highlighted in the previous subthemes reported. These included pharmacists' lack of confidence to engage in clinical roles, medical dominance and inadequate pharmacy staff to engage in roles outside the dispensary as previously reported.

Overall, patient care in Nigeria was viewed to be fragmented because of the poor collaboration among healthcare professionals. Participants made a number of suggestions on how collaborative practice between pharmacists and doctors could be enhanced including promoting inter-professional learning particularly at the undergraduate level; participation in joint events; and having institutional policies that foster collaborative working relationship.

#### **5.4.3.7 Lack of policies to support clinical pharmacy practice**

Analysis of the data generated in this study also revealed that there are no adequate policies or legal frameworks to support the development of clinical pharmacy in Nigeria. Several pharmacists reported that at present, their involvement in clinical activities have no policy backing.

*“I don't think there are sufficient policies in place if actually there is to support the development of clinical pharmacy. I think more should be done policy-wise by the federal government.” P06, Hospital Pharmacist*

*“The system is also a problem. Supposing there was a policy to say; as a pharmacist, your work will cover working in the pharmacy to provide drugs to outpatients and also going to the ward to see if there are any drug therapy problems. If there was a written policy to that effect, that will encourage the pharmacists to do that.” P26, Academic Pharmacist*

A pharmacist also noted that even the pharmacists' license to practice does not provide any backing for a clinical role.

*“I feel there are no policies to support us as pharmacists. First of all, we are legally licensed to practise as pharmaceutical chemist and the license only empowers us to manufacture, sell and distribute medicines.” P01, Hospital Pharmacists*

Comments from some medical doctors also suggested that pharmacists' involvement in direct patient care has no legal backing from the government.

*"I just think there is no legal framework for them to perform their functions. So it still goes back to the fact that the government has not given them such a backing." P17, General Practitioner*

*"No, I don't do ward rounds with pharmacists because it is not in the curriculum to do ward rounds with pharmacists..." P10, Medical consultant*

Many pharmacists including those in policymaking noted that policy barriers are as a result of medical dominance in the health policymaking process as earlier mentioned in section 5.4.3.5.

#### **5.4.3.8 Regulation**

Regulation of the handling and sales of medicines in Nigeria was commonly discussed by participants. In Nigeria, members of the public have access to some prescription only medicines including antibiotics without a doctors' prescription. Participants reported that community pharmacies and patent medicines store were common sources for these medicines. Many participants noted that non-prescription access to prescription medicines is possible as a result of government's inability to properly regulate the handling of medicines including sale and supply of 'Prescription Only Medicines' in the private sector. Other factors perceived by participants that could account for the poor regulation of the pharmaceutical sector in Nigeria include corruption, funding issues, inadequate staffing and infrastructure.

*"The problem we even have is that, if you come to a particular state capital, in the ministry of health, we have probably one staff member who is a pharmacist posted from the pharmacists' council of Nigeria to regulate the practice of pharmacy. So you can see already that, that person cannot do that. So, lack of staff, lack of structures and institutions for those who are tasked with the function of regulating practice." P35, Policymaker*

*"The government has put in place the laws but enforcement is not there. The people who are supposed to enforce the law are at the background [behind the scene] people who are sponsoring the illegal drug movement because so much pool of money goes through in drug world" P39, Policymaker*

Many pharmacists reported that community pharmacists indulge in the supply of 'Prescription Only Medicines' without prescription in order to ease patients' burden on

seeking for healthcare as a result of the limited medical prescribers and the cost of consulting a medical prescriber.

*“Here in Nigeria, pharmacists are doing everything for the sake of the patient.” P37, Community Pharmacist*

However, analysis of the interview data revealed that some community pharmacists engage in such act as a business survival strategy, thereby re-emphasising the commercial nature and interest of pharmacy.

*“Officially, we are not allowed to recommend prescription medicines but we are doing that because it is becoming inevitable. We have discovered that they have dispensing doctors and some prescriptions don't come to the pharmacy again and so the pharmacist has to deploy a survival strategy.” P16, Pharmacist*

Of importance to this research is seeking participants' opinion as to whether pharmacist prescribing would legitimise medicine supply and reduce irrational use of medicines. Many stakeholders noted that it could minimise the illegal supply of prescription medicines.

*“It will minimise illegal access, because everyone knows that they don't need to treat themselves by themselves, they can go to a professional who is trained on medicine to help them. So the back door movement that happened in Nigeria will not happen anymore.” P38 Patient group representative*

However, participants observed that effective regulation and drug distribution system is crucial to legitimising medicine supply in Nigeria.

*“It is the government and the regulatory body and the law enforcement agents that can curb this illegal drug channel. As long as these things exist, you cannot have a credible healthcare system in Nigeria. P12, Community Pharmacist*

*“Drug distribution channel must be properly handled in Nigeria. The laws of the land should be put in place properly and whoever go against the laws especially the drug laws should be properly sanctioned.” P39, Policymaker*

Furthermore, some participants noted that reclassification of some prescription medicines into a category that allow pharmacists to supply them without a prescription could also help in legitimising drug supply and reduce medicines harm.

*“...just like in the US, there should be what they call Pharmacists’ Only Medicines, so that pharmacists could be supplying these medicines.” P22, Policymaker*

*“I think if the government change the status of some of these prescription medicines to give only pharmacists the right to supply them without prescription, it will help.” P08, Community Pharmacist*

**Theme summary:** This theme revealed that several barriers were associated with the development of pharmacists’ clinical roles in Nigeria including pharmacists’ lack of confidence, shortage of pharmacy staff, underutilisation of pharmacy technicians, medical dominance, lack of collaboration with doctors and inadequate policies to support the development of clinical pharmacy practice. Generally, participants observed that pharmacists lack confidence to take on clinical roles and this was strongly linked to pharmacists’ education and training. A change in the current structure of pharmacy practice including enhanced clinical pharmacy education, specialisation, change in career structure, utilisation of pharmacy technicians could benefit the current system in Nigeria.

#### **5.4.4 Views on prescribing**

This theme presents the opinion of participants concerning the granting of prescribing rights to pharmacists in Nigeria. Six sub-themes emerged from this theme: prescribing as a logical role of pharmacists; pharmacist prescribing- a threat to doctors’ role; pharmacists’ competence in prescribing; collaborative prescribing as an appropriate model of prescribing; potential benefits of pharmacist prescribing; and potential facilitators and barriers to pharmacist prescribing. These sub-themes are discussed below.

##### **5.4.4.1 Prescribing a logical role for pharmacists**

Generally, opinions were split between pharmacists and doctors concerning extending the clinical roles of pharmacists to include prescribing. Pharmacists were generally in support of a prescribing right for pharmacists in Nigeria. They saw it as a logical role for them given their knowledge of medicines.

*“Yes, there is a need; we actually need a law to say that pharmacists can prescribe.” P26, Academic Pharmacist*

*“Yes, giving pharmacists a prescribing right will enhance the health delivery in Nigeria. A pharmacist is even more knowledgeable in drugs than most practitioners and yet he is not allowed to prescribe.” P16, Academic and Community Pharmacist*

*"I think we should be allowed to prescribe because we have a very good knowledge of medications" P23, Community Pharmacist*

In addition, pharmacists argued that since other healthcare professionals including Nurses and Community Health Workers which they perceived to be less qualified than them have been given some form of prescribing privileges in Nigeria, pharmacists deserve to be giving such role too.

*"...I teach nursing students pharmacology, can you imagine that these nurses graduated and started prescribing? If you are saying pharmacists should not prescribe, why would you allow nurses, midwife, health technologists either at the primary healthcare centres or even the general hospitals to prescribe? P08, Community Pharmacist*

*"Do you know the irony in this country is that pharmacists are not allowed to prescribe but community health workers in primary healthcare are busy prescribing? Are they better than the pharmacists?" P32 Policymaker & Pharmacists*

*"But we know when we go to the hospitals, let say a general hospital in the rural area, the prescribers really are not doctors, they are either senior nursing or community health officers. So why not allow the pharmacists to also prescribe, more so that he knows the drugs and now with his training he knows some of the diseases with their clinical features." P26, Academic Pharmacist*

Some pharmacists, particularly community pharmacists reported that they are involved in prescribing although without official recognition. They reported that they do counter prescribing in response to patients' complaints and therefore saw prescribing as a natural progression of their roles.

*"Personally I do that but it is not official. Particularly for some of us in the community practice, we do a lot of what I will tag as prescribing." P37, Community Pharmacist*

*"I attend to patients. They come with minor ailments and I treat them. So, I don't see prescribing as a difficult thing to do." P08, Community Pharmacist*

The view of prescribing as a logical progression of pharmacists' role was also expressed by a hospital pharmacist who reported that they work collaboratively with doctors to influence doctors' prescribing.

*"Sometimes we suggest to the doctor what to prescribe. So, what is stopping us from prescribing? We also feel we are able to prescribe*

*because in most occasions, we are the ones that tell the doctor what to do and the drug is our domain.” P18, Hospital Pharmacist*

However, many doctors were non-supportive of a prescribing role for pharmacists.

*On a personal note I think pharmacists should not prescribe. I think it is not part of their job, they shouldn't prescribe. P29, Resident Doctor*

*“Ehhh... looking at the Nigerian context, I have a lot of reservations about it, pharmacists are clinically not competent.” P14 Medical Consultant*

Interviews held with policymakers also reiterated the split of views observed between doctors and pharmacists as policymakers views were aligned to their professional background.

*“Yes, I think it is all right. When you look at the health team generally, pharmacists are the people that have more knowledge about drugs than any other health worker. So, in my own opinion, I think they are well equipped to be granted the right to prescribe. P27, Policymaker & pharmacist*

*“No, no, no, no, I don't support that. Any person that should be allowed to give a prescription should be a medical doctor but for a pharmacist to be a prescriber, I don't support that. Pharmacists are not trained to take good care of patients, theirs' is to dispense.” P36, Policymaker & medical doctor*

Despite many doctors' lack of support to pharmacist prescribing, a few of them reported that granting some form of prescribing right to pharmacists will be a logical thing to do. They noted that medical prescribers are insufficient and a lot of patients in the community use the community pharmacies as the first port of call for medical attention.

*“Actually, we can't run away from the fact that a lot of patients must have visited one pharmacy shop before coming to the hospital. If you can put the pharmacists, give them continuous medical education, I think it is a welcome idea for them to prescribe if this can be properly done.” P29, Resident Doctor*

*“You know, hospital facilities are not everywhere. Given our health challenges, there is need to empower pharmacists to be able to do more than they are doing at the moment. They should be equipped sufficiently with the right amount of knowledge that will enable them to discharge some of this everyday health issues that necessarily don't need to be seen by a qualified doctor.” P17, General Practitioner*



A policymaker who is also a medical doctor reported that he will only support pharmacist prescribing in rural areas where there are no doctors.

*“In a situation where you don’t have a doctor for instance especially in our rural setting, a pharmacist can prescribe and dispense, similarly a doctor who is alone in one village and there is no pharmacy staff, he should allowed to carry out some basic lab investigations, prescribe the drugs and dispense.” P36, Policymaker*

Patient group representatives interviewed also felt that prescribing would be a reasonable role for pharmacists and were supportive of pharmacist prescribing.

*“Why not? I will support the pharmacist to be given a right to prescribe because they spend years in schools studying all these things. So they have an adequate knowledge of medicines and prescriptions that they should be able to prescribe, why not? Even nurses who do not have the amount of knowledge that pharmacists have on drugs, prescribe. So why can’t the pharmacist prescribe?” P38, Patient group representative*

#### **5.4.4.2 Pharmacist prescribing: a threat to doctors’ role**

While many participants particularly pharmacists saw the granting of prescribing authority to pharmacists as beneficial; others perceived it as a threat. Some participants particularly doctors viewed the extension of prescribing authority to pharmacists as an encroachment into doctors’ professional boundary as prescribing has always been the doctors’ role in Nigeria. Therefore, doctors responded in such a way to preserve this boundary.

*“No, I will not support pharmacists prescribing. They should do their own work. Prescription is under the boundary of the medical doctors. I mean it is one of the main things we have as doctors, by the time every other person prescribes, then what does the doctor really do? So, that will be like taking our jobs from us.” P33, Policymaker and Medical Doctor*

The comment above also shows that this participant viewed prescribing as what defines and gives doctors their professional status and power.

Furthermore, pharmacists felt that if pharmacists are allowed to prescribe, it will lead to a professional conflict between pharmacists and doctors.

*“Hmm..., it will cause wahala [problem] because even without the prescribing right we are still at loggerheads.” P23, Community Pharmacist*

*“There will always be a very serious clash of interest with the doctors because of the traditional thing of doctors being the only prescriber. So if any other person comes in to start prescribing especially in the hospital setting, it is going to be a serious problem.” P06, Hospital Pharmacist*

On the other hand, some pharmacists were cautious to support pharmacists prescribing because they were concerned that it might result in the possible erosion of the pharmacists’ dispensing role. They feared that doctors are likely to seek for some dispensing rights if pharmacists are allowed to prescribe or the dispensing role of the pharmacists would have to be handed over to pharmacy technicians in order to free pharmacist up for prescribing.

*“Ehhhhh... for now, I don’t think we are mature enough for that role. Not just the pharmacists alone but even the prescribers because if we pursue that objective, the doctors too may want to say let us too have some dispensing role which is traditionally the function of the pharmacists. except we get to the level of the other countries where they understand some basic things about healthcare, I think until then, I will not want us to delve into prescribing right.” P03, Hospital Pharmacist*

The concern about pharmacists’ dispensing role erosion as a result of pharmacist prescribing were strongly expressed by pharmacists who considered dispensing as a key role that maintains pharmacists’ professional status as earlier reported in section 5.4.3.4.

#### **5.4.4.3 Pharmacists’ competence in prescribing**

Some participants including doctors, pharmacists, policymakers and patient group representatives expressed concern over pharmacists’ knowledge and skills to prescribe.

Many pharmacists interviewed commonly maintained that pharmacists are knowledgeable about medicines which in their opinion could be a facilitator to pharmacist prescribing. However, many of the doctors maintained that prescribing of medicines is a complex process that goes beyond being knowledgeable about medicines. They particularly noted that appropriate diagnosis is crucial to prescription writing. Therefore, they observed that if pharmacists are allowed to prescribe, they may not be able to make appropriate prescribing decisions because of their inadequate skills in diagnosis.

*“Yeah, the concern about pharmacist prescribing will arise basically from the fact that the competence to be able to make accurate diagnosis is critical in therapy. We know very well that symptoms are complex and interrelated. So many symptoms are generated by different disease entities and until you have the pre-requisite experience, most of the time your therapy will just be trial and error”*  
P17, Medical doctor

*“I may not see it as their role from my own opinion. I think from the way we have been trained, I think prescription goes beyond being able to issue a drug. I must be able to know what is wrong with the patient and I am not sure if the training of the pharmacist would be deep enough for him to be able to do that.”* P21, Medical doctor

A patient group representative also expressed similar fears reporting that pharmacists may not be able to make appropriate diagnosis especially in complex cases.

*“The problem is... pharmacists do not have access to running clinics like doctors do and their training from how I understand it does not comprise of them being able to find out what is wrong with the patient. I am sure they will only depend on what symptoms the patient have and thus suspect what is wrong with the patient.”* P38

However, if pharmacists are to prescribe in collaboration with doctors as discussed in section 5.4.4.4, the concern of pharmacists' inadequate skills in diagnosis would be taken care of.

In this study, doctors interviewed were asked if pharmacists could play a role in repeat prescribing for chronic conditions as being practiced in some developed countries. Many doctors were unsupportive and reported that pharmacists were unlikely to recognise some insidious underlying complications in chronic conditions.

*“If you allow the pharmacist to manage patients on long term conditions on repeat prescribing. Some of the complications patient present with are subtle, the pharmacist may not be able to know them because he is not a specialist. So the patient is a lot safer if he is with somebody that is more trained to pick the complications.”* P20, medical doctor

*“There are salient clinical features that you may not be able to pick until certain examinations have been done on the patient and if they are not picked on time, they can now result to some complications. Otherwise as community physicians, we advocate for tasks shifting.”* P21, Medical doctor

Some pharmacists including those who are policymakers also expressed concern on pharmacists' competence in prescribing.

*“To be honest, if you look at it objectively, the role of a doctor is not just to prescribe. He has a more in-depth role vis –a vis the condition of a patient, he goes through so much to arrive at the prescription. A pharmacist doesn’t have an in-depth training as a doctor. I think even if he is allowed to prescribe, it should be limited” P39, Policymaker*

*Yes, I will be very happy if Nigerian pharmacists are given some leverage or prescription right as well but before we do that; there should be a change in curriculum. Our curriculum should reflect patient care practice because the clinical component of the present curriculum we are using in this country is highly deficient in clinical areas.” P05, Hospital Pharmacist*

#### **5.4.4.4 Collaborative prescribing as an appropriate model**

Given pharmacists inadequate skills in diagnosis as observed above, many participants noted that collaborative prescribing which entails working in partnership with doctors would be an appropriate model to implement within the Nigerian context. Participants noted that this form of prescribing would overcome the problem of pharmacists’ inadequate skills in diagnoses and ensures patient safety.

*“I think in Nigeria the best way for now is to do it in collaboration with a doctor because they are trained to diagnose. So when the doctor diagnoses and may be initiate therapy, the pharmacists can now monitor but the initial diagnosis should be done by a doctor.” P11, Hospital Pharmacist*

*“I am of the opinion that pharmacists should prescribe in collaboration with doctors. Let the doctors be involved in the diagnosis because they are trained for that. If you say the pharmacists should independently manage a patient, I think it is not too right. I don’t think the pharmacist is trained in diagnosis.” P32, Policymaker & Pharmacist*

*“Yes, the pharmacists should work with doctors. The doctors should serve as the mentors to the pharmacists in this process. The pharmacist will need a lot of capacity building and on the job mentorship. Sometimes, it is not all about drugs, there could be some other things that are needed.” P24, Patient Group Representative*

Despite the unwillingness of many medical doctors to support pharmacist prescribing, a few doctors interviewed found collaborative prescribing appealing to them since they will maintain the overall management of the patient.

*“If I am sure I have a resident doctor or a pharmacist, somebody who we can share care with, why not?” P14, Medical doctor*

*“Having pharmacists prescribe alongside doctors will be feasible but it will be guided by the doctors. Where the pharmacist has a problem, he*

*should always seek consent of the doctor before taking any decision.”*  
*P10, Medical doctor*

Furthermore, participants observed that collaborative prescribing would only be practicable in hospital settings where doctors and pharmacists work together in patient care. They reported that this is unlikely in community pharmacy settings given that there is currently no structure in place that allows community pharmacists to work in partnership with doctors. In addition, some participants noted that access to patients' data by community pharmacists will also be a challenge if collaborative prescribing is to be implemented.

*“The problem is hospitals may not like to share their patients' record with community pharmacists.” P11, Hospital Pharmacist*

*“The absence of patient records will be the challenge in the community pharmacy.” P23, Community Pharmacist*

Some participants therefore suggested that if community pharmacists were allowed to prescribe, they should do so independently in very limited areas or for minor conditions. On the other hand a number of participants considered implementing both models to be appropriate in Nigeria depending on the context.

*“Like I said earlier on, for certain diseases or ailments, the pharmacist can manage them from the beginning to the end independently. But there are other situations that they will require a joint management between the doctor and the pharmacists and there could be a work out plan that can be set up for the management of the patient. In that case, of course we are now looking at very chronic diseases. The pharmacist can monitor the patient really and of course in consultation from time to time as the disease process evolved with the doctor.” P17 General Practitioner*

*“The collaborative model appears to be more professionally appropriate because it will now bring the doctor and the pharmacist to work together which is what we are advocating for. But in the rural areas where doctors are lacking, a collaborative model will not be feasible. I will advocate the amalgamate of the two depending on the practice setting.” P31, Policymaker & Pharmacist*

Overall, participants seem to prefer collaborative prescribing to independent prescribing because of pharmacists' inadequate skills in diagnosis.

#### **5.4.4.5 Potential benefits of pharmacist prescribing**

Participants interviewed outlined a number of benefits that could be associated with pharmacist prescribing in Nigeria. These benefits were identified by all participants

including those who were not supportive of pharmacist prescribing. Generally, there was a perception among many stakeholders that allowing pharmacists to prescribe could improve patients' access to treatment. Participants noted that having pharmacists as prescribers could provide quicker access to treatment and reduce patients' waiting time.

*"You will see a doctor consulting like 100 clients in a day and that is killing you know. You see some facilities there are no doctors at all. Allowing pharmacists to prescribe will go a long way." P24, Patient group representative*

*"The patient time will be saved because the patient will not have to wait all day waiting for a doctor's prescription" P2, General Practitioner*

A participant also noted that it will increase the options in which patients have to seek treatment from different professionals, thereby empowering the patient.

*"You will have more experts prescribing the drugs to the patients rather than just the doctor." P27, Policymaker & Pharmacist*

There was a perception particularly among pharmacists that pharmacist prescribing could promote safe prescribing of medicines because of pharmacists' knowledge in medicines and skills in resolving drug therapy problems.

*"Pharmacists are more likely to prescribe the right medication in terms of patients not experiencing adverse drug reactions or side effects of those drugs." P05, Hospital Pharmacist*

*"You know by our training, we are trained to identify drug therapy problems and some of these problems could be life threatening. If we are giving the right to prescribe, it will free us to save lives of people who could have been exposed to fatal doses of certain drugs." P26, Academic Pharmacist*

However, some medical doctors raised concern about patient safety and the quality of care the patient would receive if pharmacists are prescribing.

*"Since they know more about the drugs, their prescribing is likely to be safe for the patients but because their ability to make appropriate diagnosis is deficient, it may be counterproductive." P29, Resident Doctor*

Participants, particularly pharmacists observed that introducing pharmacist prescribing in Nigeria could result in certain benefits for pharmacists and the pharmacy profession. They reported that it will promote the utilisation of pharmacists' skills and make pharmacists job more satisfying.

*“It will enhance job satisfaction to the pharmacists” P26, Academic Pharmacist*

*“Definitely, there will be job satisfaction on the part of the pharmacists. I am very, very satisfied doing clinical work. Each time I go into the ward, review patient medications, identify drug therapy problem and resolve them, I feel fulfilled at the end of the day rather than doing the traditional role.” P05, Hospital Pharmacist*

A pharmacist also added that pharmacist prescribing could promote staff retention.

*“...because most pharmacists that are graduating in Nigeria go out of the country for better working conditions. So, by adding this aspect of practice [prescribing], it may retain some of them.” P16, Pharmacist*

Participants also noted that allowing pharmacists to prescribe will grant pharmacists more responsibility in patient care and enhance their professional status.

*“Yes, the professional image of pharmacists will definitely improve. People will begin to perceive pharmacists in a different light, they will not look at the pharmacist as that professional that gives the drug across the counter.” P05, Hospital Pharmacist*

*“It will boost our morale and our role will be seen as important. It will also give us more professional status and people will know that the pharmacist is not just a dispenser.” P37, Community Pharmacist*

A medical doctor also expressed similar view on the potential benefit to the pharmacy profession.

*“I think it will be a lot of fun for them. Pharmacists will be able to have patients that they treat from beginning to the end of the disease process all on their own and that will be quite an exciting experience and might inspire them to be even more professional about their practice and of course the satisfaction they will derive from all of that I think all will add up to improving perhaps the practice so to say of the pharmacist in the public eye.” P17, General Practitioner*

There was a general view among all stakeholders that pharmacist prescribing in Nigeria could reduce doctors' workload and free them up to concentrate on other specialised tasks

*“It will take the pressure off the general practitioner which means that the doctors will now concentrate on more delicate issues of diagnosis instead of having to be battling with minor illness.” P31, Policymaker & Pharmacist*

*The first advantage is that it will relieve the doctor of his workload and help him to better manage the patient. As I told you, by the time you*

*have so many patients to attend to and if you have a helping hand, it will help you to better manage the patient and the patient will be the one to have the benefit at the end of day. P10, Medical Consultant*

In addition, a participant noted that collaborative prescribing could promote teamwork and professional relationships between doctors and pharmacists.

*“The collaborative model appears to be more professionally appropriate because it will now bring the doctor and the pharmacist to work together which is what we are advocating for.” P31, Policymaker*

Generally the benefits of pharmacist prescribing were underscored by all stakeholders interviewed including those not in support of granting pharmacists prescribing authority.

#### **5.4.4.6 Potential facilitators and barriers to pharmacist prescribing**

Participants identified a number of factors that could facilitate or hinder the introduction of pharmacist prescribing in Nigeria. Many pharmacists reported that pharmacists' undergraduate training has evolved over time to be more diseases and patient orientated. They saw this as a potential facilitator to pharmacist prescribing.

*“Pharmacists' training over the years has moved from only drug focus to also patient focus. In the training, more knowledge has been impacted clinically. I think pharmacists can also add this responsibility of drug prescription because we have added more knowledge.” P16, Pharmacist*

*“By our training now, we are trained also in knowing disease conditions. As I told you earlier on, I teach pathology so that students are exposed to what kind of diseases there are and how they can be treated.” P26, Pharmacist*

Furthermore, many pharmacists are currently undergoing postgraduate training in clinical pharmacy with the West African Postgraduate College of Pharmacists. Many participants felt that the 'products' of this college are better positioned for prescribing roles.

*“Many pharmacists now are specialising through the fellowship programme of the West African Postgraduate College of Pharmacy. Those that have this training should be allowed to prescribe prescription only medicines.” P16, Pharmacist*

However, as pointed out in previous theme, many doctors argued that appropriate diagnosis is crucial in prescribing and the present pharmacists' training does not incorporate that.



*It is not all about knowing the drugs but how do you come out with a diagnosis? How do you ascertain the extent of the disease? P02, Medical doctor*

Therefore, many participants including pharmacists felt that pharmacists' inadequate skills in clinical diagnosis could be a potential barrier to pharmacist prescribing.

*"We have a very good understanding of medications but when it comes to diagnosis we may not be so good at that." P23, Pharmacist*

*"You have to have a working diagnosis for you to prescribe and I don't think pharmacists' present training involves diagnosis. Their ability to make diagnosis is deficient." P29 Medical doctor*

Also, increasing patient access to treatment was also considered a potential facilitator. Participants reported that patients have difficulty getting access to doctors because of the high patient to doctor ratio in Nigeria. This often results in long waiting times in hospitals.

*"...patients will stay very long hours in a queue waiting for very few medical doctors to come and examine them. If pharmacists are allowed to prescribe, I think it will go a long way in reducing the burden on the patients and waiting time in the clinic." P24, Patient group representative*

Therefore, participants felt that pharmacist prescribing could promote access to treatment by increasing the number of providers. In addition, they stated that pharmacist prescribing also has the potential of reducing doctors' workload. This is because many patients present to doctors with conditions which participants felt could be handled by other healthcare professionals including pharmacists and nurses. Hence, reducing doctors' workload and freeing them up to concentrate on more specialised tasks were viewed as potential facilitators.

*"As I said, our health centres are heavily congested. You know, some of the patients come to the hospital and they spend the whole day waiting, those with minor conditions can be sorted out early and get their prescriptions from a pharmacist. P02, medical doctor*

*"It will take the pressure off the general practitioner which means that the doctors will now concentrate on more delicate issues of diagnosis instead of having to be battling with minor illness." P31, Pharmacist & Policymaker*

Unlike hospitals, community pharmacies are accessible to patients in many locations.

*“We know that we can easily go to the pharmacists because there are community pharmacies on every street, not every street literally but there are more pharmacies available and close to the community than you have hospitals.” P38, Patient group representative*

*“We are the closest health facility to the community, the first port of call for every form of ailment.” P07, Community pharmacist*

Therefore, community pharmacists reported that they are usually the first point of call for many patients in Nigeria. They noted that there is a great reliance and confidence on them by members of the public.

*“From what we see happening these days, more and more people are beginning to rely on the community pharmacists for their health needs. The community pharmacists have become the first port of call for many cases even the major ones that will eventually get to the teaching hospital would have passed through the community pharmacist.” P23, Community pharmacist*

Therefore, community pharmacists felt that such reliance and confidence by members of the public on them could indicate potential acceptance by patients for pharmacist prescribing. Some doctors interviewed also felt that patients' acceptance of prescribing by community pharmacists would not be a problem given that Nigerian patients consult other less qualified personnel for their health needs.

*“I think the Nigerian patients wouldn't have issues. Very large numbers of patients are consulting even people who are far less qualified than pharmacists. They consult herbalists, those who run patent medicine stores and so many unqualified people compared to the pharmacists, I don't think that will be an issue.” P14, Medical doctor*

Hence, many participants including pharmacists and patient group representatives argued that prescribing by community pharmacists could improve access to treatment and consequently reduce the number of patients that would require doctors' care.

*“So if it becomes legalised, then we all know that we necessarily do not have to queue for a doctor for every kind of conditions that pharmacists [community pharmacists] will be allowed to take care of. So it will give you access to your drugs and healthcare needs than it is now.” P38, Patient group representative*

However, prescribing by community pharmacists as envisaged by these participants is associated with a number of challenges. These challenges include lack of collaborative working relationship with doctors including those in primary care; and lack of access to patients' records because hospitals do not share patients' information with community pharmacists.

*“The way things are, it might not be too feasible because we don’t have access to the patient records, we might not know what else is wrong with the patient and what the patient can use and may not use.”  
P07, Community Pharmacist*

Therefore, these problems could lead to fragmentation of care.

Furthermore, some participants expressed concern that community pharmacists may have conflict of interest in their prescribing since many community pharmacies were established on a business model.

*“If the pharmacist is allowed to prescribe in his community pharmacy, there will be a lot of problems because the pharmacist will only be interested in the patient buying his drugs and this can bias his prescription.” P06, Pharmacist*

*“So, if community pharmacists are going to be engaged more actively in patient care the way you are envisaging, then certainly the commercial aspect of pharmacy has to shift”. P17 General Practitioner*

*“They [community pharmacists] may have commercial interest in their prescribing because at the moment they are more used to the commercial aspect of dealing with drugs. So they will certainly need some reorientation around drugs and the need to put patient health needs first.” P38, Patient group representative*

However, some pharmacists interviewed viewed the concern for a conflict of interest in prescribing by community pharmacists differently. They noted that community pharmacists have no commercial interest. They believed that involving them in prescribing will ensure cost-effective prescribing because they will utilise their knowledge of medicine prices to provide cost effective treatment.

*“A community pharmacist has no commercial interest. Pharmacists are wonderful people” P22, Policymaker & pharmacist*

*“It will help to save cost for the patient because we will know the cost effective medicines that should be given to the patient.” P37, Community Pharmacist*

Also, some participants mentioned that community pharmacists may not have adequate facilities to support their prescribing practice.

*“I will prefer to see a doctor in a situation where I know it is complex because he has access to all the other facilities for testing, he can ask for scans and whatever for me which a community pharmacist cannot.”  
P38, Patient group representative*

*“I guess the setting in the community pharmacy now has to change because there should be a proper room where you can sit with the patient and communicate properly.” P23, Pharmacists*

In contrast, participants reported that in some tertiary hospitals, pharmacists are now working in partnership with doctors and other healthcare professions. Therefore, this could potentially facilitate collaborative prescribing.

*“We go on ward rounds with doctors and we make a contribution during ward rounds. In our hospital, we have been able to build that kind of good relationship with our doctors. They hardly go on ward rounds without inviting us because overtime they have been able to see the contribution of pharmacists to patient care.” P18, Pharmacist*

There were also reports that pharmacist’s attitude in taking up extended clinical roles could be a possible barrier to pharmacist prescribing as mentioned by a participant below.

*“Pharmacists’ attitude is usually a big barrier. Some pharmacists are very comfortable with those traditional roles, they don’t want to acquire new skills, and they don’t want to move into different areas where pharmacists are needed in clinical practice and all that.” P05, Pharmacists*

However, the popular view held by many pharmacists indicated that majority of pharmacists in Nigeria are dissatisfied with their current roles and are willing to expand their roles clinically. Such willingness for role expansion could be a driver to pharmacist prescribing.

*“...you have so much knowledge but you find yourself not being able to use that.” P04, Pharmacist*

*“Yes, the younger pharmacists are willing to expand their roles clinically, even some older ones too. The younger pharmacists because of their mode of training they see themselves as being under-utilised and that is why they are jumping at any opportunity to practice abroad where things are better.” P16, Pharmacist*

Also, some pharmacists maintained that some key pharmacy leaders and the Pharmaceutical Society of Nigeria would be willing to push for pharmacist prescribing in Nigeria.

*“We have a few key leaders who can fight for pharmacist prescribing. The PSN is also interested in the pharmacist extending their roles but I don’t know if part of what they are currently advocating for includes prescribing.” P11, Hospital Pharmacist*

Generally, resistance from the medical profession was cited as a fundamental barrier to pharmacist prescribing in Nigeria. Participants felt that such resistance is expected because doctors would react in such a way to protect their territory.

*“If you tell Nigerian doctors to relinquish what they see as their birth right to another professional, there will be serious opposition” P03, Pharmacist*

*“I think the main barrier will be the doctors. I believe they see prescribing as one of their primary roles or duties. So asking pharmacists to prescribe will be like taking their baby from them.” P38, Patient group representative*

Many pharmacists felt that medical resistance is likely to occur at policy level because of the overriding dominance of doctors in the leadership structure of health sector as previously reported in section 5.4.3.5.

*“If you look at the federal and state ministry of health, the top hierarchies are occupied by doctors. So, policy wise there is also a barrier.” P32, Policymaker*

Another major barrier mentioned was the inadequate number of pharmacists in many hospitals as previously reported in section 5.4.3.3.

*“I think there are not enough pharmacists to do that really. If you go to most facilities, you will see so many patients, the waiting time for patients to get their drugs is much, let alone pharmacists having time to interact with the patients and counsel them. The same problem the doctor is facing, the pharmacist is also facing too.” P14, Medical doctor*

*“...lack of enough pharmacists to cater for the traditional pharmacy responsibilities and for them to go into the wards. So, hospital pharmacists are overwhelmed by the traditional pharmacy responsibilities of dispensing medications and procuring drugs. So, they may not have the time to do an additional role but if they are more in number that will be facilitated.” P26, Pharmacist*

However, if pharmacy technicians are developed to handle some of the traditional roles of pharmacists, that will help in releasing pharmacists for advanced roles. But having pharmacy technicians do some of the traditional roles of pharmacists is not without resistance from some pharmacists as previously reported.

**Theme summary:** There was a split of opinion between doctors and pharmacists on granting pharmacists prescribing authority. Many pharmacists were in support of pharmacist prescribing and saw prescribing as a logical role for them while many doctors were unsupportive. These doctors expressed concern about pharmacists' skills

in diagnosis which they considered crucial in prescribing. However, collaborative prescribing which participants considered appropriate for the Nigerian context would take care of pharmacists' inadequate skills in diagnosis. Overall, participants acknowledged many potential benefits of pharmacist prescribing in Nigeria. These benefits included the potential to improve patient access to care, promote the utilisation of pharmacists' skills and reduce the workload on doctors. Furthermore, several potential barriers and facilitators to pharmacist prescribing were identified including current training provisions for pharmacists, ease of access to community pharmacists, inadequate pharmacy staff, and resistance from the medical profession.

### **5.5 Ensuring rigour in this study**

As we saw in the last chapter, rigour in qualitative research is demonstrated in these four criteria: credibility, transferability, dependability and confirmability (Lincoln and Guba, 1985).

Several steps were taken to build credibility into the study. The use of a digital recording device to record all interviews, and the transcription and cross checking of transcripts against their recordings by the researcher ensured accurate representation of participants' views. The triangulation of data sources which enhances credibility was also employed in this study (Miles et al., 2014). This was done by recruiting participants to reflect the diversity of stakeholders concerned with clinical pharmacy practice in Nigeria. Therefore, doctors, pharmacists, pharmacy technicians, policymakers and patient group representatives were included in the study. Furthermore, the themes in this study were generated from coded data and illustrative quotes were used to sufficiently support the themes reported. In addition, contrasting views of participants were also represented. The reviewing of the themes and their interpretations by my supervisors also adds to the credibility of this study.

Transferability which is similar to generalizability in quantitative research (Lincoln and Guba, 1985), was achieved through a detailed account of the study including its research setting, methods, process of interviews and data analysis to enable other readers to ascertain the transferability of the findings to other contexts. In addition, reaching saturation in the themes generated could imply that the findings could be generalised to the study population. Similarly, a detailed account of the research method including procedures involved and decisions made also contributes to the study dependability. Finally, confirmability was achieved through the detailed description of the findings of this study and the use of supporting quotes from

participants. These would enable the readers of this report to ascertain whether the account presented reflected participants' views.

## **5.6 Strengths and limitations of the study**

This is the first study in Nigeria that explored stakeholders' views on the extension of pharmacists' clinical roles to include prescribing in Nigeria. Using qualitative semi-structured interviews in this research enabled an in-depth exploration and understanding of the issues related to clinical pharmacy practice and the granting of prescribing authority to pharmacists in Nigeria. The additional strength of this research is in the mix and backgrounds of stakeholders interviewed including doctors, pharmacists, pharmacy technicians, patient group representatives and policymakers across many locations in Nigeria.

Even though this study was initially designed to involve both face-to-face and telephone interviews, the researcher was unable to travel to Nigeria to conduct face-to-face interviews due to security challenges in Nigeria at the time of this research as earlier reported. As a result, some prospective participants couldn't be reached from the UK. For example only two patient groups: the network of people living with HIV/AIDS and the diabetes association of Nigeria were contacted because the other groups couldn't be reached via email. However, the quality and depth of data obtained was not compromised (except for non-verbal response which was difficult to obtain) since the researcher was experienced in telephone interviews. In addition, data collection continued until saturation was reached.

As mentioned in the last chapter, qualitative studies are subject to certain limitations including lack of statistical generalisation but statistical generalisation was not the aim of this study. However, this study was followed-up with a quantitative survey reported in the next chapter to test the generalisability of the findings of this study.

## **5.7 Chapter summary**

This study revealed how different stakeholders socially perceive and construct the role of pharmacists in Nigeria. Pharmacists were viewed as underutilised professionals, custodians of medicines, dispensers, medicines advisers, clinicians and in the case of community pharmacists, business people. The findings of this study are similar to other studies investigating community and hospital pharmacists' identities (Elvey et al., 2013, Pottie et al., 2009, Varnish, 1998). Elvey et al. (2013) Identified nine identities: the scientist, the medicines adviser, the clinical practitioner, the social carer, the medicine maker, the medicine supplier, the manager, the business person and the unremarkable

character. These researchers presented a comprehensive list of pharmacists' identities than those found in this study. This is because their study from its design set out to investigate pharmacists' professional identities. However in this study, pharmacists' professional identity emerged as a finding. In addition, the context (the UK) in which their study was carried out is different from that of this study (Nigeria). This could account for the difference in the list of pharmacists' identities that emerged in both studies. But this assertion is not conclusive as other Nigerian pharmacists' identities are likely to be identified with a study whose primary aim is to explore pharmacists' professional identity. Nevertheless, the current study adds to the body of evidence of the professional identities of pharmacists.

The present study also revealed that clinical pharmacy practice is still underdeveloped in Nigeria and many factors were responsible for this. These factors were predominantly linked to the structure of pharmacy. They include limited clinical education and training; lack of specialisation in practice; a career structure that does not support clinical development; poor relationships with medical doctors and medical dominance; inadequate pharmacy staff; underutilisation of pharmacy technicians and inadequate policies to support the development of clinical pharmacy practice. The findings of the present study indicated that a change in the existing structure of pharmacy in Nigeria could be beneficial in developing clinical pharmacy practice.

There were splits of opinions between participants who were medical doctors and those who were not doctors regarding pharmacist prescribing in Nigeria. While many non-medical stakeholders interviewed including pharmacists and patient group representatives supported an extended role for pharmacists in prescribing, many medical doctors including those in policy making were reluctant to do so. Many pharmacists interviewed including those who are policymakers considered prescribing a logical role for pharmacists considering pharmacists' knowledge in therapeutics which they considered essential for prescribing. In addition, they also argued that they are more knowledgeable in clinical pharmacology and pathology of diseases than nurses and community health workers who are currently allowed to prescribe medicines for certain conditions in facilities where there are no doctors. However, many medical doctors interviewed commonly cited pharmacists' inadequate skills in clinical examination and diagnosis as their reason for non-support. In addition, these doctors also perceived pharmacist prescribing as an encroachment into their professional boundary domain that could undermine their authority over prescribing. However, a few doctors were supportive of collaborative prescribing since they would still maintain the overall management of the patient. In addition, many non-doctors stakeholders



interviewed preferred collaborative prescribing over independent prescribing because it will complement pharmacists' inadequate skills in diagnosis. It will also foster collaboration between doctors and pharmacists which has been identified as lacking in many practice settings in Nigeria.

The results of this study provide insightful ideas to the facilitators and barriers to developing Nigerian pharmacists' clinical roles including prescribing. The perceived benefits associated with pharmacist prescribing were commonly seen by participants as potential facilitators to pharmacist prescribing in Nigeria. These potential benefits include increasing access to patient treatment, better utilisation of pharmacists' skills, reduction in doctors' workload and the potential to legitimise prescription medicine supply. Other potential facilitators to pharmacists prescribing identified included: pharmacists' positive attitude towards extended clinical role; the existing working relationship among doctors and pharmacists in some tertiary hospitals; community pharmacists' accessibility and patients' reliance on them. On the other hand, notable barriers identified included shortage of pharmacists; pharmacists' inadequate skills in diagnosis as mentioned earlier; medical opposition and lack of government support. The implications of the views on pharmacist prescribing including potential facilitators and barriers expressed by Nigerian stakeholders interviewed are further explored in the integrated discussion chapter (chapter 7) of this thesis.

In the next phase of this project, the key findings of this study were further examined in a quantitative survey to test, compare and generalise the views expressed by participants. The design and content of the survey was primarily informed by the findings of this qualitative study. Details of the survey conducted including objectives, questionnaire design and results are presented in the next chapter.

## Chapter 6: Nigerian survey

	Phase	Method	Product
Qualitative Phase	Qualitative Data collection 1	<ul style="list-style-type: none"> <li>32 semi-structured interviews with UK pharmacy staff</li> </ul>	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 1	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to UK's pharmacy structure</li> </ul>
	Connecting qualitative study 1 & 2	<ul style="list-style-type: none"> <li>Developing interview questions</li> </ul>	<ul style="list-style-type: none"> <li>Interview guide for qualitative study 2</li> </ul>
	Qualitative Data collection 2	49 semi-structured interviews with purposively sampled stakeholders	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 2	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to barriers &amp; facilitator to clinical role extension</li> </ul>
	Connecting qualitative & quantitative phases	<ul style="list-style-type: none"> <li>Developing research objective</li> <li>Developing survey items</li> </ul>	<ul style="list-style-type: none"> <li>Research objectives</li> <li>Questionnaire</li> </ul>
Quantitative Phase	Quantitative Data collection	<ul style="list-style-type: none"> <li>Cross-sectional web survey</li> </ul>	<ul style="list-style-type: none"> <li>Numeric data</li> </ul>
	Quantitative data analysis	<ul style="list-style-type: none"> <li>Univariate and multivariate analysis</li> </ul>	<ul style="list-style-type: none"> <li>Descriptive and inferential statistics</li> </ul>
	Integrating qualitative & quantitative results	<ul style="list-style-type: none"> <li>Interpretation and explanations of qualitative and quantitative results</li> </ul>	<ul style="list-style-type: none"> <li>Discussions</li> <li>Implications for practice &amp; policy</li> <li>Future research</li> </ul>

## **CHAPTER 6: A CROSS-SECTIONAL SURVEY OF PHARMACISTS' VIEWS ON THE FACILITATORS AND BARRIERS TO EXTENDING THEIR CLINICAL ROLES TO INCLUDE PRESCRIBING IN NIGERIA**

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### **6.1 Introduction**

This chapter presents the quantitative component of the exploratory sequential mixed methods design. The quantitative component was an online cross-sectional survey conducted as a follow-up to the qualitative findings reported in chapter 5. The current chapter begins by presenting key findings of the qualitative study in chapter 5 that informed the design of the present quantitative study. This leads to the objectives of the study. The objectives are then followed with the description of the research methods employed including study design, data collection methods and analysis. The section following the methods presents the results of the study and this is followed by a discussion on the strengths and limitations of the study.

### **6.2 Key qualitative findings informing the present study**

As mentioned in the last chapter, this study was intended to test, compare and statistically generalise the qualitative findings reported in chapter 5. The semi-structured interviews held with Nigerian stakeholders including doctors, pharmacists and policymakers identified key potential areas for change in the professional structure of pharmacy in Nigeria. The key areas were in pharmacists' professional identity, pharmacists' training, specialisation in practice, career structure, collaboration in practice and utilisation of pharmacy technicians. This study sought Nigerian pharmacists' views on these key areas.

Furthermore, the qualitative findings revealed a strong support for pharmacist prescribing by pharmacists including those in policymaking; this study aims to confirm this. The stakeholders interviewed in the last chapter identified a number of potential benefits that could be associated with pharmacist prescribing in Nigeria including increasing patients' access to treatment, legitimising medicine supply and better utilisation of pharmacists' skills. They perceived that these benefits in addition to recent changes in pharmacists' training could potentially facilitate pharmacist prescribing. This study will assess the prevalence of these views among pharmacists. Also, a number of potential barriers were also reported in the last chapter. These barriers include opposition from the medical doctors; pharmacists' limited skills in clinical assessment and diagnosis; lack of government support and shortage of pharmacy staff among others. There was also a strong argument by stakeholders for collaborative prescribing

as the appropriate model for pharmacist prescribing in Nigeria. The current study therefore intends to investigate and confirm or refute all these issues. In addition, it intends to identify any demographic association or predictor of views held by participants with respect to extending the clinical roles of pharmacists to include prescribing in Nigeria.

### **6.3 Objectives**

The objectives of this study were:

1. To explore the views of pharmacists on clinical pharmacy practice in Nigeria in order to identify the potential changes needed for extended clinical role.
2. To explore the views of pharmacists in Nigeria on the extension of prescribing authority to them and determine their willingness to be prescribers.
3. To determine the demographic factors associated with pharmacists' support for pharmacist prescribing in Nigeria.
4. To identify the potential facilitators and barriers to introducing pharmacist prescribing in Nigeria

### **6.4 Methods**

#### **6.4.1 Ethics**

As with the study reported in the last chapter, ethical approval for this study was granted by the School of Healthcare Research Ethics Committee (SHREC) (Ref no: SHREC/RP/436) and the Plateau State Specialist Hospital Health Research Ethics Committee (PSSH/ADM/ETH.CO/2014/0025).

Ethical issues associated with this research were the same as those identified in previous studies including informed consent, anonymity of participants, confidentiality in handling of data and data protection. Prospective participants were provided with information on the study and the implications of participating in the study on the introductory page of the online survey (Appendix 15). This is to enable them make informed decisions to participate in the study. Prospective participants were given the opportunity to make further enquiries about the research and were allowed to make a free, independent and voluntary informed choice to participate in the study or withdraw. Submission of the online questionnaire was taken to indicate that respondents had given their consent for their responses to be collated and analysed. Respondents were duly informed about this before accepting to participate in the study (Appendix 15).

Anonymity of the respondents was achieved by making the questionnaire anonymous. In addition, it was not possible for the researcher to link completed surveys to any individual contacted for the survey. The choice of the Bristol Online Survey (BOS), a UK-based survey system that allows researchers to create and run online surveys, ensures that data entered into the system by respondents were secured according to the UK data protection act. The password protected login to the survey ensures that only the researcher had access to the results. At the completion of the survey, all data entered by respondents were directly imported from the survey system (using a university computer) into my password protected space of the M-drive of the University.

#### **6.4.2 Recruitment of participants**

The initial design of the project was to recruit participants who were representatives of the pharmacists' population in Nigeria in order to ensure statistical generalisation of the study findings. Hence, I initially intended to use the list of all pharmacists on the Pharmacists' Council of Nigeria (PCN) register (about 16,000 pharmacists as at April 2014) as the sampling frame. However, on contacting the PCN, I was told that it was not possible to get the emails of all the registered pharmacists on the council list as many pharmacists do not have their emails on the councils' database. Therefore, it was not possible to recruit participants through the council for the online survey. The Facebook group of the Pharmaceutical Society of Nigeria (PSN) was considered as an alternative. PSN is the professional body for pharmacists in Nigeria. PSN's Facebook group had 5,214 members at the time of this survey and it was used as the sampling frame to recruit participants for the survey. However, this sampling frame is biased as it excludes pharmacists who are non-members of this group. This is discussed as a limitation to this study in section 6.6.

#### **6.4.3 Sample size**

There are various methods of sample size determination including the use of formulae, web-based and computer programs (Eng, 2003). The sample size of a study depends on the type of study being conducted i.e. whether comparative or descriptive and the nature of the primary variables to be measured in the research, whether the variables are continuous or categorical (Eng, 2003, Kotrlík and Higgins, 2001). Since this survey was descriptive, the calculation of sample size was based on the sample size calculation formula for descriptive studies (Eng, 2003).

$$N = \frac{4(Z_{crit})^2 p(1-p)}{D^2}$$

Where  $N$  is the sample size;  $Z_{crit}$  is the standard normal deviate corresponding to the selected significance criteria and confidence interval (CI) given in statistical table. For this survey, a  $Z_{crit}$  value of 1.960 determined at 95% CI was used.  $P$  is the pre-study estimate of the proportion to be measured. For this research, a  $P$  value of 90% (0.9) was estimated based on other research in Nigeria which indicated that about 90% of pharmacists will support an extended clinical role (Auta et al., 2014a, Oparah and Eferakeya, 2005).  $D$  is the total width of the expected CI and an assumption of 5% (0.05) was made.

Therefore,

$$N = \frac{4(1.960)^2 0.9(1-0.9)}{0.05^2} = 553$$

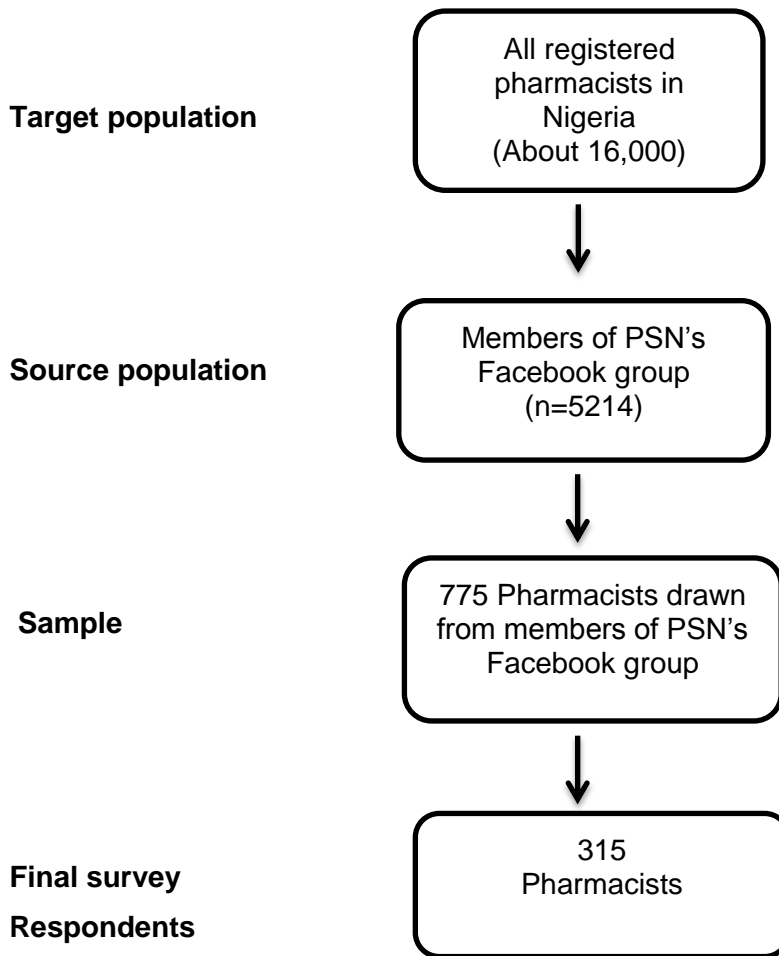
Since online surveys are usually associated with low response rates (Bryman, 2012), 40% of the sample size was added to the pre-determined sample size to yield the final sample size of 775. Therefore, 775 pharmacists were selected from the 5214 members of the Pharmaceutical Society of Nigeria Facebook group. Selecting 775 prospective respondents and sending private messages to them rather than sending a message to all the 5214 members of the group was considered because, on Facebook, group messages sent to members are seen by all. Therefore, this will breach confidentiality. In addition, sending more than 5,000 messages would have been an enormous task and I stood the danger of my account being blocked due to the volume of activity it would have involved.

The sample size determined was tested for its appropriateness for the statistical tests to be conducted in this study including regression analysis. Kotrlik and Higgins (2001) and Miller and Kuncce (1973) suggested that a minimum ratio of ten observations per independent variable is needed for regression analysis. Since the number of independent variables considered during the design of this study was below 10, the sample size estimated was considered appropriate.

#### **6.4.4 Sampling**

This survey was intended to employ a stratified random sampling technique to ensure proportional representation of pharmacists from the six regions of Nigeria. However, stratification of prospective participants according to their demographic details prior to sampling was not possible because the list of the members of the Pharmaceutical Society of Nigeria Facebook group does not contain comprehensive demographic details of members. Therefore, the survey employed a simple random sampling

technique. Random sampling was achieved with the use of Microsoft Excel 2010 to generate a list of 775 random non-repeated numbers. Following approval by the administrator of the PSN Facebook group, a list of the members of the group was retrieved in alphabetical order. This list was then numbered serially and pharmacists with corresponding numbers on the list of random numbers generated were recruited for the survey. Figure 6-1 below shows the relationship between the target population of this study (all registered pharmacists in Nigeria) and the final participants recruited.



**Figure 6-1: Relationship between target population and study participants**

#### **6.4.5 Questionnaire development**

The development of the questionnaire used in this study followed the basic principles of questionnaire design. These principles included: (i) careful selection of the wordings of each question to avoid ambiguity; (ii) avoiding multifaceted or double-negative questions; (iii) not including leading questions to avoid response bias; (iv) making each question brief and specific; (v) organising questions in a sequential and logical manner; (vi) choosing a user friendly layout; and (vii) keeping the questionnaire length brief to maximise response rate (Oppenheim, 2003, Peterson, 2000, Parfitt, 1997).

The questionnaire developed was informed by the findings of the qualitative study conducted with Nigerian stakeholders and a review of other studies investigating the extension of prescribing authority to pharmacists including Hoti et al. (2014), Hoti et al. (2010) and Child et al. (1998). Themes that emerged from the findings of the semi-structured interviews including pharmacists' professional identity; pharmacists' confidence in clinical roles; collaborative working relationship with doctors; potential changes needed in training and practice; and perceived benefits, facilitators and barriers to granting prescribing authority to pharmacists were used to develop the objectives of this study and the initial draft of the questionnaire. **Table 6-1** demonstrates how the qualitative findings were transformed into survey items.

**Table 6-1: How survey items were generated from qualitative data**

Qualitative theme	Qualitative data	Survey Item
The business image of pharmacy	<i>"...once they graduate, the next thing is that they desire to make the quickest money within the shortest possible time. So any activity that will not be profiteering to them in terms of cash, they will not want to engage on."</i>	Pharmacists are more interested in the business aspect of their practice than clinical pharmacy practice.
Confidence	<i>"They [pharmacists] are not confident enough which again I want to attribute to the training. I think if the training is adequate in that respect, their confidence in participation in such activities like ward rounds will also increase."</i>	The current undergraduate pharmacy curriculum does not produce confident pharmacists able to apply their knowledge in clinical settings
Prescribing a logical role for pharmacists	<i>"Yes, there is a need; we actually need a law to say that pharmacists can prescribe."</i>	Pharmacists in Nigeria should be given the right to prescribe
Facilitators and barriers to pharmacist prescribing	<i>"If you tell Nigerian doctors to relinquish what they see as their birth right to another professional, there will be serious opposition"</i>	There will be resistance to pharmacist prescribing by the medical doctors



The initial version of the questionnaire had 87 items intended to measure participants' views on a 5 point Likert scale: strongly agree, agree, unsure, disagree and strongly disagree. This version of the questionnaire was divided into 7 sections: demography, clinical pharmacy practice in Nigeria, collaborative practice, views on pharmacist prescribing, barriers to pharmacist prescribing in Nigeria, training need and perceived benefits. All questions in this questionnaire were closed questions. This initial version was reviewed by my supervisors who have extensive experience in pharmacy practice research and questionnaire design. A number of issues were identified with the draft and several suggestions were made to improve on the first draft. These suggestions include the inclusion of an introductory statement in each section to say why participants should answer each question and how it fit to the overall objectives of the study; the use of logic to guide respondents once they have stated the group they belong to; and the need to include an open ended question at the end of each section where participants can freely make comments.

The draft of the questionnaire was reviewed in conjunction with my supervisors until a final version was produced. The final version of the questionnaire (Appendix 15) had 3 sections and contained 50 items consisting of both close and open ended questions. The first section of the questionnaire had 8 items and sought to obtain anonymous demographic details of respondents including gender, years of experience, area and place of practice. These data are needed to enable the statistical classification of respondents' views and test for relationship between participants' demographics and views. The second section sought participants' views on clinical pharmacy practice in Nigeria in order to identify the potential changes needed to develop clinical pharmacy practice. It had 9 items including an open ended question. All the closed questions asked in this section were measured on a five point Likert scale: strongly agree, agree, unsure, disagree and strongly disagree. The 9 items in the second section explored participants views on changes needed in pharmacists' training, career structure and practice. Participants were asked at the end of this section to freely give any other relevant comments on clinical pharmacy practice in Nigeria.

The third section of the questionnaire was developed based on the views of stakeholders on granting pharmacists prescribing authority in Nigeria. It contained 33 items comprising: (i) Six (6) items (on a 5 point Likert scale) measuring participants' views on pharmacist prescribing in Nigeria including their preferred model; (ii) Twenty five (25) items (on a 5 point Likert scale) measuring participants' views on potential facilitators and barriers to introducing pharmacist prescribing in Nigeria; (iii) One (1) item with 13 sub-items measuring participants' willingness to be a prescriber and their

perceived areas of training needs. This item was developed based on the qualitative findings and the study by Hoti et al. (2014); and (iv) An open ended item seeking participants' opinions on the facilitators and barriers to pharmacist prescribing in Nigeria. All the 5 point Likert scale items in this section were measured on strongly agree, agree, unsure, disagree and strongly disagree.

#### **6.4.6 Validity and reliability**

According to Hammersley (1992 p.69) "an account is valid or true if it represents accurately those features of the phenomena that it is intended to describe, explain or theorize". Therefore, the validity of an instrument refers to the degree to which the instrument measures what it is designed to measure (Peterson, 2000, Coolican, 2004). The questionnaire developed was evaluated for content validity by my supervisors through an iterative review process. In addition, two pharmacy practice researchers in Nigeria were asked to assess the ability of the questionnaire to answer the research question, and its coverage on all relevant aspect of the research objectives as suggested by Polgar and Thomas (2008). The two researchers considered the content of the questionnaire to have met the objectives of the study. The only issue raised by one of the researchers was on the location of the section containing the demographic details of participants. The researcher considered putting it at the end of the questionnaire to be better as some participants may be put-off or become uninterested with surveys beginning with demographic details. However, this advantage was discussed in a supervisory meeting and it was considered worthwhile to leave the demographics at the initial section of the questionnaire. This is because demographic data are easy to respond to and will smoothly usher the responder into the main survey without any difficulty. However, it was agreed that if such issue comes up during the pilot study, a review of the order of the sections of the questionnaire would be necessary.

The reliability of a questionnaire is the extent to which the results obtained through the use of the questionnaire can be replicated under the same or similar conditions (Peterson, 2000, Parfitt, 1997). Various measures including internal consistency test, inter-rater reliability and test-retest reliability are used to evaluate the reliability of an instrument (Roberts et al., 2006, Peterson, 2000). Inter-rater reliability evaluates the extent to which the research instrument produces consistent results when used by different individuals while test-retest reliability is concerned with how consistent the results are when the research instrument is used at two or more points in time (Roberts et al., 2006, Peterson, 2000). Inter-rater reliability test was considered not applicable to

this study while test-re-test reliability was not carried out because in this form of reliability assessment, time is critical and it was considered not feasible within the entire timing of the PhD programme to re-test the survey instrument. However, the internal consistency test was carried out in this research. This form of reliability test, measures the extent to which different items measuring the same construct are correlated (Roberts et al., 2006, Peterson, 2000). The internal consistency of questions measuring the same construct is determined statistically using Cronbach's alpha ( $\alpha$ ) coefficient (Roberts et al., 2006, Peterson, 2000, Cronbach, 1951). The Cronbach's alpha coefficient of the 5 point Likert scale items measuring the facilitators and barriers to pharmacist prescribing in Nigeria was determined. The result is reported in section 6.4.7.3. The internal consistency of the item measuring participants' perceived training needs for pharmacist prescribing was also determined. This aspect of the questionnaire asked respondents to indicate their perceived areas of training need. Therefore, each of the areas of training need was treated as a binary variable consisting of a 'No' and 'Yes' response and coded '0' and '1' respectively. In calculating the internal consistency of items in binary responses measuring a particular construct, the Kuder-Richardson reliability coefficients (KR-20) which is also a measure of internal consistency is preferred over Cronbach's alpha as Cronbach's is more appropriate for items with a range of multiple responses (Şeref, 2009, Feldt, 1969). However, in practice, the KR-20 and Cronbach alpha could yield similar results when applied to binary variables (Feldt, 1969). Therefore the KR-20 of the 13 items measuring perceived areas of training needs of respondents in the pilot study was determined to assess their internal consistency. The KR-20 value obtained is reported in section 6.4.7.3.

#### **6.4.7 Pilot survey**

Pilot surveys are small-scale studies essentially designed to pre-test a survey instrument (Peterson, 2000). They also provide additional information including potential response rate; cost and feasibility of the main study; and data used to determine sample size for the main study in areas where there are no available information to inform sample size determination (Thabane et al., 2010, Peterson, 2000). A pilot survey was therefore undertaken in this research to pre-test the developed questionnaire including its layout; questions sequence and clarity; and determine the internal consistency of the items measuring specific constructs in the questionnaire. The pilot survey also provided the opportunity to test the possibility of using the online survey software (Bristol Online Survey) to conduct a survey with Nigerian participants.

#### **6.4.7.1 Pilot sample**

Even though what constitute an appropriate sample size for pilot studies is subject to debate, participants in pilot studies should be representatives of the study target population (Thabane et al., 2010, Peterson, 2000). Therefore they should be included in the pilot study using similar inclusion criteria that would be employed in the main study (Thabane et al., 2010, Peterson, 2000). There are several suggestions in the literature regarding the sample size of pilot studies in quantitative research. According to Peterson (2000), a sample size of at least 60 individuals are needed in piloting a survey questionnaire while Polgar and Thomas (2008) suggested that pilot survey should be conducted in about 10% of the study population. This study therefore works with the suggestion of Polgar and Thomas (2008) and recruited 80 participants for the pilot survey. The participants were pharmacists who were members of the PSN's Facebook group identified through a simple random technique by generating a list of 80 random numbers using Microsoft Excel. Members of the Facebook group whose serial number on the Facebook group list correspond with the numbers generated were contacted for the pilot survey.

#### **6.4.7.2 Pilot data collection**

An online pilot survey was conducted in August 2014 using the Bristol Online Survey. The online survey was created by the researcher and then previewed together with one of my supervisors for face value and any spelling errors before it was launched online.

Pharmacists selected from the PSN's Facebook group list were sent a message through Facebook inviting them to participate in the pilot survey. The message sent to them contained the link to the online pilot survey. Participants were asked to provide feedbacks to the researcher on any question they considered ambiguous or any other issue they identify with the questionnaire including style, length, access to the online questionnaire and difficulty faced when completing the online survey. A follow-up message was sent after two weeks thanking those who have completed the survey and requesting those who were yet to participate to do so.

#### **6.4.7.3 Pilot results**

Of the 80 pharmacists that were contacted for the pilot survey, 48 participants attempted to complete the survey but only 41 were completely filled. This represents a response rate of 51.3%. This response rate was considered good for an online survey since they are associated with low response rate (Bryman, 2012). No report was received from any participant indicating that any of the questions asked was confusing

or difficult to answer. In addition, analysis of the uncompleted surveys showed that the missing response per items (with the exception of the open ended questions) were less than 10%. This further indicates that respondents had clear understanding of questions asked and were able to respond to them. Almost a third (n=12) of the respondents responded to the open ended questions. This was not considered a major concern as non-response rate as high as 76% have been reported for open ended question in many surveys (Andrews, 2005). In addition, the open ended questions asked were optional in the main survey. They were expected to generate narrative data that were not intended for statistical generalisation.

Reliability testing of the questionnaire was carried out using Chronbach's alpha ( $\alpha$ ). The internal consistency of the 25 items measuring the facilitators and barriers to granting prescribing rights to pharmacists in Nigeria was determined using SPSS and that gave an  $\alpha$  value of 0.745. In social research including pharmacy practice research, an  $\alpha$  value of 0.7 is usually considered acceptable (George and Mallery, 2003). Therefore the internal consistency of the items included in the questionnaire to measure the facilitators and barriers to pharmacist prescribing in Nigeria was considered appropriate. The KR-20 of the 13 items measuring respondents' perceived areas of training need for pharmacist prescribing was 0.892. Similar to Cronbach's alpha, the KR-20 range from 0-1 and the value obtained from the pilot was considered good. Overall, the researcher and the supervisory team thought there was no need for any modification of the questions asked.

Nevertheless, other issues related to the administration of the questionnaire were identified by respondents including non-inclusion of a progress bar and having many questions on a single page as indicated by respondents' comments below.

*"Include a progress bar and take out the page numbers. It didn't help me to know I was on page 2 of 6, I just wanted to know if I was nearly done or how much longer I had to go."*

*"I think people might be more inclined to go to the end of the survey if the questions are spread over more pages rather than have so many on one page. I know you have split them in to sections which cover particular topics but for the respondents, it is easier to click on next rather than keep scrolling down."*

These comments were considered and it was observed that unlike other online survey systems, the Bristol Online Survey do not have a progress bar where it indicates the percentage of the survey covered. It only indicates progress made based on the number of pages covered as used in the pilot. Also, having the online survey into many

pages as suggested was also considered. However, the supervisory team consider it worthwhile to keep the number of pages of the survey to a minimum. This is because internet connection in Nigeria may not be as good to allow respondents navigate through so many pages without much difficulty or being disconnected. Therefore, the fewer the pages, the easier it is for respondents to navigate through the questionnaire.

#### **6.4.7.4 Modifications based on pilot findings**

Given the findings of the pilot survey, no major modification was considered necessary to the content and layout of the piloted online survey. The only modification made to the survey was to make responding to all the closed ended questions compulsory in order to minimise the number of missing response in the survey. However, the open ended questions were optional.

Since no major changes were made to the questionnaire following the pilot study, the data collected were included in the overall results of this study. However, some researchers have expressed concern over the inclusion of pilot results in the main study in quantitative research. They argue that this is likely to lead to data contamination (van Teijlingen and Hundley, 2002). This was not considered to be the case in this study. Data contamination was unlikely because pilot participants were drawn from the same target population used for the main study. In addition, they were included in the study based on the same inclusion criteria and sampling technique used for the main study. Furthermore, the pilot participants were not recruited into the main study. Therefore no new or additional data were collected from them.

#### **6.4.8 Main study**

A cross-sectional survey was conducted from September to October 2014 among pharmacists in Nigeria using an online self-completion questionnaire as the data collection instrument. A simple random sample of 695 pharmacists who were members of the Facebook group of the PSN were invited to participate in the online survey. They were invited through a generic recruitment mail (see Appendix 16) sent to their Facebook inbox. The mail contained a link to the online survey.

The first page (see Appendix 15) of the online survey contained an introductory statement relating to the study. In addition, it contained information on consent and implication for participating in the study. Those who accepted to continue with the survey moved onto the next page of the survey which contained the survey questions. The survey consisted of 50 items which were divided into 3 sections as described in section 6.4.5 above.

Reminders were sent to research participants, 2 weeks after they received the initial invitation mail. Since the link sent to participants for the survey was generic, it was not possible to track those that had responded to the survey. Therefore, reminders were sent to all those recruited in the survey, thanking those that have completed the survey and urging those that have not to please do so. An additional 3 weeks was allowed to collect responses following the reminder. The survey was closed at the end of October 2014.

#### **6.4.9 Data Analysis**

The data collected in this study were imported from the BOS system into the IBM SPSS version 22 for data management and analysis. The analysis of the data proceeded as described below.

##### **6.4.9.1 Descriptive analysis**

Descriptive statistics are methods used in describing the basic feature of a sample (Mann, 2007). Descriptive statistics includes among others frequencies, mean, median, standard deviation and variance (Marsh and Elliott, 2008). In this study, frequencies and percentages generated using SPSS were used to describe the demographic characteristic of respondents including respondents' gender, academic qualifications, years of experience and area of practice. Respondents' views were also summarised in frequencies and percentages. In some occasions, these views were presented in bar or pie charts to enhance understanding of the data.

##### **6.4.9.2 Bivariate relationships**

The data collected in this research were mainly categorical. Therefore, relationships between two (bivariate relationships) variables for example respondents' practice setting and views on granting pharmacists prescribing authority were evaluated using chi-square test. In testing for associations between variables, respondents' views were rescaled into three categories (strongly agree/agree, unsure and disagree/strongly disagree) instead of the five point Likert scale (strongly agree, agree, unsure, disagree and strongly disagree) which the data was collected. This rescaling was done because of the small sample size of the study. In addition, re-categorising respondents' view into three (as opposed to 5) in chi-square analysis will minimise the probability of making type 2 error (failing to reject the null hypothesis even though there is a difference between the groups in the population) which is usually manifested when the sample size is small or when considering a small sub-group within a large survey (Marsh and Elliott, 2008). Furthermore, Fisher's exact test was used to determine statistical

difference between groups in instances where the groups were small, particularly when the numbers of counts per cell in the contingency table were less than 5 in more than 20% of the cells (Field, 2009). In all the Chi-square and Fisher's exact tests conducted, a p-value of less than 0.05 was considered statistically significant.

#### **6.4.9.3 Logistic regression**

A binary logistic regression was conducted to determine the independent predictors of support for pharmacist prescribing. The dependent variable which was a dichotomous variable was coded as 0 and 1 for responses not supporting pharmacist prescribing and those supporting it, respectively. The demographic characteristics of respondents including gender, years of experience and area of practice were used as the independent or predictor variables.

#### **6.4.9.4 Analysis of textual data**

Two questions in the survey sought textual responses from respondents. In one of the questions, respondents were asked to comment freely on clinical pharmacy practice in Nigeria. In the second question, they were asked to comment on any additional information that the researcher could consider as potential barriers and facilitators to granting prescribing rights to pharmacists in Nigeria. The textual data obtained from participants were extracted from the BOS system and imported into Nvivo software version 10 for data management.

The data were analysed using thematic analysis and proceeded in a similar fashion as previously reported in the preceding chapters. The transcripts generated were read repeatedly to familiarise the researcher with the data. These data were then coded inductively as the researcher read through the transcripts to generate codes. Coded data were thoroughly examined and links were established between codes to develop categories and potential themes. These themes were then reviewed in relation to the coded data and the objectives of this study.

### **6.5 Results**

#### **6.5.1 Response rate**

Of the 695 pharmacists contacted for the main survey (which excluded the 80 already included in the pilot), 316 attempted to complete the survey but only 274 surveys were completely filled while the remaining 42 were uncompleted. The 42 uncompleted surveys were unusable and therefore excluded from the study. Hence, the response rate for the main study was 39.4% ( $n=274/695$ ). Adding the pilot surveys [pilot



response rate of 51.3% (n=41/80)] to those obtained in the main study yielded an overall response rate of 40.6% (n=315/775).

This is one of the first online pharmacy practice surveys in Nigeria. Therefore, there is no available data for comparison in terms of response rate. However, the response rate (40.6%) of this study is small compared to other pharmacy practice surveys where questionnaires were administered face-to-face to pharmacists in their practice settings in Nigeria. For example, Erah and Nwazuo (2002) and Oparah and Eferakeya (2005) obtained a response rate of 79% and 67% respectively, in their survey. Nevertheless, online surveys including those of pharmacy practice are generally associated with low response rate (Bryman, 2012, Pedersen et al., 2011). For example, Pedersen et al. (2011) reported a response rate of 28.8% in a national survey of hospital pharmacy practice in the US. Therefore, the response rate of the present study was considered good.

#### **6.5.2 Demographic details of respondents**

Table 6-2 presents a summary of the demographic characteristics of respondents. Majority of respondents were male (n=197; 62.5%). About half of the respondents were between 31-40 years old and have between 0-10 years of experience as pharmacists. The Bachelor of Pharmacy degree was the most common basic pharmacy qualification held by respondents (n=294; 93.3%). Twenty eight (8.9%) respondents hold a postgraduate clinical pharmacy qualification. Many respondents were working as hospital pharmacists (n=190; 60.3%). Hospital pharmacists included those working in primary (n=10; 3.2%), secondary (n=68; 21.6%) and tertiary care (n=112; 35.6%). Many of those that responded to the online questionnaire were located in the north-central (n=88; 27.9%) and south-west (n=80; 25.4%) geopolitical zone of Nigeria.

**Table 6-2: Demographic characteristics of respondents**

<b>Demographic</b>	<b>Number of respondents</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	197	62.5
Female	118	37.5
<b>Age group (years)</b>		
21-30	73	23.2
31-40	148	47.0
41-50	84	26.7
> 50	10	3.2
<b>Years of experience</b>		
0-5	92	29.2
6-10	105	33.3
11-15	60	19.0
16-20	32	10.2
> 20	26	8.3
<b>Type of undergraduate pharmacy degree</b>		
Bachelor of Pharmacy	294	93.3
Pharm D	11	3.5
Bachelor of Pharmacy and Pharm D.	10	3.2
<b>Hold a postgraduate clinical pharmacy qualification</b>		
Yes	28	8.9
No	287	91.1
<b>Hold the Fellowship of the West African College of Pharmacy</b>		
Yes	37	11.7
No	278	88.3
<b>Primary area of practice</b>		
Hospital	190	60.3
Community	44	14.0
Industry	23	7.3
Academic	28	8.9
Administrative	13	4.1
Others	17	5.4
<b>Geopolitical zone</b>		
North-west	47	14.9
North-east	39	12.4
North-central	88	27.9
South-west	80	25.4
South-east	28	8.9
South-south	33	10.5
N=315		

Recent data on the demographic distribution of pharmacists in Nigeria is lacking. However, available data as at December 2007 showed that 30.5% of the 13,199

pharmacists in the country were females (AHWO, 2008). Majority of pharmacists in the country as at then were located in South-west (44%) and North-central (20%) region of Nigeria (AHWO, 2008). However, precise data on the practice settings of these pharmacists were lacking (AHWO, 2008). Even though 37.7% of respondents in this study were female and the majority of respondents resided in North-central and South-west region, the statistical representation of these data is unlikely. This is because the current demographic distribution of pharmacists in Nigeria is likely to be different from the 2007 data. Furthermore, the population (PSN's Facebook group) to which the sample of this study was drawn was a biased one.

### **6.5.3 Views on clinical pharmacy practice in Nigeria**

This study explored the views of Nigerian pharmacists on key aspect of clinical pharmacy including education, specialisation in practice, career pathway and the development of pharmacy technicians. Respondents reported that specialisation in practice (n=320; 98.4%) and a clinical career pathway for pharmacists (n=320; 98.4%) would be needed for the development of clinical pharmacy practice in Nigeria (Table 6-3). These views were commonly held by all categories of respondents as it was not associated ( $p > 0.05$ ) with any demographic characteristics of respondents. About two-thirds of the respondents (n=220; 69.8%) agreed that the present undergraduate pharmacy curriculum does not produce confident pharmacists able to apply their knowledge in clinical settings. This view was found to be associated with hospital pharmacists ( $p < 0.05$ ). A higher proportion of pharmacists in tertiary (n=85; 75.9%) and secondary (n=41; 60.3%) hospitals compared to those in primary (n=5; 50.0%) hospitals reported that the current undergraduate curriculum is not sufficient for practice in clinical settings.

Many respondents (n= 256; 81.3%) reported that the current separation of prescribing as doctors' role and dispensing as pharmacists' role in Nigeria is not in the best interest of the patient. This view was commonly held by all categories of respondents as it was not associated ( $p > 0.05$ ) with any of respondents' demography.

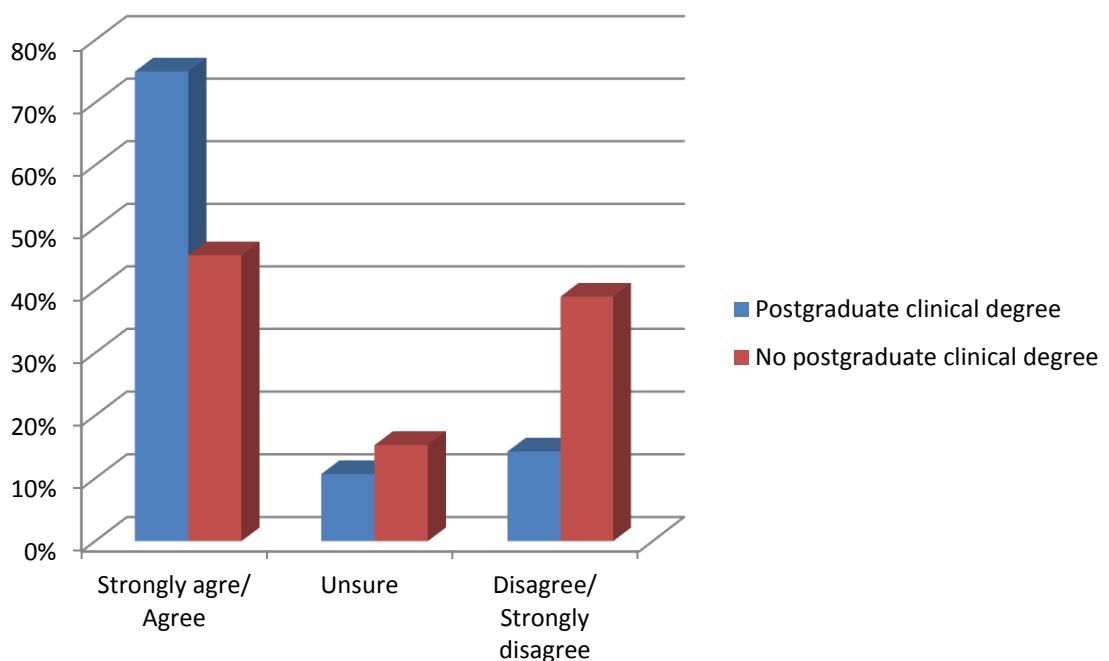
**Table 6-3: Views of respondents on clinical pharmacy practice in Nigeria**

Statements	SA/A n (%)	Unsure n (%)	D/SD n (%)	Demographic factor associated with
Pharmacist specialisation in different clinical sub-specialties would promote the development of clinical pharmacy practice in Nigeria	310 (98.4)	3 (1.0)	2 (0.6)	None
A clinical career pathway should be created for pharmacists who want to be clinical pharmacists.	310 (98.4)	1 (0.3)	4 (1.3)	None
The current undergraduate pharmacy curriculum does not produce confident pharmacists able to apply their knowledge in clinical setting	220 (69.8)	17 (5.4)	78 (24.8)	Hospital pharmacists (p=0.033)
Collaborative practice between doctors and pharmacists in patient care is needed for the development of clinical pharmacy practice	303 (96.2)	5 (1.6)	7 (2.2)	None
Pharmacy technicians should be further trained to do some of the traditional medicine supply functions of pharmacists	152 (48.3)	47 (14.9)	116 (36.8)	Postgraduate clinical qualification (p=0.010)
There are policies in place in the country that support the development of clinical pharmacy practice.	47 (14.9)	134 (42.5)	134 (42.5)	None
The current separation of prescribing as doctors' role and dispensing as pharmacists' role in Nigeria is in the best interest of the patient.	39 (12.4)	20 (6.3)	256 (81.3)	None
Pharmacists are more interested in the business aspect of their practice than clinical pharmacy practice.	131 (41.6)	21 (6.7)	163 (51.7)	None

N= 315; SA/A: Strongly agree/Agree; D/SD: Disagree/Strongly disagree

As seen in the table above, many respondents were either unsure (42.5%) or disagreed (42.5%) that there are policies in the countries that support the development of clinical pharmacy practice. Also, over a third of respondents (41.6%) reported that pharmacists are more interested in the business aspect of their practice than clinical pharmacists practice. This result further confirms the claim in chapter 5 of the commercial interest of community pharmacists.

Furthermore, about a half (n= 152; 48.3%) of the respondents were in support of further training of pharmacy technicians to enable them do some traditional medicine supply roles of pharmacists. This view was found to be associated (p < 0.05) with having a postgraduate qualification in clinical pharmacy. Seventy five percent (n=21) of those with a postgraduate qualification in clinical pharmacy compared to 45.6% (n=131) of those without a postgraduate clinical pharmacy qualification held this view (see Figure 6-2).



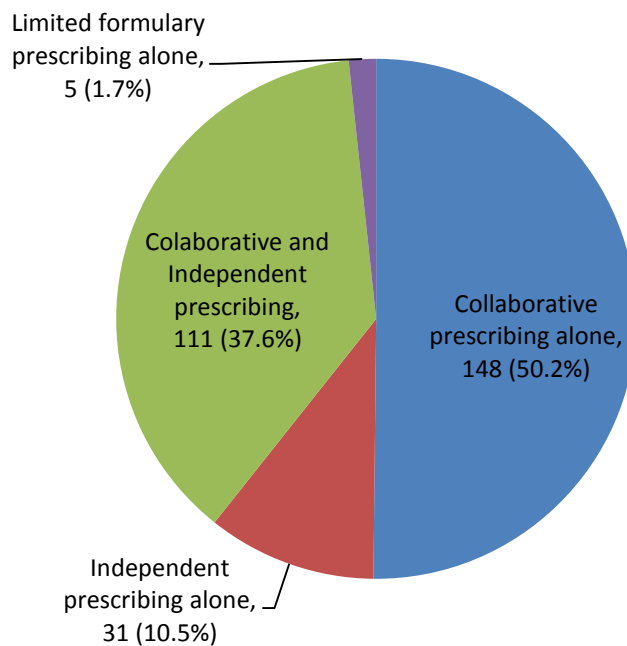
**Figure 6-2 : Relationship between postgraduate clinical qualification and respondents' agreement on further training of pharmacy technicians to do some pharmacists' traditional medicine supply roles**

Also, just over half of the respondents (n=163; 51.7%) were not in agreement that pharmacists are more interested in the business aspect of their practice than clinical pharmacy practice.

#### 6.5.4 Views on pharmacist prescribing

The results of this study revealed an enormous support for an extended role in prescribing for pharmacists in Nigeria. Three hundred and six (97.1%) respondents agreed that pharmacists should be given the authority to prescribe medicines. Of these 306 respondents, 295 (96.4%) were willing to be prescribers. Analysis of the data showed no significant difference ( $p < 0.05$ ) between hospital and community pharmacists in their willingness to be prescribers as 95.8% and 97.7% of hospital and community pharmacists respectively, were willing to be prescribers.

Of the 295 respondents who were willing to be prescribers, 148 (50.2%) would prefer to prescribe in collaboration with medical doctors where the doctor makes the diagnosis while 31 (10.5 %) preferred independent prescribing. Just over one-third of these respondents (n=111; 37.6%) would prefer a combination of collaborative and independent prescribing. Prescribing from a limited drug formulary was the least preferred model of prescribing among respondents as seen in Figure 6-3.



**Figure 6-3: Respondents' preferred model of prescribing**

The chi-square tests performed showed no significant difference ( $p > 0.05$ ) between hospital and community pharmacists in their preference for any of the prescribing models as seen in Table 6-4.

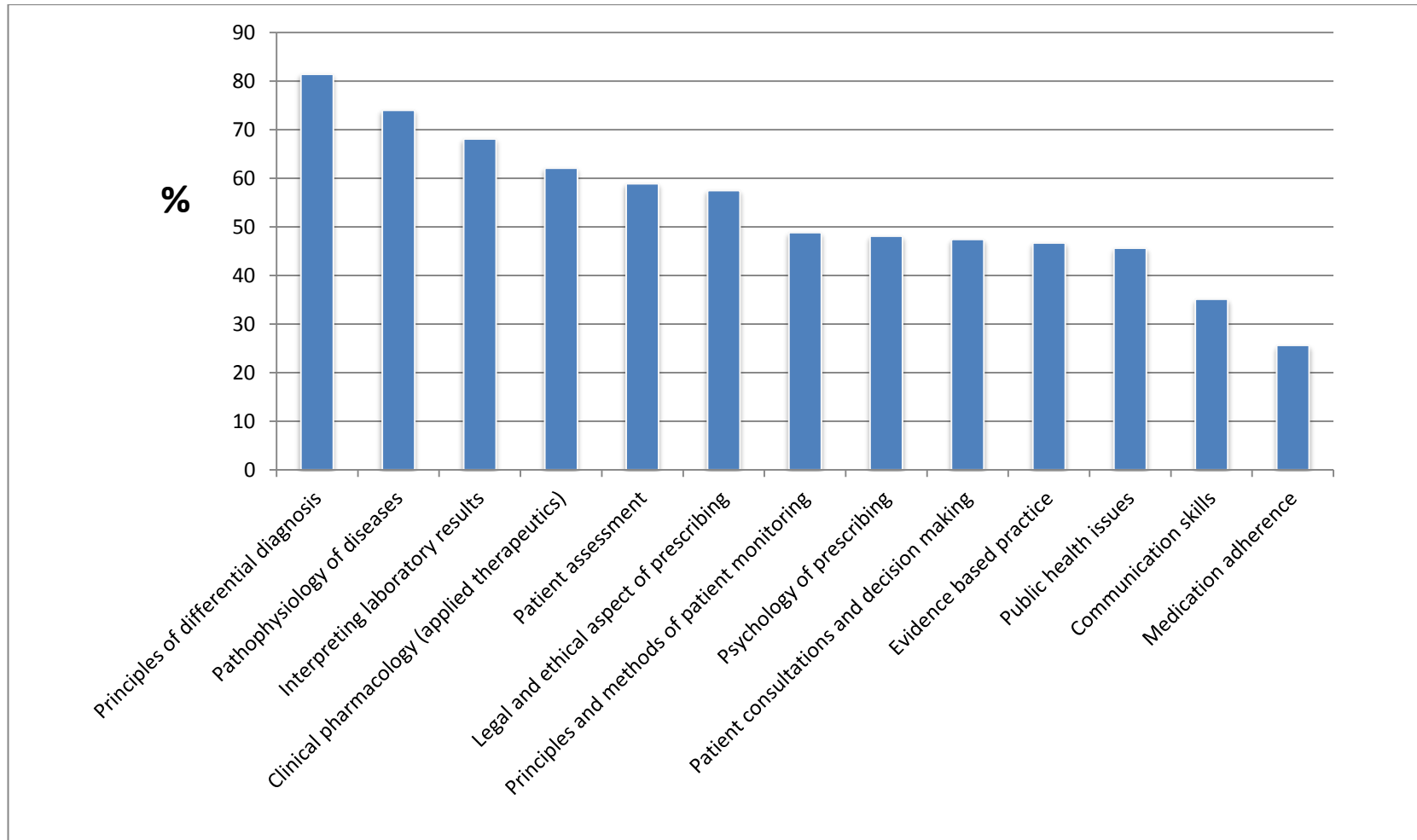
**Table 6-4: Relationship between respondents' area of practice and preferred prescribing model**

<b>Areas of practice</b>	<b>N</b>	<b>Col. alone n (%)</b>	<b>Ind. alone n (%)</b>	<b>Both n (%)</b>
<b>Hospital</b>	182	93 (51.1)	21 (11.5)	65 (35.7)
<b>Community</b>	43	18 (41.9)	4 (9.3)	19 (44.2)
<b>Others</b>	70	37 (52.8)	6 (8.6)	27 (38.6)

N=295; Col. Alone= Collaborative prescribing alone; Ind. Alone= Independent prescribing alone

The majority of respondents (n= 234; 79.3%) who were willing to be prescribers strongly agreed or agreed that prescribing should be reserved for experienced pharmacists who are able to demonstrate certain competences. This view was commonly held by all categories of respondents as it was not significantly associated ( $p > 0.05$ ) with any demographic variable.

Furthermore, the majority of respondents (n=285; 96.6%) who were willing to be prescribers reported that they will need additional training in order to become prescribers. In addition, all of these respondents strongly agreed or agreed that postgraduate clinical courses should be developed to prepare pharmacists for prescribing. The most perceived areas of training need were in the principles of differential diagnosis (81.4%), pathophysiology of diseases (74.0%) and interpreting laboratory results (68.1%). Medication adherence (25.6%) and communication skills (35.1%) were reported as areas of least training need as shown in Figure 6-4.



**Figure 6-4: Areas of training need identified by respondents**



### **6.5.5 Independent predictors of support for pharmacist prescribing**

Binary logistic regression was performed to determine the independent demographic predictors of support for pharmacist prescribing. The model included gender, holding a postgraduate qualification in clinical pharmacy, years of experience and respondents' practice setting as covariates. The predictive accuracy of the logistic regression model was high (97.1%). However, the results showed that none of the demographic variables was a predictor of the support for pharmacist prescribing among respondents. The final regression model produced did not differ significantly from the initial model containing only the constant (Chi-square=10.409; p-value = 0.494).

### **6.5.6 Potential facilitators and barriers to pharmacist prescribing**

This section presents the potential facilitators and barriers to granting prescribing authority to pharmacists in Nigeria. All respondents (n= 315) completed the facilitators and barriers scales. Table 6-5 shows the items linked to the potential facilitators and barriers to pharmacist prescribing in Nigeria. The table is presented in such a way that the items with a high proportion of strongly agree/agree responses appear at the top rows. Respondents identified increasing patients' access to care (n=308; 97.8%) and better utilisation of pharmacists' skills (n=307; 97.5%) as the most likely facilitators. On the other hand, resistance from the medical doctors (n=299; 94.9%) and pharmacists' inadequate skills in diagnosis (n=255; 81.0%) were perceived as the most likely barriers. Other factors identified by respondents that could facilitate pharmacist prescribing were ensuring effective use of the limited human resources for health (n=290; 92.1%), reducing doctors' workload (n=273; 86.7%), cost-savings on healthcare budgets (n=271; 86.0%) and legitimising prescription medicine supply (n=246; 78.1%).

Similarly, other barriers identified by respondents were shortage of pharmacists (n=220; 69.8%), pharmacists' lack of time (n=165, 52.4%), lack of access to patients' clinical data (n=208; 66.0%), pharmacists' limited training in clinical assessment (n=192; 61.0%) and poor working relationships with medical doctors (n=199; 63.2%). Lack of government's support also emerged as a barrier to pharmacist prescribing in Nigeria. Many respondents were either uncertain (n=127; 40.3%) or disagreed (n=143; 45.5%) that the government is interested in developing pharmacists' clinical roles. Furthermore, many respondents perceived that reduction in quality of care (n=286; 90.8%), the potential for prescribing errors (n=257; 81.6%) and conflict of interest (n=167; 53.0%) in prescribing will not be barriers to pharmacist prescribing in Nigeria.

**Table 6-5: Perceived facilitators and barriers to pharmacist prescribing**

Statements	SA/A n (%)	Unsure n (%)	D/SD n (%)
Pharmacist prescribing will increase patients' access to care	308 (97.8)	2 (0.6)	5 (1.6)
Pharmacist prescribing will enable better use of pharmacists' professional skills	307 (97.5)	3 (1.0)	5 (1.6)
There will be resistance to pharmacist prescribing by the medical doctors	299 (94.9)	4 (1.3)	12 (3.8)
Pharmacist prescribing will ensure effective use of the limited human resources in the health sector	290 (92.1)	13 (4.1)	12 (3.8)
Pharmacist prescribing will reduce doctors' workload	273 (86.7)	20 (6.3)	22 (7.0)
Pharmacist prescribing will save healthcare cost for the government.	271 (86.0)	32 (10.2)	12 (3.8)
Pharmacists' skills in making diagnoses are limited	255 (81.0)	17 (5.4)	43 (13.7)
Pharmacist prescribing will minimise the current illegal supply of 'Prescription Only Medicines' without a prescription in Nigeria	246 (78.1)	51 (16.2)	18 (5.7)
There are inadequate number of pharmacists in the country to do additional roles	220 (69.8)	20 (6.3)	75 (23.8)
Pharmacists lack access to patients' clinical data	208 (66.0)	21 (6.7)	86 (27.3)
Pharmacists' training in clinical assessment is limited	192 (61.0)	26 (8.3)	97 (30.8)
Pharmacists lack time to take on additional roles	165 (52.4)	20 (6.3)	130 (41.3)
Pharmacists lack confidence to take on clinical roles	141 (44.8)	23 (7.3)	151 (47.9)
There are inadequate facilities within community pharmacist to allow pharmacist prescribing	115 (36.5)	31 (9.8)	169 (53.7)
Pharmacist prescribing will only happen if technicians are further trained to take on some of the supply roles of pharmacists	108 (34.3)	51 (16.2)	156 (49.5)
Pharmacists have negative attitude toward taking up clinical roles	106 (33.7)	34 (10.8)	175 (55.6)
Pharmacists have a close working relationship with doctors in patient care	89 (28.3)	32 (10.2)	194 (61.6)
Pharmacists will have commercial interest in prescribing	79 (25.1)	69 (21.9)	167 (53.0)
There will be conflict of interest with pharmacists acting as both prescribers and dispensers	61 (19.4)	55 (17.5)	199 (63.2)
The government is interested in developing pharmacists' clinical roles	45 (14.3)	127 (40.3)	143 (45.4)
Pharmacist prescribing will create confusion among the public as to the role of doctors and pharmacists	33 (10.5)	38 (12.1)	244 (77.5)
Pharmacist prescribing will increase the likelihood for prescribing errors	27 (8.6)	31 (9.8)	257 (81.6)
Pharmacist prescribing will reduce the quality of care the patient receives	20 (6.3)	9 (2.9)	286 (90.8)
Pharmacist prescribing will not be accepted by patients	7 (2.2)	11 (3.5)	297 (94.3)
Pharmacist prescribing will be more expensive for the patient	6 (1.9)	14 (4.4)	295 (93.7)

N=315; SA/A: Strongly agree/Agree; D/SD: Disagree/Strongly disagree

### 6.5.7 Analysis of textual data

Two optional open ended questions (question 17 and 50 in Appendix 15) were asked in this study. Respondents made comments on clinical pharmacy practice and the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria.

Generally, 151 (47.9%) respondents responded to 'Question 17' while 69 (21.9%) responded to 'Question 50'. The comments were short responses with an average word length of 36. The responses from both questions were collectively analysed. Analysis of the comments showed similar findings with that of the interviews held with Nigerian stakeholders in chapter 5, thereby confirming the qualitative findings.

Overall, respondents' comments revealed that clinical pharmacy practice in Nigeria is still in its infancy stage. Many respondents viewed it as an evolving practice whose development has been slow due to the lack of an enabling practice and policy environment.

*"Clinical pharmacy practice in Nigeria is at a low ebb probably because the environment is not enabling". R69, Community Pharmacist*

*"The systems and structures in place in Nigeria had not given adequate room for clinical pharmacy practice". R152, Hospital Pharmacist*

Respondents reported that in many hospital facilities, pharmacists' roles have been limited to dispensing and counselling of patients on their medicines. Many respondents viewed this as an underutilisation of their skills.

*"What we find pharmacists do is what we call 'two 3 times daily' which even an illiterate can do if shown how to do it." R55, Hospital Pharmacist*

*"Pharmacists in hospitals simply count drugs and do nothing more at the hospitals, their brains just waste away without proper use of it." R36, Public Health Pharmacist*

Respondents in their comments associated the underdevelopment of clinical pharmacy practice to a number of challenges. These challenges could be classified into internal factors which are pharmacy related including limited clinical education and pharmacists' attitude to clinical roles; and factors which are external to the pharmacy profession including opposition from the medical profession and policy barriers. Respondents perceived that these challenges could potentially serve as barriers to

granting prescribing authority to pharmacists in Nigeria. The themes that emerged from respondents' comments are presented in Table 6-6.

**Table 6-6: Themes and supporting quotes identified from the analysis of textual data**

<b>Theme</b>	<b>Description</b>	<b>Supporting quotes</b>
Limited clinical education (109 comments)	The current undergraduate training curriculum was viewed by many respondents as deficient in clinical component. According to respondents, this has resulted in the lack of confidence demonstrated by pharmacists in clinical settings. In addition, respondents reported that post-registration training with specialisation is needed to enhance clinical pharmacy practice. Respondents also noted that if pharmacists' roles are to be extended to include prescribing, additional training would be necessary.	<p><i>"The pharmacy curriculum does not give the pharmacist the opportunity to develop confidence to practice as a clinical pharmacist. Therefore there is need to review the curriculum."</i> R190, Hospital Pharmacist</p> <p><i>"Sadly, the training provided is not geared towards making pharmacists confident and competent in carrying out these clinical duties."</i> R21, Academic Pharmacist</p> <p><i>"Clinical pharmacy practice in Nigeria can be improved through the review of curriculum, introduction of residencies program for pharmacists which will allow for various specialisation"</i> P187, Academic Pharmacist</p>
Pharmacists' attitudes (21 comments)	Respondents mentioned that many pharmacists prefer to carry on with their existing role in dispensing rather than take on additional clinical roles. Respondents also mentioned that a number of pharmacists are only interested in the business aspect of pharmacy practice. Furthermore, younger pharmacists cited lack of support/mentorship from their older colleagues as possible barriers.	<p><i>"Many pharmacists are not ready for change. Hence, changing their routine practice is very difficult."</i> R28, Hospital Pharmacists</p> <p><i>"The younger pharmacist are more patient oriented while the older ones are more business oriented on their practice".</i> R12, Community Pharmacist</p> <p><i>"There is need for older colleagues to show more interest in mentoring younger colleagues".</i> R115, Hospital Pharmacist</p>
Inadequate numbers of pharmacists (10 comments)	Respondents reported that pharmacists are inadequate in number. As a result, they are unable to perform additional roles other than their traditional role of dispensing. They reported that this has slowed the development of pharmacists' role outside of the dispensary.	<p><i>"One major problem is inadequate staffing. A general hospital having between 10-12 doctors has probably 2 or 3 pharmacists. Therefore many pharmacists are not able to attend to in-patients."</i> R301, Hospital pharmacist</p> <p><i>"The number of pharmacists in the nation does not support additional role to be assigned to pharmacists because we are still battling to cope with dispensing and patient counselling."</i> R288, Hospital Pharmacist</p>

**Table 6-6: Themes and supporting quotes identified from the analysis of textual data continued.**

<b>Theme</b>	<b>Description</b>	<b>Supporting quotes</b>
Policy (37 comments)	Lack of appropriate policies to support the development of clinical pharmacy practice was commonly reported by respondents. Respondents felt that the current policy documents including the national drug policy and the pharmacists' license to practice, recognised pharmacists' roles as being product-based.	<p><i>"There are no government policies to encourage the clinical pharmacy practice." R173, Hospital Pharmacist</i></p> <p><i>"There is no government framework on the practice of clinical pharmacy especially at the primary and secondary levels of health care." R248, Hospital Pharmacist</i></p> <p><i>"The license to practice is more commercial than clinical, We are licensed to import, export, sell and distribute drugs. The only clinical aspect that has been introduced recently is 'to counsel patients'." R134, Academic Pharmacist</i></p>
Medical dominance (49 comments)	Medical doctors' control and influence on health policies, administrative structure of the health system and roles of other healthcare professionals were commonly reported. Respondents also commented on lack of collaboration between doctors and pharmacists in Nigeria and viewed this as a challenge to clinical pharmacy development. Overall, respondents reported that any role extension including pharmacist prescribing that would potentially challenge medical control would be resisted by medical doctors.	<p><i>"The doctors hold the political power as far as the health sector is concerned in Nigeria. The physicians have always antagonised all policies that tend to promote the growth of pharmacy profession." R290, Hospital Pharmacist</i></p> <p><i>"The obstacles to clinical pharmacy practice are largely due to lack of legislative backing and outright resistance (from doctors) to the changing roles of the clinical pharmacist from traditional dispensing to collaborative patient care." R67, Hospital Pharmacist</i></p> <p><i>"Medical doctors will do anything in their power to stop pharmacist prescribing so that they can maintain their control over us." R64, Hospital Pharmacist</i></p>

## 6.6 Study strengths and limitations

This is the first national survey that investigated pharmacists' views on the extension of their clinical roles to include prescribing in Nigeria. As mentioned earlier, the population in which the respondents of this survey were drawn was a biased one. Only members of the Facebook group of PSN were recruited which excluded Nigerian pharmacists who were not members of the group. This makes the findings of this study unlikely to be generalised. Despite this limitation, this study triangulated the qualitative findings in chapter 5. In addition, it provides valuable insight into the facilitators and barriers to developing pharmacists' clinical roles to include prescribing in Nigeria.

About 60% of those contacted for this survey did not participate in the study. This is likely to introduce a non-response bias in the findings of the survey. However, with respect to views on pharmacist prescribing, non-response bias is unlikely because of the highly supportive views for pharmacist prescribing recorded in this study (Hoti et al., 2010). This implies that a significant difference in the results obtained is unlikely.

## **6.7 Chapter summary**

This study was intended to further explore and confirm the qualitative findings reported in chapter 5. Overall, the findings of this survey confirm the results of the qualitative study in the last chapter thereby enhancing its validity.

The findings on clinical pharmacy practice in Nigeria revealed that the present undergraduate pharmacy curriculum does not produce confident pharmacists who are able to apply their knowledge in clinical settings. Also, the survey identified the need for a clinical career pathway for pharmacists, pharmacists' specialisation in practice, collaboration with medical doctors in practice, utilisation of pharmacy technicians in some traditional pharmacists' roles and adequate policies to support the development of clinical pharmacy practice. These findings reflect some of the key potential areas for change.

Generally, pharmacists showed a positive attitude towards pharmacist prescribing as the majority of them supported it and were willing to be prescribers. Many of those who were willing to be prescribers would prefer to prescribe in collaboration with doctors. However, many of these pharmacists who were willing to prescribers noted that they will need additional training in order to be prescribers. The training areas particularly identified were in the aspects of principles of differential diagnosis, pathophysiology of diseases and interpreting of laboratory results. These knowledge and skill gaps could be handled by training including mentorship under a medical prescriber as currently being practiced in the UK and New Zealand.

The major facilitators to pharmacist prescribing identified in this survey were linked to the potential benefits of pharmacist prescribing. These facilitators are increasing patients' access to care, better utilisation of pharmacists' skills, effective use of the limited human resources for health, reducing doctors' workload, cost-savings on healthcare budgets and legitimising prescription medicine supply. However, a number of barriers were identified. The commonly reported barriers were the resistance from medical doctors and pharmacists' inadequate skills in diagnosis. Other potential barriers also identified were shortage of pharmacists, pharmacists' lack of time, lack of

access to patients' clinical data, pharmacists' limited training in clinical assessment, poor working relationships with medical doctors and lack of government support. The narrative data from survey respondents also confirm these findings.

Therefore, in the next chapter, an integrated discussion will be carried out on the major findings of the three studies conducted in the entire research project. This discussion will form the basis of the overall conclusion and recommendations of the entire project work.

## Chapter 7: Discussion and conclusion

	Phase	Method	Product
Qualitative Phase	Qualitative Data collection 1	<ul style="list-style-type: none"> <li>32 semi-structured interviews with UK pharmacy staff</li> </ul>	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 1	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to UK's pharmacy structure</li> </ul>
	Connecting qualitative study 1 & 2	<ul style="list-style-type: none"> <li>Developing interview questions</li> </ul>	<ul style="list-style-type: none"> <li>Interview guide for qualitative study 2</li> </ul>
	Qualitative Data collection 2	49 semi-structured interviews with purposively sampled stakeholders	<ul style="list-style-type: none"> <li>Textual data (interview transcripts)</li> </ul>
	Qualitative data analysis 2	<ul style="list-style-type: none"> <li>Thematic analysis</li> </ul>	<ul style="list-style-type: none"> <li>Themes related to barriers &amp; facilitator to clinical role extension</li> </ul>
	Connecting qualitative & quantitative phases	<ul style="list-style-type: none"> <li>Developing research objective</li> <li>Developing survey items</li> </ul>	<ul style="list-style-type: none"> <li>Research objectives</li> <li>Questionnaire</li> </ul>
Quantitative Phase	Quantitative Data collection	<ul style="list-style-type: none"> <li>Cross-sectional web survey</li> </ul>	<ul style="list-style-type: none"> <li>Numeric data</li> </ul>
	Quantitative data analysis	<ul style="list-style-type: none"> <li>Univariate and multivariate analysis</li> </ul>	<ul style="list-style-type: none"> <li>Descriptive and inferential statistics</li> </ul>
	Integrating qualitative & quantitative results	<ul style="list-style-type: none"> <li><b>Interpretation and explanations of qualitative and quantitative results</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Discussions</b></li> <li><b>Implications for practice &amp; policy</b></li> <li><b>Future research</b></li> </ul>



## CHAPTER 7: DISCUSSION AND CONCLUSION

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### 7.1 Introduction

This final chapter presents an integrated discussion of the key findings of the three studies conducted as part of the mixed methods research presented in this thesis. The discussion will provide the basis for the conclusion and recommendations of this thesis.

The present chapter begins with a synopsis of the aim, objectives and key findings of this thesis. This is then followed by an integrated discussion of the key findings and the implications of the findings on the extension of pharmacists' clinical roles to include prescribing in Nigeria. The integrated discussion is structured around two broad headings: development of clinical pharmacy practice and the potential for pharmacist prescribing in Nigeria. Under each heading, discussions are made around key themes (see Figure 7-1 on page 227) that emerged from the empirical studies. For examples, in the heading considering the 'development of clinical pharmacy practice' key themes discussed were: government support through appropriate legislation and policies; education and training; pharmacy workforce shortages and utilisation of pharmacy technicians; career structure and specialisation and medical dominance and professional relationship with doctors. The discussion on pharmacist prescribing in Nigeria was organised into: views on pharmacist prescribing and facilitators and barriers to pharmacist prescribing.

The discussions on the above mentioned themes are then followed by the section on the strengths and limitations of the exploratory sequential mixed methods design used in this research. Furthermore, this chapter presents a conclusion and then makes policy, practice and research recommendations which addresses the final objective of this thesis:

- To make practice and policy recommendations for pharmacist prescribing in Nigeria.

### 7.2 Overview of thesis aim, objectives and key findings

The aim of this research is to investigate the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria. This aim was addressed through theoretical and empirical investigations. The theoretical component of the thesis was intended to:

- Review the barriers and facilitators to pharmacist prescribing in the UK

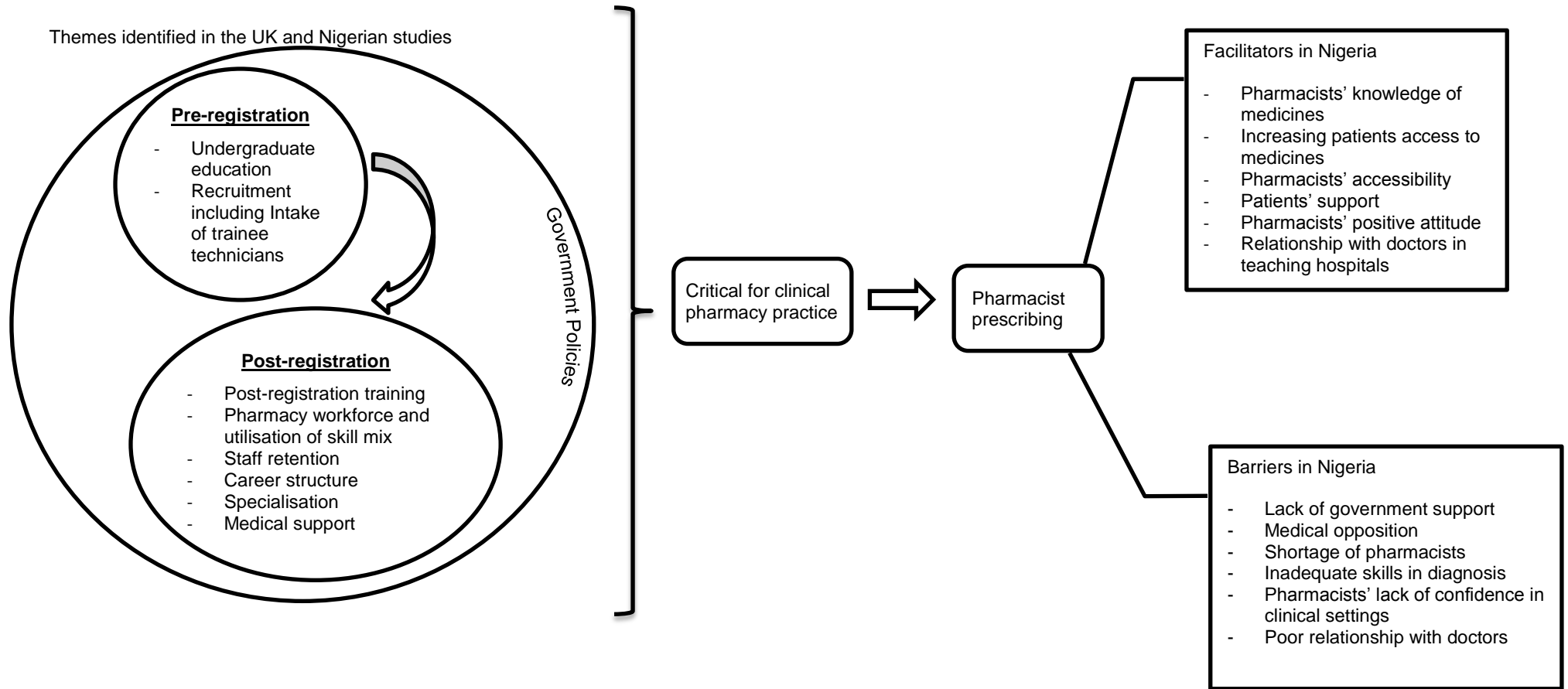
This was achieved through a scoping review of the literature. The detailed findings were presented in **chapter 2**. However, the review revealed that the available evidence on pharmacist prescribing is predominantly based on stakeholders' perceptions including patients, doctors and pharmacists. The key facilitators to pharmacist prescribing identified in the scoping review were legislation, pharmacists' education and training, pharmacists' clinical experience including specialisation in a clinical area prior to prescribing, pharmacists' willingness/motivation to be prescribers, relationship with the medical doctors, patients' acceptance, access to support from organisations, peers and medical mentors and team approach to prescribing. The scoping review also revealed that the shortage of medical doctors and community pharmacists' accessibility (even though there aren't many community pharmacists as prescribers) also facilitated the extension of prescribing authority to pharmacists in the UK. The barriers to pharmacist prescribing identified were often converse. Medical resistance to pharmacist prescribing was commonly reported, however, many of the barriers to pharmacist prescribing identified were mainly organisational including lack of organisational strategy for nonmedical prescribing, lack of funding and shortage of pharmacy staff.

The empirical component of the research employed a sequential mixed methods approach to:

- Investigate the changes in the structure of pharmacy practice in the UK prior to the introduction of pharmacist prescribing in order to identify lessons that might assist in the potential changes needed in Nigeria.
- Explore the views of stakeholders involved in prescribing and pharmacy practice about the barriers and facilitators to the extension of a prescribing role to pharmacists in Nigeria.
- Identify the potential changes that would be required in the structure of pharmacy practice for the development of pharmacist prescribing in Nigeria.

The findings of the three studies that comprised the mixed methods research have been described in detail in chapters 4, 5 and 6. Figure 7-1 overleaf represents the key issues that emerged from the research.

**Figure 7-1: Key issues that emerged from empirical research**



The findings in **chapter 4** linked the development of pharmacists' clinical roles including prescribing, to changes in the structure of pharmacy. Chapter 4 identified a shift in the focus of pharmacy training from purely scientific to a patient orientated one; positive attitudes of pharmacists towards extended clinical roles; specialisation in practice; a career route that recognised advanced pharmacy practitioners; enhanced working relationships with doctors; the development of pharmacy technicians to do some roles previously undertaken by pharmacists and supportive government policy environment as key factors that enabled change particularly in hospital pharmacy practice in the UK. Chapter 4 concluded by suggesting that changes in the traditional structure of pharmacy practice could benefit the development of pharmacists' clinical roles in Nigeria.

Hence, the qualitative interviews with Nigerian stakeholders reported in chapter 5, explored their views on the current structure of pharmacy practice and on making prescribing a part of the pharmacists' role in Nigeria. The results in **chapter 5** revealed an ongoing struggle by Nigerian pharmacists to establish their clinical identities as many non-pharmacy stakeholders viewed pharmacists' roles to be mainly supply-based. Barriers to the development of clinical pharmacy practice in Nigerian hospitals identified included pharmacists' lack of confidence, shortage of pharmacy staff, underutilisation of pharmacy technicians, lack of specialisation and clinical career structure for pharmacists, poor relationship with doctors, medical dominance and opposition, and lack of policies that support clinical pharmacy practice.

On the other hand, there were differences of opinions concerning pharmacist prescribing among Nigerian stakeholders interviewed. While many non-medical stakeholders including pharmacists and patient group representatives supported pharmacists prescribing in Nigeria, many medical doctors including those in policymaking positions were reluctant to do so. However, 'collaborative' prescribing where the doctor sets the limits and remains in overall charge of the patient was identified by many stakeholders including some doctors as an appropriate model for pharmacist prescribing in Nigeria. Many stakeholders considered the potential benefits associated with pharmacist prescribing, especially in increasing patients' access to medicines as a key facilitator to pharmacist prescribing in Nigeria. Other factors which stakeholders considered could facilitate pharmacist prescribing were pharmacist expert knowledge of medicines, pharmacists' positive attitude towards clinical roles, the current working relationship between doctors and pharmacists in some teaching hospitals and community pharmacists' accessibility and patients' reliance on them. Many potential barriers to pharmacist prescribing were identified. Notable among them

were medical resistance and pharmacists' inadequate skills in diagnosis. Other key barriers mentioned by stakeholders were shortage of pharmacists, lack of collaboration between doctors and pharmacists and lack of access to patients' medical records by community pharmacists.

The research then continued with **chapter 6**, which reported a cross-sectional survey of Nigerian pharmacists' views intended to confirm the findings of the qualitative interviews in chapter 5. Overall, the findings of the survey confirm the findings of the qualitative interviews. Similar to the Nigerian stakeholders' interviews, the pharmacists' survey identified the need for collaborative practice, specialisation in practice, a career pathway for clinical pharmacists, a change in pharmacy training to reflect a more patient orientated approach, and better utilisation of pharmacy technicians in Nigeria. The majority of pharmacists in the survey reported that the current separation of prescribing as the doctors' role and dispensing as the pharmacists' role in Nigeria is not in the best interest of the patient. Therefore, these pharmacists showed a positive attitude towards pharmacist prescribing and were willing to be prescribers. However, they indicated that they would need additional training particularly in the aspects of the principles of differential diagnosis, pathophysiology of diseases and interpretation of laboratory results in order to be prescribers. Similar to the findings of the qualitative interviews, collaborative prescribing was preferred over independent prescribing in the survey.

Furthermore, the results of the survey also revealed that the potential benefits associated with pharmacist prescribing including increasing patients' access to treatment and better utilisation of pharmacists' skills could facilitate pharmacist prescribing in Nigeria. Also resistance from the medical doctors and pharmacists' inadequate skills in diagnosis were perceived as the most likely barriers to be encountered and would need to be overcome. Other barriers reported in the survey also confirm those identified in the interviews including shortage of pharmacists and lack of government support.

### **7.3 Development of clinical pharmacy practice**

#### **7.3.1 Government support**

The interviews conducted in chapter 4 with pharmacists and pharmacy technicians in the UK indicated that government support through appropriate legislations and policies were instrumental in the development of pharmacists' clinical roles. As mentioned in previous chapters, pharmacists in the UK were able to take on a prescribing role as a

result of the legislative change contained in the Health and Social Care Act 2001. Other research reports including Penm et al. (2015a) and Gastelurrutia et al. (2009) have identified support from government or healthcare authorities as a key facilitator to the development of clinical pharmacy practice in hospital and community pharmacies. In China for instance, recent reports have shown that the development of hospital pharmacists' clinical roles have been supported by the new policies made by the Ministry of Health (Penm et al., 2015a, Penm et al., 2014). These policies included those relating to the establishment of a drugs and therapeutics committee and the employment of clinical pharmacists in hospitals (Penm et al., 2014).

Although, the Nigerian Drug Policy states that the government shall promote the practice and development of clinical pharmacy in hospitals in order to enhance patient care (FMoH and WHO, 2005), there has been no strategic follow-up by government to this commitment. The findings from the interviews and survey conducted with Nigerian participants in chapters 5 and 6 indicated that government support towards the development of clinical pharmacy practice is lacking. In the cross-sectional survey conducted, the majority (85.0%) of pharmacists who participated were either unsure or disagreed that there were policies in place in Nigeria that support the development of clinical pharmacy practice. This was because the available policy documents including the National Drug Policy recognised pharmacists' role to be mainly supply-based (FMoH and WHO, 2005). In addition, the Nigerian government has been slow to implement changes that would enhance the development of clinical pharmacy practice. For example, despite government's assurance in 2005 to reclassify the medicines in Nigeria into three categories: prescription only, pharmacy only and general sale medicines to enable pharmacists supply the 'Pharmacy only' medicines without a prescription (FMoH and WHO, 2005), this is yet to be actualised.

In the UK, a number of factors facilitated government support for extended clinical roles including improving patients' access to medicines, utilisation of pharmacists' skills, cost saving on medicines budgets and cost effective use of available human resources (Department of Health, 1999). Therefore these drivers could be used by pharmacists in Nigeria to advocate for government support for extended roles.

### **7.3.2 Education and training**

Research evidence from chapter 4 suggested that the development of credible practitioners was essential to achieve change in pharmacy practice. This depends on the robustness of training received by pharmacists. Pharmacy training particularly at undergraduate level is evolving to meet the challenges of healthcare provision in

hospital and community pharmacy settings. Even in countries where pharmacists' roles have been expanded considerably, the undergraduate curriculum is constantly being reviewed in order to prepare pharmacists for future roles (Smith and Darracott, 2011, Canadian Pharmacists Association, 2011). For example, in the UK, the undergraduate pharmacy curriculum has been restructured to include more clinical components and practice-based learning. Procedures are on the way to integrate more fully the pre-registration year into the undergraduate programme (Smith and Darracott, 2011). The reasoning behind this is to produce more competent pharmacists able to apply their knowledge and skills in clinical settings upon graduation.

The research evidence from the Nigerian studies reported in Chapters 5 and 6 indicated that the present undergraduate pharmacy programme in Nigeria does not produce confident pharmacists who are able to apply their knowledge in clinical settings. Even though the curriculum of the undergraduate pharmacy programme in Nigeria has changed significantly (Udeogaranya et al., 2009, Alo, 2006), the clinical components of the present curriculum in many pharmacy institutions is insufficient for clinical pharmacy practice. In addition, experiential learning through clinical rotations which will potentially enhance pharmacists' clinical skills and confidence in clinical settings is inadequate (Udeogaranya et al., 2009). In the undergraduate training curriculum of many pharmacy institutions in Nigeria, clinical pharmacy rotations are usually carried out in the final year of the undergraduate programme. These clinical rotations only account for about 10% of the final year curriculum (NUC, 2007). Furthermore, when students are involved in clinical rotations, they are usually conducted in settings where clinical pharmacy services are yet to be fully developed, which limits students' practice-based learning experience (Udeogaranya et al., 2009). Therefore, to enhance pharmacists' confidence, the current training curriculum needs to incorporate more clinical contents with practice based learning conducted at sites where clinical pharmacy services are offered. However, finding appropriate training sites will continue to be a challenge as long as pharmacists' roles in many hospital settings remain underdeveloped.

Another factor that could account for the lack of confidence seen among pharmacists in clinical settings in Nigeria could be the absence of a national framework to evaluate the skills and competencies of those entering into the profession. Unlike the UK, there is currently no pre-registration assessment for pharmacists (PCN, 2014a). New graduates enter into the profession after a year of pre-registration training in an accredited centre. At the end of the training programme, these graduates are issued a 'certificate of experience' as evidence of experience with a registered pharmacist which is a pre-

requisite for application to register as a pharmacist in Nigeria (PCN, 2014a). Even though the pre-registration training centres are accredited by the PCN, the potential for variation in training among the various training centres is high. Therefore a national pre-registration assessment is essential to ensure that pharmacists achieve minimum competences standard before entering into the profession.

Furthermore, the research evidence from chapter 4 showed that practice-based postgraduate clinical pharmacy programmes are essential in enhancing pharmacists' clinical skills and confidence in clinical settings. Many researchers have argued that these programmes provide a specialised level of training that cannot be achieved within the undergraduate pharmacy programme (Jungnickel et al., 2009, Leiker et al., 2009, Murphy et al., 2006). This is because the undergraduate pharmacy programme prepares pharmacists for practice in diverse kind of settings including the industry. Therefore, it cannot achieve the level of depth needed for independent practice in patient care settings (Jungnickel et al., 2009). Hence many countries including the UK and US have taken up post-registration clinical pharmacy training in order to prepare pharmacists' for specialised roles in clinical settings (Leiker et al., 2009). In addition, post-registration clinical training is increasingly becoming a pre-requisite for advanced clinical practice in hospitals in many countries, including the UK, Portugal and Spain (Van Mil and Schulz, 2006).

In Nigeria, masters of clinical pharmacy programmes are available in some Universities (Ogaji and Ojabo, 2014). However, these programmes are largely theoretical with little practice based learning. More recently, the West African Postgraduate College of Pharmacists (WAPCP) has played a significant role in the postgraduate training of pharmacists in clinical pharmacy. WAPCP was established by the West African Pharmaceutical Federation in 1991 to prepare pharmacists in the West African region including Nigeria for expanded roles (WAPCP, 2013). The clinical pharmacy programme of the WAPCP is a distance learning programme of 4 years duration incorporating two cycles of update lectures annually (WAPCP, 2012b). Since its inception, at least 300 Nigerian pharmacists have completed the WAPCP clinical pharmacy programme (WAPCP, 2012a). In 2014, a residency component was introduced into the programme with some of the graduates of the programme serving as preceptors at practice site (WAPCP, 2014). However, the effectiveness of the residency programme would largely depend on the development of clinical pharmacy services at the selected practice sites of the residents. Nevertheless, pharmacists' accounts in the qualitative interviews in chapter 5 indicated that the WAPCP programme is a key driver in the development of pharmacists' clinical skills in Nigeria.



Many pharmacists argued that the graduates of this college are better positioned for extended clinical roles. In addition, the WAPCP programme appears to be more popular among pharmacists than university-based postgraduate programmes because of its flexibility. Pharmacists are able to participate in this programme from their practice settings. Overall, this programme appears to have more potential than the present university-based masters' programmes in preparing hospital and community pharmacists for potential clinical roles in Nigeria. However, further evaluation of this programme is necessary to confirm this claim and to investigate how the present WAPCP programme is meeting the training needs of pharmacists in patient care settings.

Similarly, the present training curriculum for pharmacy technicians outlined by the Pharmacists' Council of Nigeria (PCN, 2004), seems sufficient to enable them carry out routine manual tasks associated with dispensing including selection, assembling and labelling of medicines as would be discussed in section 7.3.3. However, additional post-registration training would be needed to enable technicians to take on other advanced roles including accuracy checking.

### **7.3.3 Pharmacy workforce shortages and utilisation of pharmacy technicians**

An important barrier to the development of clinical pharmacy practice in Nigeria is the shortage of pharmacists. This was identified in the two studies conducted with Nigerian participants. For instance, in the cross-sectional survey conducted, about 70% of respondents reported that there are inadequate numbers of pharmacists in the country to take on additional clinical roles. In addition, slightly more than half of the respondents reported that pharmacists lacked time to take on additional roles. Other research reports from Nigeria have also highlighted the shortage of pharmacists as a barrier to providing pharmaceutical care (Oparah and Eferakeya, 2005, Erah and Nwazuo, 2002). This is unsurprising considering the ratio of pharmacists to the population of Nigeria. As mentioned earlier in chapter 5, there are about 17,000 pharmacists in Nigeria which represents about 10 pharmacists to 100,000 people (PCN, 2014b), compared to the UK with about 49,000 practising pharmacists (78 per 100,000 people) (OECD, 2013). Besides, the pharmacists currently practising in Nigeria are far less than this quoted figure. This is because the 17,000 available pharmacists include non-practising pharmacists and those who have migrated. For instance, only 7,584 pharmacists have applied for and were licensed to practice in 2014 by the Pharmacists Council of Nigeria (PCN, 2014c). Since adequate pharmacy staffing has been identified as a facilitator to the development of clinical pharmacy

practice (Penm et al., 2015b, Bond et al., 2004, Bond et al., 1999), this shortage of pharmacists is a barrier to the delivery of clinical pharmacy services in Nigeria and must be addressed.

Key factors responsible for pharmacists' shortage in Nigeria are: insufficient supply of pharmacists by training institutions; movement of pharmacists into other sectors such as marketing and non-governmental organisations where remuneration and conditions of service are better; and migration of pharmacists to other countries (Ubaka et al., 2013, Federal Republic of Nigeria, 2007). There are currently 16 accredited pharmacy training institutions in Nigeria (PCN, 2012). These institutions are unable to meet the supply demand for pharmacists. The expansion of the current training institutions has been hindered by inadequate facilities and academic staff to train pharmacists among other things. Therefore, this acute shortage of pharmacists is likely to continue unless the issues highlighted above are addressed.

The classical response to pharmacists shortages is to increase the production of new pharmacists by increasing the number of pharmacists training institutions or student intake; or to increase the utilisation of pharmacists' support staff in order to free up pharmacists for advanced roles (Cooksey et al., 2002). Both strategies have been recommended and implemented in response to pharmacists shortages in many advanced countries including Australia, UK and the USA (Anderson et al., 2009). However, increasing the production of new pharmacists does not present a short term feasible option for Nigeria in view of the constraints discussed. In addition, it will take a minimum of five years (following initial plan to increase pharmacists' numbers) to produce new pharmacy graduates since pharmacy programmes last for a minimum of 5 years in Nigeria. Therefore, increasing the utilisation of the current pharmacy technicians' workforce represents an immediate solution with long term benefits for Nigeria.

As revealed in the UK study reported in chapter 4, utilising trained pharmacy technicians in the dispensing process including accuracy checks of dispensed items could do a lot in freeing up pharmacists for extended clinical roles. Furthermore, available international evidence supports the pharmacy technicians' role in dispensing. A prospective study conducted in three large hospitals in Washington State shows no difference between pharmacists' and trained pharmacy technicians' accuracy checks of dispensed medicines (Ness et al., 1994).

However, the interviews held with Nigerian stakeholders reported in Chapter 6 reveals that there are no clear job descriptions for pharmacy technicians. Therefore, their

utilisation in many Nigerian hospitals is dependent on the availability of pharmacists and the discretion of their supervising pharmacists. For example, in teaching hospitals where there are relatively adequate numbers of pharmacists, they serve as 'assistants' providing support to pharmacists. Their role could range from arranging medicines on shelves to counting or packaging of medicines for dispensing. The interviews with Nigerian stakeholders suggest that in many cases, the physical aspects of dispensing including selection, assembling and labelling of medicines are typically done by pharmacists in these hospitals.

Generally, dispensing of medicines in many Nigerian hospitals usually consists of a series of steps. This process begins with validation of prescriber's and patient's information following the receipt of a prescription. After which, the prescription is clinically validated. This is then followed by the selection, assembling and labelling and entering of labelled medicine items into a register. The final phase of the dispensing process involves accuracy checking, packaging and delivery of the medicines to patients. Patient counselling is usually done at the point of the delivery.

The active involvement of pharmacists in all of these stages account for why they are usually tied to the dispensary. Thus, utilising pharmacy technicians in the physical aspects of dispensing following the clinical check of prescription including selection, assembling, labelling and accuracy checks of final dispensed medicines would free pharmacists' up to do more clinical role in Nigeria.

However, for technicians' roles to be considerably expanded to include accuracy checks of final dispensed medicines, additional training and accreditation as currently done in the UK would be needed. The interviews held with Nigerian pharmacy technicians indicated that many pharmacy technicians were happy to be further trained to enable them take on some of the traditional roles of pharmacists including dispensing. Therefore, such positive attitude shown by technicians presents an opportunity to take advantage of in order to enhance clinical pharmacy practice in Nigeria.

Nevertheless, some participants in the qualitative interviews in chapter 5 reported that there are inadequate pharmacy technicians in Nigeria. As mentioned earlier, reliable data on the number of pharmacy technicians in Nigeria is lacking because their registration with the Pharmacists' council has not yet been made mandatory for practice. Some Nigerian participants in the qualitative interviews attributed the current shortage of pharmacy technicians to restrictions by the Pharmacists' council on the intake of trainee pharmacy technicians. There are at least 27 pharmacy technicians'

training institutions in Nigeria (PCN, 2004). The Pharmacists' council has restricted the number of trainee intake in each institution to 15 annually (PCN, 2004). Anecdotal evidence has shown that this number is below the training capacity of many of these institutions. Therefore, this restriction could be an attempt by pharmacists to maintain their dominance over the 'pharmacy territory' by maintaining a specific ratio of pharmacists to pharmacy technicians. But as seen in the UK study, pharmacy technicians are needed to release pharmacists for extended roles. Therefore, not having sufficient pharmacy support staff could impede pharmacists' role extension.

#### **7.3.4 Career structure and specialisation**

The findings from the UK study conducted revealed that the opportunity to specialise and move up the career ladder through a clinical career pathway rather than management were significant drivers to the changes in hospital pharmacy practice. These findings necessitated the investigation of the present career structure of hospital pharmacists in Nigeria. The interviews with Nigerian stakeholders revealed that the present career structure consist of a single career route for pharmacists which becomes increasingly managerial as one progresses up the career ladder. In addition, progression across the career ladder is largely based on practitioners' years of practice rather than competencies developed. Therefore, many Nigerian stakeholders appreciated the inability of this career structure to support the development of clinical pharmacy practice. This is because experienced clinical pharmacists are often lost to management posts as they move up the career ladder. Therefore almost all (98.4%) pharmacists who participated in the cross-sectional survey in chapter 6 indicated that a clinical career structure should be created for clinical pharmacists. As in the UK, this will make pharmacists aspirational and motivate them to develop clinical competencies that are appropriate for advanced practice. In addition, it also promotes the retention of experienced clinical staff who desire to use their expertise to enhance patient care rather than move into managerial roles where their clinical expertise would be untapped.

The UK study in chapter 4 and others including Marriott et al. (2008) suggest that specialisation is supported by a clinical career route. For instance, Marriott et al. (2008) reported that the introduction of the senior clinical positions in hospital pharmacy practice in Australia resulted in the development of more specialised clinical practice. Specialist as opposed to generalist practice is essential to enhance pharmacists' contribution to patient care considering that pharmacists will have to work with other specialists in multidisciplinary teams. In addition, the complex nature of diseases and

medicines makes it increasingly difficult for a pharmacist to expertly address all medication related issues in all categories of patients in all care settings including community, hospital and mental health settings (Jungnickel et al., 2009). This makes specialisation imperative in order to enhance patient care. Other disciplines such as medicine and nursing have in time past realised this (Storey et al., 2011). However, in pharmacy, specialisation is yet to be widely adopted in many countries.

Although studies comparing the relative impact of specialist and non-specialist pharmacists in patient care are lacking, a systematic review conducted to assess the impact of care provided to cancer patients by specialists and non-specialist clinicians showed that the patients receiving specialists' care had better health outcomes including reduced mortality rate than those receiving care from non-specialists (Grilli et al., 1998). Hence, pharmacists' specialisation is likely to have a similar impact on patient care. A few studies including Leape et al. (Leape et al., 1999) have revealed that pharmacists' contribution in patient care including drug therapy interventions is enhanced when an experienced pharmacist specifically works with a specialist team as opposed to a generalist.

The need for pharmacists' specialisation in Nigeria was underscored by many participants including pharmacists and doctors in the qualitative interviews conducted with Nigerian stakeholders. In addition, nearly all pharmacists in the Nigerian survey supported pharmacists' specialisation in different clinical areas. Specialisation in practice is easily achievable if practice-based post-registration trainings such as residency training programmes are available (Storey et al., 2011, Bright et al., 2010, Jungnickel et al., 2009). This will enable pharmacists to develop specialised skills in specific clinical areas. The residency components of the WAPCP programme mentioned earlier can be used to facilitate specialisation within clinical areas. However, the specialisation of pharmacists' into different clinical areas would take pharmacists away from general functions. This would potentially impact negatively on the number of pharmacists that are available for generalist roles and worsen the present shortage of pharmacists in Nigerian hospitals. Therefore, a more flexible and practical approach to specialisation is needed in Nigeria. In the interim, the training of advanced generalist practitioners with additional specialist skills should be explored. This would allow pharmacists to be useful in both generalist and specialist areas of their interest.

Therefore, this thesis proposes the Pharmacist with Special Interests (PhwSIs) model that is similar to that of the UK, as an interim route to pharmacists' specialisation in Nigeria. In the UK, PhwSIs are generalist pharmacist practitioners who supplement

their core generalist role by delivering additional specialist role (Department of Health, 2006a). Their accreditation is based on a number of competency clusters including expert skills and knowledge in a defined specialist area (Department of Health, 2006a). Although, PhwSI work in primary care settings in the UK, this can be adopted in Nigerian hospitals. Post-registration training incorporating both theoretical and practical components can be designed for pharmacists entering into hospital practice to enable them to develop core advanced generalist and specialist skills in a defined clinical area. This training programme should be designed based on a specific competency framework that would be used to assess practitioners at the end of the training.

### **7.3.5 Medical dominance and professional relationship with doctors**

Medical dominance and poor professional relationships with doctors were commonly reported by Nigerian stakeholders including doctors and pharmacists as barriers to the development of clinical pharmacy practice in Nigeria. In Nigerian hospitals, doctors control the boundaries of the professional work of other healthcare professionals because they are perceived to have the prime responsibility of patient care. Therefore, they define the role played by other healthcare professionals in patient care. Hence, pharmacists' direct involvement in patient care has always been viewed by Nigerian doctors as an encroachment into their professional boundary and has often times been resisted (Erah, 2003).

Chapter 4 revealed that establishing professional relationships with doctors led to doctors' support for clinical pharmacy practice in the UK. For instance, the UK interviews revealed that doctors who had good rapport with pharmacists were instrumental in recommending pharmacists to their colleagues. On the contrary, the two Nigerian studies conducted revealed a poor professional working relationship between doctors and pharmacists in many practice settings. In the survey conducted, less than a third (28.3%) of respondents agreed that a close professional relationship existed between pharmacists and doctors in Nigeria, while the remaining were either unsure (10.2%) or disagreed (61.6%). This poor professional relationship may account for lack of doctors' support for clinical pharmacy practice. Hence, collaborative working relationships between doctors and pharmacists are needed for the development of clinical pharmacy practice including prescribing in Nigeria. This view was supported by nearly all (96.2%) of the pharmacists who participated in the survey.

Zillich et al. (2004) suggested that collaborative working relationship with doctors can be initiated by establishing communication with doctors through the development of services that improve doctors' care of the patient (Zillich et al., 2004). This will involve

identifying a gap in doctors' practice where pharmacists can fill in positively. For example, the development of drug information services by UK pharmacists in the late 1960s and later ward pharmacy services following the increasing number of medicines available in clinical practice, established communication between doctors and pharmacists. Doctors were relying on pharmacists for medicines information in order to be up-to-date with new medicines and minimise prescribing errors. This service added value to doctors' roles by enhancing their care of the patient and established a collaborative working relationship.

Furthermore, many authors have argued that doctors with positive experience of clinical pharmacists are usually supportive of clinical pharmacy practice (Adamcik et al., 1986, Ritchey and Raney, 1981). As seen in chapter 4, doctors' trust and commitment to work with pharmacists further developed in the UK as pharmacists established themselves as reliable practitioners through the demonstration of their knowledge, clinical skills and contribution to patient care. Therefore, Nigerian pharmacists must seek to identify areas where they can make positive contributions that will enhance doctors' care of the patient and ultimately result in better communication and closer working relationship between them and doctors.

Working in collaboration with other healthcare professionals requires the knowledge of each other's roles (Jungnickel et al., 2009). Many authors have argued that collaboration between healthcare professionals increases as they become aware of each other's knowledge and skills (Zwarenstein et al., 2009, O'Daniel and Rosenstein, 2008). Therefore, inter-professional education has been suggested as a means of promoting inter-professional understanding among healthcare professionals (Zwarenstein et al., 2009). In Nigeria, pharmacy and medical students are trained in isolation from one another (uni-professional education) as it is largely done in the UK. This form of learning may account for the stereotype views held by doctors concerning pharmacists' role in patient care during the qualitative interviews conducted with Nigerian stakeholders. Therefore, joint learning sessions within undergraduate programmes would help to promote understanding of the roles of both professionals in patient care. Learning sessions such as joint therapeutics teaching sessions between medical and pharmacy students as reported by Greene et al. (1996) could be beneficial. For instance, the Kings College, London has developed a number of inter-professional training opportunities for undergraduate students of medicine and other health sciences to enhance inter-professional collaboration in practice (Kings College, 2015). For example, the 'Keeping Patients Safe from Medication Errors' workshop of the university gives final year students of medicine, nursing, midwifery and pharmacy

the opportunity to learn medication management together and that could enhance collaborative practice in medication management in practice.

Other measures that could foster inter-professional relationships between pharmacists and doctors include providing opportunities for pre-registration pharmacists to work with doctors during internship training; organising joint continuing education events or clinical meetings; and having policies/legislations that would enhance collaborative practice (Van et al., 2012). For example, in Ontario, Canada, a legislative amendment, the *Regulated Health Professions Statute Law Amendment Act, 2009* was introduced to support inter-professional collaborations between healthcare professionals (Government of Ontario, 2009). This legislation mandated regulatory colleges to work collaboratively with each other to foster collaborative practice (Government of Ontario, 2009). This form of legislation could be beneficial in Nigeria.

Also, the relative isolation of many hospital and community pharmacists from other healthcare professionals as revealed in the qualitative interviews in chapter 5 also contributes to their poor professional relationships with doctors. However, participants in the Nigerian qualitative interviews noted that in some teaching hospitals where pharmacists have expanded their roles beyond the dispensary, a good professional relationship exists between pharmacists and doctors.

## **7.4 The potential for pharmacist prescribing in Nigeria**

### **7.4.1 Views on pharmacist prescribing**

Interviews with Nigerian stakeholders showed a split of opinion between participants who were medical doctors and others. While many non-medical stakeholders interviewed including pharmacists and patient group representatives supported an extended role for pharmacists in prescribing, many medical doctors including those in policy making were reluctant to do so.

Many medical doctors in the qualitative interviews conducted were unsupportive of pharmacist prescribing because prescribing in Nigeria is mainly under their jurisdiction. Therefore many doctors viewed pharmacist prescribing as an encroachment into medical territory and a challenge to medical dominance. This finding is unsurprising because similar attitudes were shown by medical doctors in other countries including South Africa and Canada where pharmacists have attempted to expand their roles to include prescribing (Kondro, 2007, Gilbert, 1998). Doctors in these countries responded in such a way to protect their professional territory from encroachment (Kondro, 2007, Gilbert, 1998). The general behaviour of medical doctors could be



explained by the sociological theory that posit that prescribing is a core role that confers clinical autonomy to medical doctors and also grants them control over the role of other healthcare professionals (Britten, 2001, Eaton and Webb, 1979). For example, a pharmacist's role of dispensing is dependent on an instruction (prescription) from a doctor. This therefore puts the medical doctor in control of the work sphere of the pharmacist (Eaton and Webb, 1979). Hence, the fear of the loss of this control could account for doctors' non-support for pharmacist prescribing.

On the other hand, many Nigerian pharmacists' interviewed supported pharmacist prescribing. Pharmacist support was further demonstrated in the survey conducted where 97.1% of the 315 Nigerian pharmacists who participated reported that they should be given the authority to prescribe medicines. In addition, nearly all (96.4%) those who supported pharmacist prescribing were willing to be prescribers. These findings are similar to those reported by Hoti et al. (2010), where 83.9% of the 2592 Australian pharmacists who participated in a survey were in favour of a prescribing authority being extended to them. The strong support for pharmacist prescribing is unsurprising in view of pharmacists' aspirations for better utilisation of their skills and enhanced clinical autonomy in their practice (Buckley et al., 2006). These desires are believed to be achievable within the scope of practice of the pharmacist prescriber (McCann et al., 2011, Stewart et al., 2009a). Therefore, such perception would have influenced pharmacists' support for prescribing.

Furthermore, many pharmacists interviewed including those who are policymakers considered prescribing to be a logical role for pharmacists considering pharmacists' knowledge in therapeutics which they considered essential for prescribing. In addition, they also argued that pharmacists are more knowledgeable in clinical pharmacology and pathology of diseases than nurses and community health workers who are currently allowed to prescribe medicines for certain conditions in facilities where there are no doctors. However, prescribing is a complex process that encompasses identifying patients' problems, specifying treatment objectives, determining the safe and cost-effective treatment and instituting and monitoring of patients' therapy (De Vries et al., 1994). These processes involve the use of the prescribers' knowledge and skills in diagnosis and therapeutics to make informed clinical decisions concerning patients' therapy (Nissen, 2011). Unlike the medical practitioners' training, pharmacists' basic training is limited in clinical assessment and diagnosis. Therefore, many participants identified pharmacists' limited skills in diagnosis as a potential barrier to pharmacist prescribing in Nigeria. However, in many countries where pharmacists are legally allowed to prescribe including the UK and New Zealand additional training is

provided to prepare pharmacists for prescribing (Stewart et al., 2012, Nissen, 2011). The training incorporates applied therapeutics and differential diagnosis; and a period of learning in practice under a medical mentor (Stewart et al., 2012). In addition, these countries implemented collaborative or supplementary forms of prescribing initially which do not require the pharmacist to make diagnostic decisions. Therefore, a collaborative form of prescribing as suggested by Nigerian participants (in both the interviews and survey) would be good for initial implementation in Nigeria. This form of prescribing would appeal to doctors as the diagnosis and initial treatment decisions remain with the medical prescriber (Nissen, 2011). Also, certain benefits are likely to be associated with a collaborative prescribing in Nigeria. It will foster collaboration between doctors and pharmacists and provide the prescribing pharmacist with the opportunity to learn from the medical prescriber, especially in the aspects of diagnosis. The experience gained could be instrumental if independent prescribing is subsequently implemented. In addition, collaborative prescribing will overcome the problem of pharmacists' access to patient clinical records which was viewed by 66% of the survey respondents as a potential barrier to pharmacist prescribing.

However, collaborative prescribing is more likely to be successful within hospital settings in the Nigerian context. Unlike hospital pharmacists, there is currently no system in place to foster collaborative working relationships between doctors and community pharmacists. In addition, community pharmacists have no access to patients' medical records maintained by hospitals. As a result, these factors are likely to present a challenge to community pharmacist collaborative prescribing.

Therefore, a model likely to be successful in Nigerian community pharmacies is a limited form of independent prescribing using approved formularies or standard treatment guidelines for minor conditions. This was the type of prescribing model community pharmacists were authorised to do in South Africa (Ward et al., 2014). As mentioned earlier in chapter 2, these pharmacists were licensed to independently diagnose and prescribe for disease conditions listed in the South Africa's Primary Health Care Essential Medicine List and Standard Treatment Guidelines (SAPC, 2011). Community pharmacists are found in many communities including those underserved with health facilities in Nigeria (Auta et al., 2014b). Previous studies in Nigeria have advocated policy change to allow community pharmacists to treat minor disease conditions in Nigeria (Auta et al., 2014b, Oparah and Arigbe-Osula, 2002). Hence, utilising community pharmacists to provide primary healthcare in a similar manner to South Africa, offers an opportunity to increase patients access to care particularly in communities underserved by primary health centres. It also offers the opportunity to

revitalise the current primary health care system in Nigeria which has been described as ineffective, and could serve as an incentive for community pharmacies presence in rural areas (WHO, 2015, Ward et al., 2014). Nevertheless, additional training would be needed to prepare community pharmacists to independently diagnose and treat disease conditions using standard treatment guidelines at the primary healthcare level.

Furthermore, almost all pharmacists (96.6%) who reported that they were willing to be prescribers in the survey stated that they will need additional training to be prescribers. The perceived areas of most training needs were in the principles of differential diagnosis, pathophysiology of diseases and interpretation of laboratory results, although much of these could be included on the undergraduate courses. These findings further confirm respondents' concerns of pharmacists' inadequate skills in diagnosis and clinical assessment as potential barriers to pharmacist prescribing in Nigeria. In addition, the findings of this study were similar to those of Hoti et al. (2014) where Australian pharmacists identified the pathophysiology of diseases, principles of diagnosis and patient assessment and monitoring as their most preferred areas of training needs. As mentioned previously, pharmacists intending to be prescribers in many countries are required to undergo additional training to enhance their competence in prescribing. Although training requirements vary across countries, the UK training model appears to be better established than others and has been evaluated for its appropriateness in meeting the training needs of prescribers. Many supplementary and independent pharmacist prescribers in the UK have reported that the prescribing courses they attended provided them with relevant knowledge and skills for their roles. In addition, the period of learning and practice under a medical prescriber was highly appreciated (Latter et al., 2010, Cooper et al., 2008d). The UK training curriculum for non-medical prescribers is based on the National Prescribing Centre's (NPC) prescribing competencies framework (Brown, 2014, NPC, 2012). This is a single framework that ensures that all prescribers irrespective of their professional background develop comparable set of competencies (NPC, 2012). A similar competencies framework has been developed for Australian prescribers (NPS, 2012). Developing similar competencies framework and using it to inform the training of prescribers in Nigeria would be beneficial. Such competencies framework would ensure that all prescribers in Nigeria attain a minimum level of competency in which they can safely and competently prescribe medicines within their jurisdiction.

#### **7.4.2 Potential facilitators and barriers to pharmacist prescribing**

As mentioned earlier in section 7.2 many potential facilitators and barriers to pharmacist prescribing were identified in the two studies conducted with Nigerian participants. The potential facilitators mentioned earlier were the potential benefits associated with pharmacist prescribing especially in increasing access to treatment, the perceived pharmacists' expert knowledge of medicines, pharmacists' willingness to be prescribers, the current working relationship between doctors and pharmacists in some teaching hospitals and community pharmacists' accessibility and patients' reliance on them. The potential barriers to pharmacist prescribing identified were medical resistance, pharmacists' inadequate skills in diagnosis, shortage of pharmacists, lack of collaboration between doctors and pharmacists, lack of access to patients' medical records by community pharmacists and a perceived lack of political will from government to drive the pharmacist prescribing agenda. These facilitators and barriers are similar to those identified in other countries including the UK as demonstrated in the review chapter of this thesis.

Many of the Nigerian stakeholders interviewed perceived that the potential benefits associated with pharmacist prescribing could facilitate it happening in Nigeria. Patient group representatives were very supportive of a prescribing authority for pharmacists because they perceived it would promote quick and convenient access to treatment. Other stakeholders including medical doctors and policymakers also acknowledged that pharmacist prescribing could potentially increase patients' access to treatment in Nigeria. Furthermore, nearly all the survey respondents (97.8%) acknowledged this benefit. Increasing patients' access to medicines while maintaining patient safety has primarily been one of the key policy objectives of non-medical prescribing including pharmacist prescribing in countries where it has been introduced including the UK and Canada (Alberta College of Pharmacists, 2007a, Department of Health, 2005b). As pointed out in chapter 2, patients in some studies in the UK have reported an increase in patients' access to care including perceived reduction in appointment delays as a result of non-medical prescribing (Courtenay et al., 2011b, Stewart et al., 2009a). This would be of great benefit to patients in Nigeria. For example, about 110 million malaria cases are clinically diagnosed annually in Nigeria and uncomplicated malaria accounts for about two-thirds of outpatient visits in hospitals (NPC and ICF MACRO, 2009). As mentioned in chapter one, more than 50% of out-patients wait for between one to three hours to see a doctor as a result of the shortage of medical prescribers (Ogunfowokan and Mora, 2012, Umar et al., 2011, Ajayi, 2002). Therefore, authorizing pharmacists to prescribe for these uncomplicated cases of malaria could provide prompt access to

malaria treatment. In addition, it could potentially reduce doctors' workload even though research evidence demonstrating this claim is still lacking as identified in chapter 2. However, it is logical to assert that an extra pair of hands would be of immense help to an already overburdened medical practitioner particularly in relieving the medical practitioner to concentrate on other, more complex tasks.

Historically, role extensions in healthcare including the extension of prescribing authority have also been centred on increasing the utilisation of the skills of healthcare professionals (Bright et al., 2010). In many occasions, healthcare professionals advocate for role extension following the acquisition of additional skills (PCNZ, 2007). Therefore, it is unsurprising that many pharmacists in both the qualitative interviews and survey conducted, considered promoting the utilisation of their skills as a potential driver for pharmacist prescribing in Nigeria. This is particularly important given recent advances in pharmacists' education and training such as the clinical pharmacy programme of the WAPCP whose goal is to prepare pharmacists for future roles. Notwithstanding, many pharmacists in the qualitative interviews and comments offered in the survey questionnaire acknowledged the need for additional training as a prerequisite for prescribing.

Other potential benefits of pharmacist prescribing which Nigerian participants thought could facilitate the extension of prescribing authority to pharmacists were its likelihood to legitimise the supply of medicines and reduce harm associated with access to prescription medicines without a prescription, and save government's cost on healthcare. However, this problem of non-prescription access to prescription-only medicines in Nigeria is as a result of the poor regulation of the pharmaceutical sector and the porous drug distribution channels (Auta et al., 2012). Therefore, this problem is likely to continue unless the issues with the drug distribution routes are addressed and the pharmaceutical sector is well regulated with appropriate sanctions applied to offenders.

On the other hand, contrasting views exist in the qualitative literature regarding the potential for non-medical prescribing to save government's healthcare cost (Pojskic et al., 2014, Cooper et al., 2008a). While some individuals argued that it could save salary cost by utilising healthcare professionals who are paid less compared to doctors, others maintained that the overall cost of providing healthcare would be unaffected because of the small proportion of non-medical prescribers (Blenkinsopp et al., 2008, Cooper et al., 2008a). In addition, some individuals believed that other indirect costs associated with non-medical prescribing including training costs, and the increase in

the utilisation of prescribing services could increase government spending (Pojskic et al., 2014, Cooper et al., 2008a). Furthermore, economic evaluations of non-medical prescribing are lacking. Available research evidence is weak in methodologies. For example, Dole et al. (2007) evaluated a pain clinic managed by a pharmacist prescriber in the US. They reported that pharmacist prescribing in non-cancer related pain led to annual savings of \$450,000. However, this was a single site study that was not randomised or controlled. Therefore, the economic impact of pharmacist prescribing is still unknown. Notwithstanding, savings on healthcare cost could potentially facilitate pharmacist prescribing in Nigeria since historically many governments including those in advanced countries have used financial savings on healthcare spending as one of the reasons for role extension or substitution.

In the Nigerian interviews conducted, many community pharmacists interviewed felt well placed for prescribing considering their accessibility and the reliance on them by members of the public. In addition, many pharmacists and patient group representatives felt that allowing community pharmacists to prescribe would legitimise their current practice of recommending medicines to patients in response to patients' symptoms. Legalising this practice could potentially drive pharmacist prescribing. For example, in the Netherlands, representatives of the Nurses' organisations interviewed in a qualitative study investigating Nurse prescribing reported that prescribing authority was extended to nurses in order to legitimise their practice of prescribing (Kroezen et al., 2013). This was because nurses in the Netherlands were prescribing without legal backing prior to extension of prescribing authority to them (Kroezen et al., 2013). Hence, the current counter prescribing practice of community pharmacists in Nigeria and the reliance on them by members of the public for their treatment needs could be a potential facilitator to pharmacist prescribing. However, introducing prescribing in community pharmacies in Nigeria is subject to a number of challenges. These challenges as reported earlier include lack of collaboration between community pharmacists and doctors; and lack of access to patients' clinical records since there is no structure in place that would facilitate exchange of patients' clinical data between community pharmacies and hospitals. In addition, some Nigerian participants including pharmacists and patients felt that the commercial interests of community pharmacists would be a potential barrier to prescribing authorisation.

Medical resistance was a key barrier that emerged from the Nigerian stakeholder interviews. It was also perceived by the majority of survey respondents (94.9%) as the most likely barrier to pharmacist prescribing. This finding is consistent with the experience of other countries including the UK, US, Canada and South Africa as

reports from these countries have shown fierce resistance from the medical profession on the extension of prescribing authority to pharmacists (Glatter, 2012, Kondro, 2007, Moss, 2005, Gilbert, 1998). For example, Gilbert (1998 p.155) described the opposition from the medical profession in South Africa as “a fierce and organised resistance”. Also, in the UK, the Department of Health’s plan to introduce independent nurse and pharmacist prescribing was described by leaders of the British Medical Association as “an irresponsible and dangerous move” (Moss, 2005). Medical resistance in Nigeria is likely to be minimal if pharmacists are to prescribe in collaboration with doctors since doctors would still maintain the overall control of the prescribing process. In addition, the doctor in collaborative prescribing sees the pharmacist as someone who enhances or complements the doctors’ role and not doctors’ substitute. However, independent prescribing is viewed by doctors as substitutive of their role in patient care and therefore attracts much resistance from doctors (Kondro, 2007, Hadley, 1989).

Furthermore, one of the ways of overcoming medical control over a task domain such as prescribing is through the intervention of the state by making legislation that would grant prescribing authority to other healthcare professionals (Gilbert, 1998). The unsupportive views for pharmacist prescribing expressed by many doctors including those in policymaking in the interviews conducted seem to suggest that a government intervention would be necessary for pharmacist prescribing to become a reality in Nigeria. However, pharmacists’ comments in both the interviews and survey conducted showed that the government has not played an active role in driving the ‘pharmacy agenda’ and this could be a barrier to pharmacist prescribing. In addition, health policies in Nigeria are predominantly informed by the decisions of the National Council on Health (Senate, 2008). The National Council of Health is the highest health policymaking body in Nigeria and advises the government on healthcare delivery (Senate, 2008). Healthcare professionals other than doctors including pharmacists have described this council as being medically dominated in terms of its membership and decisions (Muanya, 2014). This could have a serious policy implication for pharmacist prescribing. However, this trend is likely to change with the recent signing of the National Health bill in Nigeria which among other things, granted more powers to healthcare professionals other than doctors in the health policy structure of the country (Muanya, 2014). This was revealed in the comments made below by the president of the Pharmaceutical Society of Nigeria following the signing of the bill into law.

*“Historically, the harmonised version of the National Health Bill signifies the first time the borders of restriction in healthcare was opened as major Health Professional Associations and Trade Unions*

*are represented in key structures of the new Health Act.” (Muanya, 2014)*

Therefore, if this bill is implemented, it would significantly impact on the health policymaking process in Nigeria.

Pharmacists' inadequate skills in diagnosis and limited training in clinical assessments were also identified as potential barriers in the Nigerian studies conducted. In the survey, 81.0% and 61.0% of respondents noted that pharmacists' inadequate skills in diagnosis and limited training in clinical assessments respectively, were potential barriers. These results explain why 81.4% and 58.9% respectively of those who were willing to be prescribers reported that they will need additional training in the principles of differential diagnosis and patient assessment. These barriers could be resolved with additional training. Furthermore, as mentioned earlier, prescribing in collaboration with doctors will complement pharmacists' inadequate skills in diagnosis as the diagnosis of the disease condition would rest on the doctor.

Other barriers to pharmacist prescribing identified in the Nigerian studies conducted were organisational. These barriers included shortage of pharmacists and pharmacists' lack of time to take on additional role. These issues were discussed earlier on in section 7.3.3. Section 7.3.3 identified that increasing the utilisation of pharmacy technicians in Nigeria represents a feasible immediate option to address pharmacists' shortage and lack of time to do extended clinical roles. It identified that adequately trained pharmacy technicians could do a lot in freeing up pharmacists' time.

Furthermore, in order for pharmacists to expand their scope of practice, there must be an internal drive for change from pharmacists themselves. Although, pharmacists' negative attitudes towards clinical roles were reported as potential barriers to role extension, analysis of the quantitative and qualitative survey responses revealed that this attitude does not cut across all groups of pharmacists. The qualitative data showed that many young pharmacists were interested in taking on clinical roles. In addition, the high level of pharmacists' willingness to be prescribers recorded in the survey negates the perception that pharmacists are unwilling to take on clinical roles. Similarly, the interviews conducted with UK participants and other research reports have emphasised the importance of having leading individuals who will push for change in pharmacy practice at both local and national levels (Roberts et al., 2003, Tsuyuki and Schindel, 2008). Some Nigerian pharmacists interviewed showed confidence in the ability of the Pharmaceutical Society of Nigeria to push for change in pharmacy practice. The recent advances by the society including the call for the transition from the Bachelor of



Pharmacy (B. Pharm) to the Doctor of Pharmacy (Pharm D) as pharmacists' entry level qualification to practice (PSN, 2014), represent a positive move for practice change that would subsequently support pharmacist prescribing in Nigeria.

### **7.5 Strengths and limitations of the exploratory sequential mixed methods design**

The strength and limitations of the individual studies conducted in this research have been discussed in the individual chapters. This section discusses the strength and limitations of the overall exploratory sequential mixed methods design employed in the research contained in this thesis.

As identified in chapter 3, one of the advantages of mixed methods research is its ability to offset the weaknesses associated with mono-methods by drawing on the strengths of the combination of qualitative and quantitative studies (Teddlie and Tashakkori, 2008, Johnson and Onwuegbuzie, 2004). In this research, a limitation of the qualitative studies conducted was their lack of generalisability to a larger population. For example, the views on pharmacist prescribing expressed by pharmacists in the Nigerian stakeholders' interviews could not be generalised to the Nigerian pharmacists' population because it was only possible to interview a few purposeful samples. However, with the cross-sectional study conducted, a larger population of randomly sampled Nigerian pharmacists participated in the survey. Despite the limitations associated with the survey as outlined in chapter 6, the highly supportive view for pharmacist prescribing reported from this larger sample of pharmacists is indicative of the views of the Nigerian pharmacists' population. Therefore, the survey was useful in offsetting the potential weakness associated with the qualitative interviews. The interviews were also useful in providing rich and insightful data that would be unlikely to be generated by a survey.

Although, the quantitative component (survey) of the exploratory sequential mixed methods design plays a supplementary function as priority was given to the qualitative phase, the survey conducted, which triangulates the qualitative findings, would make the findings of this thesis acceptable to quantitative-biased audiences (Creswell and Plano-Clark, 2011). Also, the sequential nature of the exploratory mixed methods design makes it easier for the entire project to be described, implemented and reported in this thesis. Likewise, this design has resulted in the development of a new instrument (the questionnaire used in the survey) which can be adopted by other researchers to measure pharmacists' views on extended clinical roles including prescribing in similar context. Another key strength of the overall research is in the

range of stakeholders that participated in the studies conducted. This enabled the use of multiple perspectives to triangulate research evidence.

However, certain limitations were associated with the mixed methods design employed in this thesis. Firstly, the sequential nature of the design makes it time consuming as the first study would have to be concluded before the second could be implemented and so on. Secondly, it was not possible to apply for ethical approval at the beginning of the study since one study is informing the other. Therefore, the direction of the next study is largely unknown until the findings of the study before it are obtained. This makes it difficult to satisfy the ethics committee in the University of Leeds for a single approval for the study. Also, because the studies were conducted in both the UK and Nigeria, ethics approval was obtained in both countries which required a considerable amount of time.

Furthermore, as a result of the time constraint associated with this design, only a single reliable test, the internal consistency test was carried out on the questionnaire developed. Other confirmatory tests such as the test-re-test reliability and factor analysis which measures items correlations were not done. This is worthy of investigation in further research.

## **7.6 Research dissemination**

A part of this research has already been disseminated in some peer-reviewed journals and conferences listed below.

1. Auta A, Maz J, Strickland-Hodge B. Perceived facilitators to change in hospital pharmacy practice in England. *International Journal of Clinical Pharmacy*. DOI:10.1007/s11096-015-0153-9 (online first article)
2. Auta A, Strickland-Hodge B, Maz J, Alldred DP. Pharmacist prescribing in the United Kingdom and the implication for the Nigerian context. *West African Journal of Pharmacy*. 2015; 26(1): 54-61
3. Auta A, Maz J, Strickland-Hodge B. Clinical pharmacy practice in Nigerian hospitals: flourishing or floundering? Poster presentation at the 75th International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences. Düsseldorf, Germany. 29 September - 3 October 2015
4. Auta A, Maz J, Strickland-Hodge B. Pharmacists' willingness to be prescribers in Nigeria: a cross-sectional survey. Poster presentation at the 75th International Pharmaceutical Federation (FIP) World Congress of Pharmacy

and Pharmaceutical Sciences. Düsseldorf, Germany. 29 September - 3 October 2015

5. Auta A, Strickland-Hodge B, Maz J. Exploring pharmacy staff perception on the facilitators to change in hospital pharmacy practice in the United Kingdom. Oral presentation at the Postgraduate Research Student Conference of the School of Healthcare, University of Leeds. 24th October 2014.
6. Auta A, Strickland-Hodge B, Maz J. Pharmacist Prescribers – would it work in Nigeria? Exploring the barriers and facilitators. Poster presentation at the Postgraduate Research Student Conference of the Faculty of Medicine and Health, University of Leeds. 8th July 2013

Further dissemination will include presenting the summary of the key findings and recommendations of this research to the Federal Ministry of Health, Pharmacists' Council of Nigeria and Pharmaceutical Society of Nigeria. In addition, other aspects of the research will be published in peer-reviewed journals.

## **7.7 Conclusion**

This research was designed to investigate the facilitators and barriers to extending pharmacists' clinical roles to include prescribing in Nigeria. An audit trail of the key findings and conclusions of the chapters reporting the individual studies conducted in this thesis showed that this thesis has accomplished its aim.

The UK study reported in **chapter 4** identified many barriers and facilitators that were associated with the development of clinical pharmacy practice in the UK. However, many of the facilitators identified were linked to the changes in the professional structure of pharmacy including changes in pharmacy education and training; specialisation in practice; a career route that recognised advanced pharmacy practitioners; enhanced working relationships with doctors and the development of pharmacy technicians to do some roles previously undertaken by pharmacists. Hence, the UK study suggests that changes in the traditional structure of pharmacy could benefit the development of pharmacists' clinical roles in Nigeria.

The findings of the Nigerian studies reported in **chapters 5** and **6** revealed that pharmacy practice in Nigeria is characterised by limited roles with dispensing medicines as the core function of pharmacists; a generalist approach to practice; limited post-registration education and training to enhance pharmacists clinical skills; shortage of pharmacists; limited roles for pharmacy technicians; a single career pathway that is increasingly managerial as pharmacists progress through their career;

professional isolation of pharmacists from other members of the healthcare team, medical opposition to clinical pharmacy practice and inadequate policies to support the development of clinical pharmacy practice. According to Rogers (2003), the structure of a social system can facilitate or hinder the adoption of an innovation. This assertion is consistent with the findings of the UK study in this thesis where a change in structure of pharmacy resulted in enhanced clinical roles for pharmacists. Therefore, this thesis concludes that the existing structure in Nigeria does not support the development of clinical pharmacy practice.

In relation to pharmacist prescribing, the Nigerian studies indicated that it would be well supported in Nigeria by many stakeholders including pharmacists and patient group representatives. Pharmacist prescribing represents an opportunity to promote patients' access to treatment and the utilisation of pharmacists' skills in Nigeria. Important factors that could facilitate pharmacist prescribing included the pharmacists' expert knowledge of medicines; potential benefits associated with pharmacist prescribing; positive attitude of pharmacists towards extended clinical roles including prescribing; community pharmacists' accessibility and the existing working relationship of pharmacists with doctors in some teaching hospitals. On the other hand, several barriers to pharmacist prescribing were identified. These barriers included pharmacists' inadequate skills in clinical assessment and diagnosis as earlier mentioned, pharmacists' lack of confidence to do clinical roles, shortage of pharmacists, poor working relationships with medical doctors, lack of medical and government's support. In view of these barriers, pharmacist prescribing is likely to be unsuccessful in the current structure of pharmacy practice in Nigeria. Therefore, this thesis suggests that a change in the current structure of pharmacy is needed to enhance pharmacists' clinical roles including prescribing. The key areas for change are contained in the recommendations made below.

## **7.8 Recommendations**

The following recommendations are made based on the findings of this thesis.

### **7.8.1 Recommendations for policy**

- Government should make policies that would support the development of clinical pharmacy practice in all hospitals in Nigeria. These policies should include those relating to the recruitment and retention of clinical pharmacists.

- A clinical career structure should be created for hospital pharmacists. This will allow hospital clinical pharmacists to progress in rank and status without moving into managerial roles and remain active clinically.
- Professional working relationships between doctors and pharmacists should be encouraged. This can be initiated locally in hospitals by developing policies that promote multidisciplinary working relationships among members of the healthcare team.
- The government should develop and define pharmacy technicians' roles and responsibilities in all practice settings.
- Pharmacist prescribing presents an opportunity to improve patients' access to treatment and utilisation of pharmacists' skills. Therefore, in the future, government should consider the extension of prescribing authority to pharmacists in Nigeria.
- The Pharmaceutical Society of Nigeria and other pharmacy groups including the Nigerian Association of Hospital and Administrative Pharmacists should provide leadership, serve as change agents and advocate for extended clinical roles for pharmacists. They should lobby the government to develop policies that will support the development of clinical pharmacy practice in Nigeria.

### **7.8.2 Recommendations for practice**

- Pharmacists have valuable roles to play in patient care. Therefore, they should be integrated within healthcare teams in hospitals.
- Pharmacists should perform roles that are commensurate to their level of training. Therefore, their roles should move beyond dispensing. Ward pharmacy should be practised in all hospitals.
- Specialisation in different clinical areas should be encouraged in order to enhance the contribution of pharmacists to patient care.
- In view of the pharmacists' shortage, the PhwSIs model of practice should be considered as an interim route to pharmacists' specialisation.
- Some traditional roles of pharmacists including dispensing should be handled by pharmacy technicians in order to free up pharmacist time for clinical roles.
- Collaborative practice between doctors and pharmacists is needed for the development of clinical pharmacy. This will enhance patient care and prevent fragmentation of care. In addition, professional relationships between GPs and community pharmacists should be encouraged. Therefore, the Pharmaceutical

Society of Nigeria and the Nigerian Medical Association should work together towards ensuring this.

- Community pharmacists should be trained and licensed to treat minor diseases using standard treatment guidelines and formularies.

### **7.8.3 Recommendations for education**

- More clinical pharmacy components should be included in the undergraduate curriculum. Also, more time should be spent on experiential learning at sites where clinical pharmacy services are offered in order to enhance pharmacists' confidence in clinical settings.
- Practitioners should be involved in the undergraduate training as this would help in bridging the gap between training and practice.
- There should be clearly defined competencies to be attained by entry level pharmacists following pre-registration training. Also, as in the UK, there should be a competence-based test at the end of the pre-registration year in order to ensure that all pharmacists entering into the profession in Nigeria attain a minimum level of skills.
- Post-registration practice based clinical programmes/trainings should be established in order to prepare pharmacists for advanced clinical roles. These programmes should enable pharmacists to develop specialist skills in specific clinical areas.
- Professional development frameworks should be established for both early career and senior pharmacists in order to ensure that pharmacists are developing according to the stage of their career.
- Post-registration training programmes for pharmacist technicians should be developed in order to prepare them for future advanced roles including accuracy checking and medication history taking.
- A postgraduate programme specifically designed to prepare pharmacists for prescribing would be needed prior to the introduction of pharmacist prescribing in Nigeria.
- In view of the shortage of pharmacists in Nigeria, government in the long term should consider expanding the current pharmacists' training institutions in order to increase the number of pharmacists produced in the country.
- The Pharmacists' Council of Nigeria should increase the number of trainee pharmacy technicians that technicians' training institutions are allowed to admit

into their programmes since the training institutions have the capacity to admit more than the 15 students they are currently allowed to take annually.

#### **7.8.4 Recommendations for research**

In the UK:

- More research is needed to explore what stakeholders including pharmacists and policymakers are doing to resolve the barriers associated with the implementation of pharmacist prescribing in practice settings including hospitals, GP practices and community pharmacies.
- There is also the need for research to explore pharmacists' views on the current consultant pharmacist role in hospitals including barriers to implementation and the impact on their practice.

In Nigeria:

- A cross-sectional survey of doctors' views on pharmacist prescribing in Nigeria is necessary as a follow-up to the qualitative interviews conducted with doctors in this thesis. This will enable the views of doctors to be generalised and quantitative comparisons can be made with the views of pharmacists obtained in the survey conducted in this thesis.
- There is a need to investigate how well the current post-registration training programmes in Nigeria (including that of the WAPCP) is preparing pharmacists for advanced roles in patient care settings.
- Further research is needed to determine how best the post-registration training of pharmacists in Nigeria should be organised.
- There is a need for empirical research to investigate prescribing by nurses and community health workers in Nigeria in order to identify potential barriers and facilitators.

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## Appendices

### Appendix 1: Literature Search Strategy

Example of the literature search strategies used

<b>Database: Embase Classic + Embase 1947 to 2015</b>		
<b>Updated: 10 April 2015</b>		
<b>#</b>	<b>Searches</b>	<b>Results</b>
1	Pharmac*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	1106357
2	Pharmacist* Prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	295
3	Supplementary Prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	201
4	Dependent Prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	11
5	Independent Prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	182
6	Non medical prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	166
7	Collaborative prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	14
8	Prescribing right*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	88
9	prescribing authority.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	86
10	(Extend* adj2 role*).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	1553
11	(advanced adj2 role*).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	1131
12	Prescription adaptation*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	7
13	(Expand* adj2 role*).mp. [mp=title, abstract, subject headings,	4433

	heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	
14	Nurse* Prescrib*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	607
15	prescribing privilege*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	69
16	Collaborative pract*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	1057
17	2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16	9334
18	1 and 17	1576
19	United Kingdom.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	467243
20	Britain.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	24291
21	Northern Ireland.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	4912
22	Scotland.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	16406
23	Wales.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	22465
24	England.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	76932
25	19 or 20 or 21 or 22 or 23 or 24	534803
26	18 and 25	334
27	limit 26 to yr="1990 -Current"	332

## Appendix 2: Included studies

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Blenkinsopp et al. (2008) <sup>[1]</sup>	To explore general practitioner (GP) perceptions of the advantages and disadvantages of pharmacist supplementary prescribing.	Focus group discussions with 13 GPs from 3 medical practices in the Midlands region of England.	GPs reported that prescribing pharmacists in their practices have negotiated new areas of work. However, GPs maintained control over pharmacists' prescribing practice.
Buckley et al. (2006) <sup>[2]</sup>	To investigate the factors that will enable or inhibit the implementation of non-medical prescribing.	Semi-structured interviews with 15 stakeholders including doctors and pharmacists in a secondary care trust in the West Midlands, England.	Stakeholders supported non-medical prescribing within the trust although medical staff had reservations and disagreed with independent prescribing. Pharmacists were acknowledged as experts in drug therapy but lacking diagnostic skills and knowledge of patients.
Cooper et al. (2008a) <sup>[3]</sup>	To explore the views of stakeholders involved in SP policy, training and practice, focusing upon issues such as SP benefits, facilitators, challenges, safety and costs, thereby informing future practice and policy.	Semi-structured interviews with 43 UK stakeholders, including pharmacist and nurse supplementary prescribers, doctors, patient group representatives and policymakers.	SP was perceived positively by stakeholders acknowledging its benefits to include improved access to medicines. A numbers of facilitators and barriers to implementation of non-medical prescribing were identified including prescribers' enthusiasm, support networks and awareness of non-medical prescribing.
Cooper et al. (2012) <sup>[4]</sup>	To explore whether the introduction of supplementary prescribing in the UK represent a challenge to medical authority.	Qualitative case study involving 77 observations of SP consultations and interviews with 28 patients and 11 doctors at Ten case study sites including primary care and hospital settings in England.	Supplementary prescribing was viewed positively by all participants but many doctors and patients appeared to lack awareness and understanding of supplementary prescribing. Doctors maintained control over supplementary prescribing.
Courtenay et al. (2011a) <sup>[5]</sup>	To explore the role of the organisational NMP lead across a range of practice settings within one Strategic Health Authority (SHA) and consider the development of NMP from a multi-organisational perspective.	Semi-structured interviews with 28 NMP leads across one SHA	Identified factors impeding the development of NMP including lack of clarity about the NMP lead role and responsibilities, strategic support and a lack of protected time
Courtenay et al. (2012) <sup>[6]</sup>	To provide an overview of NMP across one SHA.	An on-line questionnaire survey involving 1,585 NMPs including pharmacist prescribers across one SHA. However, 883 (55.7%) completed the survey.	About a third of pharmacist prescribers, allied health professionals, and community practitioner prescribers did not prescribe. Organisational policy and support were identified as factors affecting prescribing practice.
Dawoud et al. (2011) <sup>[7]</sup>	To investigate pharmacist prescribers' views and experiences of the early stages of SP implementation.	Qualitative longitudinal study involving semi-structured interviews with 16 pharmacist supplementary prescribers, trained in Southern England. Participants were interviewed at 3 and 6 months after registering as prescribers.	Three types of pharmacists' experiences were identified: "a blind alley", "a stepping stone" and "a good fit". Some participants felt that SP implementation was bureaucratic and limited pharmacists' freedom in their decision making.

\*Reference number of articles indicated in square brackets

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
George et al. (2006a) <sup>[8]</sup>	To explore SP pharmacists' early experiences of prescribing and their perceptions of the prescribing course.	Postal questionnaire survey involving 518 supplementary prescribers in Great Britain. Response rate was 82.2%.	Many respondents (71%) identified better patient management as the main benefit of SP while inadequate funding (36.4%) and lack of organizational recognition (18%) were reported as barriers to SP.
George et al. (2006b) <sup>[9]</sup>	To investigate community pharmacists' awareness, views and attitudes to independent prescribing and their perceptions of competence and training needs for the management of some common conditions.	Postal questionnaire survey involving 500 Community pharmacists in Scotland. Response rate was 43.4%.	Respondents showed high confidence in their ability to be independent prescribers and felt competent in diagnosing and treating the common conditions considered including uncomplicated urinary tract infection in women. However, 97.7% of respondents identified training need in diagnosis.
George et al. (2007a) <sup>[10]</sup>	To evaluate the views and experiences of SP pharmacists and DMPs regarding the PLP and identify their perceived support needs during the PLP.	Postal questionnaire survey involving 242 pharmacists and their DMPs (n = 232) in Scotland. However, 186 (76.9%) pharmacists and 144 (62.1%) DMPs completed the survey.	Just over half of the pharmacists knew what was expected of them and their DMPs during the PLP. Opportunities for professional development and teamwork were regarded as major positive experiences while organizational, attitudinal, and time barriers were reported as negatives.
George et al. (2007b) <sup>[11]</sup>	To investigate the challenges experienced by pharmacists in delivering SP services, to explore their perceptions of benefits of SP and to obtain feedback on both SP training and implementation.	Postal questionnaire survey involving 488 SP pharmacists in Great Britain. A total of 401 (82.2%) completed the survey.	About half of respondents (n=195; 48.6%) had started practising SP. Better patient management (n = 58; 29.7%) was identified as the main benefit of SP and inadequate funding (n = 27; 13.8%) as the biggest challenge in delivering SP service.
George et al. (2008) <sup>[12]</sup>	To explore the views and experiences of pharmacists and their DMPs about the PLP as part of SP training.	Focus groups discussion with 12 pharmacists and semi-structured interviews with 13 DMPs in Scotland.	Planning the PLP in consultation with the DMP was found to be crucial for an optimal learning experience. Pharmacists who did not have a close working relationship with the medical team had difficulties in identifying a DMP and organising their PLP.
Hobson and Sewell (2006) <sup>[13]</sup>	To investigate the implementation of supplementary pharmacist prescribing within primary (PCTs) and secondary care trusts (SCTs) in England.	Questionnaire survey involving pharmacists from SCTs (n=143) and PCTs (271) in England who would oversee the implementation of supplementary prescribing by pharmacists. The response rate was 68% for both surveys	Majority of pharmacists (67%) in SCTs did not believe that it would be difficult to recruit DMP while many PCTs pharmacists (47%) considered recruiting DMP as a challenge. The total number of pharmacists employed by PCTs was significantly associated with the intention to implement supplementary pre- scribing by pharmacists.
Hobson et al. (2010) <sup>[14]</sup>	To explore the opinions of patients on the development of NMP.	Semi-structured interviews with 18 patients in four primary and secondary care trusts in England.	Participants acknowledged the expert drug knowledge of pharmacists and their accessibility. However, they expressed concerns about clinical governance, privacy and facilities to provide the service in community pharmacies.

\*Reference number of articles indicated in square brackets



Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Hughes and McCann (2003) <sup>[15]</sup>	To explore barriers between GPs and community pharmacists in relation to closer inter-professional working and the extension of prescribing rights to pharmacists.	Focus groups with 22 GPs and 31 pharmacists in Northern Ireland.	The 'shopkeeper' image of community pharmacy emerged as a major theme. Many GPs saw community pharmacists as business people and felt that their commercial interest would represent a conflict of interest in pharmacist prescribing.
Lim et al. (2013) <sup>[16]</sup>	To explore the role of NMP leads in organisations across one SHA and to inform future planning.	Semi-structured interviews with 27 NMP leads across one SHA	The processes used to appoint NMP leads lacked clarity and varied between trusts. Many NMP leads did not have a designated time for their role. Factors that supported the role included organisational support and dedicated time.
Lloyd and Hughes (2007) <sup>[17]</sup>	Explored the views and professional context of pharmacists and DMPs prior to the start of supplementary prescribing training.	Semi-structured interviews with pharmacists (n=63) from the first four cohorts enrolled for supplementary prescribing training in Northern Ireland and focus groups with their DMPs (n=54)	Supplementary prescribing was generally welcomed by pharmacists and their DMPs. However, there were concerns about loss of diversity, deskilling of junior doctors, safety and professional encroachment.
Lloyd et al. (2010) <sup>[18]</sup>	Explored the context and experiences, in relation to the practice of supplementary prescribing, of pharmacists and DMPs at least 12 months after pharmacists had qualified as supplementary prescribers.	Focus groups with pharmacists (n=40) and semi-structured interviews with their DMPs (n=31) in primary and secondary care settings in Northern Ireland	Three-quarters of pharmacists qualified to practise as supplementary prescribers were not actively prescribing. This was largely due to logistical and organisational barriers rather than inter-professional tensions.
MacLure et al. (2013) <sup>[19]</sup>	To explore the views of the Scottish general public on non-medical prescribing.	Postal questionnaire survey involving 5,000 members of the general public in Scotland. The response rate was 37.1%.	Respondents generally showed a lack of understanding of NMP and expressed concern on access to patients' medical records prior to prescribing.
McCann et al. (2011) <sup>[20]</sup>	To capture information on pharmacist prescribing in Northern Ireland	Questionnaire survey involving 100 pharmacists who were identified as qualified prescribers in Northern Ireland. Response rate was 76%.	About half (46.1%) of the respondents had never prescribed since qualifying as prescribers. Barriers to pharmacist prescribing reported included inadequate funding and lack of access to patients records.
McCann et al. (2012) <sup>[21]</sup>	To provide an in-depth understanding of pharmacist prescribing from the perspective of pharmacist prescribers, medical colleagues and key stakeholders in Northern Ireland.	Semi-structured interviews with 32 participants including 11 pharmacists, 8 mentors and 13 key stakeholders in Northern Ireland.	Three major themes emerged: the effect on patient care; challenges facing pharmacist prescribers and the importance of the inter-professional team. The challenges identified included lack of support by some doctors and pharmacists' competence in dealing with complex cases.
McCann et al. (2015) <sup>[22]</sup>	To explore patients' perspectives of pharmacists as prescribers.	Focus groups with 34 patients of three independent pharmacist prescribers in primary and secondary care settings in Northern Ireland. This study is part of a larger case study conducted at three sites linked to these prescribers.	Team approach to patient care emerged as an overarching team. There was an overwhelming lack of awareness of pharmacist prescribing by patients prior to attending pharmacist prescribers' clinic.

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Smalley (2006) <sup>[23]</sup>	To evaluate patients' experience of a pharmacist-led supplementary prescribing hypertension clinic.	Postal questionnaire survey involving 127 patients attending a pharmacist-led supplementary prescribing clinic in Derby, England. The response rate was 73%.	Eighty-nine respondents (83%) attended the first clinic. Of these, 91% continue to attend, 8% no longer attend and 1% decided against participating in the clinic. Preference to continue with GP or nurse care was given as the reason for not continuing with the pharmacist prescriber.
Stewart et al. (2007) <sup>[24]</sup>	To investigate in Great Britain pharmacists, who have not yet applied for a SP course, their planned participation in training, and attitudes towards pharmacist SP.	Postal questionnaire survey involving 4300 pharmacists. The response rate was 55.1% (2371/4300).	Of the 1707 with patient contact, almost all (1668, 97.7%) were aware of pharmacist SP. Some predictors of prescribing training actions identified were: awareness of local networks for SP; receptivity to change; knowledge of colleagues who had undertaken or were currently undertaking SP training and postgraduate qualifications.
Stewart et al. (2008) <sup>[25]</sup>	To explore patients' perspectives and experiences of pharmacist SP in Scotland.	A questionnaire survey involving 180 patients of nine supplementary prescribers in primary and secondary care settings in Scotland. Response rate was 57.2%.	Most patients were positive in their attitudes, agreeing that they would recommend a pharmacist prescriber to others. However, 65% would prefer to consult a doctor.
Stewart et al. (2009a) <sup>[26]</sup>	To explore the perspectives of pharmacist supplementary prescribers, their linked independent prescribers and patients, across a range of settings, in Scotland, towards pharmacist prescribing.	Semi-structured interviews with 9 pharmacist prescribers, 8 linked independent prescribers (doctors) and 18 patients in primary and secondary care settings in Scotland.	All stakeholders were supportive of pharmacists as supplementary prescribers. Patients had little idea of what to expect on their first visit. Pharmacists and doctors expressed concerns around a potential lack of funding, inadequate support networks and continuing professional development.
Stewart et al. (2009b) <sup>[27]</sup>	To determine the awareness of, views on, and attitudes of Scottish general public toward nonmedical prescribing, with an emphasis on pharmacist prescribing.	Postal questionnaire survey involving 5,000 members of the general public in Scotland. The response rate was 37.1%.	Many respondents (56.6%) were aware of NMP and supported the pharmacist having a prescribing role. However, there were concerns about lack of privacy in a community pharmacy.
Stewart et al. (2011) <sup>[28]</sup>	To evaluate the views of patients across primary care settings in Great Britain who had experienced pharmacist prescribing.	Questionnaire survey involving 143 patients of pharmacist prescribers in Great Britain. Patients were largely recruited from general practices or community pharmacies. Response rate was 73.4%	Respondents were positive towards pharmacist prescribing and most would recommend consulting a pharmacist prescriber. However, 69.6% of respondents would prefer to consult their GP if they thought their condition was getting worse.
Tann et al. (2008) <sup>[29]</sup>	Explored GP and pharmacist perceptions of the introduction of pharmacist supplementary prescribing, focusing on the consequences for professional boundaries, power relations and knowledge	Semi-structured interviews with 7 pharmacist supplementary prescribers (PSPs) and focus groups with PSPs and 7 GPs in two PCTs in the Midlands, England.	GPs have delegated some routine work in specific chronic conditions, and a limited amount of decision making, to pharmacists. However, they maintain the overall control in the prescribing process.

\*Reference number of articles indicated in square bracket

<b>Authors, year*</b>	<b>Research aim/objective</b>	<b>Study design, participants and settings</b>	<b>Key findings</b>
Tonna et al. (2010) <sup>[30]</sup>	To explore pharmacists' perceptions of the feasibility and value of pharmacist prescribing of antimicrobials in secondary care in Scotland.	Six focus groups with 37 pharmacists from 5 Scottish regions.	Pharmacists identified potential roles and opportunities for pharmacist prescribing of antimicrobials. However, they perceived that it is unlikely for the medical profession to readily accept pharmacist prescribing unless a prior diagnosis has been made by the medical clinician.
Tully et al. (2007) <sup>[31]</sup>	To investigate the views and experiences of pharmacists in England before and after they registered as supplementary prescribers.	Semi-structured interviews with 8 pharmacists in England. Interviews were held during their training and when they qualify as supplementary prescribers.	Participants anticipated that training would legitimise their current 'informal' prescribing practices, but experienced many procedural delays in implementing their new role including delays associated with registering as a prescriber.
Warchal et al. (2006) <sup>[32]</sup>	To ascertain whether successfully completing a supplementary prescribing (SP) course can empower pharmacists in terms of their extended roles	Postal questionnaire survey involving 38 pharmacist supplementary prescribers in the UK. This was followed with 10 telephone interviews with respondents in the survey who agreed to be interviewed.	Participants were confident to begin their new roles; however, they experienced a number of barriers particularly among community pharmacists where time and access to patients' medical records were a problem. These challenges were less likely with hospital pharmacist prescribers.
Weiss and Sutton (2009) <sup>[33]</sup>	Investigated the potential threat to medical dominance posed by the addition of pharmacists as prescribers in the UK.	Semi-structured interviews with 23 pharmacist supplementary prescribers in Great Britain.	Pharmacist prescribing has been aided by: (1) blurred definitions of prescribing; (2) the emphasis on new prescribers' competence urging pharmacist prescribers to limit their areas of clinical practice; and (3) a team approach to patient management.
McIntosh et al. (2012a) <sup>[34]</sup>	To investigate newly registered pharmacists' awareness of pharmacist prescribing and views on potential future roles as prescribers.	Postal questionnaire survey involving 1658 pharmacists joining the Pharmacist Register of the RPSGB in 2009. Response rate was 25.2% (n = 418)	Majority (79.5%) of respondents were aware of non-medical prescribing. Most (86.4%) expressed interest in prescribing training. The results revealed access to patient information as a barrier to pharmacist prescribing implementation.
Baqir et al. (2010) <sup>[35]</sup>	To evaluate pharmacist prescribing including barriers to implementation across the north east of England.	Mixed methods: Questionnaire survey involving 179 pharmacists who had completed a prescribing course in the University of Sunderland. This was followed by a focus group discussions with 6 of the pharmacists involved in the survey.	97 responded to the survey. Of these 84 had registered as prescribers but 37 were currently not prescribing including those who had never prescriber (n=24). Barriers identified included change of job and lack of organisational support. Pharmacists' relationship with their medical colleagues was noted as a facilitator.

\*Reference number of articles indicated in square brackets

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Adigwe (2012) <sup>[36]</sup>	To develop new theory regarding the experience of nurses and pharmacists who qualify as prescribers and to explain the barriers and facilitators they encounter when prescribing for chronic pain.	Mixed methods: qualitative component involves interviews with 22 non-medical prescribers and 12 patients, while the quantitative component survey 545 non-medical prescribers in Yorkshire and Humber region, England. Survey response rate was 33% (n=180).	Maintaining relationships with colleagues, managers and patients influenced how prescribers perceived safety and support in NMP. Pharmacists were seen as more knowledgeable in relation to medicines but were limited by a lack of experience with chronic pain patients, access to CPD and concerns around 'second checking'.
Candlish et al. (2006) <sup>[37]</sup>	To follow up pharmacists who have successfully completed their SP course, with particular interest in those who are prescribing and the barriers encountered.	Postal questionnaire survey involving 107 pharmacists who had successfully completed their SP course at the University of Sunderland, England. Response rate was 50.5%.	50% (n=27) of respondents were had started prescribing. Those not prescribing commonly reported change of job (22.2%), no SP role available (33.3%), (18.5%) await prescription pads (18.5%), and reported insufficient time (11.1%) as barriers.
Dapar (2012) <sup>[38]</sup>	To investigate the structures and processes of pharmacist prescribing in Great Britain, focusing on primary care settings.	Mixed methods: The quantitative component was a postal questionnaire survey among 1654 pharmacist prescribers in Great Britain. Response rate was 42.3% (n=695). The qualitative component was semi-structured interviews with 34 pharmacist prescribers.	Prescribers in hospitals of general medical practices were more likely to have prescribed than those in community practice. Professional isolation, lack of access to patient medical records and administrative support were hindering prescribing in community practice. However, lack of clarity and definition of the pharmacist prescribing role was hindering Pharmacist prescribing in all settings.
Latter et al. (2010) <sup>[39]</sup>	To evaluate nurse and pharmacist independent prescribing in order to inform planning for current and future prescribers.	Multi-study design involving surveys, case studies and stakeholders workshop.	Between 2% and 3% of both the nursing and pharmacist workforce are qualified to prescribe medicines independently. 93% of nurse prescribers and 80% of pharmacist prescribers had used their independent prescribing qualification. NMP has been largely driven by individual practitioners and only about 50% of Trusts had a strategy or written plan for the development of NMP.
Jones and Western (2009) <sup>[40]</sup>	To investigate the views of healthcare professionals (HCPs) on the service provided by the SP pharmacists within a mental health outpatient setting.	Semi-structured interviews with 12 HCPs (7 doctors, 3 nurses and 2 social workers) who work in collaboration with SP mental health pharmacists in 3 outpatient clinics in Wales.	Participants were supportive of pharmacist prescribing within their work environment, acknowledging that pharmacists have extensive knowledge of the medication they prescribe. However, there was a lack of awareness within the services of the pharmacists' role
Lloyd et al. (2005a) <sup>[41]</sup>	To explore the views and opinions of junior house officers (JHOs) and senior house officers (SHOs) on the introduction of hospital pharmacist supplementary prescribing in Northern Ireland.	Questionnaire survey among 516 JHOs and SHOs in 11 hospitals in Northern Ireland. Response rate was 22.3% (n=115)	Majority of doctors (84.4%) felt they currently had a good working relationship with pharmacists. However, 68.1% were unaware of the role of a supplementary prescribing pharmacist.

\*Reference number of articles indicated in square brackets

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Cope (2013) <sup>[42]</sup>	To identify the likely predictors of successful NMP in a community pharmacy setting, what barriers were required to be overcome and how these were overcome in order to achieve success.	Semi-structured interviews with 18 pharmacist prescribers in England, Wales and Scotland	All participants were positive towards developing NMP. Pharmacists in England and Wales, where central funding was not available, described accessing funding as being a key issue. Pharmacists in Scotland, where central funding was available, cited continuity of funding as being of greater importance.
Lloyd et al. (2005b) <sup>[43]</sup>	To explore the views and opinions of nurses towards the introduction of hospital pharmacist supplementary prescribing in Northern Ireland.	Questionnaire survey among 820 nurses in 11 hospitals in Northern Ireland. Response rate was 25% (n=205)	The majority of nurses (79%) felt they currently had a good working relationship with pharmacists but only 20% were aware of the role of a pharmacist supplementary prescriber.
MacLure et al. (2011) <sup>[44]</sup>	To explore how pharmacist prescribers view their transition from supplementary to independent prescribing with particular focus on potential facilitators and barriers affecting service development	Semi-structured interviews with 22 pharmacist prescribers who had completed, or were on their conversion course at Robert Gordon University, Scotland.	The most cited facilitators were supportive professional relationships, training courses and prior prescribing experience. Barriers to the transition included time, resource and funding constraints and the perceived need for a national strategy supported by local Health Boards.
McIntosh et al. (2012b) <sup>[45]</sup>	To determine the current views and attitudes towards, and uptake of prescribing training programmes among pharmacists in Great Britain.	Postal questionnaire survey involving 4000 non-prescribing pharmacists on the practising Register of the RPSGB. Response rate was 32.7%.	95.9% (n = 1254) were aware of pharmacist prescribing. Most (65.9%, n = 862) had never thought about training as prescribers or had thought about it but had not explored it further. Some barriers were reported including lack of organisational and financial support for pharmacist prescribing.
Mulholland (2013) <sup>[46]</sup>	To determine how far pharmacist prescribing has developed in Neonatal Intensive Care Units (NICU), what benefits are perceived and what barriers have been encountered.	A survey involving Neonatal and Paediatric Pharmacists Group members working in NICU. Total numbers of questionnaire distributed was not indicated but 45 responses were received. Also, the research setting was also not indicated.	Just under half (47%) were prescribers, with 40% being independent prescribers. Lack of funding and time to undertake prescribing course and the potential need for a second pharmacist to clinically check what a pharmacist has prescribed were reported as barriers.
Sutton et al. (2010) <sup>[47]</sup>	To explore pharmacist prescribing in clozapine clinics.	Case study methodology incorporating quantitative (patient surveys) and qualitative (semi-structured interviews with staff and patients) methods in 7 sites.	Pharmacist independent prescribers (PIPs) were leading 3 of the clozapine clinics, while the remaining 4 were run by nurses. However, these pharmacists were working as supplementary prescribers. Reasons for this included lack of support from colleagues and 'the system' and being wary of taking responsibility for the prescribing of clozapine.

\*Reference number of articles indicated in square brackets

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Alaeddine et al. (2014) <sup>[48]</sup>	To identify how pharmacist independent prescribers use their prescribing skills in Imperial College Hospital NHS Trust (ICHT).	Questionnaire survey involving 19 Pharmacist independent prescribers at ICHT, London. Response rate was 68% (13/19)	77% of PIPs report prescribing only for inpatients, 15% solely in outpatient clinics and 8% in both. Some reasons given by prescribers for not prescribing frequently were: do not wish to de-skill medical staff, lack of time, excess workload, asking doctors is faster, not seeing patients independently, and not having the opportunity to attend ward rounds.
Rees (2013) <sup>[49]</sup>	To evaluate pharmacist independent prescribing in Wales	Questionnaire survey involving 128 pharmacists who qualified as independent prescribers in Wales. Response rate was 59% (n=75)	About two-thirds (64%, n=48) have used their qualification. Factors that enabled this included support from colleagues (n=28), clinical knowledge and experience (n=8), time (n=7) and funding (n=3). Reasons given for not prescribing were lack of time (n=10) and funding (n=9).
Park et al. (2013) <sup>[50]</sup>	To investigate patient opinion on pharmacist prescribing during their inpatient stay on an elective orthopaedic ward.	A questionnaire was distributed to all (58) patients admitted to an elective orthopaedic ward.	Most patients (65.5%) felt that pharmacists were appropriately qualified to prescribe their medicines during their inpatient stay. However, 58.6% were not aware that pharmacists were able to prescribe.
Phelps et al. (2014) <sup>[51]</sup>	To improve GPhC's understanding of the registrants' work, training and professional practice.	Online and postal survey involving 3040 registered pharmacists including pharmacist prescribers (n=1914) in Great Britain. 21,672 registered pharmacy technicians were also surveyed. Response rate for pharmacists was 50.8%.	Three quarters (74%) of prescribers had prescribed at some point since they qualified. However, only 61% of all prescribers had prescribed in the last 12 months of the survey. The reasons giving for not prescribing were categorised into lack of opportunities (such as commissioning environment), changed circumstances (such as moving into a management role) and personal reasons such as retirement and maternity leave
Jones (2006) <sup>[52]</sup>	To conduct research on the training, implementation and development of pharmacist supplementary prescribing in wales.	Case study approach which included semi-structured interviews with 7 pharmacists during and after training, and non-participant observation of pharmacist supplementary prescribers' consultations. Follow-up semi-structured interviews were held with pharmacist prescribers (3), DMP (1) and patients (2).	Participants were supportive of pharmacist prescribing. Pharmacist supplementary prescribing was perceived to benefit patient care, utilise skills and a 'stepping stone' to independent prescribing. Barriers to implementation were identified including funding, time and access to patient medical records.

\*Reference number of articles indicated in square brackets

Authors, year*	Research aim/objective	Study design, participants and settings	Key findings
Shrestha et al. (2011) <sup>[53]</sup>	To assess the views and experiences of nurse and pharmacist prescribers and the attitudes of doctors and non-prescribing pharmacists regarding the role of a non-medical prescriber in a secondary care setting	Questionnaire survey administered to pharmacist prescribers, non-prescribing pharmacists, nurse prescribers and doctors in Whipps Cross University Hospital NHS Trust, London, England. The response rates were 100% (6/6), 93% (14/15), 35% (7/20) and 20% (12/60), respectively.	All the non-medical prescriber respondents were independent prescribers. All respondents viewed NMP positively. However, 42% (5) of doctors showed concerns for the boundary encroachments of NMP and 67% (9) of them agreed there was a lack of diagnostic skill among non-medical prescribers to prescribe independently. 83 % (5) of pharmacist prescribers showed concerns regarding their lack of diagnostic skills.
While et al. (2004) <sup>[54]</sup>	To investigate community pharmacists' views regarding supplementary prescribing.	Postal questionnaire survey involving 238 community pharmacists from 7 primary care trusts in England. Response rate was 53.4% (n=127).	Respondents expressed concerns regarding supplementary prescribing to include lack of time for consultation (25.2%) and access to patient records (20.5%). Pharmacists with postgraduate qualifications more positive on their views on supplementary prescribing.
Ziegler et al. (2014) <sup>[55]</sup>	To explore the barriers to becoming a qualified pharmacist prescriber, investigate pharmacist prescribers' experiences of the transition from qualifying as a prescriber to prescribing in a palliative care context and identify any continuing professional development needs.	Questionnaire survey among 180 members of the National Palliative Care Pharmacy Network. The response rate was 38.9% (n=70).	All pharmacists reported that a pharmacist prescribing qualification would be relevant to their current role. Only 20% (14) were currently prescribing as Pharmacist Independent Prescriber. They prescribe a wide range of medicines in patients with complex comorbid conditions. This complexity presented some unmet training needs.
Child et al. (1998) <sup>[56]</sup>	To identify attitudes towards pharmacist-written prescriptions and pharmacist prescribing.	Questionnaire survey among 19 doctors, 200 nurses and 87 hospital pharmacists in Birmingham, England. The response rate was 57.5%	Support for pharmacist-written prescriptions and pharmacist prescribing ranged from 43.6 per cent to 94 per cent, depending on the scenario described and the profession of the responder. 95.5% of pharmacists were willing to prescribe. Barriers to pharmacist prescribing identified included, education/training, access to patient data, lack of time and shortage of pharmacists.
Department of Health (1999) <sup>[57]</sup>	To develop a framework to determine in what circumstances health professionals might undertake new roles with regard to the prescribing, supply and administration of medicines.	Consultations and group meetings with key stakeholders. Over 750 submissions were received.	The report identified facilitators for change to the arrangement of prescribing, supply and administration of medicines. These included changes in patients' expectations, professional relationships and education/training of healthcare professionals
Winstanley (2009) <sup>[58]</sup>	To explore the continuing professional development (CPD) needs of pharmacist prescribers	Cross-sectional survey involving 971 pharmacist prescribers in Great Britain. The response rate was 30% (n=294).	Almost half of the respondents were currently prescribing. Most pharmacists wanted to extend their scope of practice and to have access to appropriate resource for CPD.
McIntosh et al. (2015)	To describe and understand reasons for non-prescribing	Semi-structured interviews with 7 pharmacists and 6 nurses who qualified as prescribers but were not prescribing in Scotland.	Reasons for not prescribing identified were Lack of organisational support to implement and develop NMP and lack of access to patients' medical records by community pharmacists.

\*Reference number of articles indicated in square brackets

### Appendix 3: Comparisons of common paradigms used in social and behavioural sciences

Paradigm	Positivism	Postpositivism	Pragmatism	Constructivism
<b>Methods</b>	Quantitative	Primarily quantitative	Quantitative and qualitative	Qualitative
<b>Logic</b>	Deductive	Primarily deductive	Deductive and inductive	Inductive
<b>Epistemology</b>	Objective point of view. Knower and the known are dualism	Modified dualism. Findings probably objectively "true"	Both objective and subjective point of view	Subjective point of view. Knower and the known are insuperable.
<b>Axiology</b>	Inquiry is value free	Inquiry involves values, but they may be controlled	Values play a large role interpreting results	Inquiry is value-bound
<b>Ontology</b>	Naïve realism	Critical or transcendental realism	Accept external reality. Choose explanations that best produce desired outcomes	relativism
<b>Causal linkages</b>	Real causes temporally precedent to or simultaneous with effects	There are some lawful, reasonably stable relationships among social phenomenon. These may be known imperfectly. Causes are identifiable in a probabilistic sense that changes over time	There may be causal relationships, but we will never be able to pin them down.	All entities simultaneously shaping each other. It's impossible to distinguish causes from effects



## Appendix 4: Ethical approval letter for the UK study

Faculty of Medicine and Health  
Research Office

University of Leeds  
Worsley Building  
Clarendon Way  
Leeds LS2 9NL  
United Kingdom

☎ +44 (0) 113 343 4361

20 June 2013

Mr Asa Auta  
PhD Student  
School of Healthcare  
Baines Wing  
University of Leeds  
Leeds, LS2 9JT



UNIVERSITY OF LEEDS

Dear Asa

Ref no: SHREC/RP/344

**Title:** Investigating changes in the professional structure of pharmacy in the united kingdom: lessons for the Nigerian context

Thank you for making the requested amendments to the documentation for the above project following review by the School of Healthcare Research Ethics Committee (SHREC). I can confirm a favourable ethical opinion based on the documentation received at date of this letter:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Ethical_Review_Form_V3_AA	1	07.05.13
Information-Sheet_AA	1	07.05.13
INTERVIEW GUIDE_AA	1	07.05.13
PARTICIPANT CONSENT FORM_AA	1	07.05.13
Participant Invitation Letter	1	07.05.13
Risk_Assessment_form	1	07.05.13
SHREC_response	1	10.06.13
Information-Sheet_version2	2	10.06.13
PARTICIPANT CONSENT FORM_version2	2	10.06.13
SHREC_response2	1	13.06.13
PARTICIPANT CONSENT FORM_version3	3	13.06.13
Information-Sheet_version3	3	13.06.13

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](mailto:FMHUniEthics@leeds.ac.uk)

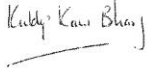
Ethical approval does not infer you have the right of access to any member of staff or student or documents and the premises of the University of Leeds. Nor does it imply any right of access to the premises of any other organisation, including clinical areas. The SHREC takes no responsibility for you gaining access to staff, students and/or premises prior to, during or following your research activities.

*Please note:* You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, 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

A handwritten signature in black ink, appearing to read "Kuldip Kaur Bhargava". The signature is written in a cursive style and is positioned above a horizontal line.

**Dr Kuldip Bhargava, OBE**  
**Acting Chair, School of Healthcare Research Ethics Committee**

## Appendix 5: Participant Information Sheet (UK study)



UNIVERSITY OF LEEDS

### INVESTIGATING THE CHANGES IN THE PROFESSIONAL STRUCTURE OF PHARMACY IN THE UNITED KINGDOM: LESSONS FOR THE NIGERIAN CONTEXT

You are being invited to take part in the above named study but before you decide, please read the following information.

#### **What is the purpose of this study?**

This study is the first part of a larger study aimed at identifying the barriers and facilitators to extending prescribing roles to pharmacists in Nigeria. Findings from this study are expected to inform the next phase of study in Nigeria.

There is evidence from the literature that the current roles of pharmacists in the UK including prescribing are supported by the changes that occurred in the professional structure of pharmacy following the implementation of the recommendations of the Noel Hall Report (1970) and the Nuffield Report (1986).

This study will investigate the changes in the professional structure of pharmacy in the UK prior to the introduction of pharmacist prescribing in order to learn lessons from the UK experience that might assist in the potential changes needed in Nigeria.

#### **Who is doing the study?**

This study is being undertaken by Mr Asa Auta as part of his PhD studies at the School of Healthcare, University of Leeds. Dr Barry Strickland-Hodge, Dr David Alldred and Dr Julia Maz from the School of Healthcare, University of Leeds are supervising this research.

#### **Why have I been asked to participate?**

You have been invited to participate in this study because you were practising as a pharmacist or pharmacy technician in the UK between the 1970s and 1990s and have witnessed the changes that occurred in hospital and community pharmacy practice within this period. We are inviting about 30 participants in total to take part in this study.

#### **What will be involved if I take part in this study?**

If you choose to participate in the study, you will be invited to a single interview which will last approximately one hour and will be audio-recorded. The interview will take place at a time and location convenient to you. If you live outside the Yorkshire region, the interview will be by telephone. You will need to give us a contact phone number of your choice, which will be used for the telephone interview.

#### **What are the advantages and disadvantages of taking part?**

There is no direct benefit to you for taking part in this study, but your views will help us understand the issues that are important in changes in professional structure and role

expansion; and will assist us in determining the potential changes that will be needed in the Nigerian context.

**Do I have to take part ?**

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

**Can I withdraw from the study at any time?**

You are free to withdraw at any time before or during the interview without giving a reason and up to two weeks after the interview has taken place. Once this period has expired, the information obtained from you will be analysed and cannot be withdrawn.

**Will the information obtained in the study be confidential?**

All information obtained from you will be kept strictly confidential. Your name will be removed from the interview transcription, which means only Asa will know what you have said. Asa's supervisors: Dr Barry Strickland-Hodge, Dr David Alldred and Dr Julia Maz may have access to the audio interview and transcripts for the purpose of verification of transcription and analysis. However, all your personal identifiable details will be removed before granting them access to your data. The digitalised record of your interview will be deleted after transcription and the transcript held in a password protected secure network of the University of Leeds for a period of five years, after which, it will be securely and irreversibly deleted from the device on which it is stored.

**What will happen to the results of the study?**

Your responses and that of other participants will be analysed. Some quotes will be used from all participants' responses to illustrate the views of participants. However, these quotes will not be associated with your name. The results of this study will form part of Asa's PhD thesis and will also be published in a scientific journal and be presented at a conference.

**Who has reviewed this study?**

Ethical approval has been granted by the School of Healthcare Research Ethics Committee (Ref no: SHREC/RP/344 of 20 June 2013).

**If you agree to take part, would like more information or have any questions or concerns about the study please contact**

*Asa Auta*  
*PhD Student,*  
*School of Healthcare,*  
*Baines Wing,*  
*University of Leeds,*  
*LS2 9UT, Leeds, UK.*  
*Tel: 0113 3437185 or email: hs09aa@leeds.ac.uk*

***Thank you for taking the time to read this information sheet.***



## PARTICIPANT CONSENT FORM

### INVESTIGATING THE CHANGES IN THE PROFESSIONAL STRUCTURE OF PHARMACY IN THE UNITED KINGDOM: LESSONS FOR THE NIGERIAN CONTEXT

Please confirm agreement to the following statements by putting a tick in the box below:

I have read and understood the participant information sheet

I am aware that I can ask questions about the research and receive satisfactory answers

I have received enough information about the study

I understand that I am free to withdraw from the study at any time without giving a reason before or during the interview and for up to two weeks after the interview has taken place and that all information obtained from me will not be included in the study following my withdrawal.

I understand that that once the information obtained from me has been analysed, it cannot be withdrawn.

I understand that my interview will be audio-recorded

I understand that any information I provide, including personal details, will be kept confidential, stored securely and only accessed by those carrying out the study

I understand that any information I give may be included in published documents but all information will be anonymised.

I agree to take part in this study

Participant Signature ..... Date

Name of Participant:

Researcher Signature ..... Date

Name of Researcher:

## Appendix 7: Final interview guide used in the UK study

### INVESTIGATING CHANGES IN THE PROFESSIONAL STRUCTURE OF PHARMACY IN THE UNITED KINGDOM: LESSONS FOR THE NIGERIAN CONTEXT

#### Preamble:

Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the changes in the professional structure of pharmacy in the UK prior to the introduction of pharmacist prescribing. This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point in time. All information obtained from you will be kept confidential.

Are you happy for me to record the interview?

#### Key Interview Questions

1. May I ask how long you have been a practising pharmacist?
  - *This will help me decide which changes they may have seen introduced*
2. What is your current main practice setting as a pharmacist/pharmacy technician?
3. What is your current role in your practice setting?
  - *If a prescriber, note the type of prescriber (SP or IP) and should later in the interview find out from the participant how the changes that occurred in pharmacy structure are related to or currently supporting his/her present role*
4. Can you tell me something about the roles you have had in your career and how these roles have evolved over time?
  - *If in senior management at a point, they may have been responsible for change and know what it was like prior to the change*
  - *Probe to know what factors were responsible for changes in roles of participant if necessary.*
5. In your opinion, what changes have occurred in the structure of pharmacy in the UK since you registered?

*If prompting is needed, mention changes following Noel Hall & Nuffield Reports*

  - *Career structure*
  - *Roles of supporting staff*

- *Roles of pharmacist (may mention some of the extended roles such as prescribing at this stage)*
- *Salaries*
- *Training*
- *Others*

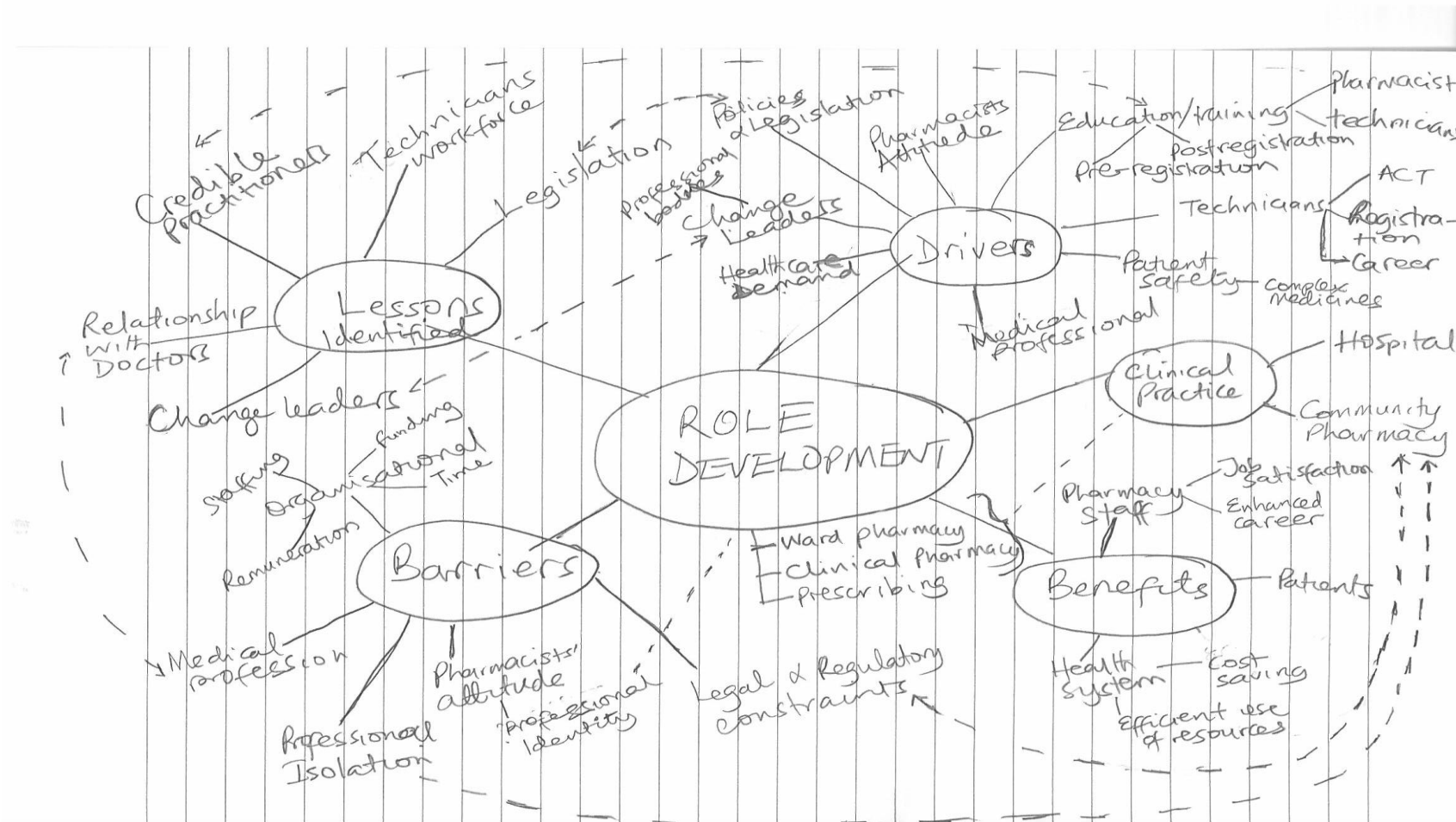
*Prompt 2: Do you have an idea on what made pharmacists to move into the ward in the first instance?*

6. How have these changes affected pharmacy staff roles (expansion or erosion)?
  - *Need to ensure the word roles is stressed but may also want to consider activities of the different staff groups*
7. What do you think were the facilitators for change?
  - *May need to explain what facilitators mean at this stage and keep this definition the same for all interviews. May need some examples as prompts such as influential individuals, need for change, need to keep professionals interested, patient expectations, educational programmes, specialisation, legislation*
8. Were there any barriers to the change process? If they were, how were they overcome?
  - *What were the barriers to developing clinical roles*
  - *May need to have some examples ready such as money, other professional groups, other pharmacists or pharmacy technicians.*
9. What advantages and disadvantages do you think are associated with these changes?
  - *This should help consider barriers and facilitators and if the interviewee is in favour of change or not.*
10. In your opinion, what lessons do you think are there for other countries to learn from the UK experience?
11. Do you have any other comment that you think might be helpful to this research?

**Thank you for taking part in this interview**

Appendix 8: Mind mapping of potential ideas during thematic analysis

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## Appendix 9: SHREC's Ethics approval letter for the Nigerian study

Faculty of Medicine and Health  
Research Office

University of Leeds  
Worsley Building  
Clarendon Way  
Leeds LS2 9NL  
United Kingdom

☎ +44 (0) 113 343 4361  
10 March 2014



UNIVERSITY OF LEEDS

Mr Asa Auta  
PhD Student  
Baines Wing  
School of Healthcare  
Faculty of Medicine and Health  
University of Leeds, LS2 9JT

Dear Asa

Ref no: **SHREC/RP/436**

Title: **Facilitators and barriers to extending pharmacists' clinical role to include prescribing: a mixed methods study**

Thank you for making the requested amendments to the documentation for the above project following review by the School of Healthcare Research Ethics Committee (SHREC). I can confirm a favourable ethical opinion based on the documentation received at date of this letter and granted subject to the following condition(s):

- **No research commences until approval from the Plateau State Specialist Hospital Health Research Ethics Committee in Nigeria has been granted.** (Please provide a copy of this approval to the committee when it has been received)

Document	Version	Date Submitted
Ethical_Review_Form_V3_Nig_study_AA	1	03.02.14
Medium Risk Fieldwork RA form_Nig_study_AA	1	03.02.14
SHRECRP436 Reviewer comments_AA	1	04.03.14

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](mailto: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.

*Please note:* You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, 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

**Dr Julia Maz**  
Acting Chair, School of Healthcare Research Ethics Committee

## Appendix 10: Nigerian ethics approval letter

# PLATEAU STATE SPECIALIST HOSPITAL JOS



Ref. No. PSSH/ADM/ETH. CO/2014/025  
Old Bukuru Road,  
P.M.B. 2113,  
Jos, Nigeria  
Tel. 073-462180  
Fax: 073-464031

Email: [psshjos@yahoo.com](mailto:psshjos@yahoo.com)

Date: April 01, 2014

**Reg. No: NHREC/05/01/2010b**  
**Notice of Expedited Review and Approval**

**Re:** Facilitators and barriers to extending Pharmacists' clinical role to include prescribing: A mixed methods study

**Name of Principal Investigator:** Asa Auta

**Address of Principal Investigator:** School of Healthcare, University of Leeds, Leeds, UK

**Date of receipt of valid application:** 13 March, 2014

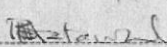
**Date of meeting when final determination of research was made:** 01 April, 2014

This is to inform you that the research described in the submitted protocol has been reviewed and given expedited approval by the Health Research Ethics Committee.

This approval dates from **01/04/2014 to 31/03/2015**. Note that no participant accrual or activity related to this research may be conducted outside of these dates.

Endeavor to submit a copy of the work to the institution through the committee Secretary on completion, please.

*The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit to your research site without previous notification.*

  
Dr. Bitrus Matawal, MBBS, FWACS  
Chairman, HREC PSSH



**FACILITATORS AND BARRIERS TO EXTENDING PHARMACISTS'  
CLINICAL ROLE TO INCLUDE PRESCRIBING**

You are being invited to take part in the above named study but before you decide, please read the following information.

**What is the purpose of this study?**

Prescribing to patients has been the exclusive role of doctors and dentists until the introduction of non-medical prescribing in some countries which allowed other health professionals including nurses and pharmacists to prescribe medicines.

In Nigeria, only medical doctors and dentists have the legal right to prescribe medicines. However, a nurse or a community health worker can be designated by the government to prescribe medicines in a primary healthcare facility without a doctor. Access to medicines in Nigeria can be seriously affected by the shortage of medical prescribers, long waiting times in hospitals and poor geographical access to physicians.

Pharmacists in Nigeria are highly educated professionals with expertise in medicines management. Despite the cost and high level of training of Nigerian pharmacists, their expertise is not utilised effectively. They mainly perform the traditional role of dispensing, which could be handled by suitably trained pharmacy technicians as in other countries such as the UK.

This study will therefore investigate the facilitators and barriers to extending the clinical role of pharmacists to include prescribing in Nigeria.

**Who is doing the study?**

This study is being undertaken by Mr Asa Auta as part of his PhD studies at the School of Healthcare, University of Leeds. Dr Barry Strickland-Hodge and Dr Julia Maz from the School of Healthcare, University of Leeds are supervising this research.

**Why have I been asked to participate?**

You have been invited to participate in this study because you have been identified as a stakeholder who has been involved in prescribing, pharmacy practice or training in Nigeria. We are inviting about 40 participants in total to take part in this study.

**What will be involved if I take part in this study?**

If you choose to participate in the study, you will be invited to a single telephone interview which will last about 30 minutes and will be audio-recorded. The interview will take place at a time convenient to you. You will need to give us a contact phone number of your choice, which will be used for the telephone interview.

### **What are the advantages and disadvantages of taking part?**

There is no direct benefit to you for taking part in this study, but your views will help us understand the issues that are important in clinical role extension for pharmacists in Nigeria and assist in determining the potential changes needed in pharmacy practice, training and policy.

### **Do I have to take part?**

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

### **Can I withdraw from the study at any time?**

You are free to withdraw at any time before or during the interview without giving a reason and up to two weeks after the interview has taken place. Once this period has expired, the information obtained from you will be analysed and cannot be withdrawn.

### **Will the information obtained in the study be confidential?**

All information obtained from you will be kept strictly confidential. Your name will be removed from the interview transcription, which means only Asa will know what you have said. Asa's supervisors: Dr Barry Strickland-Hodge and Dr Julia Maz may have access to the audio interview and transcripts for the purpose of verification of transcription and analysis. However, all your personal identifiable details will be removed before granting them access to your data. The digitalised record of your interview will be deleted after transcription and the transcript held in a password protected secure network of the University of Leeds for a period of five years, after which, it will be securely and irreversibly deleted from the device on which it is stored.

### **What will happen to the results of the study?**

Your responses and that of other participants will be analysed. Some quotes will be used from all participants' responses to illustrate the views of participants. However, these quotes will not be associated with your name. The results of this study will form part of Asa's PhD thesis and will also be published in a scientific journal and be presented at a conference.

### **Who has reviewed this study?**

Ethical approval has been granted by the School of Healthcare Research Ethics Committee (Ref no: SHREC/RP/436) and the Plateau State Specialist Hospital Health Research Ethics Committee (Ref no: PSSH/ADM/ETH.CO/2014/025).

### **If you agree to take part, would like more information or have any questions or concerns about the study please contact**

*Asa Auta*

*School of Healthcare,*

*University of Leeds,*

*LS2 9UT, Leeds, UK.*

*Tel: +447448486187 or email: hs09aa@leeds.ac.uk*

***Thank you for taking the time to read this information sheet.***



## PARTICIPANT CONSENT FORM

### FACILITATORS AND BARRIERS TO EXTENDING PHARMACISTS' CLINICAL ROLE TO INCLUDE PRESCRIBING

Please confirm agreement to the following statements by putting a tick in the box below:

I have read and understood the participant information sheet

I am aware that I can ask questions about the research and receive satisfactory answers

I have received enough information about the study

I understand that I am free to withdraw from the study at any time without giving a reason before or during the interview and for up to two weeks after the interview has taken place and that all information obtained from me will not be included in the study following my withdrawal.

I understand that that once the information obtained from me has been analysed, it cannot be withdrawn.

I understand that my interview will be audio-recorded

I understand that any information I provide, including personal details, will be kept confidential, stored securely and only accessed by those carrying out the study

I understand that any information I give may be included in published documents but all information will be anonymised.

I agree to take part in this study

Participant Signature ..... Date

Name of Participant:

Researcher Signature ..... Date

Name of Researcher:

## **Appendix 13: Draft interview guides for the Nigerian study**

### **Pharmacists and pharmacy technicians**

#### **Preamble:**

Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the barriers and facilitators to extending the clinical role of pharmacists to include prescribing in Nigeria. This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point. All information obtained from you will be kept confidential.

Are you happy for me to record the interview?

#### **Demography and investigating pharmacy professional structure**

- When did you qualify as a pharmacist or pharmacy technician?
- What is your current practice setting?
- Can you tell me something about your career to date including the previous jobs you have had and your current role?
- What factors influenced the choice of your present job?
- What career structure is available for pharmacy staff in your institution? Are there provisions for a clinical career pathway?
- What is your general view of pharmacists and pharmacy technicians, what they do and what they're like?
- Describe a typical role of pharmacy staff in your organisation?
- What is your opinion on the level of pharmacists' clinical involvement and contribution to a multidisciplinary health team?
- What kind of roles will you want to see pharmacy staff do?
- What educational and training provisions are available for pharmacy staff in your institution?

#### **Views on pharmacist prescribing**

- Are you aware that pharmacists are prescribing in some countries?
- Do you think pharmacists should be given the right to prescribe medicines in Nigeria?
- How do you think patients will feel about the pharmacists prescribing their medicines?
- Do you have any reservations concerning extending prescribing rights to pharmacists?

- What are the constraints or barriers to having the pharmacists prescribe medicines in Nigeria?
- How do you think doctors will react about pharmacist prescribing, will they be ready to support the pharmacists develop role in prescribing?
- What factors will enable the pharmacists develop a role in prescribing in Nigeria?
- In your opinion, what are the potential areas for pharmacist prescribing in Nigeria?
- What changes to the structure of pharmacy in your place of work would be needed to develop prescribing by pharmacists?
- What benefits do you think are there in having the pharmacists prescribe medicines?
- Do you have any question or comment on issues that you think have not been covered by this interview?

**Thank you for taking part in this interview**

## **Doctors**

### **Preamble:**

Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the barriers and facilitators to extending the clinical role of pharmacists to include prescribing in Nigeria. This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point. All information obtained from you will be kept confidential.

Are you happy for me to record the interview?

### **Demography and investigating pharmacy professional structure**

- How long you have been a practising doctor?
- What is your current role and specialty?
- What is your general view of pharmacists, what they do and what they're like?
- What experience have you had with pharmacists in your institution?
- What is your opinion on the level of pharmacists' clinical involvement and contribution to a multidisciplinary health team?
- What kind of roles will you want to see pharmacists do?

## **Views on pharmacist prescribing**

- Are you aware that pharmacists are prescribing in some countries?
- Do you think pharmacists should be given the right to prescribe medicines in Nigeria?
- How do you think patients will feel about the pharmacists prescribing their medicines?
- Do you have any reservations concerning extending prescribing rights to pharmacists?
- What are the constraints or barriers to having the pharmacists prescribe medicines in Nigeria?
- Will you be willing to support the pharmacists develop a role in prescribing?
- What factors will enable the pharmacists develop a role in prescribing in Nigeria?
- In your opinion, what are the potential areas for pharmacist prescribing in Nigeria?
- What benefits do you think are there in having the pharmacists prescribe medicines?
- Do you have any question or comment on issues that you think have not been covered by this interview?

## **Thank you for taking part in this interview**

### **Policymakers and other stakeholders**

#### **Preamble:**

Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the barriers and facilitators to extending the clinical role of pharmacists to include prescribing in Nigeria. This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point. All information obtained from you will be kept confidential.

Are you happy for me to record the interview?

#### **Demography and investigating pharmacy professional structure**

- Can you tell me a bit about your current role?
- Do you have an idea on the career structure available for pharmacy staff?



- What is your general view of pharmacists, what they do and what they're like?
- What is your opinion on the level of pharmacists' clinical involvement and contribution to multidisciplinary health team?
- What kind of roles will you want to see pharmacy staff do?
- What educational and training provisions are available for pharmacy staff?

### **Views on pharmacist prescribing**

- Are you aware that pharmacists are prescribing in some countries?
- Do you think pharmacists should be given the right to prescribe medicines in Nigeria?
- How do you think patients will feel about the pharmacists prescribing their medicines?
- Do you have any reservations concerning extending prescribing rights to pharmacists?
- What are the constraints or barriers to having the pharmacists prescribe medicines in Nigeria?
- How do you think doctors will react about pharmacist prescribing, will they be ready to support the pharmacists develop role in prescribing?
- What factors will enable the pharmacists develop a role in prescribing in Nigeria?
- In your opinion, what are the potential areas for pharmacist prescribing in Nigeria?
- What benefits do you think are there in having the pharmacists prescribe medicines?
- Do you have any question or comment on issues that you think have not been covered by this interview?

**Thank you for taking part in this interview**

**NB: Interviews were tailored towards the experience of each stakeholder**

## Appendix 14: Final interview guide used in interviewing Nigerian pharmacists and pharmacy technicians

<b>Areas covered by the interview</b>
<b>Preamble</b> <p>Thank you for agreeing to take part in this interview. The purpose of this interview is to investigate the barriers and facilitators to extending the clinical role of pharmacists to include prescribing in Nigeria. By prescribing, we mean granting pharmacists the legal right to prescribe 'Prescription Only Medicines' as currently practised by doctors in Nigerian hospitals. This differs from counter prescribing or the supply of over the counter medicines as currently practised by community pharmacists in response to patients' complaints or symptoms.</p> <p>This interview is expected to last about an hour, and you are free to stop from participating in the interview at any point. All information obtained from you will be kept confidential.</p> <p>Are you happy for me to record the interview?</p>
<b>Demography and investigating pharmacy professional structure</b> <ul style="list-style-type: none"><li>• When did you qualify as a pharmacist or pharmacy technician?</li><li>• What is your current role?</li><li>• What career structure is available for pharmacy staff in your institution? Are there provisions for a clinical career pathway?</li><li>• What is your general view of pharmacists and pharmacy technicians, who they are and what they do?</li><li>• What experience have you had with doctors in your workplace? What kind of professional relationship exists between doctors and pharmacists in your workplace?</li><li>• What kind of clinical roles do you do in your practice? Prompt:<ul style="list-style-type: none"><li>○ Level of pharmacists' clinical involvement</li><li>○ Contribution to a multidisciplinary health team?</li></ul></li><li>• What kind of clinical roles will you want to do or see pharmacists do in Nigeria? Prompt:<ul style="list-style-type: none"><li>○ Why?</li><li>○ What are the barriers to attaining such roles</li></ul></li><li>• What educational and training provisions are available for pharmacy staff in</li></ul>

your institution?

### **Views on pharmacist prescribing**

- Are you aware that pharmacists are prescribing in some countries?
- Do you think pharmacists in Nigeria should be granted the right to prescribe prescription only medicines? Why?
- Do you have any reservation concerning extending prescribing rights to pharmacists?
- What are the constraints or barriers to having the pharmacist prescribe medicines in Nigeria?
- How do you think pharmacists could be introduced to prescribing in the future?
- Prompts
  - Potential areas
  - Models: Collaborative/independent  
In collaborative prescribing, the pharmacist prescribes in partnership with a doctor where the doctor makes initial diagnosis and treatment decisions, while the pharmacist may continue therapy, adjust doses, change therapy or discontinue a medication within an agreed plan. In independent prescribing; the pharmacist is responsible and accountable for his or her prescribing decisions including clinical assessment, diagnosis (where applicable) and management of the patient.
  - Limited prescribing?
- What factors will enable the pharmacists develop a role in prescribing in Nigeria?
- What changes to the structure of pharmacy in your place of work would be needed to develop prescribing by pharmacists?
- What benefits do you think are there in having the pharmacists prescribe medicines?
  - Will it promote safe supply of medicines or minimise medicine related harm?
- Do you have any question or comment on issues that you think have not been covered by this interview?

**Thank you for taking part in this interview**

## Appendix 15: Online Survey Questionnaire



### FACILITATORS AND BARRIERS TO EXTENDING PHARMACISTS' CLINICAL ROLE TO INCLUDE PRESCRIBING IN NIGERIA

Dear colleague, I am a Nigerian pharmacist undertaking research into the facilitators and barriers to extending the clinical role of pharmacists in Nigeria to include prescribing. I am inviting you to take part in this study but before you decide, please read the following information.

This research is being carried out by Mr Asa Auta as part of his PhD studies at the School of Healthcare, University of Leeds. Dr Barry Strickland-Hodge and Dr Julia Maz from the School of Healthcare, University of Leeds are supervising the research.

In the UK and to a lesser degree in other countries, pharmacists have prescribing rights. I am interested in finding out if such rights would be possible in Nigeria. This short online survey has two sections. The first concerns clinical pharmacy practice to identify the potential changes needed to develop clinical pharmacy in Nigeria. While the second section relates to granting prescribing rights to pharmacists in Nigeria. Your opinion as a pharmacist working in Nigeria, is essential to my research.

There is no known or anticipated risk for you in participating in this survey. All the information that will be obtained from you will be handled confidentially. I will publish the trend data to let you know the results. No individual can be identified in the published results. Please give us as much detail and comment as possible.

If you decide to take part in the survey, you will complete an anonymous questionnaire which will last about 15 minutes. Submission of the questionnaire will be taken to indicate that you have given your consent for your responses to be collated and analysed and once the completed questionnaire has been submitted, consent cannot be withdrawn.

I would like to assure you that this study has been reviewed and received ethics clearance from the School of Healthcare Research Ethics Committee and the Plateau State Specialist Hospital Health Research Ethics Committee. However, the final decision to participate is yours.

If you would like more information or have any question or concern about the study, please feel free to contact Mr Asa Auta, School of Healthcare, University of Leeds, Leeds, LS2 9JT, UK. Tel: +44113 3437185 or email: [hs09aa@leeds.ac.uk](mailto:hs09aa@leeds.ac.uk)

If you agree to participate in the study, please click below to continue.

**Note that once you have clicked on the CONTINUE button at the bottom of each page you cannot return to review or amend that page**

Please tell us a little about you and your current role which will help us classify your response statistically.

1. Are you:

- Male
- Female

2. Which best describes your age group?

- 21-30 years
- 31-40 years
- 41-50 years
- 51-60 years
- above 60 years

3. Which undergraduate pharmacy degree(s) do you hold?  
(select all that apply)

- BSc Pharm/B. Pharm
- Pharm D.
- Other (please specify):

4. Do you hold any postgraduate qualification in clinical pharmacy?

- Yes
- No

Please specify the qualification

5. Do you hold the Fellowship of the West African College of Pharmacy?

- Yes
- No

6. How long have you been a pharmacist?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26-30 years
- Above 30 years

7. What is your primary area of practice?

- Hospital
- Community pharmacy
- Industry
- Academic
- Administrative
- Other (*please specify*):

What is the type of your hospital facility?

- Primary
- Secondary
- Tertiary

8. In which geopolitical zone is your place of work located?

- North-west
- North-east
- North-central
- South-west
- South-east
- South-south

## Section A: Clinical Pharmacy Practice in Nigeria

What are your views on clinical pharmacy practice in Nigeria? Please indicate your level of agreement for each of the following statements.

9. Pharmacist specialisation in different clinical sub-specialties would promote the development of clinical pharmacy practice in Nigeria

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

10. A clinical career pathway should be created for pharmacists who want to practice as clinical pharmacists.

- Strongly agree

- Agree
- Unsure
- Disagree
- Strongly disagree

**11.** The current undergraduate pharmacy curriculum does not produce confident pharmacists able to apply their knowledge in clinical settings

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**12.** Collaborative practice between doctors and pharmacists in patient care is needed for the development of clinical pharmacy practice

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**13.** Pharmacy technicians should be further trained to do some of the traditional medicine supply functions of pharmacists

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**14.** There are policies in place in the country that support the development of clinical pharmacy practice.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**15.** The current separation of prescribing as doctors' role and dispensing as pharmacists' role in Nigeria is in the best interest of the patient.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**16.** Pharmacists are more interested in the business aspect of their practice than clinical pharmacy practice.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**17.** Please feel free to give any other relevant comments on clinical pharmacy practice in Nigeria



## Section B: Views on Pharmacist Prescribing

Please indicate your level of agreement to the following statements on pharmacist prescribing in Nigeria

**18.** Pharmacists in Nigeria should be given the right to prescribe.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**19.** Pharmacists should prescribe in collaboration with medical doctors where the doctor makes the diagnosis.

- Strongly agree
- Agree
- Unsure



- Disagree
- Strongly disagree

**20.** Pharmacists should prescribe independent of medical practitioners

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**21.** Pharmacists should only be allowed to prescribe from a limited drug formulary.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**22.** Prescribing should be reserved for experienced pharmacists who are able to demonstrate certain competences.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**23.** Postgraduate clinical courses should be developed to prepare pharmacists for prescribing

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

Please indicate your level of agreement to the following statements on the likely facilitators and barriers to introducing pharmacist prescribing in Nigeria

**24.** Pharmacist prescribing will increase patients' access to care

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**25.** Pharmacists' skills in making diagnoses are limited

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**26.** Pharmacists' training in clinical assessment is insufficient for prescribing

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**27.** Pharmacist prescribing will increase the likelihood for prescribing errors

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**28.** Pharmacist prescribing will reduce the quality of care the patient receives

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**29.** Pharmacist prescribing will enable better use of pharmacists' professional skills

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**30.** There will be conflict of interest with pharmacists acting as both prescribers and dispensers

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**31.** Pharmacists will have a commercial interest in prescribing

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**32.** Pharmacists have close working relationship with doctors in patient care

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**33.** There will be resistance to pharmacist prescribing by the medical doctors

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**34.** Pharmacist prescribing will save healthcare costs for the government.

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**35.** Pharmacist prescribing will minimise the current illegal supply of 'Prescription Only Medicines' without a prescription in Nigeria

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**36.** Pharmacists lack access to patients' clinical data

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**37.** Pharmacists have negative attitudes toward taking up clinical roles

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**38.** Pharmacists lack confidence to take on clinical roles

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**39.** There are inadequate numbers of pharmacists in the country to engage in additional roles

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**40.** Pharmacists lack the time to take on additional roles

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**41.** Pharmacist prescribing will create confusion among the public as to the role of doctors and pharmacists

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**42.** There are inadequate facilities within community pharmacy to allow pharmacist prescribing

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**43.** Pharmacist prescribing will not be accepted by patients

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**44.** Pharmacist prescribing will be more expensive for the patient

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**45.** Pharmacist prescribing will reduce doctors' workload

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**46.** Pharmacist prescribing will only happen if technicians are further trained to take on some of the supply roles of pharmacists

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**47.** Pharmacist prescribing will ensure effective use of the limited human resources in the health sector

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**48.** The government is interested in developing pharmacists' clinical roles

- Strongly agree
- Agree
- Unsure
- Disagree
- Strongly disagree

**49.** If pharmacists are to be granted prescribing rights, would you be willing to be a prescriber?

Yes  No

In what area(s) do you think you will need additional training in order to be a prescriber? *(select all that apply)*

- Clinical pharmacology (applied therapeutics)
- Communication skills
- Pathophysiology of diseases
- Patient consultations and decision making
- Patient assessment
- Principles of differential diagnosis
- Principles and methods of patient monitoring
- Interpreting laboratory results
- Evidence based practice
- Medication adherence
- Psychology of prescribing
- Public health issues
- Legal and ethical aspect of prescribing
- I will not need further training
- Other *(please specify)*:

**50.** Please feel free to add any other comment that you think will be important for us to consider on the facilitator and barriers to granting prescribing right to pharmacists in Nigeria.

## **Appendix 16: Online survey recruitment letter**

Dear Pharmacist,

I am a PhD student at the School of Healthcare, University of Leeds, United Kingdom. I got your details from the PSN's Facebook group. I write to invite you to participate in the online survey I am carrying out to investigate the facilitators and barriers to extending pharmacists' clinical role to include prescribing in Nigeria. In the UK and to a lesser degree in other countries, pharmacists have prescribing rights. I am interested in finding out if such rights would be possible in Nigeria. Your opinion as a pharmacist working in Nigeria is essential to my research.

Please find below the link to the survey for further information.

<https://www.survey.leeds.ac.uk/pharmnigeria/>

Kind regards

Asa Auta