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An Investigation of the Structures and Processes of Pharmacist Prescribing in Great Britain: a Mixed Methods Approach

MAXWELL PATRICK DAPAR

PhD **2012**

An Investigation of the Structures and Processes of Pharmacist Prescribing in Great Britain: a Mixed Methods Approach

Maxwell Patrick Dapar

A thesis submitted in partial fulfilment of the requirements of Robert Gordon University

for the degree of doctor of philosophy

January, 2012

"Taste and see that the LORD is good"

Psalm 34:8

To my wife Rose and daughter,

Peniel Nanret,

for perseverance through those moments when I was physically present, yet absent

Abstract

The aim of this research was to investigate the structures and processes of pharmacist prescribing in Great Britain, focusing on primary care settings. A 'sequential-mixed methods' was employed in the conduct of the research.

The first phase was a cross-sectional postal questionnaire of all pharmacist prescribers (n= 1654 in January 2009), to quantify the extent and nature of prescribing and key factors associated with prescribing practice.

Response rate was 42.3% (n=695). The pharmacy practice setting was significantly associated with prescribing (those in hospital or general medical practice were more likely to have prescribed ($p< 0.05$), than respondents in community practice). Factor analysis of attitudinal statements on prescribing implementation revealed factors, grouped as: 'administrative structures and processes', 'perceptions of pharmacists' prescribing role**'** and 'facilities for prescribing'. Scores for 'facilities for prescribing' varied depending on practice setting. Respondents in community practice recorded lower median scores compared with those in general medical practices. However, there were no statistically significant differences in median scores between respondents based in GP and hospital settings.

In-depth qualitative work undertaken in the second phase further explored facilitators of, and challenges to prescribing practice (e.g. the lack of defined prescribing roles) identified in phase one. Semi-structured interviews were conducted with a purposive sample of 34 prescribers. Prescribers were selected from diverse settings, including secondary care from England and Scotland, to highlight key factors contributing to prescribing success which could potentially inform extrapolations of successful practice from one setting to the other.

The 'framework' approach to qualitative data analysis was rigorously applied, revealing that the professional isolation and issues around access to clinical data and administrative support in the community setting may have negatively impacted on prescribing implementation. Notably, a perceived lack of clarity and definition of the pharmacist prescribing role was a key theme in hindering prescribing practice of pharmacists irrespective of setting. Participants

described ‘ideal’ roles which they perceived as potentially providing clarity, definition and direction to facilitate implementation.

The original data generated through this research highlights that prescribing implementation is less than desired, especially in community pharmacies. Pharmacist prescribing appears to have progressed little since supplementary prescribing developments in 2004, even with the much heralded arrival of independent prescribing in 2006. Interestingly, phase 2 participants suggested a ‘hybrid supplementary/independent’ prescribing model, as more likely to succeed. In this model, pharmacist prescribers favour a cooperative practice arrangement in which doctors diagnose and pharmacists prescribe. The implication of these findings and specific recommendations for policy makers, other key stakeholders and practitioners are discussed in detail within the thesis.

Key words: Prescribing, pharmacist, supplementary, independent, non-medical, primary care, Structures, processes, Great Britain.

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Lorna McHattie was a great help with the literature review and she gladly gave up her office for me to use in conducting the interviews. Dr Alex Wilson, consultant statistician was very helpful and supportive with the analysis of quantitative data. Mrs Toni Simpson helped me with creating the project webpage and provided technical support to the very last stage of the thesis preparation. Mrs Katie MacLure assisted with document formatting and layout at various stages of the project. Mrs Linda Adams made sure that I had access to all facilities when need. Mr Brian De Jonckheere kept my system up-to-date and made available all the software for data management and analysis.

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External outputs

Parts of this work have been presented at various local and international conferences and abstracts of these presentations have been published in the following journals.

1. Dapar M, McCaig D, Cunningham ITS, Diack L and Stewart D. Training undergraduate pharmacy students for prescribing: views of primary care based pharmacist prescribers in Great Britain. *International Journal of Pharmacy Practice* 2010; Supplement 2: 16-17. (Oral presentation at the Royal Pharmaceutical conference 5th-6th September 2010 Imperial College London)

2. Dapar M, McCaig D, Cunningham ITS, Diack L and Stewart D. Current status of prescribing by pharmacists in Great Britain. *Pharmacy Practice* 2010; 8(supplement 1):56-57. (Oral presentation at the 16th International Social Pharmacy Workshop 23rd -26th August, 2010 Lisbon Portugal)

3. Dapar M, McCaig D, Cunningham ITS, Diack L and Stewart D. Pharmacist prescribing in Great Britain: why do qualified pharmacist prescribers not prescribe?. *Pharmacy Practice* 2010; 8(supplement 1): 100. (Poster presentation at the 16th International Social Pharmacy Workshop 23rd -26th August, 2010 Lisbon Portugal)

4. Dapar M, McCaig D, Cunningham ITS, Diack L and Stewart D. Facilitators and barriers to pharmacist prescribing: exploring the association of pharmacy practice setting. *International Journal of Pharmacy Practice* 2010; Supplement 1: 38-39. (Poster presentation at the Health services Research and Pharmacy Practice Conference 12th -13th April, 2010 University of Manchester)

5. Dapar M, McCaig D, Cunningham ITS, Diack L and Stewart D. The nature and extent of prescribing by pharmacists in primary care settings of Great

Britain.(Poster presentation at the Celtic Pharmacy Festival, 6th-7th March 2010; Edinburgh, UK)

6. Supplementary and independent prescribing by pharmacist in Great Britain: current status of implementation (Poster presentation at the Celtic Pharmacy Festival, 6th-7th March 2010; Edinburgh, UK)

Drafts of full papers are being prepared for publication in peer–reviewed journals.

Forward

This thesis is a report of the research work I conducted over the past three and half years, in fulfilment of the requirements of the Robert Gordon University (RGU) Aberdeen, for the award of a PhD. In the research, I investigated the structures and processes of pharmacist prescribing practice focusing initially on the primary care setting, but subsequently expanding the scope to include secondary care. This iterative process has developed my research skills and enabled me to make original contributions to the growing field of pharmacist prescribing practice and research.

Pursuing a PhD in Pharmacy Practice at RGU was the culmination of a life-long ambition an interest in enhanced pharmacy services. Having obtained a Bachelor of Pharmacy with honours from the University of Jos, Nigeria, I worked as a pharmacist in various settings, including practice experience as a clinical pharmacist in secondary and tertiary hospitals. However, I realised that my interest was more in academic teaching and research than actual practice. This led me to take up appointment as a lecturer in the Department of Clinical Pharmacy, University of Jos. To enhance my career prospects in academia, I enrolled for an MSc, in pharmacology, with bias in clinical pharmacology, where I researched the prescription patterns and treatment outcomes for hypertension in four hospitals in Jos, Nigeria. It was after this that I decided to join the vibrant pharmacy practice and education research group at RGU, to further develop my skills and experience in research.

The doctoral research training at RGU capitalised on many internal and external training opportunities to broaden my research experience. Presenting aspect of my research work at national and international conferences, served as a useful peer review mechanism for the research. In addition, the internal symposia of the School of Pharmacy and Life Sciences provided opportunities for other PhD students and academics to scrutinise the research. Therefore, this thesis is a product of a rigorous research that contributes to the knowledge base in the field of pharmacist prescribing.

Throughout the thesis, I have described details of the project reported in this thesis which is organised in two phases covering quantitative and qualitative approaches in a mixed methods research design.

The first chapter provides a general introduction to the research. The chapter opens with historical developments in the practice of pharmacy, starting from the early apothecaries to clinical pharmacy practice in the 1960s, pharmaceutical care in the late 1980s, and finally focusing on pharmacist prescribing. This provides the introduction and background to non-medical prescribing in Great Britain, with particular attention to pharmacist prescribing. The rest of the chapter reviews key publications on the subject of pharmacist prescribing in Great Britain, and highlights the gaps in knowledge, which the current research hopes to answer with original data.

Chapter 2 outlines a general introduction to methodology and related concepts, and shows how these concepts informed the use of specific quantitative and qualitative methods in a mixed-methods approach in the conduct of the current research. I have outlined the key philosophical assumptions underlying the research traditions, but I have argued for the pragmatic choice of methods that are driven by the research question rather than philosophical debates. I have used this argument to justify the selection of the specific methods employed in this doctoral research project. Throughout the chapter, I have focused my discussion on how each set of philosophies underpin research in the health services and pharmacy practice domains.

Chapter 3 presents the quantitative phase of the research project, using a cross-sectional questionnaire survey approach which investigated the nature and extent of prescribing activities undertaken by pharmacists. However, it was not possible, using the survey approach, to gain in-depth explanations of all the issues involved. How some respondents were able to prescribe despite the challenges shows that much can be learnt from exploring the experiences of pharmacist prescribers. These issues are best addressed by qualitative methods, which informed designing a mixed methods project.

Chapter 4 presents Phase 2, in which the views, experiences and perceptions of pharmacist prescribers on the implementation of prescribing practice were explored in semi-structured telephone interviews. Results of the quantitative phase of the research on the apparent lack of clarity in the prescribing role of pharmacists were also explored.

In Chapters 3 and 4, specific strengths and limitations of quantitative and qualitative methods were discussed in order to put the finding in contexts. The key findings in each phase were then considered in relation to published literature.

Chapter 5 integrates findings of both quantitative and qualitative phases which were brought together and considered in terms of their implications for policy and practice of pharmacist prescribing. This informed specific recommendations from the current study for policy makers and other stakeholders in the implementation of pharmacist prescribing practice. Key issues that warrant further research are considered before drawing an overall conclusion to address the aims of the research.

List of Abbreviations

Bcc	Blind carbon copy
CDs	Controlled drugs
CINHAL	Cumulative Index of Nursing and Allied Health Literature
CMP	Clinical Management Plan
CPD	Continuing Professional Development
CPS	Community Pharmacy Scotland
DMP	Designated Medical Practitioner
ECR	Emergency Care Record
GB	Great Britain
GP	General Practitioner
GPhC	General Pharmaceutical Council
GSL	General Sales List
IP	Independent Prescribing
IPA	International Pharmaceutical Abstracts
IT	Information Technology
KIS	Key Information Summary
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
K-W	Kruskall-Wallis test

Medline	Medical Literature Analysis and Retrieval System Online
NHS	National Health Services
NMP	Non Medical Prescribing
NoSREC	North of Scotland Research Ethics Committee
P	Pharmacy Medicines
PCA	Principal Component Analysis
PCS	Palliative Care Summary
PCT	Primary Care Trust
PDF	Portable Document Format
PGD	Patient Group Directions
PharmaCAT	Pharmacist Consultation Assessment Tool
PLP	Period of Learning in Practice
POM	Prescription Only Medicines
PMR	Patient Medication Records
RCGP	Royal College of General Practitioners
RCT	Randomised Controlled Trials
RPS	Royal Pharmaceutical Society
RPSGB	Royal Pharmaceutical Society of Great Britain
SCT	Secondary Care Trust

SP	Supplementary Prescribing
SPSS	Statistical Software for the Social Sciences
TAM	Traditional African Medicine
UK	United Kingdom
α	Chronbach's Alpha Coefficient for Internal Consistency

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Chapter one: General introduction

This chapter provides a general introduction to the research reported in this thesis. The overall aim of the research was to investigate the different dimensions of structures and processes of pharmacist prescribing implementation in Great Britain. Section 1.1 highlights some historical developments in the practice of pharmacy, starting from the early apothecaries to clinical pharmacy practice in the 1960s, pharmaceutical care in the late 1980s, and finally pharmacist prescribing within the last decade. Section 1.2 gives a background of non medical prescribing (NMP) in Great Britain with particular attention to pharmacist prescribing, which is the focus of the project. Section 1.3 defines prescribing and reviews pharmacist prescribing internationally, highlighting differences and similarities with the concept as applied in Great Britain. The rest of the chapter reviews key publications on the subject of pharmacist prescribing in Great Britain.

The geographical scope of this research is Great Britain (GB) encompassing England, Scotland and Wales. However, some legislation and policy directions guiding the implementation of NMP are determined by the central Government of the United Kingdom (UK) which also includes Northern Ireland (NI). Consequently, the sections covering background and review of key publications on pharmacist prescribing will occasionally refer to the UK rather than GB.

1.1 Some historical milestones in the development of pharmacy practice

The history of pharmacy can hardly be separated from that of medicine. The Sumerians of Mesopotamia (present day Iraq) around 2700 BC were known to have treated patients using crude plant drugs and other remedies. They regulated the practice of medicine between 1795 and 1750 BC; a period in which they separated diagnosis and treatment of disease from preparation and supply of medicines, the latter being carried out by apothecaries (1). At about the same time as the Sumerians, other cultures in Egypt, Greece, Rome, Arabia India and China were independently developing and recording significant events in the history of medicine and pharmacy. The Arabians introduced into Europe

the concept of separating diagnosis and treatment from preparation and supply of medicinal products. However, the defining moment in the history of pharmacy practice probably came in 1231 AD with the Edict of Palermo. Fredrick II of Hohenstaufen, Emperor of Germany and King of Sicily, passed an Edict which clearly distinguished between the responsibilities of physicians and those of apothecaries. This distinction was not yet applicable in the territories known today as GB (1, 2).

In the early twentieth century the profession of pharmacy continued the historical role of apothecaries, compounding and dispensing medicinal products requested by patients or physicians. However, during the 1960s pharmacy progressed towards full professional status with the emergence of clinical pharmacy practice (3). Clinical pharmacy is defined as: “the science and practice of pharmacy concerned with the optimisation of medication therapy and the promotion of health, wellness and disease prevention” (4). This emphasises a focus on individual patients, or patient groups through clinical services including: therapeutic drug monitoring, rational use of medicines and medicines information services (3, 5).

Clinical pharmacy practice allows pharmacists to combine expertise in the physical and chemical properties of drugs, with appropriate clinical knowledge and skills. They perform extended roles beyond dispensing that involve clinical judgements and decisions on appropriate, safe and effective use of medicines in patient care (6). However, clinical knowledge is not the only requirement for achieving optimum pharmaceutical services. A new philosophy termed ‘Pharmaceutical Care’, emerged in pharmacy practice in which pharmacists work with other health professionals to identify and resolve drug-related problems in patient care (3). By the early 1990s, the concept of pharmaceutical care had become embedded in the professional functions of pharmacists (7).

Hepler and Strand defined pharmaceutical care as; “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve the patient’s quality of life” (3). This practice philosophy requires the cooperation of pharmacists with other health care professionals and patients to identify existing

or potential drug-related morbidities, and to resolve or prevent them (3). Drug-related morbidity has been a major problem in patient care. Published data suggests between 3.5 and 7.3% of hospital admissions are linked to adverse drug reactions, about half of which are preventable (8, 9). Similarly, a prospective study of adverse drug reactions in one UK hospital reported an adverse drug reaction incidence of 14.7%, and estimated the cost to the NHS in England at above £171 million annually (10). Inappropriate prescribing has been documented as the leading cause of preventable drug-related morbidity (11). Therefore, any measure to improve the prescribing process will ultimately improve patient care through prevention or resolution of drug related morbidities (12).

Pharmacy practice, having progressed from the earlier roles of compounding and dispensing medicines, now includes such tasks as giving medicines advice to health care professionals and patients. Pharmacists may identify medication needs of individual patients, then recommend appropriate remedies or adjust drug dosage(s) to achieve definite therapeutic outcomes (3). These activities of pharmacists constitute part of the prescribing process, and may be described by the loose term ‘pharmacist prescribing’ (13). The rest of this chapter will focus on prescribing by pharmacists.

1.2 Definition of prescribing

The Medicines Act 1968 classifies medicines into three categories under which they can be supplied to patients (14). Prescription only medicines (POMs) can only be supplied on presentation of a valid prescription written and signed by an authorised health professional. Pharmacy (P) medicines can be supplied from pharmacies without prescription, but under the supervision of a registered pharmacist. Medicines on the general sale list (GSL) can be supplied from pharmacies and supermarkets over-the-counter, without necessarily requiring the supervision of a pharmacist (14). According to the Medicines Act 1968, to prescribe is ‘to order in writing the supply of a prescription-only medicine for a named patient’. Under this Act, physicians and dentists were the only health professions authorised to prescribe for human use (15). However, the term

prescribe has been used in a general sense to mean an order to authorise the supply of any category of medicine, which may not be a POM at the expense of the national health services (NHS) of the UK. This extended definition also includes any advice given to patients on suitable remedies including medicines which may be purchased over-the-counter (16).

1.2.1 Pharmacist prescribing

The legal classification of some medicines into the P and GSL categories, (14) and the extensive training of pharmacists in the actions, uses and side effects of medicines place them in a position to be involved in advising or deciding the most appropriate medicines for patients in hospitals or community. Moreover, community pharmacists provide clinical advice to patients over-the-counter to resolve drug-related problems, and to treat minor ailments (17). Therefore, the term prescribing used in the context of pharmacists' activities describes different levels of pharmacists' involvement in the selection and use of medicines (13).

For the purpose of clarity the term 'pharmacist prescribing' is used throughout this thesis with particular reference to supplementary and independent prescribing. This form of prescribing implemented for pharmacists, nurses and allied health professionals in GB within the general concept of non medical prescribing, confers legal authority on these groups of professionals to prescribe medicines for human use at the expense of the National Health Services (16), details in sections 1.3.5-1.3.8. Although the focus in this thesis is supplementary and independent prescribing by pharmacists in GB, the next section will provide a global overview of pharmacists' activities related to prescribing.

1.3 Pharmacist prescribing in the global context

There are eight models of pharmacist prescribing practice operating in different countries; described variously as 'collaborative', 'dependent', 'supplementary' or 'independent' prescribing. These terms refer to different sets of activities in different countries. Moreover, each country and sometimes different states within the same country have authorised pharmacists in their particular

jurisdictions to prescribe medicines with different levels of autonomy (18). Most of the published literature describes the situation in the United States of America, Canada, Australia and the UK; a summary of these models is presented next.

1.3.1 Pharmacist prescribing in the United States of America and Canada

The United States of America (USA) and Canada have similar pharmacist prescribing models in operation. There are three levels of prescribing activities undertaken by pharmacists, depending on jurisdiction (19),(18), (20). The first level, 'independent prescribing' authority, is held by professionals with sole responsibility for the clinical outcome of patients. The independent prescriber in this context must possess legally defined levels of knowledge and skills in diagnosis before they can be licensed. The second level of prescribing, 'dependent prescribing', involves formal written agreements in which independent prescribers delegate their prescribing authority to dependent prescribers. Under this arrangement, pharmacists in some provinces of Canada are authorised to prescribe under protocol, prescribe according to formulary, or prescribe by referral (21). The third level of prescribing authority 'collaborative prescribing' requires a co-operative practice relationship between the physician and the pharmacist. Physicians diagnose diseases based on their expert consultation and physical assessment skills, and then pharmacists apply their expertise in pharmacotherapy in the selection and maintenance of drug regimes (21), (19).

The State of Florida in the USA has, since 1984, granted pharmacists legal authority to independently prescribe from a range of medicines (19). Recent reports suggest that six other States in the USA are in the process of granting independent prescribing rights to pharmacists, similar to the one in Florida, while forty-three States have granted pharmacist prescribing authority under collaborative arrangements with physicians (22), (18), In Canada, the provinces of Alberta and Manitoba have granted collaborative prescribing rights to pharmacists, while Saskatchewan and British Columbia are considering proposals to do likewise (21).

1.3.2 Pharmacist prescribing in Australia and New Zealand

In Australia, there are two schedules of medicines, schedule 2 ('pharmacy medicines') and schedule 3 ('pharmacists only medicines') from which pharmacists have been prescribing independently for many generations (23). However, for the purpose of enabling pharmacists to prescribe from other schedules of medicines, four prescribing models have been developed for possible implementation in Australia (23) (18). Under the four prescribing models, pharmacists in Australia will potentially do one of the following:

i. Prescribe under protocol (patient group directions, and repeat prescribing)
ii. Prescribe under no protocol (independent prescribing from schedules 2 and 3)
iii. Limited formulary prescribing (prescribing schedules 2 and 3 medicines for patients referred to pharmacists)
iv. Broad formulary prescribing (supplementary prescribing and collaborative prescribing)

It is envisaged that pharmacists in Australia will be able to exercise varying degrees of clinical freedom and prescribing responsibility once the four models are implemented in practice (23).

In New Zealand any registered health professional can enter into a collaborative or supplementary prescribing agreement with an independent prescriber under standing orders or protocols (24). This opportunity has been explored by pharmacists, who enter collaborative arrangements for prescribing with doctors. However, a move by the Pharmacy Council of New Zealand to gain official recognition for the Advanced Pharmacist Practitioner (Pharmacist Prescriber) role, has not received the desired support (25).

1.3.3 Pharmacist prescribing in Africa and Asia

There are no published accounts of the implementation of prescribing by pharmacists in Asia and Africa. The majority of the African population depends on Traditional African Medicine (TAM) for health need. In some countries up to

90% of the population use TAM, but have very limited access to trained medical doctors (26). Leach *et al*. suggest the training of physician assistants up to diploma level to prescribe for, and competently manage common conditions especially in the rural areas. This, they proposed as a way of resolving the challenges posed by inadequate manpower on the access of patients to medicines in Africa (27). It is of particular concern, that the health system and pharmacy practice in Africa are not as developed as those in western countries. Medicines that should only be available on prescription are sold over the counter, without accompanying prescriptions (28). Moreover, health professionals often extend the scope of their practice beyond their statutory roles and responsibilities. Therefore, it is common to find doctors and pharmacists who prescribe and dispense at the same time (29).

The closest pharmacists in Africa have come to obtaining legal prescribing authority is in Ghana. The Government has recognised community pharmacists as the preferred health professionals to treat sexually transmitted infections among the population (30). Although there are no formal reports of pharmacist prescribing in Africa and Asia, Governments in these regions are adopting various innovative strategies including, the reorientation of pharmacists to take on more specialised non-dispensing roles such as formulation and management of medicines policy in order to enhance access to essential medicines (27).

1.3.4 Pharmacist prescribing in Europe

To date, the United Kingdom (UK) is the only country in Europe with legal pharmacists' prescribing rights, in the form of supplementary and independent prescribing (31,32). This has been implemented in all sectors of pharmacy practice including general medical practices. Supplementary and independent prescribing in GB, the subject of this research will be described in detail next.

1.3.5 Non medical Prescribing

In the UK, prescribing by professionals other than doctors and dentists was introduced in 1986 when the Department of Health commissioned the Cumberlege committee to review nursing care of patients in their homes. The

report of that committee highlighted delays experienced by nurses in the home care of patients, because they had to wait for GPs to prescribe simple items like wound dressings. Therefore, the committee recommended that nurses be authorised to prescribe for some conditions, from a limited range of medicines (33). Subsequently in 1989, an Advisory Group on Nurse Prescribing established by the Department of Health reviewed circumstances under which community nurses might prescribe. The advisory group recommended that district nurses and health visitors be authorised to prescribe in the four clinical areas of minor injury, minor illness, palliative care and health promotion. They could prescribe dressings and six medicines classified as POMs, in the nurse prescriber formulary (34). This was the beginning of nurses' involvement in prescribing.

Later in 1997, the Department of Health established a committee to review the Prescribing, Supply and Administration of Medicines. This review produced two reports known as the Crown reports. The first, in 1998, recommended the implementation of regulations for the supply of medicines under group protocol; later termed patient group directions (PGDs). This is, strictly speaking, not a form of prescribing, but a written policy to permit some health professions, including pharmacists and nurses, to supply or administer medicines to specified categories of patients (35). The second Crown report, in 1999, recommended the extension of prescribing rights to pharmacists, optometrists, physiotherapists, radiographers and podiatrists. These health professions along with nurses make up the group of prescribers included under the general term of non medical prescribers (NMP) (16). The Crown review being central in the background to NMP warrants close attention. Therefore, key highlights of that report, particularly relating to pharmacist prescribing, will be considered next.

1.3.6 Summary of the final report of the Crown review

Prior to the Crown review, doctors and dentists were the only health professions authorised to prescribe POMs for patients, which were reimbursed by the NHS (15). One of the aims of the Crown review was to determine how health professionals could change the way services were delivered in terms of

prescribing, supply and administration of medicines (16). To this end, the committee set out to develop a framework under which health professionals could adopt new roles for the benefit of patients. These benefits included the optimal use of professional skills of staff and other resources, and also widening the access of patients to medicines (16).

Innovative approaches to the prescribing of medicines became imperative because of changes that had already taken place in the patient care environment. Firstly, the training, education and clinical practice of various health professions were changing rapidly. Secondly, patients had become more aware of issues related to their health, and were taking charge of the treatment of their conditions. This brought about changes in what patients expected from health professionals. Finally, patient care had become a multi-disciplinary team responsibility, partly because of the complexity of medicines which makes it difficult for a single clinician in any profession to claim sufficient expertise across the whole spectrum of drugs applicable in their practice (16). Consequently, the framework developed by the Crown review proposed that new groups of health professionals in the UK could apply for the legal authority to prescribe medicines in specific clinical areas. Therefore, the review recommended that:

> *"Government should take general powers in primary legislation, enabling ministers, through regulations, to designate new categories of dependent and independent prescribers for the purpose of the Medicines Act, to authorise them to prescribe medicines for reimbursement by the NHS, and to limit or specify the medicines or classes of medicines which they may prescribe."* (16).

By this recommendation the Crown review committee categorised two types of prescribers: independent and dependent, to be recognised in the UK as legal prescribers of medicines for human use in compliance with the Medicines Act of 1968.

1.3.7 Independent, dependent and supplementary prescribing

Independent prescribing (IP), in the context of the final report of the Crown committee refers to the initial contact between a patient and the healthcare professional, who prescribes for that patient. Accordingly,

> *"The independent prescriber is responsible for the assessment of patients with undiagnosed conditions and for decisions about the clinical management required, including prescribing"* (16).

Similarly, dependent prescribing refers to the scenario in which the clinical management of diagnosed patients is transferred from the independent to the dependent prescriber. "A dependent prescriber is responsible for the continuing care of patients who have been clinically assessed by an independent prescriber. This continuing care may include prescribing, which will usually be informed by clinical guidelines and will be consistent with individual treatment plans; or continuing established treatments by issuing repeat prescriptions, with the authority to adjust the dose or dosage form according to patients' needs" (16). The term dependent prescribing was later replaced by supplementary prescribing.

> *"Supplementary prescribing (SP) is a voluntary partnership between the independent prescriber (a doctor or dentist) and a supplementary prescriber, to implement an agreed patient-specific clinical management plan (CMP) with the patient's agreement"* (16)

SP was implemented in 2003 to enable pharmacists, nurses and optometrists, after undergoing additional training and registration, to prescribe any medicine, including controlled drugs, within the framework of a patient-specific CMP. This provision was changed in 2005 to accommodate other health care professions, namely chiropodists/podiatrists, physiotherapists and radiographers, as supplementary prescribers (36, 37).

Independent prescribing for pharmacists, nurses and optometrists was implemented in the UK in 2006 (32, 38). Under this arrangement, nurses could prescribe any medicine for any medical condition, within their competence, including some controlled drugs. The same applies to pharmacist independent

prescribers who may prescribe any medicine, including unlicensed products within their professional competence excluding CDs. However, a pharmacist IP my may prescribe CDs using a CMP a supplementary prescribing arrangement. Optometrist independent prescribers were only permitted to prescribe any licensed medicine for ocular conditions (38). Currently, the Department of Health defines independent prescribing as:

> *"prescribing by a practitioner e.g. doctor, dentist, nurse, pharmacist or optometrist responsible and accountable for the assessment of patients with undiagnosed and diagnosed conditions and for decisions about the clinical management, including prescribing"* (39).

This marked the beginning of pharmacist prescribing in the UK. The rest of this chapter and subsequent chapters will focus on the implementation of prescribing by pharmacists in GB. However, the concept of pharmacist prescribing as practised in other countries will be reviewed first, before proceeding with details of implementation in GB.

1.3.8 Pharmacist supplementary and independent prescribing in GB

The Crown review marked the watershed in the implementation of prescribing by pharmacists in GB. Having accepted the recommendations of the Crown review, the Department of Health introduced changes to legislation, and made administrative and policy changes to facilitate implementation of prescribing by pharmacists in GB (36, 37). However, the policy requires that pharmacists meet a national minimum standard of educational qualification and training prior to registration and practice as prescribers (16, 18). Legislative changes permitted higher education institutions to organise training courses for pharmacists who wished to qualify as prescribers. Consequently, the Council of the Royal Pharmaceutical Society of Great Britain (RPSGB) now the General Pharmaceutical Council (GPhC) agreed with the Medicines Commission and the Committee on Safety of Medicines in October 2002 on the curriculum for the training of pharmacist prescribers (36, 40). Pharmacists with two years post-registration experience can undertake additional GPhC-accredited training. The training programme leads to the award of a practice certificate in supplementary

or independent prescribing, which qualifies the pharmacist to apply for annotation as a prescriber on the GPhC register. Training involves a minimum of 200 hours didactic learning delivered over 25 days, either face to face, or in combination with distance-learning modules. This is then followed by a period of at least 12 days supervised learning in practice (PLP), under a designated medical practitioner (36, 40).

The first supplementary prescriber was registered by the RPSGB in February 2004 (41), and a Scottish pharmacist became the first in primary care to write a prescription in April of the same year (41, 42). Independent prescribing for pharmacists was introduced in 2006 (43), and pharmacists qualified as supplementary prescribers for less than five years could take additional courses to convert to the independent prescribers status (43). The conversion course was an equivalent of two days didactic learning and a minimum of two days PLP to develop autonomous working skills. At the same time, qualified pharmacists who were not yet supplementary prescribers could take up full training to become independent prescribers according to the curriculum designed by the RPSGB (40). In 2007 the first pharmacist independent prescription was written in a secondary care hospital, marking what can be described as the official implementation of pharmacist prescribing in GB (44). There are now over 2000 pharmacists trained and registered as prescribers, practising in secondary care, general medical practice, and community pharmacy settings across GB (45).

1.4 Review of literature on pharmacist prescribing in GB

This section will focus on empirical research published in peer reviewed journals in order to critically appraise the current state of knowledge on the subject of supplementary and independent prescribing by pharmacists in GB. The objective of this review is to summarise what is known and to identify gaps in the literature on the subject of pharmacist prescribing. It was noted in the introduction that the legal framework for the implementation of supplementary and independent prescribing is applicable UK wide (GB and Northern Ireland). Therefore, this section will refer to both GB and UK as appropriate.

1.4.1 Search strategy

A Medline search was conducted for research papers published between January, 2003 and January, 2011. The search used a keyword combination of pharmacist*, with a phrase search for “independent prescribing” or “supplementary prescribing”. The search was limited to English language journals based on the scope of the review. The search was repeated in the databases International Pharmaceutical Abstracts (IPA) and Cumulative Index for Nursing and Allied Health Literature (CINAHL). Results of the search were managed in Reworks® bibliography database, where duplicates were eliminated and the full text of included papers sought and read repeatedly before attempting critical appraisal.

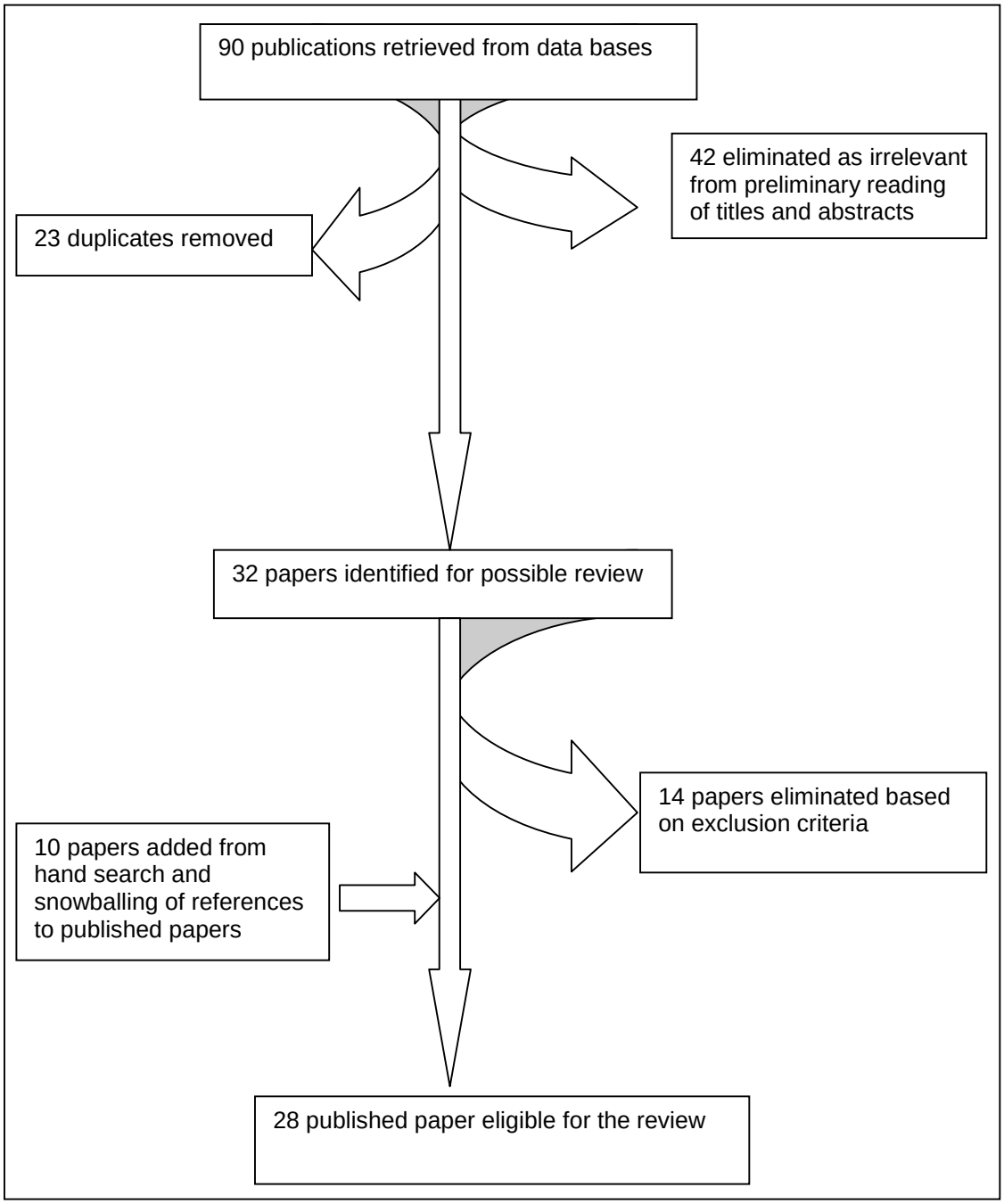
1.4.2 Inclusion and Exclusion criteria

Papers published on the subject of pharmacist prescribing in GB, Northern Ireland (NI) or across the whole of the United Kingdom (UK) were included. Papers were also included if the subject of the research was nurse and pharmacist prescribing in the UK, which had a direct bearing on the objectives of the present research. Papers were excluded if they reported pharmacist prescribing outside the UK, as the geographical scope of this project is limited to GB. Also excluded from the review were commentaries, editorials, views and opinions, since these are mostly subjective accounts of individuals. In addition, for the assurance of methodological rigour, reports and journalistic articles describing pharmacist prescribing were all excluded because these have not been subjected to peer review mechanisms.

1.4.3 Search results

Applying the search criteria retrieved ninety research publications (Medline 24, CINAHL 27 and IPA 49). Retrieved papers were screened and organised as shown in Figure 1.1

Figure 1.1 identification and sorting of literature for review



Twenty eight primary research papers were reviewed and findings presented according to the main themes that emerged from the literature as follows: Implementation of pharmacist prescribing, inter-professional relationships and patients' or general public's perspectives.

1.4.3.1 Implementation of pharmacist prescribing in GB

Most of the research published on the subject of pharmacist prescribing described implementation in GB. Sixteen of the studies reviewed, addressed this theme (Table 1.1) and are discussed under the following subthemes: early views and experiences of pharmacist prescribers; impact of pharmacists' prescribing practice; development of pharmacist prescribing; and training pharmacists for prescribing implementation.

A. Early views and experiences of pharmacist prescribers

Pharmacist prescribing as a new policy presented various implementation opportunities to the early cohorts of pharmacists who adopted this practice (Table 1.1). Some studies reported views and experiences of pharmacist prescribers who implemented SP. Dawoud and colleagues revealed that some pharmacist prescribers encountered severe challenges while trying to implement SP especially within primary care (46). Similarly, Hobson and Sewell reported more SP implementation challenges among pharmacist prescribers in primary care, than those in secondary care trusts (47). However, a large proportion of the samples in these studies were based in secondary care hospitals. This may have biased the findings that were reported. Moreover, both studies were limited to England, so the views and experiences of pharmacists in other parts of GB may have differed. This assertion was supported by contrary findings in a study by George *et al.,* who conducted a national survey of pharmacist prescribers in GB. They reported higher use of the prescribing qualification in primary care than secondary care settings (48). Two previous reviews of the NMP literature in GB revealed that pharmacist prescribers had made appreciable impact on the health care environment, despite many barriers and challenges to their prescribing practice (49, 50).

B. Impact of pharmacist prescribing

Among the studies that reported pharmacist prescribing implementation, few had the primary objective to assess impact on patient care. However, many highlighted perceived benefits to patients, pharmacists, and other health professionals. Tonna *et al.,* studied the feasibility and value of pharmacists

prescribing antimicrobials in Scotland, and reported positive findings (51). Another study that analysed the volume and cost of pharmacists prescribing in England, reported a ten-fold increase in the number and net ingredient costs of items prescribed between 2004 and 2006 (52). In addition, Cooper *et al.,* reported positive views about perceived benefits of SP among a wide range of stakeholders. However, the authors reported conflicting opinions about the economic impact of SP on the NHS (53). Whilst data presented in the reported studies were collected between 2004 and 2007, this literature review did not identify subsequent research that specifically determined clinical, economic or humanistic outcomes of pharmacist prescribing. These aspects of pharmacist prescribing implementation need to be addressed in order to accumulate the necessary evidence for the continued development of the service.

C. Development of prescribing practice

This literature review did not identify any papers that specifically reported experiences of pharmacist prescribers with the implementation of IP. However, it is interesting that many pharmacist prescribers view IP as the logical progression from SP (48,54), although some considered SP only as a stepping stone to IP(46). Many studies reported conflicting views of pharmacist prescribers about their skills and confidence to prescribe without direct medical involvement (49). George *et al.* revealed in a sample of Scottish community pharmacists that IP was considered likely to improve patient care. However, participants had concerns about the competence of pharmacists in clinical examination and diagnosis (55). Similarly, Hobson and Sewell identified risks and safety concerns about pharmacist prescribing, due to a lack of standard monitoring systems for evaluating the competence of pharmacist prescribers post-qualification (56). It is reassuring, therefore, that pharmacist prescribers have given priority to patient safety issues, and only prescribe within their competence (49, 50). As IP continues to develop, it is apparent that acquiring appropriate clinical assessment and diagnostic skills will remain a major focus, as demonstrated by Stewart *et al.* who developed and validated a tool for the assessment of pharmacist prescribers' consultations (57). Tools such as this

should become an integral part of the training of pharmacists for prescribing in the future.

D. Training pharmacists for prescribing

The studies that reported implementation of pharmacist prescribing consistently highlighted issues of education and training. Benefits of training in terms of increased competence and confidence of pharmacists to implement prescribing have been identified. George *et al.* reported pharmacist prescribers' views that the period of learning in practice (PLP) provided them with opportunities to broaden their clinical skills (58). Similar findings were reported by others; pharmacist prescribers and designated medical practitioners (DMPS) used the PLP to develop shared learning (59) (60). However, other aspects of the pharmacist prescribing training have been criticised. Researchers found some dissatisfaction among pharmacist prescribers about the content and mode of teaching on SP courses (61, 62). This may have hindered some pharmacists from undertaking the training to qualify as prescribers.

Cooper *et al.,* reported improvements in both content and delivery of prescribing training courses over the years (61). However, this has not been matched by a dramatic increase in the number of pharmacists that enrol for prescribing training. Stewart *et al.,* reported that the majority of pharmacists who described themselves as 'innovators' and 'role models', had either never thought of training, or had taken little action in terms of training (63). Yet it is apparent that full implementation of pharmacist prescribing cannot be achieved in GB unless pharmacists train to become prescribers. It is relevant, therefore, to investigate issues related to training of pharmacist prescribers. This may reveal findings that have a direct bearing on the policy and practice of pharmacist prescribing.

Table 1.1, Published papers relating to implementation of prescribing by pharmacists in GB (n=10)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
Dawoud *et al.* Pharmacist supplementary prescribing: a step toward more independence (46)	To investigate pharmacist prescriber's views and experiences of the early stages of SP implementation	Qualitative longitudinal interviews with each participant 3 and 6 months after registering as prescriber	16 pharmacist prescribers in southern England, purposively sampled to gain maximum variability	Three types of pharmacists' experiences were described in relation to prescribing implementation, and some perceived SP only as a stepping stone to IP	A longitudinal design aimed to capture changes in practice, but no direct analysis was done to show this. The authors acknowledged that a longer follow-up period would have been more useful, yet they did not justify the choice of six months as the optimum follow-up period. The paper was published in 2010, but earlier research had made similar findings with more robust designs
Stewart *et al.* Developing and validating a tool for the assessment of pharmacist prescribers' consultations (57)	To develop and validate an assessment tool based on the Royal College of General Practitioners (RCGP) video assessment tool, for assessment of pharmacist prescribers' consultations	Experienced GP assessors rated performance of pharmacist prescribers' consultations recorded on video. Patient also completed satisfaction surveys Interclass correlation coefficient tested the agreement between assessors' scores, and patients' satisfaction.	2 GP assessors, 10 pharmacist prescribers and 14 patients	The tool (PharmaCAT) had discriminatory power between pharmacist prescribers; reliably confirmed by two independent assessors. However, assessor scores did not correlate well with patient satisfaction	The study was limited by small sample size, and non representation of secondary care pharmacists. Notwithstanding, findings add a new dimension in the evaluation of pharmacists prescribers' consultation skills. The tool can be developed further to be used in the training and assessment of non medical prescribers generally.

Table 1.1 cont'd, Published papers relating to implementation of prescribing by pharmacists in GB (n=10)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
Cooper *et al.* stakeholders' views of UK nurse and pharmacists supplementary prescribing (53)	To explore the views of stakeholders involved in SP policy, training, and practice.	Semi-structured interviews generated the data, while constant comparison and the framework approaches were used to analyse data.	43 stakeholders including nurses, pharmacists, doctors, policy makers and academics.	Stakeholders had a positive view of SP but it was envisaged that IP implementation would supersede SP.	The study incorporated views from a wide range of stakeholders. However, sample recruited through personal contacts of researchers raised the possibility of selection bias. Authors recognised that findings were limited, especially because patients were not represented in the sample.
Hobson and Sewell-Supplementary prescribing by pharmacists in England (47)	Investigate the implementation of pharmacist SP by primary and secondary care trusts (PCT/SCT) in England	Cross-sectional questionnaire survey collected data on: demographics, recruitment of DMPs and implementation of SP, as well as attitudes about SP. Non parametric tests assessed association between variables.	Pharmacists who will oversee implementation of SP in PCT (n= 303) and SCT (n =168)	68% response for both PCT and STC pharmacists. PCT pharmacists thought it was more difficult to recruit DMPs their SCT counterparts. Implementation of prescribing was more likely in GP practices than in community pharmacies	Study achieved a reasonable response rate, and applied rigorous statistical tests. However, the study population was made up of pharmacists that supervised prescribing implementation. Hence findings did not reflect the views of pharmacists who practiced prescribing.
George *et al.* Independent prescribing by pharmacists: a study of the awareness, views and attitudes of Scottish community pharmacists (55)	To investigate Scottish community pharmacists' awareness, of independent prescribing and perception of competence and training needs for the management of some common conditions.	Postal questionnaire survey on: pharmacist awareness of IP, perception of patients' accessibility to medicines, safety of IP by community pharmacists, perception of necessary skills for implementation of IP, attitudes towards becoming an IP, pharmacy and pharmacists demographics.	Scottish community pharmacists (n = 500) randomly selected.	43% response rate. Pharmacists perceived IP would improve patients' access to medicines. Clinical training for diagnosis of common diseases was regarded as important by majority. Identified education and training benchmarks relevant to the development of prescribing from SP to IP.	Authors acknowledged the limitations of their study in terms of the low response rate and the restriction to Scotland which had unique contractual agreements for community pharmacists than those in other parts of GB. The study applied robust statistical procedures to yield valid and reliable findings.

Table 1.1 cont'd, Published papers relating to implementation of prescribing by pharmacists in GB (n=10)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
George *et al.* Supplementary prescribing: early experiences of pharmacists in GB(48)	To determine demographics of all SP pharmacists in GB and to explore early experiences and perceptions of SP pharmacists on training course.	Postal questionnaire survey on: SP training, activities as prescribers, first CMP and demographics. Chi square, Mann-Whitney U test to identify predictors of practicing SP; then binomial logistic regression of significant variables.	All SP Pharmacists in GB (n= 518)	82% response rate. Demographics were presented. 71% of respondents identified better patient care as benefits of SP while 36% identified funding as the greatest barrier to implementation.	High response rate gave fairly good idea of the key factors in the implementation of SP. The findings were replicated by many subsequent studies utilising both qualitative and quantitative methods.
Hobson and Sewell- Risks and concerns about supplementary prescribing: survey of primary and secondary care pharmacists (56)	To investigate the perceptions of secondary care trust chief pharmacists and primary care trust (PCT) pharmacists on the risks and concerns of supplementary prescribing	Postal questionnaire survey on: demographics, recruitment of DMPs and implementation of SP, as well as attitudes about SP. Factor analysis to explore relationships between attitudinal statements	Chief pharmacists of hospitals (n= 151) and PCT pharmacists (n= 271) in England	68% response rate in both respondent populations. Some concerns about SP related to the lack of clinical assessment during training and monitoring competence after qualifying.	Authors acknowledged limitation in some questions. The PCT questionnaire had weak reliability, and low internal consistency of extracted factors.
Cooper *et al.* Learning to prescribe pharmacist experience of supplementary prescribing training in England (61)	To explore pharmacists' perceptions and experiences of learning to prescribe on SP course focus on inter-professional learning, course content and subsequent use of prescribing in practice	Cross-sectional questionnaire survey. Descriptive statistics; chi square to test possible correlations between variables. Open comments analysed qualitatively	All pharmacist supplementary prescribers in England who completed SP training between 2003 and 2007.	Response 51%, less than half were using qualification. Most useful aspect of training was PLP, but inter professional teaching was of mixed valued due to difference in professional background	The study had a small sample size, and was restricted to England therefore, findings be generalised to other situations in GB.

Table 1.1 cont'd, Published papers relating to implementation of prescribing by pharmacists in GB (n=10)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
George *et al.* Views of pharmacists and mentors on experiential learning for PSP trainees (62)	To explore the views and experiences of SP pharmacists and DMPs about the PLP; and to evaluate the extent to which PLP had prepared SP pharmacists for prescribing	Focus group discussion with pharmacist prescribers and telephone interviews with DMPs	12 pharmacist prescribers and their linked DMPs	Planning the PLP in consultation with the DMP necessary for optimal learning experience. Formal independent assessment of competence may improve the quality of training.	The study sample came from a cohort of pharmacist prescribers who undertook prescribing training in one University. Hence, experiences may vary from those of pharmacists who trained in other institutions. However, the findings were similar to other those of Cooper *et al.*
George *et al.* Experiential learning as part of pharmacist supplementary prescribing training: feedback from trainees and their mentors (60)	Evaluate the views and experiences of SP pharmacists and Designated Medical Practitioners (DMPs) on the period of learning in practice (PLP)	Postal questionnaire survey. Descriptive and comparative statistical analysis of data to describe demographics and experiences of PLP	All pharmacists who had started SP Training at Robert Gordon University (n = 242) and their DMPs (n = 232)	Response rate 77% for pharmacists and 62% DMPs. A little above half of SP pharmacists knew what was expected of them during PLP. Opportunities for professional development and teamwork were identified by both SPs and DMPs as benefit. However, lack of time was reported as a challenge by SP trainees and DMPs.	The study sample received prescribing training from the institution of researchers, and these may have influenced the findings. The authors recognised the inherent possibility of response bias.
Tully *et al.* pharmacists' changing views of their supplementary prescribing authority (64)	Explore the views of pharmacists in England regarding SP before and after they became supplementary prescribers.	Semi-structured interviews pre and post registration	8 pharmacists from a population of 45, undergoing SP training in the north of England	Pharmacists anticipated that training would legitimise and enhance their prescribing practices prior to registration but experienced procedural delays in implementation.	The study gave useful insights into pharmacists' supplementary prescribing as a starting point for further research, although some participants were training in the institution of the researchers with possible response bias.

1.4.3.2 Inter-professional perspectives of Pharmacist prescribing in GB

Views and perceptions of different health professionals regarding pharmacist prescribing are important, considering the multi-disciplinary environment in which the service operates. Accordingly, eight studies were identified that explored this theme (Table 1.2). This theme is discussed in terms of inter-professional tensions and opposition to pharmacist prescribing by other members of the health team.

Blenkinsopp *et al.* identified among some GPs, opposition to the idea of pharmacist prescribing because those doctors felt that SP would undermine their role in patient care (65). Similarly, Tann *et al.,* reported a perception among some GPs, that pharmacist prescribing was implemented as part of a grand plan to undermine the future existence of doctors (66).. Cooper *et al.* reported that doctors seemed more willing to support pharmacist supplementary, rather than independent, prescribing. The authors argued that the preferential support of pharmacist SP by doctors was because doctors viewed the SP model with its CMP requirement as less of a challenge to medical leadership of the health team unlike the IP model (67). Weiss and colleagues had previously drawn similar conclusions as Cooper *et al.* that IP, unlike the SP model, may challenge medical dominance in healthcare. In response, doctors were said to have downgraded the importance of prescribing. Instead, they emphasised diagnosis as the ultimate role in healthcare, wherein no other health profession but doctors had the requisite knowledge and skills (67,68). Doctors felt at ease with SP, since they could use the CMP to regulate prescribing activities of pharmacists. Moreover, doctors actively encouraged pharmacist supplementary prescribers to seek advice from them, in ways that suggested powerlessness of the pharmacist prescriber and dependence on the doctor (66).

Buckley had earlier argued that doctors would likely accept pharmacist prescribing within protocols, more than independent prescribing (69). This view was also captured in the findings of other researchers who investigated pharmacist prescribing in different parts of the UK (54, 70). Similarly, non prescribing pharmacists and nurses were reported to have displayed some resistance to pharmacist prescribing (65, 66). Such inter-professional tensions

are likely to undermine the implementation of pharmacist prescribing. Therefore, as prescribing by pharmacists becomes more established, it is important to investigate inter-professional relationships in order to indentify and resolve those issues that may directly impact on the policy and practice of pharmacists prescribing. A summary of inter-professional relationships explored in the published literature are presented in Table 1.2

Table 1.2 Published papers relating to inter-professional perspectives of pharmacist prescribing (n=8)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
Blenkinsopp *et al.* Opportunity or thread GP perceptions of pharmacist prescribing (65)	To explore the perceptions of general practitioners (GPs) on the advantages and disadvantages of pharmacist supplementary prescribing	Focus group discussion. Content Analysis of data using the framework approaches.	Thirteen GPs from a purposive sample of three GP practices that had experience of working with pharmacist supplementary prescribers	GPs perceived benefits from pharmacist prescribing in terms of improved patient care and cost savings. They acknowledged the expertise of pharmacists on medicines and felt pharmacists were more likely to independently manage patients than nurses. Yet doctors still wanted to maintain control of the prescribing process.	The research was restricted in terms of geographical coverage, and there was no indication of when data was collected. However, perspectives of other health professions were captured. This has a direct bearing on the implementation of any new policy in a multi-disciplinary environment.
Tann *et al.* Beating the bounds? The introduction of pharmacist supplementary prescribing in the UK National Health Service (66)	Explore GP and pharmacist perceptions of the introduction of supplementary prescribing focusing on consequences for professional boundaries	Focus group discussion with GPs, and interview with pharmacists	Pharmacist prescribers and GPs who had worked with them	Pharmacists perceived themselves more expert with drugs than GPs. Doctors exercised professional dominance by determining the scope of prescribing practice for other health professions.	Same study that produced the paper opportunity or thread, but this adds details of pharmacists' perspectives regarding intra and inter professional tensions in pharmacist prescribing.
Tann *et al.* The great boundary crossing: perceptions on training pharmacists as supplementary prescribers in the UK(59)	To explore the perceptions of GPs and pharmacist supplementary prescribers on the training and also explore experiences of pharmacist supplementary prescribers on subsequent continuing professional development.	Qualitative interviews focus group discussions, documentary and critical incidents analyses.	General medical practitioners and pharmacists supplementary prescribers	Pharmacists and doctors enjoyed reciprocal learning during the PLP because of pharmacists' good knowledge of drugs. Recording critical incidents and discussing them was suggested as one way of enhancing shared learning.	All the pharmacist prescribers were trained in the same university so findings may not reflect the views of those who trained in other institutions.

Table 1.2 cont'd, Published papers relating to inter-professional perspectives of pharmacist prescribing (n=8)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
Weiss *et al.* The changing nature of prescribing: pharmacists as prescribers and challenges to medical dominance (68)	To investigate the role of prescribing as an indicator of professional power; and the potential threats posed by pharmacists prescribing to medical dominance in healthcare.	Semi-structured interviews with pharmacist prescribers followed by case study of selected prescribing sites. Only interviews reported.	23 pharmacist prescribers	The pharmacy profession has prescribed under various definitions and has established a role in prescribing. However, doctors have maintained control by emphasising the competence of pharmacist prescribers. This suggests that supplementary prescribing does not yet threaten medical dominance.	This research draws on complex sociological principles and theories. However, findings have direct application in the policy and practice of pharmacist prescribing.
Cooper *et al.,* Further challenges to medical dominance? The case of nurse and pharmacist prescribing (67)	To reflect upon whether the introduction of supplementary prescribing constituted a challenge to medical dominance.	Case study approach using Semi-structured interviews and non participant observation. Also documentary analysis	Pharmacist supplementary prescribers, but included the views of doctors, nurses and patients as stakeholders.	Medical dominance was not challenged by supplementary prescribing, because doctors actively maintained overall control. Besides, pharmacist prescribers and patients passively accorded superior status to doctors.	The study presented a wide perspective of stakeholders in the implementation of prescribing and advanced the arguments of Weiss *et al.* However, pharmacist prescribers in community setting were not represented. There was no indication of when the study was conducted, therefore, not possible to judge the currency of findings.
Lloyd *et al.* 'It's showed me the skills that he has': pharmacists' and mentors' views on supplementary prescribing (70)	To explore the context and experiences of pharmacists and their training mentors at least twelve months after the pharmacists qualified as supplementary prescribers	Follow-up study using focus group discussions and interviews	Pharmacists and mentors who participated in a pre training study were followed up between May 2005 and September 2007	Benefits of supplementary prescribing were identified in terms of reduced workload of doctors. Pharmacist prescribers view independent prescribing as the logical progression in their career, but doctor had reservations about that.	Barriers identified in the first study did not appear to have been resolved in this study, just as observed with from the implementation literature in GB.

Table 1.2 cont'd, Published papers relating to inter-professional perspectives of pharmacist prescribing (n=8)

Author(s)/Title	Aims /objectives	Method	Population	Key findings	Comments
Lloyd *et al.* Pharmacist and mentors' views on the introduction of pharmacist supplementary prescribing (54)	Explore the views and professional contexts of pharmacists and their DMPs prior to starting SP training.	Focus group discussions with pharmacists and face-to-face interviews with DMPs	63 pharmacist prescribers in the first four cohorts of SP training in Northern Ireland, and 54 DMPs	Supplementary prescribing was well received and was anticipated to improve patient care and inter-professional relationships. However, some concern about safety and professional boundary encroachment.	Qualitative study whose findings can not be generalised outside the study area. However, the study revealed similar issues of implementation in other parts of the UK.
Buckley *et al.* Inter and intra professional barriers to non medical prescribing (69)	Explore inter and intra professional barriers to non medical prescribing.	Semi-structured interviews	Fifteen stake holders in one NHS trust	SP was expected to legitimise previous informal arrangements of doctors signing pharmacists' prescriptions. Medical staff preferred to maintain control. Pharmacists were seen as experts in drug therapy but lacking diagnostic skills and close knowledge of the patients.	The research was limited to one NHS trust but findings were similar to those of other researchers and point out issues that pharmacists could reflect on as SP is implemented. Further research could also benefit from information provided by this research.

1.4.3.3 Patients' and the general public's perspectives of pharmacist prescribing in GB

In addition to the views of other health professionals, the literature contains reports of research focused on patients' and the general public's perspectives of pharmacist prescribing. Five studies addressed this objective (Table 1.3). Hobson *et al.* reported that patients acknowledged the inherent merits of having pharmacists as prescribers, because of their expertise on medicines and accessibility. Yet, the same patients still perceived pharmacists as inferior prescribers compared to doctors in terms of knowledge and clinical skills. Moreover, the study reported patients' preference for consulting nurse prescribers above pharmacist prescribers (71). In contrast, Stewart *et al.,* found that patients trusted the knowledge and skills of pharmacist prescribers, whom they thought offered better management of medication problems than nurses. (72) These findings also reflected the views of patients in a cross-sectional questionnaire survey across Scotland (73). Similarly, a survey of the Scottish general public revealed that the public was more aware of pharmacist than nurse prescribing and that they regarded pharmacist prescribers more highly than nurse prescribers (74). This is in line with the report of Smalley, which suggested that hypertensive patients thought the standard of care they received from a pharmacist prescriber was better than the regular GP care (75). It is therefore apparent that patients appreciate pharmacist prescribing. However, research needs to generate the necessary evidence of patient benefits in order to enhance the implementation of pharmacist prescribing policy.

Table 1.3 Published papers relating to patients' and general public's perspectives of pharmacist prescribing in GB (n=5)

Author(s)/title	Aims /objectives	Method	Population	Key findings	Comments
Hobson *et al.* Pharmacists and nurses as independent prescribers: exploring patient's perspective (71)	To explore perceptions of patients on the development of non medical prescribing focusing on patients' preferences between nurse and pharmacist prescribers of whom they consulted.	Semi-structured interviews. Descriptive and explorative analysis of interviews using interpretive phenomenological analysis.	18 patients in 4 NHS trusts in England managed by pharmacist prescribers. Also, patients managed by GPs for comparison.	Patients' preference of doctors and nurse prescribers appears to be in response to practical concerns about pharmacists implementing prescribing in community pharmacies which lack facilities like private consultation rooms and access to electronic medical records.	Interviews were conducted between January and August 2006, when independent prescribing was just being introduced. Therefore, patients may have given views based on speculation. Moreover, no patients were recruited from community pharmacies, yet they made strong claims in relation to the suitability of community pharmacies for prescribing. Authors provided no clear basis for comparison between nurses and pharmacists, therefore hard to objectively evaluate findings.
Stewart *et al.* Exploring patient's perspectives of pharmacist supplementary prescribing in Scotland (73)	To explore patients' perspectives of pharmacist supplementary prescribing in Scotland	Cross-sectional questionnaire survey, measuring attitudes towards pharmacists SP and satisfaction with consultation	180 patients in primary and secondary care spread across Scotland. 10 pharmacists recruited 20 patients each	Response rate 57.2%. Patients had mainly positive experiences, and high level of satisfaction with consultation of pharmacist prescribers. Yet, more than half would prefer to see their doctors instead of the pharmacist prescriber.	Sample size was small, but the patients all had experience of SP including some from community pharmacy. The findings were contrary to those of Hobson *et al.,*; but in this case SP was directly studied so findings may be more indicative of real experiences.

Table 1.3 cont'd, Published papers relating to patients' and general public's perspectives of pharmacist prescribing in GB (n=5)

Author(s)/title	Aims /objectives	Method	Population	Key findings	Comments
Stewart *et al.* Views of pharmacist prescribers, doctors and patients on pharmacist prescribing implementation (72)	To explore the perspectives of pharmacist supplementary prescribers, their linked independent prescribers and patients in Scotland towards pharmacist prescribing.	Telephone interviews, and data analysed for emergent themes using the framework approach.	10 pharmacist supplementary prescribers across Scotland recruited at least one DMP and 3 patients for interviews.	18 patients interviewed were initially confused about what to expect from a consultation with pharmacist prescriber but this quickly changed as they actually experienced SP.	The interviews were between October to Dec 2006 with findings opposite Hobson *et al.* findings in this study were confirmed by other studies.
Stewart *et al.* Cross-sectional survey of the Scottish general public 's awareness of views on, and attitudes towards NMP (74)	To determine the awareness views and attitudes of members of the Scottish general public on NMP.	Cross-sectional questionnaire survey. Appropriate statistical analyses applied.	5000 members of the Scottish general public.	Response rate was 34.6%. Respondents more comfortable with pharmacist prescribers than nurses. However, many did not know enough to rate the professions.	Authors recognised limitation in terms of low response rate but argued that respondents' characteristics were very similar to that of the whole population. This appeared to be the only study that attempted to get the public's views on the implementation of prescribing by pharmacists.
Smalley L Patients' experience of pharmacist supplementary prescribing (75)	To evaluate patients' experiences of a pharmacist led supplementary prescribing hypertension clinic.	Postal questionnaire survey.	All patients attending one SP clinic for hypertension in a GP practice. (n = 127)	87 % response rate. Percentage frequency of patients' experiences was presented.	Small sample size, but study provides insight into the patients' experience of SP. Author considered possible response bias as patients most satisfied with the service of the pharmacist prescriber were more likely to have responded

1.4.4 Summary of the literature

From the publications reviewed, the views, perceptions and early experiences of pharmacist prescribers have been identified. At the same time key factors in the implementation of prescribing by pharmacists have been highlighted by various research papers. Significantly, all data reported in the published papers were collected prior to the full implementation of pharmacist independent prescribing. Therefore, although much has been reported in the publications reviewed, there is still a gap in knowledge on the issues surrounding SP and IP implementation. It is not clear whether barriers and challenges identified in early studies have been resolved, and how they were resolved if at all (48, 60, 63, 75, 76). Indeed those studies that have been repeated subsequently have found that initial barriers to the implementation of pharmacist prescribing had either persisted or the expectations of pharmacists had not been met (46, 64, 70). With the current experience in supplementary and independent prescribing by pharmacists in GB, there is a clear need for more quantitative research to determine the structures of prescribing implementation. Also, there is the need for in-depth qualitative research to understand the process involved in successful implementation of prescribing by pharmacists. These are the aims of the current research project.

1.4.5 Key points from the literature

- SP implementation faced with challenges such as the need for CMPs which limit practice
- There was no evidence to indicate whether the subsequent introduction of IP had increased practice considering that IP does not require CMPS.
- The literature reported some resistance to SP by some doctors who feel professionally threatened. This may get worse with IP.
- The literature had documented evidence of the PLP component of prescribing training. It is important to explore the option of incorporating prescribing training in the undergraduate curriculum.

1.5 Aims of the project

The overall aim of the research was to explore developments in SP and IP since implementation; focusing on an investigation of the structures and processes of prescribing practice by pharmacists in Great Britain. In order to achieve this aim, the research was designed to be executed in two phases.

In Phase 1 of the project, the aim was to determine the nature and extent of prescribing activities undertaken by pharmacist prescribers, to establish background information and update on the status of pharmacist prescribing practice in GB. In Phase 2, the aim was to apply qualitative approaches to study in depth, the issues that may be identified in Phase 1; to provide a comprehensive explanation of the processes involved in the prescribing practice of pharmacists in GB. Detailed and specific research objectives will be described in each phase of the research project as appropriate.

Chapter Two: Methodology

This chapter outlines a general introduction to methodology and related concepts, and shows how the concepts informed the use of specific methods in the conduct of this research. The chapter is divided into three main sections covering quantitative, qualitative, and mixed-methods research traditions. Each section begins with a discussion of the key philosophical assumptions underlying a particular research tradition which is followed by a brief critique of the methods applicable in that research tradition, and then the detail of selected methods is described. Therefore, this chapter on methodology will present and justify the selection of the specific methods employed in this doctoral research project. Throughout the chapter, the discussion of methodology moves from a general description to a focus on how each set of philosophies underpins research in the health services and pharmacy practice domains, to which the current project pertains.

2.1 General introduction to research methodology

This section defines research methodology and the related concepts of ontology and epistemology. These are the components of the philosophical debates that surround the conduct of social research generally, and health services research in particular.

Blaikie defines research methodology as “discussions of how research is done, or should be done, and the critical analysis of methods of research.” In this context, methodology covers the logic surrounding how new knowledge is generated and justified (77). Methodology, therefore, extends beyond a simple description of the techniques used to collect and analyse data (research methods). It includes a discussion of the philosophical assumptions that govern these techniques as a rationale for the selection and application of appropriate methods in research. Philosophical assumptions, described as ‘paradigms’, by Guba and Lincoln, underpin research in the sense that choice of a particular methodological approach adopted by any researcher, depends on the researcher’s response to ontological and epistemological questions (78).

According to Blaikie, ontology is concerned with the nature of social reality or what exists, while epistemology describes the possible ways of knowing social reality (assumptions about how what exists can be known) (77). Denzin and Lincoln explained the relationship of these concepts in the research process as follows:

> *"...the researcher approaches the world with a set of ideas, a framework (theory, ontology) that specifies a set of questions (epistemology) that he or she then examines in specific ways (methodology, analysis)"* (79)

The research project reported in this thesis falls within the domain of pharmacy practice, a sub-specialty of health services research. Bowling defines health services research as:

> *"...an applied field of multi-disciplinary research concerned with the relationship between the provision, effectiveness and efficient use of health services and the health needs of the people"* (80).

Health services research follows defined rules and procedures to gather relevant information useful for answering questions related to the health needs of the population. Health needs include the social interactions and relationships between health professionals, as providers, and patients, as recipients, of health services (81). Health services research primarily applies quantitative methods, rooted in the natural sciences, qualitative methods, rooted in the social sciences, or a mixture of both approaches. The rest of the chapter will focus on these approaches to traditions and highlight the unique strengths and weaknesses of each one in order to justify and guide the selection of appropriate methods for the research questions being addressed in this doctoral research.

2.2 Quantitative research methodologies

This section introduces quantitative research methodology, highlighting the main philosophical assumptions behind it. Also, experimental and quasi-experimental techniques of quantitative enquiry are described briefly, before focussing on the survey method in more detail.

Quantitative research measures the relationship between two or more variables as a means of quantifying numerically. The relationship between variables is expressed in the form of theories or hypotheses and measured using standardised instruments. Data from measurements are represented by numbers and subjected to statistical analyses, in order to explain the relationship between the variables of interest (82). In other words, quantitative research begins with well defined concepts or hypotheses about which data to collect and analysed to derive new scientific knowledge, through deductive reasoning (80). The collection and analyses of data in quantitative research assumes the existence of 'reality' or 'truth' in social phenomena. It is these realities that are measured objectively using standardised instruments. These assumptions represent the positivist/ post-positivist philosophies of research described in the next section.

2.2.1 Philosophical assumptions underpinning quantitative research

The positivist philosophy in research assumes a 'realist' ontology; that is the existence of a single reality or 'fact' within the phenomenon being investigated. In terms of epistemology, positivism believes it is both possible and essential to observe and measure that single reality without interference by the researcher (objectivity) (78). Positivism is concerned with the determination of 'cause' and 'effect' relationships, and argues that science must be concerned with only variables that can be measured objectively, devoid of any influence of the interaction between the researcher and the observed phenomenon (83). However, this claim of a single objective reality in positivism presents practical challenges in health services research. Positivism assumes that social phenomena can be measured in the same way as medical science would use instruments to measure parameters such as temperature or blood pressure (80). This is often impractical as it is seldom possible for scientific observations to be made totally indifferent to the context within which the observer operates (84, 85). This limitation of positivism, led to the emergence of post-positivism as an alternative research philosophy.

The ontological basis of post-positivism is ‘critical realism’ which retains belief in the existence of a single ‘reality’, but argues that reality can never be fully attained (78). In other words, post-positivism holds that it is not possible to completely prove theories or hypotheses. Rather, theories are considered as provisional explanations of ‘reality’ and not absolute truths (81). The post-positivist epistemology acknowledges the influence of interactions between the researcher and the researched. It accepts ‘objectivity’ as an essential guiding principle in research, but argues that it is never possible to completely achieve objectivity (78). Post-positivist assumptions have tended to dominate social research, and have often been called the scientific method (86).

Some research questions can be investigated within the premise of the post-positivist philosophy. For example, the effectiveness of two drugs in the treatment of a disease can be tested and compared using randomised, controlled experiments. Similarly, where background information about health services research questions are available, researchers can deploy quantitative methods using standardised instruments for data collection (80). The quantitative techniques applied in health services research are presented next.

2.3 Quantitative methods (experimental and quasi-experimental designs)

Quantitative research designs encompass a wide range of specific methods which broadly group as experimental, quasi-experimental or non-experimental. Experimental research has the general aim of establishing causal relationships between variables. However, non-experimental quantitative research mainly describes the characteristics of variables hence the methods are often referred to as descriptive (87).These two categories of quantitative research are discussed briefly focussing on their distinguishing characteristics. The strengths and limitations of these methods for the research questions addressed in this doctoral research project are also described.

2.3.1 Experimental research

Experiments are the means by which researchers ensure control in the environment under study. In the natural sciences such as biology, scientists keep all conditions constant while manipulating the independent variables. The influence of extraneous factors on the outcome (confounding variables) is kept to the barest minimum possible. Consequently, the observed effect can be potentially ascribed to the intervention, or manipulation of the independent variable. The main distinguishing feature of experimental research is the random allocation of subjects into test and control groups, to permit the manipulation of the independent variable (87). Randomisation uses statistical calculations to ensure that every member of the study population gets an equal chance of being in either the test or control group. This then ensures that outcomes of experimental research can only be attributed to the independent variable. Research into some human actions and behaviours relies on statistical analyses of quantitative data to produce inferences. The findings are regarded as facts or general theories about the characteristics of interest in the study population, especially when other experiments replicate the findings in different populations and sub-populations (88). The concept of experimental research has been applied in the health setting in the form of randomised controlled trials RCTs (81).

Results of RCTs are considered to yield valid explanations or evidence that a particular intervention caused the observed effect. In other words, RCTs can be used to determine cause and effect with a high degree of precision or accuracy (internal validity). Consequently, the strength of evidence from RCTs is usually graded highest in the hierarchy of health services research (89). However, findings from an RCT may be inapplicable outside the population from which the sample was drawn (90). Steps taken to eliminate the influence of confounding variables permit the accurate determination of cause and effect between manipulation of independent variables and outcome. At the same time this narrows the conditions for which the results could apply (external validity) (80, 87). Therefore, many health services research questions are investigated by non experimental designs.

2.3.2 Limitation of experimental designs for this research project

Randomisation, the main requirement of experimental research designs is not always feasible, due to practical and sometimes ethical considerations. In addition, the procedure of manipulating independent variables may not be tenable in the case of human research subjects. Research participants do not passively respond to external stimuli; instead, they contemplate and interpret information about their environment and then respond appropriately (80). This imposed key limitations to the use of any experimental design in this doctoral research project. The research did not aim to determine any causal relationships for which an RCT would have yielded results with the strongest internal validity (accuracy). Rather, the research questions were mainly descriptive and hence, were more suited to non-experimental designs (87), particularly the survey method. Non-experimental quantitative research designs will be described next.

2.3.3 Quasi-experimental designs

Quasi-experimental designs do not require random allocation of subjects into control and test groups, but research participants are assigned into two or more groups. These designs still permit the investigation of causal relationships, but yield findings that are weaker than true experiments in terms of internal validity (87). Observed outcomes may be open to alternative explanations because of the external influence of uncontrolled factors. The main features of experimental and quasi-experimental research designs are summarised in Table 2.1. Descriptive surveys fall within this category of quantitative research and they will be considered next.

2.3.4 Survey research design

This section introduces survey research design, highlighting the main characteristics of cross-sectional questionnaire surveys. The postal method of delivering questionnaires will be described, along with a brief critique of strengths and limitations of surveys in health services research. The discussion will also cover the rationale and justification for choosing this particular method in the current research project.

Surveys are the most widely used research design adopted by pharmacy practice researchers to address a wide range of objectives (91). The design could be descriptive or analytical depending on the type of research question. Analytical survey designs explore the association between particular variables in search of causal relationships and explanation of the phenomenon under investigation in a manner similar to experiments (80). Descriptive surveys, on the other hand, mainly estimate proportion or count variables of interest in a whole population or representative samples of them. Such surveys may also determine how often certain events occur together (association), but they are not suitable for explaining why the observed relationships occur (causality) (92). Descriptive designs collect numerical data, which are statistically analysed to elucidate information on trends, attitudes or opinions of a population. Data collection in surveys may be cross-sectional, to compare different subgroups of the population at a single point in time, or longitudinal, in which case the same group of respondents is examined repeatedly over a period of time to reveal trends and associations (80, 90, 92).

Table 2.1 Summary of experimental and quasi-experimental research designs applied to health services research

Main features	Strengths	Limitations	Example of Designs
Experimental designs (Randomised controlled trial (RCT)			
Experimental and control groups with similar characteristics Intervention of interest withheld from control group Random assignment of participants to experimental or control group Participants have equal chance of being in either group. Requires a hypothesis to test a causal relationship	Randomisation minimises the likelihood of selection bias and increases accuracy to infer that observed difference is due to manipulation of the independent variable (internal validity). Can predict cause and effect relationships and clarify the direction of causation. Possible to determine which independent variable accounts for the outcome of interest. Greater flexibility, efficiency and statistical manipulations; consequently more robust findings and inferences	Difficult to completely eliminate external influences (confounding variables) in human studies Confounders often make it impossible to identify a specific variable as the cause of the outcome observed in human phenomena The controlled environment of experiments bear little resemblance to real life human health issues in health services research (weak external validity) Experiments cannot capture all factors involved in human health; example choices and preferences of health professionals and patients	1. Post test only, 2. Pre and post test 3. Factorial
Quasi-experimental designs			
There may or may not be controlled groups No random assignment of research participants to groups Researcher may not manipulate independent variable	Relatively cheap compared to experiments Relatively quick results Useful in studying rare health conditions Better than experiments at generalising from research findings to real life situations in human research (external validity)	Potential for selection bias and confounding higher than for experiments. Limitation on the conclusions possible from these studies and cannot establish causality. Difference between case and control groups cannot be fully explained by the independent variable (weak internal validity).	1. Case-control studies 2. Cohort studies 3. Data base studies 4. Descriptive surveys 5. Analytical surveys

A limitation of surveys compared to experiments is the absence of a control group, and the non-manipulation of variables being investigated. This implies that any inferences from surveys never completely exclude the influence of uncontrolled variables, hence the design is less suitable for proving causal relationships (92).Notwithstanding, by following the trend of events in the natural setting, and surveys give rise to findings that are closer to reality than those from the controlled-environment of experiments (92). Surveys conducted on sufficiently large samples are likely to produce findings which can be generalised to the population from which the sample was drawn (81).This presents a practical advantage for health services research concerned with estimating the association between demand, provision and utilisation of health services in the community. Moreover, sample surveys are cheaper than full population studies and are easier to conduct across wide geographical areas (80).These practical advantages make surveys the methods of choice in health services research.

2.3.5 Cross-sectional questionnaire surveys

Questionnaires are the standardised instruments used for the collection of data in survey research designs. The term questionnaire survey in its broadest context covers several methods of administering the instrument, including postal questionnaire surveys, group or self-administered questionnaires, and structured interviews, conducted face-to-face or by telephone (92, 93). A questionnaire survey is cross-sectional when the collection of data is done at one point in time. The data collection instrument may be delivered to respondents by post for self-completion, as in postal questionnaire surveys. This method of delivery removes face-to-face contact between the researcher and respondents, therefore it minimises undue influences of the researcher on respondents. In addition, the method provides a rapid and cost-effective means of reaching respondents across wide geographical regions (92). The use of questionnaires in health services research has been on the increase. Unfortunately, this popularity of the method has also been associated with a higher potential for inappropriate use arising from poor questionnaire design (94). The quality assurance of questionnaire surveys in terms of validity and reliability are central considerations, therefore, in the development of questionnaires. These issues are addressed in the next section.

2.3.5.1 Reliability of questionnaire surveys

Reliability refers to the extent to which the data collection instrument will re-produce the same measures of a variable when administered repeatedly (repeatability), or the probability that the instrument is free from random error. It is also the estimate of the extent to which the questions measure the same concept (internal consistency) (80, 92). It is therefore important that the questionnaire is standardised to collect accurate information about the variables of interest. There are several procedures for assessing the reliability of questionnaires including: test-retest, Cronbach' alpha, split half, multiple form, item-item correlations and item-total correlations,(80) but a description of the first two will suffice for this thesis. Repeat-reliability or reproducibility of a questionnaire is commonly estimated by a procedure of test-retest, in which the questionnaire is administered to the same individual on two different occasions. Assuming no change in the variable being measured, a respondent is expected to record the same score each time the questionnaire is administered. Computing the correlation between scores recorded in each of the two measurements gives an indication of the consistency of respondents' answers to the same questions when repeated. This correlation is used as a proxy to measure how respondents interpreted the questions (91). A reliable questionnaire should produce high correlations with values close to 1; however, a low correlation may reflect a change rather than poor reliability of the instrument (80).

Practical considerations often make it impossible to carry out the test-retest reliability check procedure. Moreover, research participants may respond to a questionnaire the second time based on their experience with the first one, so that results may not in reality be a comparison of the same instruments (92). In these circumstances, the internal consistency of questions is used as an estimate of reliability. This is determined using the Cronbach's alpha coefficient (α), by calculating the correlation coefficient among the questions. The literature suggests that α value above 0.7 indicate good reliability (91). Internal consistency does not require the repeated administration of the questionnaire, unlike the test-retest procedure for estimating reliability. These principles will be applied in Phase1 of the current research project (see Chapter 3).

2.3.5.2 Validity of questionnaire surveys

Validity is the level of assurance that the data collection tool actually measures what it was designed to measure (92). Pharmacy practice research considers validity of survey questionnaires as the extent to which the questions elicit accurate responses that are relevant to the research objectives (91). This is the internal validity of the questionnaire, in contrast to external validity, which is a measure of how much the research findings reflect the true situation in the population of interest. In questionnaire development several aspects of validity are considered, but two types of validity are particularly relevant in pharmacy practice research; face and content validity. (91) Face validity is the subjective assessment of the physical appearance, relevance and clarity of the question (80). Checking for face validity also ensures that the data collection instrument is devoid of questions that respondents would be reluctant to, or unable to answer. (91) Assessment of the face validity is improved upon by adopting the more systematic approach of content validity. This involves a panel of experts who check the questions to ensure that all relevant issues are exhaustively covered, both from the researcher's and respondent's perspectives (80, 91).

The external validity of a survey, defines how the results of research conducted with selected individuals could be generalised, and thus applied to other populations. This is determined most importantly by the sampling procedure, sample size and response rates (91). Assuming that sampling is adequate, in terms of selection, size and response rate, it may then be possible to apply probability-statistics to generalised findings from the sample to the wider population (86). This is particularly important in health services and pharmacy practice research, where the aim is often to deliver better services through a change in policy or practice. In the current research project, specific sampling considerations are presented in Chapter 3, but the general principles as it relates to external validity of surveys is described below.

2.3.5.3 Sampling procedures in survey research

Ideally, a survey would collect information from every member of the population of interest; in the case of this doctoral research project, that would be all pharmacist prescribers who worked in GP practices and community pharmacies. This would have guaranteed that the findings completely and

correctly described implementation of prescribing within these settings. This was not feasible however, and as it is the case with any research utilising the survey approach, some respondents may not be willing or able to participate (91). Moreover, there may not be any real advantage of recruiting every individual from large study populations, as this would demand huge time and resources to process the resultant data (80). Therefore, surveys rely on information from some individuals in the study population, a representative sample, who possess all the characteristics of interest (92).

Samples can be drawn by a simple random procedure to ensure that every member of the population has a statistically equal chance of being selected (92). A random sample is necessary in order to apply probability statistical analyses which permit generalising any inferences to the wider population, (86) (external validity described above) . Random sampling depends on the availability of a complete and accurate sampling frame, which is a list of every member of the population of interest (91). In this doctoral research, the sampling frame was the register of all pharmacist prescribers qualified and registered with the RPSGB. The sample of interest however, was those based in community pharmacies and general medical practices. The RPSGB register did not distinguish individuals according to their practice settings; therefore, a truly random sampling procedure was not feasible in this instance. Alternative sampling procedures, such as clustered or stratified sampling, involve grouping large populations into smaller units which are randomly selected, and individual members in the smaller units are in turn randomly recruited for the study (91). These were neither necessary nor feasible in the current doctoral research project. In such situations, the most readily accessible or willing members of the population are selected in a convenient sampling strategy (91). This was the approach used in the current project, administering questionnaires to everyone on the register of pharmacist prescribers, and using screening questions to select the desired sample (see details in Chapter 3).

2.3.5.4 Maximising response rate in postal questionnaire surveys

Achieving high response is central among the points taken into account while planning a questionnaire survey, if findings are to be generalised to the wider population of interest. Pharmacy practice researchers who use the postal

method of questionnaire administration have adopted several strategies to achieve this. Researchers enclose covering letters along with questionnaires, to explain objectives of the research. The covering letter also explains criteria used for selecting respondents, assures confidentiality, and points out potential benefits or risks of the project to respondents. Other strategies used by researchers to maximise questionnaire response include sending reminders to participants, and the use of incentives (91). These principles were applied in the design of the current research project, although no incentives were offered. The practice of inducing research participants with incentives is contentious in Europe, where it is mostly considered unethical (80). Moreover, the benefit of incentives on questionnaire response has not been verified (91). This doctoral research project adhered to principles of best practice of questionnaire surveys through all stages, including the planning and development of the questionnaire, covering letter and participant information sheet (92-94). Specific details of the questionnaire development process and validation of the questionnaire are discussed in Chapter 3, where the method is applied in the first phase of the research project.

Many health services research questions are suitable for investigation using quantitative methods. However, others such as individual's perceptions and considerations that motivate them to seek treatment are 'abstract' and less suitable for investigation using quantitative approaches. In these circumstances, qualitative methods present viable alternatives in health services research. Therefore, a discussion of qualitative research will follow in section 2.5 before ending this chapter with a brief discussion of mixed-methods research to provide the rationale and justification for the specific methods applied in Phases1 and 2 of this research project.

2.4 Qualitative research designs

This section will discuss qualitative research methodology highlighting key comparisons and contrasts with quantitative research. As with the section on quantitative research, the discussion will move from the philosophical assumptions to the range of qualitative methods, and then focus on a detailed description of qualitative interviews.

Qualitative research produces findings by procedures other than statistical analysis or quantification of numerical relationships between variables (95). The focus of qualitative research is gaining understanding of the meaning(s) research participants attach to their experiences of the social world (80). The emphasis in qualitative research is the understanding of phenomena in their social contexts; rather than controlling the environment and manipulating variables as is the case with quantitative research.

2.4.1 Philosophical assumptions underpinning qualitative research

The philosophical assumptions that underpin qualitative research are highly contested subjects and sometimes generate controversial debates among scholars in different disciplines. However, philosophical discussions highlight the links between beliefs about the nature of social reality and the possible ways of investigating and knowing that reality. Therefore, philosophy or paradigms shape the views and actions of qualitative researchers.

According to Denzin:

> *"All research is interpretive; it is guided by the researchers set of beliefs, and feelings about the world and how it should be understood and studied.... Each interpretive paradigm makes particular demands on the researcher including the questions the researcher asks, and the interpretation he or she brings to them"* (79).

Denzin then described four interpretive paradigms that generally underpin qualitative research as: positivist, constructivist, critical and feminist (79). A comprehensive discussion of these paradigms is beyond the scope of this thesis. Moreover, Barbour has argued that it is neither feasible nor desirable to distinguish clearly between the many philosophical traditions of qualitative research (96).

> *"Any attempt to categorize qualitative traditions in terms of their distinctiveness is doomed from the outset...the problem of providing a clear and comprehensive run-down of the principal traditions is exacerbated by the existence of variants of virtually any approach"* (96).

Barbour stated further that individual qualitative researchers would choose to emphasise some, and de-emphasise other aspects of a philosophical approach,

depending on their personal preferences and disciplinary dispositions (96). In this sense, the constructivist philosophy which contextualised the second phase of my doctoral research project will be introduced briefly. Positivism and related philosophies that underpin quantitative research were discussed in the previous section on quantitative research designs.

2.4.2 Constructivism

Constructivism assumes that social realities are constructed out of individual's experiences of phenomena. The ontology (nature of social reality) of constructivism assumes that 'social reality' does not exist as discrete tangible 'facts' that can be measured. Rather, it assumes that individuals create 'social reality' by constructing subjective and multiple meanings of their experiences as they live and work in the society (86). In terms of epistemology (relationship between the researcher and the social reality they seek to know), the researcher from the point of view of constructivism should take into account local contexts, and meanings that individuals create out of their experiences. This acknowledges mutual influences between the researcher and researched (97). Constructivism is related to phenomenology, which assumes that people construct social reality as they interpret the world around them, interact with each other, and assign meaning to their perceptions and experiences (98, 99).

Consequently, the philosophy of phenomenology dictates that research into human issues, such as health services, should be conducted in the natural environment, which encourages active engagement between the researcher and research participants (80). This is in contrast to the positivist philosophy predominant in quantitative research where the researcher is completely 'detached' from the subject being investigated and the researcher takes the position of an objective observer of phenomena (78). Constructivism and phenomenology require that the researcher occupies the centre stage of the research process in order to understand the social world (99). Phenomenology utilises open-ended and unstructured instruments to generate in depth accounts from a small number of participants. Researchers engage with, and immerse themselves extensively in, participants' narratives. They try to identify patterns of relationships in the data and gain insight into the meanings of phenomena from the perspective of the study participants (80, 86, 98). The presence and

personal experiences of the qualitative researcher are acknowledged as important in understanding the contexts of the issues being studied (100). The researcher is perhaps the most important research tool, and generates, rather than collects, data to provide a 'thick' description of phenomena as the researcher actively engages in the setting under study (96).

2.4.3 Main features of qualitative research

Qualitative research seeks to explain how people understand concepts and the processes by which they translate these concepts into every day practices (96) such as, how patients interpret and respond to information from health professionals that result in favourable or adverse treatment outcomes. Qualitative research by observations, unstructured interviews or documentary analyses, relies on textual data rather than numbers to explain phenomena (80, 86). In achieving this purpose, qualitative research puts little emphasis on pre-defined concepts or hypotheses at the beginning of a research project. Rather, hypotheses are developed and refined as the research progresses (100). Categories for data analysis emerge by an inductive process where the researcher begins with the observations and forms ideas which are refined into general concepts or hypotheses that can be tested by further observations (80).

The main limitation of qualitative research relates to the tendency of data generation and analysis being tedious and time consuming (88). This is more so in the field of health services, where research outcome may be needed for the formulation and implementation of policy interventions within a short span of time (88,101). This limitation does not in any way diminish the many advantages of qualitative research. The main advantage in health services research is suitability of qualitative methods to study topics about which little is known, or complex and sensitive issues (80). Qualitative methods are also acknowledged for the advantage of studying phenomena in their natural contexts, such that findings are more likely to reflect stakeholders' needs, unlike the strictly controlled environment of the laboratory (88). Qualitative research, therefore, provides opportunity to closely examine lived experiences of the social world in a way that is not possible with quantitative methods (96). As a result, qualitative research has gained popularity among health services

researchers for studying complex human interactions associated with the planning, provision, demand and utilisation of health services (102).

2.4.4 Sampling in qualitative research

Unlike quantitative research, the aim of qualitative research is not to test hypotheses or generalise findings to the wider population. Therefore, samples in qualitative research do not necessarily have to be representative of the general population. Qualitative research is more interested in understanding the complex processes behind phenomena through a detailed study of a few participants. Also, human characteristics studied in qualitative research often do not follow a 'normal' distribution among populations, and hence random sampling becomes inappropriate (103). Consequently, qualitative research adopts alternate, but appropriate, strategies in the selection of study participants. Four sampling strategies (convenience sampling, purposive sampling, snowballing and theoretical sampling) are the most commonly used in health services research (80).

Convenience sampling strategy recruits participants mainly on the grounds of being the most readily available participants; sometimes described as opportunistic sampling (80). This strategy is resource-efficient, in terms of saving time, money and efforts, but may result in low quality of data. (103) Purposive sampling deliberately selects participants based on particular characteristics relevant for producing the needed data that best illuminate the topic under investigation; for example, participants having experienced the phenomenon under investigation (104). Participants included in purposive sampling are often chosen to reflect varied perspectives on the research topic (maximum variability), including those with negative experiences. This enhances the quality and depth of the data (103). Snowballing relies on recruiting the initial participants who then suggest others that have the characteristic of interest to the researcher; this is mostly used in the absence of clear sampling frames (80). Theoretical sampling is more commonly applied in grounded theory research, where emerging concepts and theories determine the category of respondents that need to be recruited in order to develop and refine those concepts (103). Irrespective of which sampling strategy is adopted in qualitative research, there appears to be an overlap in the sense that

participants are often selected for specific purposes in accordance with the research objective (105). This was the case in the current project (see Chapter 4).

2.4.5 Reliability, validity and rigour in qualitative research

Reliability and validity were introduced as concepts that define the integrity of the quantitative research process and outcomes. It was mentioned that reliability can be assessed in quantitative research by the statistical calculation of internal consistency, or the test-retest procedure (91). However, the traditional meaning of reliability and validity, derived from the positivist paradigm of research cannot apply directly to qualitative research. Since the two research traditions have different ontological and epistemological beliefs, knowledge derived through the two research processes is different (78). Whilst quantitative research builds knowledge in the form of 'accurate' explanations of relationships among variables in phenomena, qualitative research generates understanding of the 'real-world' complexities and social contexts of phenomena (96,102,106). This difference in purpose between the two research paradigms is one reason why it is not possible to apply the same criteria, for the assessment of their quality (107). Stenbacka has argued that using reliability, validity and related concepts in qualitative research is irrelevant and often misleading; as qualitative research is never out to measure anything (106).

Notwithstanding, qualitative researchers need to demonstrate the quality of their process and outcome. Many qualitative researchers have attempted to draw parallels with the quality concepts of quantitative research, but the meaning of validity has remained contentious. (108). One of the problems is the semantics of these concepts, which as Stenbacka pointed out, may not be suited to the qualitative research paradigm (106). Therefore, the traditional quantitative terms of reliability and validity are conceptualised as 'trustworthiness', 'quality' and 'rigour' in qualitative research (107). In considering 'trustworthiness' of the qualitative research process, Lincoln and Guba suggest that researchers focus attention on four key issues: 'credibility', 'transferability', 'dependability', and 'confirmability' (109). Lincoln and Guba explained these terms as follows

i. 'Credibility' is an evaluation of how research findings represent the 'truth' about the phenomenon under investigation; i.e. confidence that research

findings truly portray a conceptual interpretation of participants' original data.

ii. 'Transferability' gives an indication of the degree to which other researchers can apply or transfer the findings to their own situations.

iii. 'Dependability' measures the stability of the findings over time which captures the quality of the entire process from data generation, data analysis, and interpretation.

iv. 'Confirmability' links the data to the findings indicating how well research findings are supported by research participants' accounts (109)

The concept of 'trustworthiness' has been made operational by replacing internal validity in quantitative research with 'credibility' in qualitative research. Similarly, external validity is replaced by 'transferability'; reliability is replaced by 'dependability'; and objectivity is replaced by 'confirmability' (110). Qualitative researchers have therefore, incorporated steps to safeguard the credibility or quality of both the research process and outcome. These include: researchers being honest and open about their theoretical inclinations and background at the outset of the research project. Also, issues of design, sampling, data generation, analysis and interpretation should by systematic, avoiding as much researcher bias as possible (80). In addition, rigour has been achieved in qualitative research by using two or more approaches to arrive at the same finding (triangulation). Other ways include asking respondents to check transcripts and verify that their perspectives have been adequately reflected (respondent validations). In all these, the qualitative researcher remains sensitive to any personal preconceptions, biases and possible influence on response of participants (reflexivity) (91,111). These principles will be applied in phase two of the current research reported in Chapter 4.

2.4.6 Range of qualitative research methods

There are three main methods of generating data in qualitative research: interviews, ethnography/observational research and focus group discussions (100). These methods actively generate data through interactions with research participants. However, some other procedures can involve the examination of documents in the form of diaries, audio or video materials (96). The methods will be introduced briefly, and then interviews described in detail. The

justification and rationale for the choice of interviews in this doctoral project will be explained later.

Observational research is the main approach of ethnography which affords the researcher opportunity to directly observe human behaviour in the natural setting (100). Ethnography observes the sequences of human activities in a manner that is open to discovering new data, and then connects observed data to local contexts of the study (112). Observational research aims at understanding more than what people say about complex phenomena (80).

Focus group discussion as a technique of generating qualitative data has its origins in market research, organisational research, community development and social science (113). The term focus group has often been construed as synonymous with group interviews. Whereas focus group discussions rely on the interactions between participants to generate data, group interview involves the researcher asking group participants the same question in turn (96). A broad description encompassing both perspectives defines any group discussion as a focus group, so long as the researcher actively encourages and is attentive to the group interaction (114). Focus group discussions have become increasingly utilised in health services research for the initial exploratory phase of research to develop items for inclusion in surveys (113). In addition, focus group discussions have been found to be successful in producing rich data about the public's views of priorities for health service (80). It is also useful in exploring culturally-sensitive beliefs of ethnic minorities about health. Group interaction allows participants to approach the issues in ways that are less threatening than they might otherwise find in one-to-one interviews (114). However, this method is not the most appropriate for accessing views or attitudes of participants. One-to-one interviews are better at generating and clarifying narratives than focus groups which are more suitable for studying how views are created and modified (96).

2.4.7 Qualitative interviews

One-to-one interviews are the most common qualitative research method. Interviews generally involve more than merely asking questions, but elicit comprehensive exchanges between the researcher and research participants (96). Interviews are either conducted by telephone or face-to-face, which can be

one-on-one or in groups. Interview formats use open-ended and unstructured questions to elicit the views and opinions of the participants (86). The unstructured nature of the interaction ensures that issues relevant to participants drive the discussion. This is in contrast to the fixed agenda of quantitative research, which uses structured survey instruments to conduct the interviews (96). Qualitative interview exchanges are kept within the topic of investigation using loose guides in semi-structured interviews (115). The interview guide comprises a few specifically-worded questions with appropriate prompts to increase the depth of interaction (80, 96).

2.4.8 Telephone interviews

Face-to-face interview has been the dominant mode of data generation in qualitative research. Researchers, using this procedure, can take added advantage of non-verbal cues from participants, to gain a deeper insight into the data. However, the presence of the researcher may influence the responses. In addition, this approach is both time-consuming and expensive (116). In contrast, telephone interviews are less commonly used in qualitative data generation; for reasons that may include: low response rates, need for shorter interviews, absence of visual cues, and also because telephones may not be available to everyone (117,118). This notwithstanding, telephone interviews allow access to participants across wide geographical areas, and hard-to-reach respondent groups. In addition, telephone interviews are cheaper and respondents may find the method less imposing than face-to-face interviews (116,119). Consequently, the use of telephones has gained prominence as an alternative procedure for administering qualitative interviews in research. Importantly, the depth and quality of data generated by telephone does not significantly differ from those generated by face-to-face interviews (119).

The limitations of qualitative methods, particularly interviews, underscore the continued importance of quantitative methods in health services research. Therefore, combining different, complementary methods is likely to lead to a more holistic understanding of a research issue. This is the crux of mixed-methods research which is discussed next, in section 2.5

2.5 Mixed-methods research design

This section begins with a discussion of the philosophy of mixed-methods research, and then describes various strategies of mixing methods, before focusing on the sequential strategy of mixed-methods research. The section then concludes with a discussion of the criteria considered in selecting mixed-methods strategies in health services research.

There are multiple definitions of mixed-methods research depending on what is combined, when or where the combination is made, the breadth of combination, the purpose of combination and whether or not the research question drives the consideration for combining research methods (120). Johnson *et al.,* drawing from 19 other definitions described mixed-methods research as the

> *"… type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (for example the use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration"* (120).

This implies that the research stages from conceptualisation through to the inference may be combined. Quantitative and qualitative research traditions are not polar opposites of each other. Instead, elements of the two research traditions could be integrated at different stages to yield valid inferences (121). Mixed-methods research may also combine two data collection and analysis techniques within the same research tradition, for example, combining two qualitative or two quantitative methods. However, it is important that in mixed-methods research, quantitative and qualitative perspectives are applied in investigating the same research question, either for corroboration of findings (triangulation) or using one method to complement findings of the other, in a way that provides a more elaborate understanding of the research question (120).

Researchers often disagree on the logic of combining qualitative and quantitative methods. However, practical reasons usually warrant the combination of the two methods in solving applied problems in health services research (122). In the United Kingdom, the mixed-methods revolution of the mid 1990s helped to diminish the traditional dominance of quantitative methods in

health services research. Researchers mostly combined surveys and interviews to address complex issues of real world access to, and effectiveness of, health care intervention programmes (123,124). In mixed-methods research design, qualitative textual data illuminate and add meaning to numerical inferences and predictions based on statistical analyses of quantitative data. Individual strengths of qualitative and quantitative methods are harnessed to overcome the limitations of either method. Consequently, stronger conclusions are drawn through convergence and corroboration of findings. These advantages come at the price of increased research workload which is often more expensive and time consuming. In addition, there are still grey areas that weaken mixed method research, for example, how to qualitatively analyse quantitative data or how to interpret conflicting results. Yet the practical reasons for mixing quantitative and qualitative research methods cannot be overlooked (88). Therefore, the philosophical reasoning behind mixed-methods approaches needs to be understood.

2.5.1 Pragmatism the philosophical basis of mixed-methods research

Aspects of mixed-methods research arise from different dimensions in the research process, and either the quantitative or qualitative approach would take priority depending on the reasons for combining them (125). Consequently, mixed-methods research is not committed to any one philosophy, because one philosophy cannot fit all. Instead, mixed-methods research adopts a more pragmatic perspective.

Pragmatism is a middle-ground philosophy which is more concerned with the application of research strategies in problem-solving than debates about such abstract concepts as the ‘truth’. In this case ‘truth’ is what works (86,126). With this approach, researchers focus on the research problem and use all available strategies to address the issues, rather than emphasise the methods (127). The task of finding answers to research questions takes prominence over philosophical arguments, and it is research questions that drive the methods of knowledge acquisition (121).

Health services research questions are complex in the sense that they are investigations of the multiple dimensions of human interactions. The interdisciplinary nature of health services research also adds complexity to the

diverse philosophical backgrounds of researchers in this field. Moreover, patients are perceived not only in terms of malfunctioning biological systems but also as people attempting to make sense and cope with their health care issues (81). One approach to addressing research questions in health adopts the quantitative perspective. This approach objectively identifies variables (cause) to be manipulated in disease to obtain cure (effect). A second approach adopts a qualitative or interpretive strategy to gain insight into the subjective experiences of patients. In the process, researchers interpret, from the patients' perspectives, the meaning of their health condition, and subsequent therapeutic actions. These two approaches are both valid and this underscores the pragmatic philosophy of mixed-methods research. The logic of enquiry in pragmatism combines induction to discover patterns, deduction to test theories and abduction for identifying the best explanation that helps to achieve understanding of the research results (88).

2.5.2 Strategies for mixing research methods

At this point it is useful to make a distinction between methods in mixed-methods as a distinct research design (methodology), and the specific techniques (methods) of data gathering and analysing data. Mixed-method refers to the overall design in much the same way as quantitative or qualitative research is a design. Along with multiple definitions of mixed-methods research, around forty types of mixed strategies have been described in the literature (121). Many of these variations do not add clarity to the plans and actions of researchers (86), instead they emphasise abstract theoretical possibilities (125). Researchers may design project-specific types of mixed methods depending on their particular circumstances (88).

Three general strategies, with several variations are available for combining quantitative and qualitative research methods: transformative mixed-methods strategies, concurrent mixed-methods and sequential, mixed-methods (86). A detailed discussion of these strategies is beyond the scope of this thesis. However, the sequential mixed-methods approach which was the strategy adopted in this project will be described briefly. Sequential mixed-methods strategy applies one method to elaborate or expand on the findings from a previous one. The design could be exploratory, where qualitative methods are

used to explore an unknown topic, followed by a quantitative phase to build on the findings of the qualitative phase. On the other hand, a sequential explanatory design begins with a quantitative phase followed by a qualitative phase (86). This was the approach used in the current project and will be described in the next section. The description will cover main features of the strategy along with its strengths and limitations.

2.5.3 Sequential mixed-methods strategy

The sequential strategy began with an initial quantitative phase, the results of which informed qualitative data collection and analysis in a subsequent phase. This strategy is straight-forward and easy to implement with clear distinct steps in each phase. However, conducting each of the two phases in sequence prolongs the data collection and analysis process (86,128). In this doctoral research, a quantitative survey was first conducted to identify and quantify the factors associated with the implementation of prescribing by pharmacists in GB. This was followed by qualitative interviews to elucidate the processes of implementing prescribing by pharmacists. The rationale and justification for choosing this approach are discussed in the next section before applying individual quantitative and qualitative methods in subsequent chapters.

2.5.4 Criteria for selecting mixed-methods strategy

The use of mixed-method research designs in social or health services enquiries have been well-documented in the literature (123,124); (128). The research project reported in this thesis, investigated policy issues of pharmacist prescribing in relation to the real world experiences of pharmacist prescribers delivering the service in the National Health Service of Great Britain. In this research, the process started with a quantitative, cross-sectional postal questionnaire survey in Phase 1. The survey established baseline parameters which described structures that supported prescribing implementation by pharmacists. Additionally, the processes adopted by pharmacists in carrying out their prescribing roles, and factors that facilitated or hindered pharmacists from implementing prescribing, were highlighted through the survey.

The strengths or advantages of cross-sectional questionnaire surveys were discussed in previous sections on quantitative research. The method was considered logistically most appropriate in view of the wide geographical

coverage of the study area (all GB). Also, external validity was particularly important in the current study in order to promote translation of study findings into practice. The cross-sectional questionnaire survey design was thought to be most appropriate to maximise the chances of achieving this link between research and practice, because pharmacist data would arise from real practice scenarios of pharmacist prescribers such that any issues identified would approximate the reality on the ground. Specific aspects of this method as applied in the research project will be discussed in Chapter 3.

Factors associated with the implementation of prescribing by pharmacists, identified from the quantitative phase, needed to be considered in terms of how they fitted into every day activities of prescribing implementation. This informed the design of in-depth qualitative interviews in Phase 2 after the quantitative phase. The unique advantages of qualitative interviews in providing depth of explanation of phenomena were discussed earlier in the section on qualitative research. The telephone method of interviewing was deemed the most appropriate approach for the particular questions addressed in this doctoral research project, again because of the wide geographical distribution of participants, which would have placed extensive demands on time and resources if face-to-face interviews were to be used. Details of this method as applied in phase two of the research project will be discussed in Chapter 4.

2.6 Chapter summary

In this chapter, the philosophical basis of quantitative research was discussed with emphasis on how this philosophy influences experimental techniques used, determine causal relationships. Non-experimental techniques that describe relationships among variables were also considered under quantitative research. Qualitative research philosophies and methods were also discussed, with reference to how these lead to understanding and elaboration of the contexts in which health services research is conducted. The apparent inadequacy of either quantitative or qualitative research designs to sufficiently address health services research questions were highlighted in the chapter. Therefore, the pragmatic advantage of mixed-methods research as a strategy for harnessing the individual strengths, and at the same time overcoming the

individual weaknesses of both quantitative and qualitative research, were presented.

The concluding part of the chapter outlined various criteria applied in the choice of mixed-methods research, with emphasis on how these were applied in the selection of cross-sectional questionnaire survey and in-depth telephone interviews as the preferred methods for use in the current doctoral research project. A detailed discussion of cross-sectional questionnaire survey method follows in Chapter 3 where the method was applied in the first phase of the project.

Chapter Three cross sectional questionnaire survey

In the previous chapter the mixed methods approach was justified as the preferred approach for the current project. This choice was based on the pragmatic reason that applying both quantitative and qualitative methods in the investigation of pharmacist prescribing in GB was likely to yield a more complete explanation of the topic. This chapter presents the quantitative phase of the project; it utilises a cross-sectional, postal questionnaire survey approach. The research question, aims and objectives relevant for the quantitative phase of the project are stated. Then follows a brief description of research governance procedures, including the ethical permission sought and obtained. The chapter then goes on to describe the details of questionnaire development, data collection, statistical tests and procedures applied in data analysis. Finally the quantitative results are presented and discussed.

3.1 Overview of research questions

The questions addressed in this phase of the research included:

A. What was the level of pharmacist prescribing implementation in GB?

At the time of data collection in 2008/2009, supplementary prescribing by pharmacists had been introduced in GB for five years, while experience with independent prescribing was less than three years (41, 42, 44). In that period, researchers had used mainly quantitative questionnaire surveys to identify key issues post-implementation of pharmacist prescribing (49, 50); but many of the studies were limited to small geographical areas of GB. In one national survey of all pharmacist prescribers registered at the time, nearly half of those who responded had started practising as prescribers (48). The number of pharmacists qualified and registered as prescribers was established in the workforce census (45). However, no published evidence of the extent or scope of pharmacist prescribing activities implemented in GB was found. Therefore, it was necessary to update the status and determine the level of prescribing

activities undertaken by pharmacists, before proceeding with any further studies.

B. What were the factors that promoted or inhibited the implementation of prescribing by pharmacists?

The literature reviewed in chapter one had identified some challenges in the early periods post implementation of SP/ IP in studies limited to small geographical units of GB. It was therefore, necessary to examine and compare factors that possibly influenced prescribing implementation across the whole of GB.

C. What were the operating procedures pharmacists adopted in the course of implementing prescribing?

The interest here was to identify how pharmacist prescribers were engaging in the practice of consulting with, and prescribing for patients, specifically: how they identified which patients they prescribed for; how they communicated with other members of the health care team; and how they handled prescribing and dispensing functions together, if they did.

3.2 Aims and objectives of the quantitative phase

The aim in this phase of the project was to determine the nature and extent of prescribing activities undertaken by pharmacist prescribers in GB. The nature of prescribing practice was described in terms of the specific activities (processes) adopted by pharmacists in delivering prescribing services. The extent of prescribing practice was measured in terms of the amount of prescribing activities undertaken by pharmacists. This involved an investigation of the structures comprising the total environment of pharmacist prescribing services.

The specific objectives in this phase of the project were:

1. To describe the demographic characteristics of pharmacist prescribers as the basis for determining the extent of prescribing activities of pharmacists.
2. To identify barriers and facilitators to the practice of pharmacists as prescribers.

3. To examine the relationship between facilitators/barriers and demographic characteristics of pharmacists engaged in actual prescribing practice.
4. To describe the processes adopted by pharmacist prescribers in delivering prescribing services.

3.3 Methods

This section will outline the specific techniques and procedures applied in the collection and analysis of quantitative data in order to fulfil the objectives stated above.

3.3.1 Research governance and study approval

The research was conducted in accordance with the ethics and research governance policies of Robert Gordon University (129). The research student project ethical review (RSPER) form (appendix 1) was completed prior to the commencement of the doctoral research. This was reviewed and approved by the ethical review panel of the School of Pharmacy & Life Sciences. Project participants were to complete structured questionnaires, and the research governance priority was to minimise any possible data protection issues to participants whilst responding to the questionnaire. Great effort was put into checking the questions to ensure that the wording did not cause distress (physical or psychological) to participants.

Project information (appendix 2) was made available to prospective participants, and this explained details of the study objectives and potential benefits, so that respondents knew enough before giving consent to participate. It was explained that no direct financial benefits were accruable to participants, but the overall benefits of the research to the development of pharmacist prescribing practice were highlighted. The demand on the time of participants, and efforts they had to commit in completing questionnaires was considered a likely source of inconvenience. The researcher applied caution to minimise this inconvenience for participants. In addition, participants were assured of absolute confidentiality of information they provided, which was achieved by keeping the questionnaires

anonymous. Although the list of names and addresses of pharmacist prescribers registered with the RPSGB (now the General Pharmaceutical Council) was used as the sampling frame, it was not possible to link returned questionnaires to individual participants. Moreover, records of research participants and questionnaire responses, including transcripts from them, were anonymised and secured in locked cabinets. Electronic versions were stored in password-protected computer files accessed only by the research student and supervisory team. All research data was managed and stored in strict compliance with the Data Protection Act 1998 (130). The records and accompanying data will be destroyed after all dissemination of research findings in publications at the end of the project.

The North of Scotland Research Ethics Committee (NoSREC) was approached to review and give advice on the ethical issues raised in the research protocol. NoSREC after due consideration advised that a full ethical application was not necessary (appendix 3). This advice was based on the proposal that pharmacist prescribers were to complete the questionnaires anonymously. Furthermore, NHS employed pharmacist prescribers were not going to be involved beyond completing demographic questions on the questionnaire. The plan at that time was to use the demographic questions to sample only prescribers based in primary care (community pharmacies and general medical practices). However, as the project evolved, it became necessary to recruit NHS pharmacists (in hospitals and other settings) for the interview stage in phase two. These changes, and the research governance issues raised, are explained further in Chapter 4.

3.3.2 Recruitment of participants

The overarching objective of this project was to characterise pharmacist prescribing activities in the primary care setting (general medical practice and community pharmacies) of Great Britain. This group of pharmacist prescribers was the target population of interest for the study. The sampling frame was the list of all pharmacist prescribers held by the (RPSGB). However, it was not possible to specifically recruit only pharmacist prescribers based in primary

care, because the sampling frame did not distinguish the practice setting of individuals. Consequently, all registered prescribers on the RPSGB list were sent questionnaires, and then screening questions were used to identify the sample of interest. This approach has been adopted by many pharmacy practice researchers in similar situations (91).

3.3.3 Questionnaire development

Questionnaire development took into account the research aims and the study population, paying attention to themes from the literature, which had relevance in this project. Questionnaires used in previous studies by George et al were studied (48, 58, 60), and questions related to prescribing practices of pharmacists and demographics were adapted. Drafts of the questionnaire were written, modified and then circulated among the supervisors of the research project. The supervisory team consisted of four academics with extensive experience in pharmacy practice research. They were also among the pioneers of pharmacist prescribing research in GB. The research team met repeatedly to review questionnaire drafts. Questions that appeared ambiguous, complex or potentially contentious were discussed and resolved during team meetings, to yield a first working version of the questionnaire for piloting testing (appendix 4).

The first version (appendix 4) was a booklet eight pages long with twenty nine questions numbered sequentially. The booklet incorporated two pages of project information to participants. The main questionnaire was divided into five sections: Section A had six questions covering two pages, on pharmacist prescribers' demographic characteristics. This section was placed at the beginning of the questionnaire contrary to suggestions in the literature (91, 92), so that screening questions could be used to identify the required sample. Section B had five questions on the prescribing practice of the respondents at the time of completion. Section C had eight questions on any changes that may have occurred in the prescribing practice of respondents from when they first registered as prescribers. Section D was about factors that possibly influenced implementation of prescribing by pharmacists, and had four questions including, one with 16 attitudinal items on a five point Likert scale. Section E comprised

five questions related to the future of pharmacist prescribing in GB. The principle that guided questionnaire development was ensuring validity and reliability as discussed in Chapter 2. This was ensured following review by the research team and pilot of the developed questionnaire.

3.4 Pilot survey

The pilot survey was conducted between January and March 2009. The primary aim of the pilot survey was to test all aspects of the draft questionnaire including: the physical appearance of the questionnaire, question sequence, simplicity or difficulty of questions, internal consistency of attitudinal items, and the statistical procedures to be used in the main study. Importantly, the pilot survey aimed to identify any issues that respondents might raise. In addition, the response of participants to an invitation for participation in the second phase of the research was tested.

3.4.1 Pilot sample

In deciding on the pilot sample, consideration was given to the fact that the population of pharmacist prescribers registered at the time (a little above1700), also included those based in hospitals and PCTs or Health Boards. It was therefore important to choose a sample size that was optimal, neither too big nor too small. A sample that was too big would have depleted the final study population, but at the same time the pilot sample needed to be big enough to identify possible problems with the questionnaire. With due regard to Bowling who suggested a sample size of 30-50 when piloting previously untested questions and scale (80), the researcher decided to pilot the questionnaire on a sample size of 50 pharmacist prescribers. The pilot sample was randomly chosen using a random number generator applied to the sampling frame. The random sampling procedure (described in chapter two) was adopted in the pilot survey so that every prescriber listed on the sampling frame had an equal chance of being recruited. This way, any issues raised by the pilot sample regarding the questionnaire should be valid for the general population of pharmacist prescribers (91, 92).

3.4.2 Collection of pilot data

Questionnaires were posted to the pilot sample in January of 2009. Enclosed with each questionnaire was a reply card (appendix 8), inviting participants for the second phase of the research. Interested participants were asked to complete the reply card with details of their telephone and email contacts. Also enclosed were a participants' information letter and two prepaid, addressed reply envelopes. The two envelopes served as additional guarantee of anonymity so that participants could return completed questionnaires and reply cards separately. This ensured that reply cards which contained identifying information of respondents could not be directly linked to any particular completed questionnaire. The pilot sample was asked to return completed questionnaires on or before two weeks from the date of receipt.

3.4.3 Pilot results

The response from the pilot sample was 24% (n=12/50) after a single mailing. Preliminary analysis of responses revealed that respondents found the questions sufficiently easy to answer, with few questions left blank. The attitudinal scale of items that measured factors influencing prescribing practice had a Chronbach's alpha value (α) of 0.72 for internal consistency. In addition, respondents gave valuable comments in open questions about developments in their individual prescribing practices. Notwithstanding, the pilot survey identified the need to review aspects of the questionnaire before using it in the main survey.

3.4.4 Modifications based on pilot results

It was considered that a questionnaire of eight pages was probably too long, and that this may have contributed to the low response in the pilot survey (92). The next stage of questionnaire development therefore, attempted to make the instrument shorter. First the information sheet was removed from the questionnaire and made into a separate document. A careful scrutiny of the responses showed that some questions were redundant, and did not generate useful data; for example, question five in appendix 4 was a complex table about respondents' SP/IP practice at the time. It was observed that questions in this

table could be modified and merged to section B of the questionnaire to generate the same information more efficiently. Some questions were removed and others re-worded or had the order changed to simplify. The 16 item attitudinal scale generated a lot of interest among the pilot sample. Therefore, in the final version of the questionnaire (appendix 5), the attitudinal scale was brought to section A, following recommendations in the literature for interesting items to appear at the beginning of questionnaires (80, 91, 92). The documents accompanying the questionnaire were also slightly modified before the final survey. The two pages of participant's information were simplified down to one page (appendix 6). This was accompanied by an A4 sized poster, which highlighted key information about the research aims, and instructions for returning completed questionnaires (appendix 7). The poster was designed to catch the attention of participants who may be reluctant to read the detailed project information sheet. The reply card (appendix 8) inviting respondents to indicate interest in the second phase was reduced in size. In addition, the card now included contact details of the research student for respondents that may want to clarify any issues.

3.4.5 Re-test of modified questionnaire

The modified questionnaire was re-tested in the same pilot sample as the first. Using the same pilot sample was necessary for two reasons: first the small number of prospective participants on the sampling frame would have been depleted further had a new pilot sample been drawn from it; secondly, administering the modified version of the questionnaire on the same sample provided an opportunity to assess the potential impact of sending reminders in the main survey. All 50 of the pilot sample were sent the modified version of the questionnaire. Anonymity of the questionnaire, however, meant that it was not possible to identify and exclude pharmacist prescribers that had already responded to the first pilot questionnaires. This was to impact also on the main data collection, as all pharmacist prescribers in the sampling frame had to be sent reminder questionnaires. Two weeks after posting the modified questionnaire, response was also 24% (12/50). The questions and accompanying responses were much clearer and easier to process than the

first version. Therefore, no further adjustments in the questionnaire were deemed necessary, except for selection of paper type and print colour.

The final version of the questionnaire (appendix 5) was four pages long, and contained both closed and open-ended questions. Again there were five sections. Section A had six items, including the 16 item attitudinal questions. Section B had nine questions dealing with the issues involved in the day to day prescribing practice of respondents. Section C had seven questions on changes in respondents' prescribing practice. Section D had five items about the future of prescribing; while section E collected demographic data. With the questionnaire developed and tested, the next task was to apply the instrument in the main survey as described below.

3.4.6 Main data collection

The final questionnaire and accompanying documents were mailed to all prescribers (excluding the pilot sample) on the register of the RPSGB (n=1,653) in April 2009. Respondents were asked to complete and return questionnaires within two weeks of receipt. Reminders were posted out to all pharmacist prescribers four weeks after the first set of questionnaires were posted. The reminder contained the same documents as the original posting except that the reminder information sheet (appendix 6) explained that to maintain anonymity it was not possible to identify and exclude those who had already responded; hence they were getting the questionnaires again. Those that had responded were asked to ignore the reminder questionnaire, with apologies for any inconvenience.

Pharmacist prescribers that that had not yet responded to the initial questionnaire were invited to do so. A second reminder, similar in every way to the first, was sent eight weeks after the first posting. Whilst this approached was intended to improve the response rate, there was no way to guarantee that pharmacist prescribers only responded once. An electronic survey would have provided the assurance that respondents only reply to the questionnaire once. However, this method of questionnaire delivery is also fraught with limitations such as selective response by participants who have access to the internet and

are able to use it. These kinds of limitations have resulted in sampling errors in electronic surveys (131).

3.5 Data Analysis

Data from completed and returned questionnaires were coded into the statistical package for the social sciences (SPSS® version 15) for data management and analysis. Data coding and entry into SPSS® for analysis was checked independently by a member of the project supervisory team, in 50 completed questionnaires selected randomly. The data was then analysed using appropriate statistical techniques aimed at meeting specific research objectives, as described below.

3.5.1 Descriptive analysis of participant characteristics

Descriptive statistics for sample distribution of variables were conducted. Simple frequency distribution was used to describe respondents according to whether or not they had engaged in actual prescribing practice. Similarly, univariate analysis of the sample distribution of demographic characteristics of respondents was carried out to provide an overview and background of the status of prescribing implementation by pharmacists in GB. Furthermore, chi-square (χ^2) was applied to categorical variables, to test for association (if any) for example, between demographic characteristics of respondents, such as practice setting as a pharmacist, and their actual engagement in prescribing practice. These statistical tests were applied pursuant to the realisation of objective one.

3.5.2 Factor analysis of attitudinal statements related to prescribing

Prior to conducting factor analysis, the suitability of the data for factor analysis was assessed in terms of adequacy of the sample size, and the strength of inter-correlation among the 16 items on the scale (132). This was achieved by performing Chronbach's alpha coefficient test for internal consistency, KMO test of sampling adequacy and Bartlett's test of sphericity.

3.5.2.1 Internal consistency of the attitudinal scale

The sixteen items on the attitudinal scale were analysed to identify facilitators and barriers of pharmacist prescribing implementation. First the internal consistency of the scale was tested using Chronbach's alpha coefficient test (described in relation to the reliability of surveys in chapter two, section 2.4.2). Chronbach's alpha coefficient of internal consistency gives an indication of the extent to which the 16 items are measuring aspects of the same underlying construct (133). The underlying construct in the current project represents factors associated with the prescribing practice of pharmacists. A good internal consistency means that individual items on the scale were collectively measuring the same thing (factors associated with prescribing). A poor internal consistency on the other hand would have meant that the scale was not a reliable measure of factors associated with prescribing, and hence there would have been no basis for continuing with factor analysis.

3.5.2.2 KMO measure for sampling adequacy and Bartlett's test of shpericity

There is some considerable debate among statisticians about the sample size requirement for factor analysis. On one hand, some statisticians argue that the absolute size of the sample determines the suitability of data for factor analysis. On the other hand, others argue that the ratio of sample size to the number of items intended for factor analysis, and not absolute sample size is important. The general recommendation is for the number of participants to be more than 300, before data can be suitable for factor analysis. Alternatively, a minimum ratio of five to ten participants is recommended per item to be factor analysed up to a total sample size of 300; beyond this, the ratio does not matter (134). The current project had a sample size of 695, and a sample to items ratio greater than 43: 1 (695:16), which satisfied both requirements for factor analysis. In addition to this abstract inspection of sample size, two statistical tests: Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) were applied to examine the strength of the relationship among the 16 statements on the attitudinal scale as a means of assessing suitability of the data for factor analysis (135).

Bartlett's test checks that there is some relationship between variables as a pre-condition for the suitability of factor analysis. The technique tests the null hypothesis that the correlation matrix is an identity matrix (where the correlation coefficient of all items would be zero). It is expected that for the data to be suitable for factor analysis, the test should be significant ($p< 0.05$) confirming that there is a relationship between the variables to be included in the analysis, and the correlation matrix is not an identity matrix (134). The principle of the KMO measure of sampling adequacy is that if two variables share common factors, then partial correlation between them should be small when the effects of other variables are controlled (135). KMO values range between 0 and 1, with the barest acceptable minimum being 0.50, and the closer the KMO value is to 1 the more suitable the data is for factor analysis (136). These statistical procedures were used to confirm suitability of the data for factor analysis.

Next, factor analysis was used to reduce the sixteen items on the scale to a smaller sub set of components (132). These components combine individual items on the scale into groups that measure the same underlying dimension(s) or construct(s) that explain the maximum amount of common variance in the data. In other words, factor analysis reduces data into the underlying components by grouping variables which correlate highly with each other, but have very little if any, correlation with the other variables in the data (134).

3.5.2.3 Extraction of components (factors) from the 16 attitudinal statements related to the implementation of prescribing

Whereas the objective of conducting factor analysis was to reduce the 16 attitudinal statements down to a small number of underlying components, the number of such underlying components could not be determined from the outset. Deciding on the number of components to extract, relied on both the Kaiser criterion (which recommends retaining those components with eigenvalues of 1 and above), and Cattel's scree plot which plots a graph of eigenvalues against extracted components, and recommends retaining only the components above the point of inflexion on the graph (132).

Components represent the linear relationship among the items on the attitudinal scale derived by calculating the eigenvalues of the correlation matrix of the scale. The eigenvalues in turn determine the relative contribution of a component in explaining as much of the variance in the data as possible. The bigger the eigenvalue the more important the component; and that is the logic behind the Kaiser recommendation of retaining any component with eigenvalue of 1 and above (134). Alternatively, the scree plot is a graphical representation of eigenvalues plotted on the Y-axis, against corresponding components plotted on the X-axis. The resultant curve has the first few components with high eigenvalues at the top left end of the graph. The slope of the graph drops sharply, after which the curve tapers into an almost horizontal line where the rest of the components with low eigenvalues spread across the X-axis. The last eigenvalue with a sharp drop in slope before the curve becomes horizontal is considered the cut-off point. Cattell, who first described this method of selecting components, recommended the retention of only those above the cut off point (134). Data in this research was examined using both the Kaiser criterion and a visual inspection of the Scree plot, before deciding on the number of components to retain in the final analysis.

3.5.2.4 Interpretation of components

Having decided on the number of components to extract from the attitudinal scale, the next task was to interpret extracted components in a way that made sense in realisation of the research objectives. The process of interpretation was facilitated by factor rotation. This procedure ensures that each item on the scale loads maximally on just one component. Two types of rotation, orthogonal and oblique, are commonly used. Specific orthogonal methods of rotation are: varimax, quartimax or equamax, depending on how they spread the factor loading for each variable on the extracted components. Oblique rotation methods, on the other hand, are direct oblimin and promax. Orthogonal rotations are mostly preferred because they give rise to components that are not correlated to each other, which are easier to interpret (134). A detailed discussion of the two rotation techniques is beyond the scope of this thesis; but it should suffice to mention that orthogonal (varimax) rotation was applied in the

current project. Responses to the 16 attitudinal statements were re-analysed specifying the number of components to be extracted, and performing orthogonal (varimax) rotation on the extracted components. The statements loaded under each rotated component were examined for common themes for the purpose of interpreting and labelling the components.

Having reduced the 16 items of attitudinal statements into components, each component was treated as a sub scale. First the eigenvalue for each component was reported, along with the percentage of variance in the data that was explained by the component singly, and in combination with other components. Finally, the reliability of the components as subscales were individually calculated using the same procedure as described for the whole scale. Total scores for each component extracted were calculated by summing the scores for the individual items loaded on that particular component. Each item was scored on a five point Likert scale; with a score of 1 indicating strong disagreement up to a score of 5 indicating strong agreement (scores of negatively worded statements were reversed). Therefore, a component that had seven of the sixteen items loaded onto it, for example, could have a minimum total score of 7 (1x7) and a maximum total score of 35 (5x7). The total scores for each component were calculated for all respondents that had written prescriptions, and saved as variables for further analysis. It should be borne in mind therefore, that all statistical tests on the components that are described hereafter, will use the total scores for these components.

3.5.3 Exploring the relationship between prescriber demographics and extracted components

As a means of realising objective 4, non parametric statistical tests were performed on extracted components; to find out whether respondents' scores differed according to demographic characteristics. Non parametric tests were particularly suitable because the predictor variables (demographic characteristics) were categorical measures. Also, the distribution of respondents' scores on the predictor variables did not obey normality patterns to otherwise permit the use of powerful parametric tests (134). Kruskal-Wallis (K-W) test was used for the comparison of predictor variables that had more

than two groups (age, length of practice experience as pharmacists and main pharmacy practice setting) (132). However, Man-Whitney U test was used to compare the total score of respondents for extracted components based on sex as a predictor variable, because sex has only two categories (134).

Any differences observed with K-W tests were followed up with *post hoc* procedures to determine which of the predictor variables were different from the others. For this purpose Mann – Whitney U test was used to compare pairs of demographic characteristics that were significant. Bonferonni adjustment was applied to correct for type one error; this involved dividing the standard significant level of 0.05 by the number of tests performed (134). Details are provided where K-W results are significant.

3.5.4 Analysis of open questionnaire comments

The questionnaires sought additional information from respondents in the form of open-ended questions. Texts of their responses to the open questions were extracted and transcribed verbatim. Transcripts for analysis were managed using NVivo® software version 8. The framework approach to qualitative data analysis was used to develop a list of coding categories for the data. This involved extensive reading of transcripts to gain insight into respondents' comments, while noting dominant and frequent themes that emerged from the transcripts. (101). The categories devised from reading the transcripts were used to code the open comments of respondents in SPSS®. Coded data were grouped into themes for further analysis by simple counting of comments in each theme, complemented by in-depth description of the themes.

3.5.5 Analysis of prescribing implementation in primary care setting

The prescribing practice of respondents based in general medical practices and community pharmacies (primary care), who had also prescribed was explored further. This used descriptive statistics to describe the processes adopted by respondents engaged in prescribing, such as how they identified the patients they prescribed for, their communication with other health professionals, the dispensing of prescriptions they wrote and the changes that had occurred in

their prescribing practice since initial registration as prescribers. These parameters were used to describe the nature of prescribing activities of pharmacists in line with objective five.

3.6 Results

This section presents results of the quantitative cross-sectional questionnaire survey.

3.6.1 Response rate

Of 1,653 questionnaires posted to pharmacist prescribers in the sampling frame, four were returned blank and six were undelivered. Therefore, these ten were excluded from the study population. From the first batch of 1,643 questionnaires posted, 406 were completed and returned. This number increased by 169, and a further 120 following the first and second reminder respectively to give an overall response rate of 42.3% (n=695/1643).

3.6.2 Characteristics of respondents

Table 3.1 summarises the demographic characteristics of respondents. The majority (71.7%, n=498) were female and almost all (95.5%, n=657) were aged between 30 and 59 years. Nearly half of all respondents (44.2%, n=307) had more than 20 years experience of practice as pharmacists. Pharmacy practice settings were mostly hospital (43.5%, n=300) with a minority (19.7%, n=137) in community pharmacies.

Table 3.1 Demographic characteristics of respondents (n=695)

Demographic Characteristic	Number of Respondents	%
Age in years		
<29	22	3.2
30-39	251	36.1
40-49	242	34.5
50-59	164	23.6
>60	9	1.3
Missing data	7	1.0
Sex		
Female	498	71.7
Male	189	27.2
Missing data	5	1.2
Main practice setting as a pharmacist		
Hospital	300	43.2
General medical practice	196	28.2
Community pharmacy	137	19.7
Other practice settings *	57	8.2
Missing data	5	0.7
Years of experience as a pharmacist		
<6	11	1.6
6-10	112	16.1
11-15	131	18.8
16-20	129	18.6
>20	307	44.2
Missing data	5	0.7

*Other practice settings included: academia, split working in community pharmacy and general medical practices, intermediate care nursing homes, health boards and primary care trusts, prison, substance misuse service centres and out of hour service centres.

3.6.3 Pharmacist prescribers not yet prescribing

Nearly one third of all respondents (31.9%, n= 222/695) were yet to prescribe. The largest proportion of respondents yet to prescribe (41.2%, n= 56/136) were based in community pharmacies with the smallest proportion (25.7%, n= 49/195) based in GP practices. Of the 222 pharmacist prescribers that had not prescribed, a majority of them (75.7%, n= 168) described in open comments, barriers they had encountered to using their qualification and skills for managing patients. These were categorised into themes of: lack of opportunity, administrative procedures, resources issues and lack of defined prescribing roles. Table 3.2 presents a summary of these findings.

Table 3.2 Themes describing reasons why qualified pharmacist prescribers were not prescribing

Themes	Description of theme	Illustrative quotes
Lack of opportunity (59 comments)	Majority of pharmacists who cited lack of opportunity as their reason for not prescribing did not explain this further. A few related lack of opportunities to change in jobs or roles.	*"In reality no prescribing role for me before, during or after completing the SP course."* (Female, hospital pharmacist, 11-15 years as a pharmacist, not prescribing) *"No opportunities to use my skills despite several discussions with …, doctors and* primary care trusts [PCTs]" (Female, community pharmacist, over 20 years as a pharmacist, not prescribing)
Administrative procedures (38 comments)	Administrative procedures that hindered the implementation of prescribing by pharmacists were mainly aspects of clinical governance and the legal framework for the operation of pharmacist prescribers in hospital settings. Within primary care, however, the administrative workload of many respondents increased to the detriment of patient-focused clinical duties including prescribing.	"… My chief pharmacist persists in raising obstacles and objections including... staffing, backfills and clinical governance issues which have so far prevented me from prescribing." (Male hospital pharmacist, more than 20 years as a pharmacist, not prescribing) *"Current workload and managerial role within NHS organisation has limited time available to undertake clinical role …*" (Male Health Board pharmacist, 16-20 years as a pharmacist, not prescribing)
Lack of funding or facilities (29 comments)	Inadequate funds prevented commissioning of prescribing clinics and also funding of staff backfills to release pharmacists for prescribing roles. In addition, implementing prescribing added operational costs to pharmacist prescribers without commensurate remuneration. Other resource issues that hindered prescribing were lack of clinic space, prescription pads and information technology.	"*My main deterrent factor is that there is no financial reward. Study in own time, extra insurance costs and society's fees, more responsibilities and all for love yet we have mortgages to pay. It is a demoralising situation"* (Female hospital pharmacist, 16-20 years as a pharmacist, not prescribing) *"Since qualifying as SP, I have tried to get funding from the local PCT to provide asthma management services as an enhanced service from the community pharmacy that is situated within the health centre; but lack of funding has been the major barrier in setting up the service".* (Female community pharmacist, less than 6 years as a pharmacist, not prescribing)

Table 3.2 cont'd Themes describing reasons why qualified pharmacist prescribers were not prescribing

Themes	Description of theme	Illustrative quotes
Lack of defined roles (14 comments)	Respondents who mentioned lack of defined prescribing roles often stated that they had to invent such roles themselves. In some instances they highlighted the absence of standard operating procedures detailing roles for prescribing.	"Moved from primary care to community pharmacy where I have been unable to develop relevant role." (Male community pharmacist, over 20 years as a pharmacist, not prescribing)
Other reasons (28 Comments)	The other reasons that hindered the implementation of prescribing by pharmacists were mostly personal such as maternity leave for some female respondents. Also some had taken career breaks, and others had retired.	*"I was on maternity leave soon after qualifying and thereafter there were no jobs around. I now work in community from12 to 6 which fits very well into my family life. I therefore, stopped looking for prescriber's job at the time being."* (Female, community pharmacist, less than 6 years as a pharmacist, not prescribing) *"I took a year off to travel after my prescribing course. On my return I wanted to wait a few months to get up to speed before prescribing, unfortunately due to staffing pressures and a drive in the department to pull us back to core services I have not found time to complete CMPs. I have not yet had an opportunity to upgrade to IP status which would solve this".* (Female hospital pharmacist, 11-15years as a pharmacist, not prescribing)

3.6.4 Comparison between prescribing and non- prescribing respondents

The characteristics of prescribing and non prescribing respondents were compared to explore possible associations between demographics and whether or not a respondent prescribed. Results are summarised in Table 3.3. Male respondents were more likely to have prescribed compared to their female counterparts. Also, the proportion of respondents who prescribed rose with increase in age and longer duration of practice as a pharmacist. These relationships did not reach statistical significance. However, the main pharmacy practice setting of respondents was significantly associated with whether or not they prescribed. Respondents based in general medical practices and hospitals were more likely to have prescribed than those in community pharmacies; χ^2 (3, n= 688) = 12.10, p< 0.05, Cramer's V was 0.13 indicating a small effect size according to Cohen's recommendation that an effect size of 0.01 be regarded as small, while .3 and .5 be regarded as medium and large effects respectively (137). Conversely, barriers that prevented qualified pharmacist prescribers from prescribing, affected those based in the community setting more than pharmacist prescribers in hospitals or general medical practices. Notwithstanding, a majority of respondents had prescribed and results of analysis of their responses will be described next.

Table 3.3 Comparison of prescribing and non prescribing respondents

Characteristic	prescribing		not prescribing	
Main practice setting as a pharmacist N= 688 (non response =7) χ^2 = 12.10*, p-value = 0.007	**N**	**%**	**N**	**%**
General medical practice	146	74.9	49	25.1
Hospital	211	70.3	89	29.7
Community pharmacy	80	58.8	56	41.2
Other practice settings	34	59.6	23	40.4
Age in years N= 686 (non response =9) χ^2 = 7.21, p-value 0.206				
<29	13	59.1	9	40.9
30-39	159	63.6	91	36.4
40-49	172	71.1	70	28.9
50-59	117	71.8	46	28.2
>60	8	88.9	1	11.1
Sex N=685 (non response =10) χ^2 = 2.34, p-value 0.125				
Male	138	73.0	51	27.0
Female	332	66.9	164	33.1
Experience as a pharmacists in years N= 688 (non response =7) χ^2 =5.9, p-value 0 .206				
<6	6	54.5	5	45.5
6-10	68	60.7	44	39.3
11-15	88	67.7	42	32.3
16-20	88	68.8	40	31.2
>20	221	72.0	86	28.0

* χ^2 significant at $p < 0.05$, N = number of respondents

3.7 Pharmacist prescribers that had prescribed

The majority of respondents (68.1%, n=473) had written prescriptions, mainly in hospital (43.1%, n=204) and general medical practice settings (42.1%, n=199). Further exploration of prescribing pharmacists (n= 473) identified a significant difference between the setting of respondents as prescribers and their main work setting as pharmacists. Only a minority of pharmacists (n= 38, 7.9%) were prescribing in community pharmacies. Table 3.4 provides details of the relationship between the main pharmacy practice setting of respondents and where their prescribing practices were located. Nearly all respondents who worked in hospitals and general medical practices engaged in prescribing within the same settings. In contrast, those based in community pharmacies implemented prescribing outside their main pharmacy practice setting, with half prescribing in general medical practices (Table 3.4).

Table 3.4 Relationship between main work setting of respondents as pharmacists and location of their prescribing practice

	Prescribing setting							
	Community pharmacy		General medical practice		Hospital		Other prescribing settings	
	Number prescribing	%	Number prescribing	%	Number prescribing	%	Number prescribing	%
Practice setting								
Community pharmacy	36	**45.0**	40	50.0	1	1.3	3	3.8
General medical practice	1	0.7	146	**98.6**	1	0.7	0	0.0
Hospital	0	0.0	4	1.9	208	**96.7**	3	1.4
other practice settings	1	2.9	11	31.4	1	2.9	22	**62.9**
Total	38	7.9	201	42.1	211	44.1	28	5.9

The percentages of respondents who prescribed in the same location as their main pharmacy practice setting are indicated in red.

Note: Practice setting is where respondents worked primarily as pharmacists. They may prescribe as part of that job, or be employed for prescribing in a different sector described as their prescribing practice.

Apart from practice setting, the other factors associated with the implementation of prescribing by pharmacists were explored, using an attitudinal scale of statements related to the practice of prescribing. Results from the analysis of these statements are presented in the sections following.

3.7.1 Factors associated with the practice of prescribing by pharmacists

Pharmacist prescribers indicated agreement or disagreement with 16 attitudinal statements as shown in Table 3.5. Highest levels of agreement were recorded for statements related to respondents' access to information technology, and to patients' medical records. Similarly, respondents indicated high agreement for the adequacy of communication between them and doctors and they were mostly satisfied with their prescribing role. In contrast, the highest disagreement was in relation to adequate remuneration for prescribing. The agreement or disagreement of respondents with individual attitudinal statements did not follow any clear pattern, and hence was not easy to interpret. Therefore, it was necessary to carry out exploratory factor analysis to reduce the 16 statements down to a manageable number of variables representing the factors associated with pharmacists' prescribing practice (134).

Table 3.5 Responses (%) to attitudinal statements relating to prescribing practice by pharmacists that prescribed (n=473)

Statements	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree	Missing data
I have adequate administrative support for my prescribing practice	14.4	**44.6**	11.6	21.6	5.7	2.1
I am remunerated appropriately for my prescribing practice	4.4	30.2	13.7	28.8	20.3	2.5
My access to information technology is adequate for my prescribing practice	29.0	**56.7**	3.0	5.9	3.0	2.5
I have sufficient access to patients' medical records for my prescribing practice	**56.2**	33.0	1.7	6.1	1.1	1.9
Independent prescribing will/does facilitate my prescribing practice	**43.3**	39.7	7.8	5.1	0.6	3.4
I have inadequate peer support for my prescribing practice	9.5	29.0	12.5	**37.8**	9.5	1.7
My other health professional colleagues do not fully support my prescribing practice	2.3	9.5	8.7	**57.3**	19.7	2.5
I have adequate communication with doctors in relation to my prescribing practice	35.9	**52.6**	4.0	4.9	0.2	2.3
I have adequate communication with other pharmacist prescribers	11.2	**41.0**	13.5	27.1	4.4	2.7
My prescribing has had no impact on patients' access to medicines	3.2	6.6	10.1	**49.5**	28.5	2.1
It would be convenient for patients to get medicines prescribed in a community pharmacy	14.2	**43.8**	25.4	9.5	3.6	3.6
My prescribing practice has had a positive clinical impact on patient care	36.6	**50.3**	8.7	1.9	0.6	1.9
My professional line manager has little awareness and understanding of non-medical prescribing	5.1	13.1	11.2	**44.0**	23.9	2.7
My professional line manager is supportive of my prescribing practice	26.0	**52.6**	11.0	5.3	2.3	2.3
My prescribing role has lived up to my expectations	16.3	**50.1**	17.8	12.1	2.1	1.7
I feel satisfied with my role as a prescriber	18.4	**53.3**	12.9	11.0	2.5	1.9

Highest level of agreement or disagreement with attitudinal statements indicated in bold

Table 3.6 Responses (%) to attitudinal statements relating to prescribing practice by pharmacists that prescribed (n=473) grouped by their pharmacy practice setting

Statements	%Strongly Disagree/Disagree			% Unsure			% Strongly Agree/Agree			p-value
	CP	GP	HOSP	CP	GP	HOSP	CP	GP	HOSP	
I have adequate administrative support for my prescribing practice	21.5	22.1	34.4	11.4	11.0	13.2	67.1	66.9	52.4	NS
I am remunerated appropriately for my prescribing practice	51.3	49.0	52.1	20.5	15.9	17.1	28.2	65.2	36.2	NS
My access to information technology is adequate for my prescribing practice*	17.9	6.1	7.2	5.1	2.0	2.9	76.9	91.8	90.0	< 0.05
I have sufficient access to patients' medical records for my prescribing practice *	20.3	3.4	2.4	3.8	0.7	1.4	75.9	95.9	96.2	< 0.01
Independent prescribing will/does facilitate my prescribing practice *	11.8	5.5	4.8	15.8	4.8	6.2	72.4	89.7	89.0	< 0.01
I have adequate peer support for my prescribing practice	35.4	44.9	39.2	15.2	12.2	12.3	49.4	42.9	48.6	NS
My other health professional colleagues fully support my prescribing practice	21.5	11.0	10.0	8.9	9.7	9.5	69.6	79.3	80.6	NS
I have adequate communication with doctors in relation to my prescribing practice*	3.8	6.2	4.3	10.1	4.8	4.3	86.1	89.0	93.8	< 0.05
I have adequate communication with other pharmacist prescribers	39.2	32.9	29.3	10.1	17.1	12.5	50.6	50.0	58.2	NS
My prescribing has had an impact on patients' access to medicines	10.1	11.6	10.0	11.4	6.8	13.3	78.5	81.5	76.8	NS
It would be convenient for patients to get medicines prescribed in a community pharmacy*	1.3	15.2	18.0	7.6	31.0	31.6	91.1	53.8	50.5	< 0.01
My prescribing practice has had a positive clinical impact on patient care*	0.0	3.4	4.3	16.5	6.1	9.5	83.5	90.5	86.3	< 0.05
My professional line manager has full awareness and understanding of non-medical prescribing*	22.4	12.3	21.2	21.1	8.9	9.4	56.6	78.8	69.3	< 0.05
My professional line manager is supportive of my prescribing practice	7.9	6.8	8.0	17.1	8.2	11.8	75.0	84.9	82.4	NS
My prescribing role has lived up to my expectations	21.5	12.9	14.2	15.2	19.0	18.4	63.3	68.0	67.5	NS
I feel satisfied with my role as a prescriber	14.1	14.3	14.6	14.1	12.2	14.2	71.8	73.5	71.2	NS

CP= Community pharmacy, GP = General medical practice, Hosp = Hospital
*Indicate statistically significant differences in attitudinal statements based on pharmacy practice setting

3.7.2 Factor analysis of attitudinal statements

The attitudinal statements in Table 3.5 were subjected to factor analysis, using principal component analysis (PCA) as the extraction method. Chronbach's alpha (α) value for internal consistency of the scale of attitudinal statements was 0.75. This indicates reliability of the scale as a measure of the factors associated with prescribing practice of pharmacists. In addition, the α value did not improve with the deletion of any of the 16 items on the scale, indicating that individual statements were measuring the same underlying construct (134). Moreover, inter- item correlation of the scale fell mostly around the accepted value of .3 indicating that individual items were sufficiently correlated with each other for factor analysis to be appropriate (132). Appendix-I shows a matrix of correlation coefficients for the sixteen attitudinal statements. Bartlett's test of sphericity also confirmed that correlation between items on the scale were sufficiently strong, making the data suitable for factor analysis (χ^2 (120) = 1392.21, p < .001, where p- values < 0.05 are accepted as suitable for factor analysis (134)). In addition, the Kaiser-Meyer-Oklin measure confirmed the sample size as adequate for factor analysis. (KMO= 0.79, the accepted minimum being .50 (136)). KMO values for individual statements ranged from 0.70 to 0.88, which also favoured retention of all 16 items in the factor analysis. Consequently, data provided by respondents in the study was deemed suitable for exploration using factor analysis.

3.7.2.1 Determination of the number of components to extract

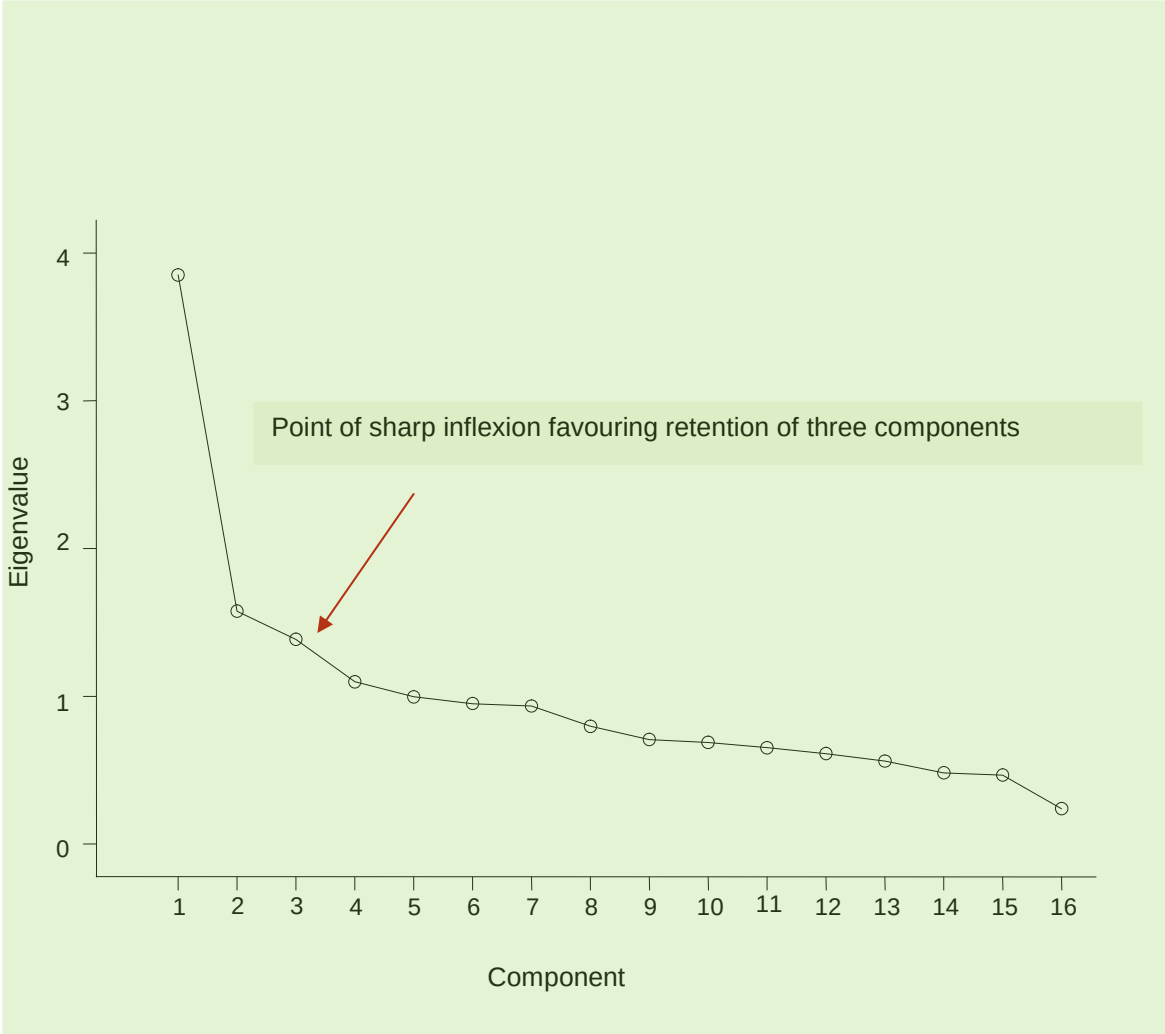
Exploratory factor analysis produced eigenvalues for all extracted components in the data as shown in Table 3.6; four components had eigenvalues above Kaiser's criterion of 1; these collectively explained 49.5% of the total variance in the data. However, in deciding the number of components to extract, Cattell's recommendation of visually inspecting the scree plot and retaining components above the cut off point was also considered (134). The scree plot in Figure,3.1 revealed a clear drop from the third to the fourth component. Moreover, the fourth, fifth, sixth and seventh components levelled out horizontally with eigenvalues very close to 1. Therefore, Cattell's recommendation, rather than Kaiser's criterion, was used as the basis for retaining the first three components in the final analysis.

Table 3.7 Total variance explained by the initial extraction of four components

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.852	24.076	24.076	3.852	24.076	24.076	2.421	15.132	15.132
2	1.575	9.845	33.922	1.575	9.845	33.922	2.006	12.538	27.670
3	1.386	8.661	42.582	1.386	8.661	42.582	1.985	12.407	40.077
4	1.098	6.865	49.447	1.098	6.865	49.447	1.499	9.371	49.447
5	.997	6.230	55.677						
6	.950	5.939	61.616						
7	.935	5.843	67.459						
8	.797	4.984	72.443						
9	.708	4.424	76.867						
10	.688	4.299	81.165						
11	.652	4.074	85.240						
12	.612	3.826	89.066						
13	.561	3.508	92.573						
14	.482	3.011	95.584						
15	.467	2.918	98.502						
16	.240	1.498	100.000						

Extraction Method: Principal Component Analysis

Figure, 3.1 Scree plot for the extraction of components (factors) from the sixteen attitudinal statements related to pharmacist prescribing



Three components extracted base on Kaiser criterion (which recommends retaining those components with eigenvalues of 1 and above), and Cattel's recommendation to retain only the components above the point of inflexion on the Scree plot (132). Moreover, the three components provided a meaningful grouping of attitudinal statements.

3.7.2.2 Extraction of three components from attitudinal statements

Using the criteria described for the determination of the number of components, a decision was made to specify the extraction of three components from the 16 attitudinal statements. Therefore, a second round of PCA was performed, which produced the matrix displayed in Table 3.7

Table 3.8 Component matrix of attitudinal statements related to prescribing

Statement	Extracted component		
	1	2	3
I feel satisfied with my role as a prescriber	**.778**	-.177	.181
My prescribing role has lived up to my expectations	**.741**	-.245	.172
My other health professional colleagues do not fully support my prescribing practice	**.630**	.045	.026
I have adequate administrative support for my prescribing practice	**.560**	.250	-.132
I have adequate communication with doctors in relation to my prescribing practice	**.557**	-.211	-.200
My professional line manager is supportive of my prescribing practice	**.553**	.370	.247
I have adequate communication with other pharmacist prescribers	**.416**	.152	.136
My prescribing has had no impact on patients' access to medicines	**.408**	-.371	.335
Independent prescribing will/does facilitate my prescribing practice	**.405**	-.221	-.187
My prescribing practice has had a positive clinical impact on patient care	.357	**-.575**	.243
My professional line manager has little awareness and understanding of non-medical prescribing	.349	**.565**	.183
I am remunerated appropriately for my prescribing practice	.319	**.485**	-.089
I have inadequate peer support for my prescribing practice	.256	.292	.135
I have sufficient access to patients' medical records for my prescribing practice	.440	-.144	**-.634**
My access to information technology is adequate for my prescribing practice	.489	.130	**-.589**
It would be convenient for patients to get medicines prescribed in a community pharmacy	.138	.145	**.413**

Extraction Method: Principal Component Analysis. (3 components extracted); factor loadings above .4 indicated in bold

Interpretation of the extracted components was aided by performing orthogonal (varimax) rotation. Table 3.8 shows the factor loading of the three components after rotation. These three components together explained 42.7% of the variance, with the first component contributing 15.6%, the second component 14.7% and the third component contributed 12.4%. Statements that clustered together in the rotated matrix of the three components suggested the following interpretation for extracted components:

1. Component 1 represents the ‘administrative structures and processes’ that facilitate pharmacists’ prescribing practice.
2. Component 2 represents respondents’ ‘perceptions of their pharmacist prescribing roles’.
3. Component 3 represents ‘facilities’ that support respondents’ practice as prescribers.

Table 3.9 Summary of factor analysis results of 16 item attitudinal statements related to the implementation of prescribing by pharmacists in GB (n =434)

Attitudinal Scale items	Rotated factor loadings		
	Administrative structures and processes	Perception prescribing role	Facilities enabling prescribing
My professional line manager has little awareness and understanding of non-medical prescribing	**.689**	-.090	-.091
My professional line manager is supportive of my prescribing practice	**.687**	.201	-.027
I am remunerated appropriately for my prescribing practice	**.541**	-.165	.191
I have adequate administrative support for my prescribing practice	**.535**	.159	.271
My other health professional colleagues do not fully support my prescribing practice	**.449**	.331	.269
I have adequate communication with other pharmacist prescribers	.393	.184	.088
I have inadequate peer support for my prescribing practice	.392	.081	-.020
My prescribing practice has had a positive clinical impact on patient care	-.123	**.713**	-.019
My prescribing role has lived up to my expectations	.332	**.709**	.189
I feel satisfied with my role as a prescriber	**.403**	**.691**	.181
My prescribing has had no impact on patients' access to medicines	.028	**.629**	-.057
I have sufficient access to patients' medical records for my prescribing practice	.035	.149	**.755**
My access to information technology is adequate for my prescribing practice	.261	-.017	**.728**
I have adequate communication with doctors in relation to my prescribing practice	.141	.401	**.445**
It would be convenient for patients to get medicines prescribed in a community pharmacy	.264	.140	-.393
Independent prescribing will/does facilitate my prescribing practice	.080	.335	.335
Eigenvalues	3.90	1.60	1.40
% of variance explained	15.6	14.7	12.4
Chronbach's alpha (α)	.61	.73	.45

Extraction Method: Principal Component Analysis - Rotation Method: varimax with Kaiser Normalization. (Factor loadings over .40 appear in bold)

Note:

- Factor loadings demonstrate the relative contribution of each statement to the extracted component.
- Eigenvalues indicate the relative importance of extracted components in explaining the observed variance in the data, represented by the percentage variance explained.

3.7.2.3 Interpretation of extracted components

Having reduced the 16 attitudinal statements to three components, the components were explored in further analysis of the factors associated with the implementation of prescribing by pharmacists. Component 1, interpreted in the previous section as administrative structures and processes, contained seven attitudinal statements as shown in Table 3.9. The total score of a participant for each component was the sum of scores recorded for individual statements. For example, a participant that strongly disagreed with all seven statements in component one would record a score of 1 for each statement, and the total score for this respondent on that component would be 7 (1x7). On the other hand, a respondent that strongly agreed with all seven statements would record a score of 5 against each statement; and their total score on that component would be 35 (5x7). Similarly, Component 2, interpreted as pharmacist prescribers' perception of prescribing role, contained four items with potential total scores of 4-20. Component 3, interpreted as facilities for pharmacist prescribing, contained five statements with potential total scores of 5-25. Subsequent results present the findings of analysis carried out on these components.

Table 3.10 Grouping of attitudinal statements on extracted components

Component 1- administrative structures and processes for pharmacist prescribing (7 items)
My professional line manager has full awareness and understanding of non-medical prescribing
My professional line manager is supportive of my prescribing practice
I am remunerated appropriately for my prescribing practice
I have adequate administrative support for my prescribing practice
My other health professional colleagues fully support my prescribing practice
I have adequate communication with other pharmacist prescribers
I have adequate peer support for my prescribing practice
Component 2- pharmacists' perception of prescribing role (4 items)
My prescribing practice has had a positive clinical impact on patient care
My prescribing role has lived up to my expectations
I feel satisfied with my role as a prescriber
My prescribing has had a positive impact on patients' access to medicines
Component 3- facilities for pharmacist prescribing (5 items)
I have sufficient access to patients' medical records for my prescribing practice
My access to information technology is adequate for my prescribing practice
I have adequate communication with doctors in relation to my prescribing practice
It would be convenient for patients to get medicines prescribed in a community pharmacy
Independent prescribing will/does facilitate my prescribing practice

3.7.3 Influence of extracted components on prescribing practice of respondents association with demographic characteristics

Exploring possible influences of extracted components on the prescribing practice of respondents yielded the following results:

3.7.3.1 Influence of extracted components on the prescribing practice of respondents using sex as a predictor variable

The relationship between pharmacist prescribers' sex and extracted components was examined using the Mann-Whitney U test. Table 3.10 presents a summary of the results. Findings revealed no statistically significant difference between the median scores of male and female respondents in terms of the administrative structures and processes, perceptions of prescribing role and the facilities for implementing prescribing. This was inferred from the probability (p) values, which were all greater than .05. The Z-score, which is the standardised variance between the individual score of each participant and the median score, provides a means of testing for statistical significance of any difference observed between male and female participants. Z-score values larger than 1.96 (whether positive or negative) indicate statistically significant differences at $p < .05$ (138). In other words, the probability of any observed difference in the median score of males and females occurring by chance when Mann-Whitney test gives a Z-score greater than 1.96 is 5%. Results in Table 3.10 show very small Z-scores, therefore they are not statistically significant. Moreover, Z-scores were used to calculate the effect size (r) according to the formula in Table 3.10. If there were any significant differences in the median score of participants based on their sex, r would give a measure of the effect sex had on that difference. Cohen in 1988 recommended effect size of .1 to be considered small effect, .3 medium effect and .5 large effects (137). All the r values on table 3.10 were well below .1 confirming that facilitators and barriers to prescribing implementation did not vary based on the sex of respondents.

Table3.11 Influence of extracted components on the prescribing practice of respondents: comparison of t based on sex

Component	Sex	Median score	N	Mann-Whitney's U test	p-value	z- score	(r) = z ÷ √ N
Administrative structures and processes							
	Female	24	315	19223.00	.371	-0.894	0.04
	Male	25	129				
Perception of prescribing role							
	Female	16	325	19999.50	.165	-1.387	0.06
	Male	16	134				
Facilities for prescribing							
	Female	21	315	19372.00	.791	-0.265	0.01
	Male	21	125				

N is the number of participants for each component sub-divided according to sex, r = Effect size

3.7.3.2 Influence of extracted components on the prescribing practice of respondents using age, experience as a pharmacist and practice setting as predictor variables

Possible associations between extracted components as outcome variables, and the predictor variables of pharmacy practice setting, age and length of experience of respondents as pharmacists, were assessed using Kruskal – Wallis' H test, which gives χ^2 values as described under the methods in section 3.4.5. Table 3.11 presents a summary of the findings. Kruskal-Wallis tests did not reveal significant differences for the influence of extracted components on the prescribing practice of respondents when they were compared on the basis of age and length of pharmacy practice experience. The difference in the median score of respondents on the component 'administrative structures and processes' approached statistical significance, when were compared in terms of the length of experience as a pharmacists (χ^2 (4) = 9.14, p = 0.06). However, Kruskal Wallis test revealed statistically significant differences in the median score of respondents on the factor, 'facilities for prescribing' depending on the setting in which they practiced as pharmacists (χ^2 (3) = 8.04, p < 0.05.)

The observed differences based on pharmacy practice setting of prescribers was followed up with *post hoc* procedures to determine which practice setting accounted for the difference . Table 3.12 shows *post hoc* Mann – Whitney test results, which indicate that the difference was mainly between prescribers based in community pharmacies, and those based in general medical practices (U= 4122.50, p= 0.005). Respondents in community pharmacies scored lower in terms of the factor 'facilities for prescribing' compared with those in general medical practices, with a small effect size (r = 0.12) according to the Cohen criterion (132). Bonferonni adjustment controlled for type one error, with a new significance level of 0.05/3 = 0.017. There were no statistically significant differences in terms of the median scores of respondents based in hospitals and those based in GP practices. The significance of these findings will be discussed.

The influence of other factors on the prescribing practice of respondents, (who had prescribed) was explored further, by the analysis of open comments they gave in the questionnaire. Findings from these comments are presented next.

Table 3.12 Comparison of respondents based on demographic characteristics

Component	Demographic Characteristic	N	χ^2	df	p- value
Administrative structures and processes	Age	443	2.38	5	.795
	Pharmacy practice setting	445	4.05	3	.256
	Experience as a pharmacist	446	9.14*	4	.058
Perception of prescribing role	Age	458	4.14	5	.530
	Pharmacy practice setting	461	2.98	3	.395
	Experience as a pharmacist	460	3.05	4	.550
Facilities for prescribing	Age	439	7.42	5	.191
	Pharmacy practice setting	441	8.04**	3	.045
	Experience as a pharmacist	442	7.89	4	.096

* χ^2 approaches significance, ** χ^2 significant at $p < .05$, N = number of participants, df = degrees of freedom

Table 3.13 Comparing the pharmacy practice setting

Facilities for prescribing	Median score	N	Mann-Whitney's U test	p-value	z- score	(r) = z ÷ √ N
Community pharmacy	20	214	4122.50*	.005	-2.544	0.12
General medical practice	21					
Community pharmacy	20	269	6596.00	.225	-1.196	0.07
Hospital	21					
General medical practice	21	333	11702.50	.039	-2.075	0.11
Hospital	21					

N is the total number of participants for each pair of comparison, r = Effect size * post hoc test significant at p< .017

3.8 Analysis of open comments from the questionnaire

This section presents findings from the analysis of open questionnaire comments of respondents who had prescribed. Data was analysed using the 'framework' approach. Among the 68.1% (n=473) of respondents in the survey who had implemented prescribing in practice, many reported circumstances that either facilitated or challenged their prescribing. Challenges that limited the prescribing practice of respondents are presented first, before the facilitators of prescribing implementation.

3.8.1 Challenges to prescribing

Responses to the question, 'Are there any factors that hinder your prescribing practice?' were analysed and grouped into main categories. Respondents described the challenges that limited their prescribing practice. Many of the themes that emerged were similar, or even the same as those described earlier for respondents who had not yet prescribed. Therefore, some of the themes may appear repetitive. The difference in this case was that respondents had found ways of implementing prescribing practice despite the challenges. The themes were: administration procedures, inadequate resources and lack of understanding of the prescribing role of pharmacists, among others. Table 3.13 presents a summary of these themes, with some verbatim quotes to illustrate each theme.

Table 3.14 Challenges to the implementation of prescribing by pharmacists

Themes	Description of theme	Illustrative quotes
Administrative procedures (136 comments)	Some respondents mentioned increased administrative and managerial workload involved in prescribing. They had to perform functions like arranging patients' appointments and other logistics. Such duties were often described as cumbersome, which forced some pharmacists, especially in the community setting, who had initially started prescribing in their own time to withdraw the service. Administrative procedures were also related to clinical governance issues, particularly regulations around the prescription of controlled drugs and the need for a second pharmacist check of any prescriptions written.	*"I work in isolation of other practice pharmacists so have to make more of an effort to meet and discuss prescribing. I do all my own administration; ePACT monitoring myself usually in my own time"* (Female GP practice pharmacist, 11-15 years as a pharmacist, prescribing) *"When a medical prescriber writes a prescription it is reviewed by a pharmacist before being dispensed. When I prescribe on my ward for an in-patient it is difficult to have another pharmacist review my prescription which leads to delays"* (Male hospital pharmacist, above 20 years as a pharmacist, prescribing)
Inadequate resources (97 comments)	Inadequate resources for respondents to implement prescribing practice, manifested most commonly in the lack of appropriate IT facilities for pharmacist prescribers to access patients' records, or for them to issue electronic prescribing. Inadequate resources also meant constraints on the staff capacity, with adverse consequences on the continuity of care and the availability of backfill cover for pharmacists to perform prescribing duties. For some respondents, the main resource issues were about securing time and space to consult and prescribe for patients.	*"The frustration is that I cannot print off repeat prescriptions nor do my own prescriptions electronically therefore, I am hand writing it and having to ask an administrator to put it into the patients' electronic records".* (Female community pharmacist, above 20 years as a pharmacist, prescribing) *"Lack of other prescribing pharmacists to provide comprehensive service"* (Female hospital pharmacist, above 20 years as a pharmacist, prescribing)

Table 3.14 cont'd Challenges to the implementation of prescribing by pharmacists

Themes	Description of theme	Illustrative quotes
Lack of understanding or lack of support for the pharmacist's prescribing role (57 comments)	Some pharmacist prescribers ascribed difficulties with implementing prescribing to a general lack of support from doctors, employing organisations, and their peers. Respondents often perceived that the pharmacist prescribers' role was not fully understood by other health care professionals, including some non prescribing pharmacists.	*"Lack of support from senior management and there is no role defined for pharmacist prescribers so I had to invent my own role; plus prescribing is extra to my core work"…* (Male hospital pharmacist, 11-15 years as a pharmacist, prescribing)
Other challenges (34 comments)	Other challenges ranged widely from issues around the lack of opportunities for appropriate continuing professional development (CPD), to the perception of competition for prescribing roles between them and nurse prescribers. Moreover some pharmacist prescribers perceived their role in prescribing as being additional to their core and "normal" roles, this often meant divided attention between prescribing and non-prescribing roles with the consequence that patients were often not followed up appropriately.	"I *have to develop my own role; fighting to find a place in between GPs and prescribing nurses"* (Female GP practice pharmacist, 16- 20 years as a pharmacist, prescribing) *"I only prescribe one morning a week, and sometimes it is hard to follow a patient through"* (Male community pharmacist, above 20 years as a pharmacist, prescribing)

3.8.2 Facilitators of prescribing implementation

Respondents who had prescribed were also asked if there were other factors that facilitated practice for them as prescribers. Many of the themes that emerged from analysis of their comments were opposite to those mentioned as challenges in the previous section. Themes that emerged included: relationship and support of stakeholders for prescribing implementation, adequate resources, specialist knowledge, defined prescribing role and the determination or personal motivation of respondents. Table 3.14 summarises these findings.

Table3.15 Facilitators of prescribing implementation

Themes	Description of theme	Illustrative quotes
Relationship and stake holder support for the implementation of prescribing (169 comments)	Many of the comments in this theme were about the support respondents got from stakeholders including: doctors, employing organisations, nurses, other pharmacists and administrative staff. Support was often attributed to good inter personal relationship and communication among members of the health team. Other health care professionals provided clinical and professional support in terms of peer reviewing respondents' prescribing decisions and giving them feedback. Also, administrative staff supported respondents' prescribing practice by handling logistic arrangements for running prescribing services.	*"I had a good rapport with medical colleagues prior to starting the prescribing course and I was already advising/shadow prescriber as supplementary prescriber prior to becoming an independent prescriber.* (Male hospital pharmacist, above 20 years as a pharmacist, prescribing) *"Long term trusting relationship of mutual respect between medical, nursing and other health care professionals and myself "*(Female intermediate nursing care home pharmacist, above 20 years as a pharmacist, prescribing) *"Practice staff organise patient appointments, and advertise my services within the practice"* (Female GP practice pharmacist, above 20 years as a pharmacist, prescribing)
Availability of adequate resources (64 comments)	Availability of adequate resources encompassed comments about pharmacist backfill and locum cover to release respondents for prescribing duties. Financial resources covered funding of prescribing clinics and also remuneration. Similarly, availability of appropriate infrastructure mainly IT facilities for access to patients' medical records and private consulting rooms were described as important facilitators by respondents	*"There is pharmacist backfill to enable a professional pharmacist check of prescriptions within the clinical team"* (Male hospital pharmacist, 11-15 years, as a pharmacist, prescribing) *"PCT had allocated a prescribing budget and was also very quick to supply prescription pads..."* (Female community pharmacist, 11-15 years as a pharmacist, prescribing) "Computer generated prescriptions for efficiency and less error of transcription..." (Female GP practice pharmacist, above 20 years as a pharmacist, prescribing)
Others (52 comments)	Other themes were about the specialist knowledge and skills of pharmacists in managing prescribing issues. This they attributed to training and experience. In addition some respondents reported having defined prescribing roles, for which they were specifically employed. Also mentioned in this category was the personal motivation of some pharmacist prescribers which propelled them to succeed against all odds	*"I have worked in this community for 6 years so I have the confidence of patients; I know them, their clinical history well etc"* (Female community pharmacist, 11-15 years as a pharmacist, prescribing) *"I was employed directly by the practice in advance of me working towards establishing prescribing within clinics there...."* (Female GP practice pharmacist, above 20 years as a pharmacist, prescribing)

3.9 Pharmacist prescribing implementation in the primary care setting

The remainder of findings presented in this chapter focus on primary care settings comprising general medical practices and community pharmacies.

3.9.1 Prescribing processes of respondents

As stated earlier, there were 333 respondents working in primary care settings; of these, 228 (68.5%) had prescribed. Aspects of current practice are given in Table 3.15. The median number of patients prescribed for, per pharmacist per week was 10; inter-quartile range 6-20. The most common patient group managed by respondents was cardiovascular diseases, comprising mostly hypertensive patients. This was followed by patients with respiratory and diabetic conditions respectively. The majority of respondents used face to face, or electronic mail communication for prescribing-related discussions with other members of the health care team. Very few of the respondents were members of any prescribing committees or groups. Table 3.15 gives details of the prescribing practice of pharmacists in the primary care setting.

Table 3.16 Prescribing activities of respondents based in the primary care setting

Aspect	N	(%)
How pharmacist prescribers chose their area of practice		
Recommended by health team	87	38.5
Based on pharmaceutical needs assessment	28	12.4
Pharmacist expertise	69	30.5
other reasons	32	14.2
No response	10	4.4
	Total 216	100.0
Prescribing patient group/therapeutic area		
Hypertension	93	41.2
Other cardiovascular diseases	63	27.9
Asthma	41	18.1
COPD	36	15.9
Diabetes mellitus	35	15.5
Analgesia	21	9.3
Smoking cessation	13	5.8
Substance misuse	13	5.8
	*Total 312	>100.0
Method of patient recruitment		
By doctor	140	61.9
Patient self-referral	62	27.4
By pharmacist prescriber	127	56.2
By other members of the health team	140	61.9
Other referral processes	199	88.1
	*Total 668	>100.0
Any involvement in dispensing own prescriptions		
Yes	42	18.6
No	174	77.0
No response	10	4.4
	Total 216	100.0
Prescribing within defined standard operation procedures		
Yes	71	31.4
No	140	61.9
No response	15	6.6
	Total 211	100.0
Any professional indemnity		
Yes	196	86.7
No	18	8.0
No response	12	5.3
	Total 214	100.0

N= number of prescribers * Total N > 226), and %> 100, because of multiple response by pharmacist prescribers who used more than one patient recruitment method and/or prescribe in more than one therapeutic area

Note primary care setting denotes general medical practices and community pharmacies

Other aspects of the prescribing practice of respondents related to their continuing professional developments. Table 3.16 shows details.

Table 3.17 development of respondents' prescribing practice

Continuing professional development activity		N	%
Attendance at conferences and meetings		154	68.1
Peer support		134	59.3
Local CPD courses		130	57.5
Job shadowing		92	40.7
Higher education course for CPD		64	28.3
Other CPD programmes		188	83.2
	* Total	762	>100.0
Hours of CPD taken in the previous one year			
Less than 10 hours		7	3.1
11-20 hours		16	7.1
21-30 hours		20	8.9
Above 30 hours		166	73.5
No response		16	7.1
	Total	226	100.0
Nature of feed back from patients			
Formal questionnaires		22	9.7
Informal verbal feedbacks		153	67.8
No response		51	22.5
	Total	226	100.0
Regularity of patient feedback			
At each consultation		29	12.8
Occasional		71	31.4
No response		126	55.8
	Total	226	100.0

N= number of prescribers, * Total n > 226), and %> 100, because multiple response was allowed.

3.9.2 Changes in the prescribing practice of respondents

Respondents were asked to indicate changes that had occurred in their practice as prescribers, since they had qualified from the prescribing course and registered with the RPSGB. The most common change cited by respondents related to the expansion of care to other patient groups and an increase in the number of patients for whom they prescribed. Table 3.16 summarises the changes.

Table 3.18 Changes in pharmacist prescribing practice

Change activity	N	%
Added patient group or therapeutic area	120	53.1
Increased the number of patients prescribing for	112	49.6
Implemented independent prescribing	96	42.5
Moved to new patient group or therapeutic area	44	19.5
Move to a different prescribing setting	37	16.4
Changed referral process	35	15.5
Other changes	202	89.4
Total	646	>100.0

N = number reporting change * Total N > 226, and >100% because of multiple response by some that reported more than one type of change. The other change category included such examples as increased personal confidence of prescribers and more frequent home visits for patients.

3.9.3 Development of prescribing by pharmacists in primary care

A majority of respondents who were already prescribing in primary care settings n = 228 (69.9%), indicated plans to develop their prescribing practice. It is likely that the training pharmacists undergo for prescribing will impact greatly on the future development of prescribing services. The questionnaire sought the views of respondents on the introduction of prescribing training for pharmacy students at the undergraduate level. A majority (63.9%) of respondents who had implemented prescribing in primary care (n = 158/228) objected to the idea, while around a quarter (23.7% n=54/228) supported the idea. Table 3.18 presents a summary of the themes that emerged from a thematic analysis of open comments of respondents regarding the training of undergraduates for prescribing.

Table 3.19 Views of pharmacist prescribers on the training of pharmacy undergraduates for prescribing

Theme	Description of theme	Illustrative quote
Risk and patient safety issues	This theme reflected the concerns of respondents about the lack of experience and maturity of fresh pharmacy graduates. Such concerns were common to both proponents and opponents of introducing the prescribing curriculum at the undergraduate level.	*"I feel that pharmacists need at least 2 years experience first as when you qualify you are still learning and putting new skills into practice - prescribing as well would be too much responsibility and potentially dangerous."* (Female GP practice pharmacist 11-15 years as a pharmacist, prescribing) *"Undergraduates are still taught therapeutics in 'SILOS', so when they attempt to manage patients with multiple co-morbidities they struggle…"* (Female GP practice pharmacist above 20 years as a pharmacist, prescribing)
Image and prestige	Pharmacists who argued in support of training pharmacy undergraduates as prescribers felt it was good for the mage of the profession. They noted that implementation would be structured, unlike the current 'piece meal' approach. They opined that the prescribing needed to be 'demystified' by making it a normal activity for any pharmacist who wanted. Conversely, those who argued against training pharmacy undergraduates for prescribing made comments that portrayed prescribing as an exclusive activity. They pointed out that the image and prestige associated with prescribing will be devalued if every pharmacist was allowed to prescribe. They feared that fresh graduates as prescribers would embarrass and tarnish the image of pharmacy.	*"Pharmacists should all qualify as prescribers as it is the only way we can enhance our role and ensure our future."* (Male community pharmacist above 20 years as a pharmacist, prescribing) *"I think it would be useful for prescribing to be incorporated into the pharmacy degree as it would further enhance the professional image of pharmacy."* (Female GP practice pharmacist above 20 years as a pharmacist, prescribing) *"…Not all pharmacists have the necessary attributes to carry out this role efficiently..."* (Female GP practice pharmacist above 20 years as a pharmacist, prescribing) *"This should be a supplementary course for those who wish to put in the work and commit themselves. If every pharmacist had this qualification it would de-value it."* (Female community pharmacist 6-10 years as a pharmacist, prescribing)
Logistics of training	It was common to find pharmacists who supported undergraduate training of prescribers alluding to the ease of taking the course at that level. On the other hand, those that objected opined that it would amount to a waste of time and resources if no immediate prescribing roles were available.	*"It is a lot easier to do the independent prescribing course whilst still a student"* (Male community pharmacist above 20 years as a pharmacist, prescribing)

3.9.4 Summary of results

A cross-sectional questionnaire survey was used in this phase to establish the demographic characteristics of pharmacist prescribers. The extent of prescribing implementation in GB was measured in the sample of respondents. In addition, the type of prescribing activities undertaken by pharmacists was described. The survey identified resource-related issues of funding, clinic space, time and IT facilities as the key factors that influenced implementation of prescribing. Availability of resources enhanced pharmacist prescribers' activities, while shortage or lack of resources hindered implementation. Similarly, administrative procedures and lack of understanding or lack of support for the pharmacist's prescribing role were identified as major challenges by respondents who had actually prescribed. Along with these challenges, a lack of defined prescribing roles was also found to be a key barrier for pharmacists who had not implemented prescribing. Moreover, among pharmacists who were prescribing, the pharmacy practice setting was the main prescriber characteristic associated with this activity. Pharmacist prescribers based in hospitals and general medical practices were more likely to have implemented prescribing. The implications of these findings will be discussed in the next section.

3.10 Discussion

In this section, the key findings of the cross-sectional questionnaire survey will be discussed in line with the aims and objectives of Phase 1. The strengths and limitations of the data collection instrument, the statistical procedures of data analysis and the quantitative results will be considered before focusing on implications of the quantitative results in relation to the policy and practice of pharmacist prescribing. The study results will be critically appraised, in the context of the published literature, in order to draw appropriate conclusions to inform and refine the research questions, aim and objectives for Phase 2 of the project.

3.10.1 Review of Phase 1 objectives

The aim of the quantitative phase of the research was to determine the nature and extent of prescribing activities undertaken by pharmacist prescribers in GB. The cross-sectional questionnaire survey approach was utilised to meet the following specific objectives:

1. To describe the demographic characteristics of pharmacist prescribers, as the basis for determining the extent of prescribing activities of pharmacists.
2. To identify barriers and facilitators to the practice of pharmacists as prescribers.
3. To examine the relationship between facilitators/barriers and demographic characteristics of pharmacists engaged in actual prescribing practice.
4. To describe the processes adopted by pharmacist prescribers in delivering prescribing services.

3.10.2 Key findings

All pharmacist supplementary or independent prescribers registered with the RPSGB as at January 2009 were invited to participate. Response rate was 42.3% (695/1, 643). The key findings from the analysis of completed questionnaires are presented under each objective of the quantitative phase as follows:

1. To describe the demographic characteristics of pharmacist prescribers, as the basis for determining the extent of prescribing activities of pharmacists.

    - Only a minority (less than 20%) of all the respondents were based in community pharmacies as the main setting in which they practiced as pharmacists; more (44%) were based in hospitals.
    - The majority of respondents (68.1%) had written prescriptions, but almost one third (31.9%) were yet to prescribe.
    - Of all the respondents that had written prescriptions, 43% prescribed in hospitals, another 42% prescribed in general medical practices while less than 8% prescribed in the community pharmacy setting.
    - Respondents, who prescribed, mostly delivered the service in the same location of their main pharmacy practice. However, of the respondents based in community pharmacies, half of those who had written prescriptions did their prescribing in general medical practices.

2. To identify barriers and facilitators to the practice of pharmacists as prescribers.

    - Statistical analysis, using Chi Squared test, revealed a small, statistically significant association between the pharmacy practice setting of respondents and whether or not they had written prescriptions.
    - Descriptive analysis of 16 attitudinal statements related to prescribing practice showed that respondents who had prescribed across all practice settings, agreed to having adequate administrative and peer support. They also agreed that their prescribing practice made positive impact on patients' access to medicines. However, they disagreed that they were appropriately remunerated for prescribing.
    - Factor analysis of the 16 attitudinal statements related to the prescribing identified three underlying factors associated with the prescribing practice of respondents, namely:

    i. **'Administrative structures and processes'** which comprised: general administrative support, adequate remuneration, communication, other health professional and peer support as well as the understanding and support of line managers for pharmacist prescribers.

ii. **'Perception of pharmacists' prescribing roles**' including: how pharmacist prescribers perceived the impact of their prescribing practice on patient care, and how prescribing practice had lived up to their expectations, and their satisfaction with their role as prescribers.

iii. **'Facilities for pharmacists' prescribing practice'** covered pharmacist prescribers' access to IT facilities, PMR and their communication with doctors.

- Analysis of open comments of respondents who had yet to prescribe revealed their reasons for not prescribing to include: lack of opportunity, administrative procedures, resource limitations and lack of defined prescribing roles.
- For the respondents who had written prescriptions, lack of stakeholders' understanding and support for pharmacists' prescribing role was said to be a major challenge to pharmacists' practice as prescribers.

3. To examine the relationship between facilitators/barriers and demographic characteristics of pharmacists engaged in actual prescribing practice.

- Non-parametric analysis revealed statistically significant differences in the median score of respondents on the factor 'facilities for prescribing', depending on the setting in which they practised as pharmacists.
- Further analysis indicated that the difference in practice setting was mainly between respondents based in community pharmacies, and those based in general medical practices. Respondents based in the community pharmacy setting recorded lower median scores in terms of the factor 'facilities for prescribing' compared with those in general medical practices.

4. To describe the processes adopted by pharmacist prescribers in delivering prescribing services.

- Of the 333 respondents based in primary care settings, 228 (68.5%) had written prescriptions.

- The most common patient group(s) managed by respondents as prescribers were cardiovascular diseases, comprising mostly hypertensive patients. This was followed by patients with respiratory and diabetic conditions.
- Many of the patients prescribed for, by pharmacist prescribers were, recruited by pharmacist prescribers themselves.
- Around 18% of respondents were involved in dispensing their own prescriptions.
- The major changes in the prescribing practice of respondents since they first registered as prescribers were described in terms of them adding new therapeutic group(s) to the patient groups with which they started prescribing practice. Other changes were: respondents increasing the number of patients they prescribed for, and implementation of IP practice.

The Implications of these findings on the policy and practice of pharmacist prescribing will be discussed in section 3.11, after a consideration of the strengths and limitations of the methodological choices made in this phase of the project.

3.10.3 Strengths and limitations of the quantitative methods

A review of the strengths and limitations of quantitative research methods was provided in Chapter 2. In particular, the cross-sectional postal questionnaire survey was described as the reference example, to highlight main advantages and disadvantages of non-experimental quantitative research. However, the quantitative phase of the research had specific strengths and limitations associated with the data collection instrument (questionnaire) and the resultant data. In this section, a critical appraisal of these strengths and limitations of the quantitative methods will be undertaken to provide a transparent means of assessing its quality.

3.10.3.1 Scope of data collected

The population of respondents represented pharmacist prescribers from across GB, from a wide range of practice settings (primary care, secondary care and specialist units including substances misuse centres, prison health centres, nursing care homes and out-of-hours centres). Respondents also covered both SP and IP practice models, including those that were not yet prescribing at the time of data collection. This variety in the composition of respondents enhances the potential to generalise quantitative findings from the current research project to the wider population of pharmacist prescribers in GB. In contrast, previous studies have tended to be restricted in geographical scope, and the focus has often been limited to either SP or IP alone. Latter *et al.* used a combination of methods, including questionnaire and telephone surveys, case studies and multi-stakeholder workshops to investigate nurse and pharmacist IP in England (139). Similarly, Bissel *et al.* utilised a combination of postal questionnaire survey, case studies and prescribing data analysis to evaluate nurse and pharmacist SP in England (140). Whilst key differences in terms of the research design adopted in the current project and those of the two studies cited are acknowledged; this project was the first to provide updated data on the status of pharmacists SP and IP practice across the whole of GB.

Moreover, all pharmacist prescribers on the sampling frame were invited to participate in the research. This eliminated the problems commonly associated with specific sampling strategies. The non-representativeness of samples selected through non-probabilistic methods was highlighted in Chapter 2. Inviting every individual on the sampling frame enhanced the strength of the quantitative phase because the results could potentially be generalised for all pharmacist prescribers in GB. This was, however, limited by the response rate (see later). Furthermore, the validity and reliability of the quantitative results were enhanced by the rigour applied in the development of the data collection instrument.

3.10.3.2 Mode of data collection

The strengths of survey research methods in general were explained in Chapter 2. There were a number of reasons for choosing the questionnaire survey approach in the quantitative phase of this project. Firstly, the decision to collect quantitative data using the questionnaire survey method was based on the fact that this method is likely to gather research findings that reflect as closely as possible, real life practice (80,141). Since the information required in the current project concerned the actual prescribing practice of pharmacists, the questionnaire survey rather than alternate quantitative methods like the RCT is best suited to accurately capture this data. Rigorous controls and randomisation would otherwise render the research condition of RCTs 'artificial', and yield very precise results with narrow applicability in situations outside the controlled conditions of the research (92). Therefore, a major strength of the quantitative phase of the project lies in the choice of a method which produced results that are readily translated into the real world practice situation of pharmacist prescribers.

Secondly, the postal delivery of the questionnaire for self completion by respondents, rather than interview administration of the questionnaire in face-to-face encounters, enhanced the quality of the data collected in this project. Bowling in 2005, reviewed 73 relevant research papers out of a total of 382 publications retrieved by systematic and non-systematic searches of the literature, on the effects of modes of questionnaire administration on data quality. The author found that postal questionnaire surveys minimise the risk of respondents giving socially desirable responses, which they may do to impress researchers, if questionnaires are administered face-to-face in interviews. In addition, the review found that postal questionnaire surveys are capable of achieving wider and more complete coverage of the study population (142). Therefore, the postal mode of questionnaire delivery in the current project, possessed inherent advantages both in terms of the resultant data quality and the cost-effectiveness of the process. Several pharmacy practice researchers assert that postal administration of questionnaires provides a rapid and cheaper means of data collection in large samples, compared with face-to-face surveys (91).

3.10.3.3 Data collection instrument

Development of the data collection instrument in the current project adhered to principles of best practice for questionnaire design recommended in the literature; which were described in section 2.3.5 and applied in sections 3.3.3 and 3.4 of this chapter. McColl *et al.*, integrated expert opinions from key textbooks with high grade evidence from experimental and quasi-experimental studies, in a selective review of the literature to identify elements of best practice in the design and conduct of surveys. The authors listed four key issues: mode of questionnaire delivery; the sequence of questions, wording and response formats; the general appearance and format of the questionnaire; and the strategies for enhancing response rate as the key issues of best practice in questionnaire research design (93). The mode of questionnaire delivery has been discussed above, and the response rate will be discussed later. However, issues of questionnaire appearance and question wording in this project were carefully considered in an iterative questionnaire development process that designed, pilot tested, modified and re-tested the instrument to ensure that the final data collection tool was robust and fit for purpose (see section 3.3).

Moreover, reliability and validity of the questionnaire used in the current project were confirmed through various approaches. Firstly, a member of the supervisory team performed independent checks of questionnaire data coding and entry into SPSS® in 50 of the completed questionnaires selected at random. This confirmed reliability of the process adopted by the research student for data handling and analysis. Secondly, ethical requirements for anonymity made it impossible to link returned questionnaires to individual respondents, as a means of performing 'test-retest' reliability analysis (section 3.3.4), but other robust statistical techniques were applied to confirm the instrument reliability. This was achieved by calculating Cronbach's alpha (α), for the internal consistency of questionnaire items. In the current questionnaire, the scale of attitudinal statements designed to measure factors associated with respondents' prescribing practice, yielded α value of .75. This confirmed the reliability of the questionnaire to collect relevant data, in accordance with recommendations that pharmacy practice research questionnaires achieved α values of 0.7 and above, in order to demonstrate high reliability (91).

3.10.3.4 Statistical procedures of data analysis

Factor analysis, a major statistical procedure applied in the analysis of the current project data, confirmed validity of the questionnaire. Evidence of the close link between construct validity and factor analysis abound in the literature; for example Hayton *et al.* in their seminal paper in 2004 included a brief review of the literature on this subject (143). Applying factor analysis to reduce a large set of measured variables to yield a few meaningful underlying constructs in the prescribing practice of pharmacists provided the assurance that the questionnaire was measuring what was intended. However, equally important, was that appropriately applying factor analytical procedures enhanced the strength of the quantitative results in this project. Fabrigar *et al.* systematically reviewed 883 articles published between 1991 and 1995 in the *Journal of Personality and Social Psychology* and found that 159 of them performed exploratory factor analysis. The authors listed key methodological and analytical decisions required to implement factor analysis, including: decisions on study design, the use of multiple variables to measure a common factor, considerations in the determination of the number of factors to extract and interpretation of the factors using appropriate rotation methods (144). Also, Russell in 2002, reviewed articles published in the same journal during 3 different years, 1996, 1998 and 2000; and listed similar methodological issues as Fabrigar *et al.* (145); which were applied in the current project.

In terms of study design for example, the best practice recommendations are for large sample sizes of at least 100 participants, 3 variables or more combining to produce a single factor in the factor analysis. Similarly, it is recommended that multiple methods are applied in determining the number of factors to extract, and using rotation methods, to interpret extracted factors (144,145). These methodological considerations of factor analysis were extensively explained and applied in the methods section of Chapter 3. Significantly, the results obtained from this procedure yielded extracted factors (components) of practical significance to the practice of pharmacist prescribing. Performing further non parametric statistical tests established the significant association between an extracted component (facilities for prescribing) and the prescribing practice of respondents, hence attesting to the robustness of the statistical procedures utilised in the research. Despite the enumerated strength of the survey, the

quantitative phase of the project still had some limitations which are discussed next.

3.10.3.5 Response rate

The potential to generalise from results of the quantitative phase of this project to the general population of pharmacist prescribers may have been limited by a low response rate of 42.3%. This was further complicated by a sampling frame that did not distinguish respondents according to their practice settings; therefore, it is not possible to determine the representativeness of the respondents to the target population of pharmacist prescribers based in the primary care setting of GB in accordance with the aims of the quantitative phase of the project. However, the response rate is consistent with the less than 50% response rates recorded in several pharmacy practice studies (91). Moreover, the characteristic of study participants reflect the same pattern on the register of the GPhC. In 2010 there were 50,660 pharmacists registered in GB. Of these, a majority were female and 51% were within the 30-49 years age group. Slightly more than 2000 pharmacist were annotated as prescribers on the GPhC register in 2010 (146). Most of the studies on pharmacist prescribers have focused on specific sub-populations within narrow geographical areas(49).

The first large scale study of pharmacist prescribing in GB involving all pharmacist prescribers n= 518 achieved a high response rate of 82.2% (n=401/488 excluding the 30 who participated in the pilot survey). In this study, George *et al.* utilised a cross-sectional questionnaire survey approach to investigate the early experiences of pharmacist prescribers following the introduction of SP in GB (48, 58). However, unlike the current study which had a study population of 1,643, the study by George *et al.* had a study population of less than 500 participants who may be demographically different from the current study population. It appears that previous studies of pharmacist prescribing which recorded relatively high response rates were mostly small scale studies on small target populations. Cooper *et al.* conducted a thematic review of the literature of nurse and pharmacist prescribing in GB and concluded that many of the published quantitative studies were limited, because they relied on small samples of pharmacist prescribers (49). Therefore, despite

the low response rate in the current study, the findings provide the most current and comprehensive national data on pharmacist prescribing practice.

Moreover, some of the best practice recommendations to improve response rate to questionnaire surveys were applied in the design and conduct of the current project. Edwards *et al.* in 2009, reported results of a systematic review of 481 RCTs, from which 110 different strategies to improve the response rate to postal questionnaire surveys were investigated. The authors found that giving research participants monetary incentives more than doubled the response rate. They identified other key strategies for improving response rate as: length of questionnaire, follow-up and reminders, inclusion of a cover letter informing participants of the potential benefits of the research to the society, assurance of confidentiality, personalised questionnaires and the use of stamped envelopes for the return of completed questionnaires (147). Although the review by Edwards *et al.* provided evidence that monetary incentives double response rates, this strategy could not be used in the current project because of its controversial ethical implications (80). Similarly, it was not possible to use personalised questionnaires because of the ethical requirement for the anonymity of respondents. Other recommendations of Edwards *et al.* were rigorously applied in the current project (see section 3.4).

3.10.3.6 Biases

Sackett catalogued 35 different types of bias associated with sampling and measurement procedures in analytical research (148). Although many of these forms of bias are more relevant in experimental research designs, a few of them are applicable to survey designs and will be discussed in the context of the current project. Many other forms of bias in research are recorded in the literature, including: non-response bias, recall bias and social desirability bias (80,141). Despite the rigorous quality assurance strategies applied in the development and administration of the current questionnaire, it was not possible to completely eliminate all bias.

The low response rate may have resulted in bias, because only pharmacist prescribers highly interested or involved in prescribing practice may have responded to the questionnaire; such that the results could be biased by

'atypical' experiences. This was compounded by ethical requirements for anonymity which did not permit the identification of questionnaire respondents for the purpose of analysing possible non-response bias. However, evidence of a systematic review suggests that non-response bias may be less problematic when studying members of the same professional group such as physicians, compared to studies involving the general public (149). Whilst this review by Kellerman and Herold was focused on physicians, a similar argument may hold true for pharmacist prescribers. Respondents in the current questionnaire survey, were similar in terms of demographic characteristics to the general population of pharmacist prescribers, reported in the latest analysis of GPhC registers (146). This similarity in the characteristics suggests that pharmacist prescribers are a fairly homogenous professional group for whom non response bias may not be a major issue of concern.

Questionnaire surveys are particularly prone to recall bias; some questions may task the memory of respondents to the extent that the information they provide is selective and biased. However, this was probably less of a concern in the current project since respondents were only required to give data on actual prescribing practice. Social desirability bias occurs when respondents give particular answers to impress researchers. This can potentially be a matter of concern, especially considering that the sponsoring University for the current project is a major provider of pharmacist prescribing training, and may have been the training institution for many of the respondents. However, the postal mode of questionnaire delivery and the anonymity of returned questionnaires eliminated face-to-face contact with respondents, to minimise possible social desirability bias (see strengths above). Notwithstanding, the results of the questionnaire survey should be interpreted with caution; these will be discussed in the next section.

3.10.3.7 Discussion of key findings

The general aim in this research project was to investigate the structures and processes of pharmacist prescribing in GB. According to Donabedian, 'structures' comprise those attributes of the environment in which healthcare is delivered, including: facilities, equipment, financial and human resources and the way they are organised to deliver health services. Similarly, 'processes'

describe the actual activities undertaken in the course of delivering health care. These include: patients' care seeking activities that lead to health practitioners' activities such as diagnosing illness and prescribing treatment (150).

Whereas, Donabedian framework of 'structures', 'processes' and 'outcomes' were proposed in relation to the definition and evaluation of the quality of healthcare, his conception of 'structures' and 'processes' will be applied in this project to discuss the implementation of pharmacist prescribing practice in GB. The structures of pharmacist prescribing will cover the environment in which they practice, including: setting, facilities, resources and personnel. Identifying and quantifying these structures in the current project give an indication of the amount (extent) of prescribing activities undertaken by respondents. Similarly, the processes of pharmacist prescribing cover the activities undertaken by pharmacists in the delivery of prescribing services, including conditions they manage, how they identify the patients to prescribe for, dispensing of their prescriptions and their prescribing related CPD activities. These give a description of the type (nature) of prescribing activities undertaken by pharmacists in GB. The implication of these findings on the policy and practice of pharmacist prescribing will be presented in the next section.

A. Structures of pharmacist prescribing practice

i. Pharmacy practice setting

Results of the survey revealed that a majority of respondents had implemented prescribing practice (i.e. they had prescribed for patients). Pharmacist prescribers in the survey were already delivering prescribing services in various settings, including: hospitals, GP practices, community pharmacies, prison health centres, hospices, out-of-hour centres and substance misuse services. 'Pharmacy practice setting' was the only demographic characteristic of respondents that significantly predicted their prescribing practice. This is the setting in which respondents practise primarily as pharmacists. Non-parametric analysis revealed statistically significant association between pharmacy practice setting, and whether or not respondents had written prescriptions. Respondents in hospitals and general medical practices were more likely to have written prescriptions than their colleagues based in community pharmacies; they may or may not be prescribing in the same setting as their primary pharmacy

practice. Differences in the prescribing practice of pharmacists according to the setting in which they are based has been reported in the literature.

A cross-sectional questionnaire survey to investigate early SP experiences of pharmacists in GB, involved all registered prescribers at the time (n= 488 excluding the 30 who participated in the pilot). The study which achieved a response rate of 82.2%, found that nearly half of the respondents were practicing SP (60). The authors also found that 58.4% and 29.9% of the first prescriptions written by pharmacists came from those in general medical practice and hospital settings respectively. Thus they established that SP practice was less likely in community pharmacies than in hospital and general medical practice settings. Interestingly, even the hospital and general medical practice settings had been associated with differences in SP implementation for pharmacists. A survey of SCT chief pharmacists and individuals responsible for SP implementation in PCTs across England showed that nearly equal proportion of respondents (57% and 56% respectively) in the two settings, planned to fully implement SP by 2005 (47). However, the authors perceived that SP implementation barriers were more in general medical practices because pharmacists were initiating novel roles and services, unlike SP in the hospital setting which in most cases formalised existing practices.

The two studies cited above were undertaken when pharmacist prescribing was in its infancy in GB, and only the SP model was operational (60) (47). This represents a key difference with the current survey in terms of the study populations. It was envisaged that the eventual implementation of IP was likely to be more useful for pharmacists in different settings for different reasons. Reporting on the risks and concerns about SP (a different aspect of the Hobson and Sewell survey data cited above), Hobson and Sewell observed that SP was better suited for chronic disease management; which made that model less useful in hospital settings managing acute illnesses; hence IP was going to be more useful. On the contrary, they argued that SP was less suitable for community pharmacists because of the location of their premises outside GP surgeries. Hence, IP was going to be more useful for managing minor ailments (56). Despite the earlier optimism on the potential utility of IP in all settings, the current study, conducted after several years of IP experience, shows that the

'structures' for implementing pharmacist prescribing have not developed equally in all settings. The level of prescribing undertaken in hospitals and general medical practices, compared to community pharmacies, suggests that the community pharmacy sector is least favourable for pharmacist prescribing practice. This holds several implications for the policy and practice of pharmacist prescribing in GB.

The low proportion of community pharmacists among respondents in comparison to hospitals and general medical practices reflects the demographic pattern in the GPhC register; which has less than one-quarter of prescribers based in the community setting, despite nearly three-quarters of all registered pharmacists in GB working in community pharmacies (146). This does not align with the Government's plan to deliver health services to the British public through community pharmacies, as outlined in various policy documents (17,151-153). Moreover, the 'Crown' report which recommended the implementation of NMP listed enhancing patients' access to medicines and making best use of health professionals' (pharmacists') clinical skills, among the goals for introducing the service (16). Therefore, the current survey results cast doubts on whether the goals of implementing NMP for pharmacists are attainable, given the current level of prescribing practice in community pharmacies. The community pharmacy setting is best positioned to achieve the objectives of increasing access of patients to medicines and making the best use of pharmacists' skills, largely attributed to the number of pharmacists working in that sector and the size of the population it serves (154-156). It is particularly relevant that more than 90% of the British population visit community pharmacies annually, either as patients or healthy clients (155), making this the pharmacy practice setting with the greatest potential to create an impact through pharmacists' prescribing activities. Therefore, it could be argued that the overall success of pharmacists prescribing depends to a very large extent on successful prescribing practice in community pharmacies.

ii. Facilities for pharmacist prescribing

Factor analysis of attitudinal responses to prescribing related statements in the questionnaire identified three 'factors' associated with the practice of pharmacists as prescribers. These were: 'administrative structures and

processes'; 'perception of pharmacists' prescribing role'; and the 'facilities for pharmacist prescribing'. Differences in the practice setting of respondents (discussed above) were found to have arisen mainly in terms of the 'facilities for pharmacist prescribing'. This encompassed individual statements covering: access of pharmacist prescribers to patients' medical records; access to IT facilities; communication with doctors; convenience of community pharmacies; and the IP model as a facilitator of pharmacist prescribing practice. Availability of adequate facilities appears to be a consistent factor involved with the delivery of non-dispensing, cognitive roles in community pharmacies both in the UK and internationally.

A systematic review of the literature conducted by Bond *et al.* to understand community pharmacists' response to the challenge of delivering enhanced cognitive roles within the NHS, confirmed the key role of facilities in NHS service delivery. The authors identified 50 research papers published within and outside the UK, related to the involvement of community pharmacists in the provision of health care services. They found consensus among pharmacists that lack of facilities for access to patients' medical records, severely limited expansion of community pharmacists' roles from technical dispensing, to patient oriented clinical services (157). Similarly, Blenkinsopp and Celino reviewed published evidence, and practice examples of the contribution of community pharmacists to the management of patients with long-term medical conditions, and found that inadequate IT links hindered remote access to patients' medical records from community pharmacies. This in turn imposed a major limitation on their capacity to contribute optimally to the management of chronic diseases in the UK (158).

Although the reviews cited above did not focus solely on pharmacist prescribing practice, they are equally relevant for all patient oriented pharmacy services, including prescribing. Capitalising on the open comments of survey respondents and the individual statements that were grouped together by factor analysis, show that facilities for prescribing is comprised of issues including: IT links for access to patients' medical records; space for patient consultation; availability and adequacy of qualified support staff; and the financial resources needed to commission and sustain services. The extent of pharmacists prescribing

practice identified among study respondents based in hospitals and GP practice settings may indicate taking advantage of the facilities already in place for medical prescribers. This is particularly relevant to the NHS plans for modernising services, which emphasises multi-disciplinary delivery of healthcare (159). This underscores the challenges faced by prescribers in community pharmacies in terms of the location of their premises, and the lack of facilities for integration with the other members of the health team.

Data from observational studies indicate that community pharmacies within and outside the UK have unique advantages, which have been applied to increase access of the public to health services such as vaccination of at-risk individuals (160); and improved smoking cessation rates in NHS patients with attendant cost savings (161). However, challenges resulting from inadequate facilities may hinder full exploitation of the potential available in the community pharmacy sector. The observed limitations in the practice of prescribing by respondents in the community pharmacy setting appear to nullify their advantage of easy accessibility on the high street and longer opening hours (158). Therefore it is important that this issue is explored further to gain in-depth understanding on the setting and facilities (structures) of pharmacist prescribing practice. This will be explored further in the qualitative phase of the project, drawing upon the successful implementation of prescribing by pharmacists in hospitals and GP practices (see Chapter 4).

B. The processes of pharmacist prescribing

i. Current prescribing practice of pharmacists

The processes of prescribing in the current study are denoted by routine activities undertaken by pharmacists in prescribing for patients. Analysis of the prescribing procedures used by respondents in primary care highlighted several issues. Firstly, the most common conditions managed by pharmacist prescribers were cardiovascular, respiratory and endocrine systems. Secondly, a majority of questionnaire respondents personally identified or recruited patients into their prescribing services; and thirdly, there is at present no clear national guidance for the specific procedures adopted by pharmacist prescribers in delivering prescribing services. Many of these issues have been reported in previous studies. George *et al.* found that training in cardiovascular

conditions during the PLP was a major predictor of pharmacists' eventual practice of SP. In addition, the authors found that 27.2% of their respondents, experienced challenges with the referral process, for identifying suitable patients for SP (48).

Despite similarities in the results of the study by George *et al.* and the current survey, the difference between them should be noted. The current study, unlike the one conducted by George *et al.* covers a period of relatively widespread implementation of SP, and subsequent transition from SP to IP. It is perhaps of concern that the same issues seemed to have persisted; and may have serious Implications on the development of pharmacists' prescribing practice. This is even more apparent when viewed against the original context of the policy that introduced NMP, which was to increase the access of patients to medicines and decrease the workload of doctors; freeing them to take on the management of more complex patients (16). The current survey results show that pharmacist prescribing practice is mostly confined to the management of a few conditions, for a few patients mostly identified by pharmacist prescribers themselves. It could be argued that such 'piecemeal' approach to pharmacist prescribing practice is incapable of decreasing doctors' workload or making the best use of pharmacists' skills. Since a large proportion of the patients who could easily be managed by pharmacist prescribers are still being managed by doctors, and a wide range of conditions that could benefit from pharmacists' expertise has not become the key focus of activities. It is perhaps more worrisome that after nearly 10 years of pharmacist prescribing implementation there is no national strategy to match the areas of practice of pharmacist prescribers, to the needs of the population. This notwithstanding, it is significant that the most common condition of pharmacist prescribing is in the cardiovascular system. This has a huge potential impact on the health of the British population considering that, cardiovascular diseases are the most common impediments to good quality of life and remain the highest cause of mortality in the UK (162).

Other processes of pharmacist prescribing identified in the current study show that respondents were applying a variety of quality assurance steps in their prescribing practice to ensure patient safety. Most of them had completed more than 30 hours of CPD activities within the preceding year; and they self-audited

their practice by getting feedback from patients and other health professionals. Pharmacists were particularly cautious when dispensing their own prescriptions. Some of them faxed their prescriptions to colleagues in other community pharmacies for double-checking, before such prescriptions were dispensed. These elaborate quality assurance steps stress the emphasis pharmacist prescribers place on patient safety and the quality of their prescribing practice. This has been confirmed in recent reports. A survey of nearly 300 pharmacist independent prescribers in England incorporated a second phase, which also involved the secondary analysis of national datasets of safety incidents relating to prescribing, to determine the safety and clinical appropriateness of pharmacist prescribers' consultations, using the medicines appropriateness index. The authors found that pharmacist IP was safe and clinically appropriate, and that most patients were satisfied with the level of medicine information provided by the pharmacist prescribers (139). Although the current project did not specifically aim to establish the safety, or clinical appropriateness of pharmacist prescribing, it is known that the right processes are essential prerequisites to good outcome of healthcare (150). Therefore, determining the procedures utilised by pharmacist prescribers in the current project is important.

It is reassuring that respondents in this study approached prescribing practice with caution. This is particularly relevant in view of the initial concerns raised by some doctors, that non-medical prescribing was going to compromise patient safety (163). However, as pharmacist prescribing practice continues to develop in GB, it may perhaps become necessary to re-examine the procedures adopted by practitioners in the implementation of the policy. Hobson and Sewell (discussed previously) argued that SP was likely to develop in an ad-hoc fashion due to lack of national strategy to guide on the therapeutic areas of pharmacists SP, and the type of expertise to be developed by pharmacist prescribers (47). The current findings reiterate the necessity of providing such national guidelines on specific activities like: therapeutic areas of practice, patient recruitment and referral procedures and combined prescribing and dispensing roles, especially in community pharmacies where the same individual may be responsible for both functions. This would clarify, and possibly enhance, prescribing practice of pharmacists towards achieving the goals of increased access to medicines and decreasing doctors' workload. The

prescribing processes, described in the current study, could inform such policy review. Thus, the qualitative phase of the project will attempt to gain a more in-depth understanding of the processes that either work well or do not work well for pharmacist prescribers.

ii. Change and development of pharmacist prescribing practice

Results of the current survey suggest that little has changed in the implementation of pharmacist prescribing. Despite half of the respondents reporting that they had increased the number of patients they were prescribing for, the median number patients benefiting from pharmacist prescribing per week was 10 (inter-quartile range 6-20). Similar results have been reported in a survey of pharmacist IP in England (discussed previously) (139). The survey which involved all pharmacist IP in England (n= 388) showed that 80% of all qualified pharmacist prescribers were prescribing for patients, and almost 40% of them managed less than 10 patients per week. Similarly, reports have shown that the volume of items prescribed by pharmacists and the net ingredient cost of the items they prescribed only increased slightly; in contrast with the volume and cost of items prescribed by nurse prescribers in England between 2004 and 2007 (140). This implies that pharmacist prescribing, contributes only a small fraction to the total number and cost of items prescribed in the NHS. It appears doubtful if the current level of prescribing implemented in GB can achieve the overall aim of decreasing the workload of doctors, in order to allow them to concentrate on complicated patients. Perhaps increasing the number of pharmacist prescribers, could mitigate this problem. Incorporating prescribing training in the pharmacy undergraduate programme may be one path to increasing the number of pharmacist prescribers; this way, pharmacists could graduate from university qualified to prescribe.

A majority of respondents in the present study opposed the idea of pharmacy students, graduating from the undergraduate programme, qualified to prescribe. Instead, they felt that pharmacists need to gain practice experience before they could become safe prescribers. However, there seems to be a reluctance of experienced pharmacists participating in prescribing training. A cross-sectional questionnaire survey of 4300 British pharmacists' planned participation in SP training, and their attitudes towards SP achieved a response rate of 55.1%. The

authors found that almost all respondents were aware of pharmacist SP, but only a minority were contemplating participation in SP training. The majority had not thought about participating in SP, including those who considered themselves as 'venturesome' and early 'adopters' of innovations (63). The study by Stewart *et al.* sampled pharmacists that had not yet applied for prescribing training, in contrast to the current study which studied pharmacists who were already qualified as prescribers. However, respondents in the current study seemed to have a consensus of opinion that the taught elements of the prescribing course could be introduced in the undergraduate programme, leaving the PLP to be undertaken post qualification.

This may present a less cumbersome way of training pharmacists for prescribing in the future. Any change in the way pharmacists are prepared for prescribing, may have far reaching implications on the policy and practice of pharmacist prescribing in GB and internationally. Many developed countries now make significant reference to events in GB, as they plan and implement initiatives to extend the role of pharmacists in healthcare (18,164). Hence, the issue of training pharmacy undergraduates for prescribing will be explored further in the qualitative phase of the project.

C. Barriers to pharmacist prescribing

A significant proportion of respondents in this study had not prescribed. Again, the pharmacy practice setting was the main difference in terms of demographic characteristic, between respondents who had prescribed and those that had not. Respondents based in community pharmacies were less likely to have prescribed compared with their colleagues who were based in hospitals or general medical practices. Non-prescribing respondents indicated lack of opportunity as the main barrier that prevented them from applying their prescribing qualification in practice; this resulted from such other reasons as: administrative procedures, resource limitations and the lack of defined prescribing roles for pharmacists.

Similar issues have been identified as challenges to the practice of pharmacists as prescribers. George *et al.* found that lack of organisational recognition, lack of funding, administrative delays resulting in the non-availability of prescription

booklets and change of jobs by pharmacists were the main reasons why some respondents were not prescribing (48). More recently, a cross-sectional questionnaire survey of 179 pharmacist prescribers in the north-east of England achieved a response rate of 54.7% (98/179). The authors found that 37 respondents were not prescribing at the time of data collection. Of the respondents not prescribing, 24 had never prescribed mainly because of the lack of defined prescribing role in their organisations; and 13 pharmacists were no longer prescribing because they had changed jobs (165).

Although the studies cited above differ from the current study in terms of the study population and sample size, the current findings indicate that little progress has been achieved in terms of resolving the initial barriers and challenges to pharmacist prescribing practice. There is presently no national strategy for implementation of prescribing practice; hence pharmacist prescribing seems to depend largely on the efforts of individual practitioners. Baqir *et al.* commenting on their article cited above, argued that pharmacist prescribing being 'person-dependent' stood the risk of collapsing in the event that pharmacist prescribers experienced changes in their personal circumstances (166). A questionnaire survey of 1992 random sample of nurse prescribers (25% of all nurse prescribers) in the UK, achieved a response of 70%. The study found that the main barrier to nurse independent prescribing practice was as a result of problems caused by local arrangements in their organisations (167). While key differences between nurse and pharmacist prescribing are acknowledged, the findings make apparent the need for a national strategy to guide NMP practice.

For pharmacist prescribing, such guidance may include a clarification of how the prescribing role of pharmacists should function in the multi-disciplinary health team. It should be noted that despite identified barriers to pharmacists' prescribing practice, a majority of the current study respondents had successfully prescribed, especially in hospitals and general medical practices. The apparent success of prescribing in these settings may provide some insight into enhancing the prescribing practice in the community setting. Therefore the issues that have either worked well, or not worked well, in the prescribing

practice of pharmacists will be explored further, using qualitative methods in Phase 2 of the project.

3.10.4 Summary and conclusion

In this quantitative phase of the research project, a cross-sectional questionnaire survey identified the pharmacy practice setting of respondents, as the main predictor of whether or not they applied their prescribing qualification in practice. In addition, 'facilities for prescribing' comprising IT infrastructure for access to patients' medical records and electronic prescribing, were found to be more readily available in hospitals and general medical practices, than in community pharmacies. Thus, the extent of pharmacist prescribing implemented in these settings was significantly more than community pharmacies. The limitations of pharmacist prescribing practice in the community setting have potentially negative implications. This may hinder the achievement of enhanced patients' access to medicines, and may neither make the best use of pharmacists' skills nor reduce doctors' workloads which were the overarching objectives of implanting NMP in the first instance. The quantitative phase also provided a description of the processes by which respondents delivered prescribing services in the primary care setting. This has highlighted several issues in the prescribing practice of respondents. Thus further qualitative studies would be required to provide a more comprehensive understanding of the research project.

3.10.5 Reflections for further work

Facilitators and barriers to pharmacist prescribing practice have been identified. However, it was not possible, using the survey approach, to gain in-depth explanations of all the issues involved. How some respondents were able to prescribe despite the challenges, shows that much can be learnt from exploring the experiences of pharmacist prescribers. Findings in the quantitative phase about prescribing role of pharmacists being unclear or misunderstood implied that progress in the development of pharmacist prescribing may require some clarification of the functions and operations of pharmacists as prescribers. Thus, it would be useful to explore pharmacist prescribers' views and perceptions of the 'ideal' role for them in the care of patients. These issues can best be addressed by qualitative methods, which was the rationale for designing a

mixed methods project to lead into a second phase of data collection. Using the ‘sequential mixed methods strategy discussed in Chapter 2, it is now possible to extrapolate on the quantitative results, with in-depth qualitative investigation of the factors that facilitate or inhibit successful implementation of pharmacists prescribing in GB. In the next phase, the views and perceptions of pharmacist prescribers regarding identified barriers and ways of advancing the implementation of pharmacists prescribing practice will be explored in Chapter 4

Chapter Four: Qualitative Interviews

This chapter presents Phase 2, the in-depth qualitative telephone interviews. The chapter begins with a recap of the key findings of the quantitative phase, and then outlines the aims and specific objectives of the qualitative phase. A description of the methods applied in data generation and analysis are then presented, before rounding up with findings and discussion of the qualitative interviews.

4.1 Quantitative findings that informed the conduct of phase two

The results presented in Chapter 3 were derived through a quantitative cross-sectional questionnaire survey, and it was established that a majority of respondents were already practising as prescribers in GB. Working in general medical practices or hospitals was significantly associated with respondents' tendency to engage in prescribing practice. The main difference among the practice settings was identified in terms of the facilities and infrastructure available to support prescribing practice of respondents. In addition, respondents enumerated a number of facilitators and challenges to their prescribing practice including a lack of a clearly-defined prescribing role. It was not possible using the quantitative method to explore these findings further; for example, how the identified barriers and facilitators impeded or aided the prescribing practice of respondents. Restricting respondents in the quantitative phase to a few answer categories in the questionnaire did allow them to fully express their views, perceptions and experiences of prescribing practice. In contrast, qualitative methods have the advantage of eliciting rich data from the perspective of research participants as discussed in chapter two. Therefore, this phase of the project complements the quantitative phase by providing depth and more rounded explanations of the issues involved in pharmacist prescribing in GB.

4.2 Reflection on the focus of the project informed by findings of the quantitative phase

The original aim of the project, as described in Chapter 1, was to explore developments in SP and IP since implementation; focusing on an investigation of the structures and processes of prescribing practice by pharmacists in the

'primary care' settings of Great Britain. The project was planned to be executed in two phases; in Phase 1, demographic characteristics of all pharmacist prescribers were collected in a questionnaire survey which used filter questions to focus the study on respondents based in the primary care setting. This practice setting comprised of community pharmacies and general medical practices as described in Chapter 3. The community pharmacy sector alone employs more than seventy percent of all pharmacists registered in GB (146). Moreover the latest pharmacy workforce census revealed that one quarter of pharmacists worked in more than one setting in GB, combining roles in community pharmacy and general medical practices (154). This informed the original proposal to conduct the study in the primary care setting; and on this basis Community Pharmacy Scotland provided funding for the project.

However, results in Phase 1 had shown that only a minority (less than 25%) of pharmacist prescribers were based in the community pharmacy setting; with even fewer (less than 8%) engaged in actual prescribing within this setting. In addition, the quantitative phase identified significant associations between the practice setting of respondents and their tendency to engage in actual prescribing practice. These findings signified that practice setting may be exerting a significant influence on the implementation of prescribing by pharmacists. That being the case, it would be possible to extrapolate from experiences in one setting and apply same to practice in other settings, for example, it may be possible to draw lessons from successful prescribing hospitals and apply them in a community pharmacy setting or vice-versa. Therefore, the results of Phase 1 constituted grounds for expanding the focus of the research to also include secondary care. The mixed methods strategy adopted for this project (described in chapter two) supports this expansion through an iterative process in which results of the quantitative phase informed and guided the design of the subsequent qualitative phase (86). Consequently, in this second phase of the project, respondents based in the hospitals will be included in the sample to be interviewed. The research governance and ethical issues raised by this inclusion, and the steps taken to address them, will be explained in section 4.3.1

4.3 Aims and objectives

The aim of the telephone interview phase was to explore in-depth key findings of the quantitative phase, applying qualitative methods to probe the views, perceptions, and experiences of respondents regarding prescribing practice. The intention was to provide a deeper explanation of the issues involved in the implementation, and possible developments, of pharmacist prescribing practice and policy.

The specific objectives were:

1. To clarify from the perspective of pharmacist prescribers why and how factors identified from the quantitative phase enhanced, or impeded their prescribing practice.
2. To describe measures already adopted by individual pharmacist prescribers, and their views of the strategies needed for successful implementation of pharmacist prescribing practice.
3. To define and clarify the pharmacist's prescribing role from the perspective of pharmacist prescribers themselves; and to explore their perceptions of developments in the pharmacist's prescribing role.

4.4 Methods

The rationale for the choice of qualitative methods for this phase of the project was described in Chapter 2. In particular, the advantage of qualitative methods for eliciting rich data about the real world experiences, views and perceptions of research participants was highlighted (96). This advantage has increased the prominence of qualitative methods in addressing research objectives as the ones outlined in section 4.3, which relate to the development of effective health services (91). In addition, the relatively low cost and high efficiency of telephone interviews compared with face-to-face interviews was considered in Chapter 2; despite generating data of similar quality (116,119). These considerations justified the application of in-depth, semi-structured, telephone interviews for data generation in the qualitative phase of the project. The specific steps and procedures of data generation and analyses are explained in the sections following.

4.4.1 Ethical considerations

In Phase 1, the North of Scotland Research Ethics Committee (NoSREC) advised that the project did not require a full ethics review (appendix 3). This advice was partly based on the understanding that NHS-employed pharmacist prescribers were not going to be involved in the research, as explained in Chapter 3. However, expansion in the scope of the project discussed in sections 4.2 necessitated the inclusion of hospital pharmacists in the interview sample. In addition, the research student and the project supervisory team considered the project in its expanded form more as service evaluation, than research (168,169). Therefore, the NoSREC was approached again for guidance and advice on Phase 2 of the project. The NoSREC concurred with the categorisation of the project as service evaluation (appendix 10), which did not require a full ethics application (170).

Phase 2 of the project was planned in compliance with the ethics and research governance policy of Robert Gordon University (129) described in Chapter 3. Project information (appendix 11) was sent to prospective interview participants by electronic mail. Information provided included: background to the project; objectives of the study; criteria for choosing them as participants; and their freedom to participate or withdraw from participating. In addition, prospective participants were informed of the project sponsors, potential benefits of the project, and what would happen to results of the study. They were assured of the confidentiality of their responses, and that any data they supplied would be processed and stored in accordance with the Data Protection Act 1998 (130). All project records, including interview audio clips and transcripts, will be destroyed on completion of data dissemination at the end of the study.

4.4.2 Initial development of the interview guide

An initial draft of the interview guide was developed around some key findings of the quantitative phase that needed deeper explanations. Questions were organised into sections to reflect the objectives outlined in section 4.3. This draft was reviewed by members of the project supervisory team with diverse academic and professional backgrounds, who were also experienced in pharmacy practice research using qualitative methods. The review by the supervisory team served to highlight potential pitfalls in the interview schedule.

For example, they observed that some questions were too structured, and were worded almost as in a questionnaire. This reflected the research student's prior background and training as a pharmacist with more experience in quantitative than qualitative methods. Therefore the supervisory team offered advice on restructuring and re-wording questions in the interview schedule. Table 4.1 is a summary of the main points covered in the initial draft, before review by the supervisory team.

Table 4.1 initial draft of the interview guide

Areas covered by the interview
Introduction and preliminary activities • Greetings and self introduction to respondent • Remind respondent of the project background and aims • Assurance to keep to agreed time • Confirm that respondent has accessed and accepted the online consent form • Seek permission to audio-record interview • Guarantee confidentiality; assure interviewee of responsible handling and storage of data during transcription, analysis and reporting
Demographics • Background information about respondent • Information on prescribing practice
Section1 Clarify why and how facilitators enhance and barriers impede the prescribing practice of pharmacists. • Facilitators of prescribing implementation • Barriers of prescribing implementation
Section 2 Clarify their perception and understanding of the pharmacist prescribing role and possible developments of the role in future • Describe their experience of prescribing implementation • Define ideal prescribing role • Describe ideal prescribing scenario • What would they do differently in terms of prescribing implementation
Section 3 Development of prescribing • Views on key developments in future • Views in relation to the future training of pharmacists as prescribers • Diagnosis, prescribing and dispensing • Any general issues

The interview guide was re-drafted and reviewed several times, and this resulted in redundant, leading or ambiguous questions being removed. A few questions were added to clarify the prescribing role of pharmacists as specified in Objective 3 (section 4.3). Development of the interview guide was iterative, and was constantly evolving throughout the interviews. The loose structure of the interview guide was used to direct conversations, but at the same time, the

research student paid attention to participants' accounts and modified questions in subsequent interviews as appropriate. Issues raised by respondents were followed up and clarified in subsequent interviews. Therefore, the interview guide served as a flexible tool for moderating each interaction between the interviewer and interviewee in line with best practice of investigating health services issues (80,96).

The re-drafted interview guide had four main sections which covered the following general headings:

1. Section 1: Introduction and additional demographic questions
2. Section 2: Questions to clarify why and how specific factors facilitate and/or hinder implementation of prescribing by pharmacists.
3. Section 3: Questions to clarify pharmacist prescribers' perceptions of their roles as individual prescribers, including their desires and expectations.
4. Section 4: Questions to explore respondents' views regarding development of pharmacist prescribing in general, and other issues they considered relevant in the implementation of prescribing by pharmacists.

Table 4.2 gives a summary of the redrafted interview guide (details provided in appendix 12).

Table 4.2 Draft interview guide after review by supervisory team

General areas covered in each interview
Section 1 Additional demographic characteristics 1. How long they have been registered as a pharmacist 2. When they registered as a prescriber 3. Age 4. Main practice setting as a pharmacist 5. Prescribing setting if different from 4 6. Approximate number of hours spent prescribing in a week 7. Approximately number of patients prescribing for in a week 8. Patient groups managed as a prescriber
Section 2 Facilitator and barriers of prescribing implementation 1. What works or does not work very well in their prescribing practice 2. How do they monitor what works well 3. What changes have occurred in their prescribing practice 4. How difficulties have been resolved 5. If difficulties not resolved how they work around the challenges
Section 3 Perception of prescribing 1. What they consider ideal prescribing role in their practice as individuals 2. What they would change or do differently in prescribing if they had the opportunity 3. Key advice a new pharmacist prescriber 4. Developments they would want to see in their individual prescribing practice
Section 4 General development of pharmacist prescribing 1. Their views on development of prescribing within the profession of pharmacy 2. Views on the training of future pharmacist prescribers 3. Any other developments they consider relevant

After developing the interview guide, the research student's interviewing skills and techniques were tested in a mock telephone interview with a colleague. The mock interview provided the research student with an opportunity to assess his preparedness for performing multiple tasks during the interviews. These tasks included technical handling of the telephone and recording equipment, monitoring recording sound level, volume, pitch, and also keeping track of time. With this preparation completed, the quality of the draft interview guide was to be tested further in pilot interviews.

4.4.3 Pilot interviews

The draft interview guide was used in pilot interviews with two pharmacist prescribers. The two interviews were recorded and transcribed verbatim, by the research student. Transcripts of the interviews, together with digital audio recordings, were reviewed for accuracy of transcription by the project supervisory team members. This provided an opportunity to check the structure,

flow and clarity of questions. The check involved assessment of the responses provided against the questions put to respondents, to detect any misunderstanding of questions. Review of the pilot interviews also considered how the research student engaged respondents in conversation, using appropriate prompts to elicit responses. In addition, approximate length of interviews conducted with the draft guide was assessed. The supervisory team did not consider any major change necessary in the interview guide or interview techniques adopted by the research student. Therefore, data from the two pilot interviews were included in the final sample for analysis.

4.4.4 Interview participants

Prospective participants for the telephone interview were selected from a list of respondents who accepted the invitation that accompanied questionnaires in the quantitative phase. Details of pharmacist prescribers (n=165) who completed and returned the reply card from Phase 1 of the project were entered into a database, to serve as the sampling frame for phase two. Reply cards allowed respondents to provide email contact details, through which they were sent invitations for the interviews phase. An invitation email containing a portable document format (pdf) attachment of the project information sheet (appendix 11) was sent to all pharmacist prescribers in the sampling frame. The invitation email also contained a link to an online project web page, hosted by Robert Gordon University. The web page provided additional information, and contained a consent and copyright form (appendix 13). Prospective participants had to read and agree to the copyright and consent form, before being included in the interview sample. Copyright consent granted the research student permission to use anonymised data from the interviews, including verbatim quotes, in any resultant publications. The project webpage also made provisions for participants to provide details of their telephone number(s), and preferred day(s) and time(s) during which the interviews could be conducted. These arrangements were necessary to minimise any disruptions or inconveniences to interviewee's schedules.

4.4.5 Sampling strategy and sample size

Qualitative sampling strategies used in health services research were described in chapter two (section 2.5.4). Selection of research participants to fulfil predetermined criteria (purposive sampling) was described as the main sampling strategy in qualitative research; and many of the other qualitative sampling strategies are variants of purposive sampling (105). The pre-determined criterion for the qualitative phase of the current project was to selectively recruit interview participants with the purpose of achieving maximum variability in terms of demographic characteristics. The sample so recruited would capture a wide range of respondents' perspectives in the interviews. It was specifically desirable to obtain an interview sample that covered the main pharmacy practice settings. This was particularly important because the pharmacy practice setting had been identified as an important predictor of prescribing practice in the quantitative phase. Moreover, the expansion in scope of the project explained in section 4.2 meant that pharmacist prescribers based in hospitals were now to be included in the interview sample. This was to be achieved by deliberately selecting interview participants from the sampling frame, who met those criteria. However, response to emails inviting pharmacist prescribers for the interviews was very low. It became expedient to adopt a convenience sampling strategy, to recruit the most 'readily-available' participants, as described in Chapter 2. In this process, pharmacist prescribers were recruited consecutively into the interview sample as they accepted the invitation to participate.

In terms of the sample size, there are no guidelines in the literature regarding the appropriate number of interviews to achieve data saturation. However, pharmacy practice researchers have typically interviewed between 15 and 50 participants (169). In the current project, sample selection was planned to continue up to a maximum of thirty. It was anticipated that thirty interviews were sufficient to cover the issues being investigated and achieve data saturation, without being too unwieldy to manage. This assumption tallied with the recommendation of various authors that between 5 and 50 interviews were sufficient. Moreover, Guest et al conducted an experiment involving 60 interviews, and reported that data saturation occurred after about 12 interviews (171). Therefore, when a total of thirty-four pharmacist prescribers agreed to be

interviewed, it was decided to include all of them; since this falls within the 15 to 50 range, typically interviewed in pharmacy practice research (169). Despite adopting a convenience sampling strategy, the final interview sample displayed maximum variability in terms of the characteristics of participants, similar to what would have been achieved by purposive sampling.

4.4.6 Data generation

All 165 pharmacist prescribers on the sampling frame individually received a generic invitation by email to participate in the telephone interviews. Emails were sent using the blind carbon copy (Bcc) function, so that the email addresses of other recipients were concealed. Whenever a pharmacist respondent accepted the invitation, the completed consent and copyright form was automatically transmitted to the researcher's e-mail box. The pharmacist prescriber provided a preferred telephone number, specific day(s), date(s) and time(s) convenient for them to grant the interviews. The researcher then sent individual emails to such respondents confirming details of the interview appointment. This was followed later by another email 24 hours before the actual interview to confirm that interviewees' schedules had not changed. On the appointed date and time the interviewee was telephoned using a conference call facility, and the conversations were audio recorded using a Marantz® digital audio recorder. Recruitment emails were sent to the first 85 pharmacist prescribers on the sampling frame for Phase 2, followed by two reminders at two weekly intervals. The process was repeated for the second batch of 80 pharmacist prescribers eight weeks after the first.

Interviews were to be of short duration, lasting between 15 and 20 minutes, in order to keep respondents interested. Interview participants were also aware that they could stop the interview at any time without having to explain their reasons. This ensured that the interviews did not last longer than was convenient for the participant. However some participants who wanted to talk for longer had the chance to direct the conversations beyond 20 minutes. Interviews were arranged and conducted sequentially until all participants who accepted the invitation had been interviewed. Digital audio recordings of the interviews were replayed and listened to several times, before they were transcribed verbatim into Microsoft® word documents by the research student.

The transcript of each interview was read by the research student, while simultaneously listening to the digital audio recording to check for accuracy of transcription. This was confirmed by members of the project supervisory team who also read interview transcripts and listened to digital recordings at the same time. They did not find any major errors of transcription; hence data was ready for analysis.

4.4.7 Data analysis

Transcripts of telephone interviews were analysed with the aid of Nvivo® 8 software, a computer programme for managing qualitative data. The framework approach for qualitative data analysis was used to organise and categorise interview transcripts into emerging themes and sub-themes in a hierarchical order. This approach was developed for applied policy research and involves five inter-related stages as described by Ritchie and Spencer. The stages are familiarisation, identifying a thematic framework, indexing, charting, mapping and interpretation (101). These steps were made operational in this project as follows:

- Familiarisation began with taking notes as issues were raised by participants during each interview. Key concepts were marked as potential themes to be used in the coding of interview data. Additionally, interview transcripts were read repeatedly, while listening to the digital audio recordings, to get a good grasp of the full range of issues discussed by research participants.
- Identifying a thematic frame work was achieved by reviewing the potential themes noted during the interviews, along with any ideas or concepts identified from the repeated reading of the interview transcripts. The research objectives were used to derive some thematic codes *apriori; as* some questions were automatically categorised into pre-determined codes. However, emerging themes were identified from issues that were recurrent in the narratives of pharmacist prescribers.
- Nvivo® facilitated the labelling of all interview transcripts according to the identified codes during the indexing stage of data analysis.
- Charting categorised the indexed data according to how they related to each other. This process involved moving chunks of data, and re-

arranging them under main themes or sub themes depending on the central idea they contained. In the process some themes were merged, and others broken down, while some passages of the data were charted into more than one category.

- The mapping and interpretation stage evaluated central ideas embedded in the themes and subthemes to provide explanations of the data. This involved the use of verbatim quotes to illustrate themes or subthemes. The selection of quotes considered opposing views, contradistinctions and exceptions to further explain the data, in line with research objectives.

The supervisory team read transcripts of interviews and listened to digital audio recordings to devise thematic coding categories which were used to check the robustness of the themes and sub-themes developed by the research student. They also reviewed how the coding categories were applied in analysing the data and found no major concerns; thereby attesting to the validity of the analytical process. Findings from this exercise are reported in the next section.

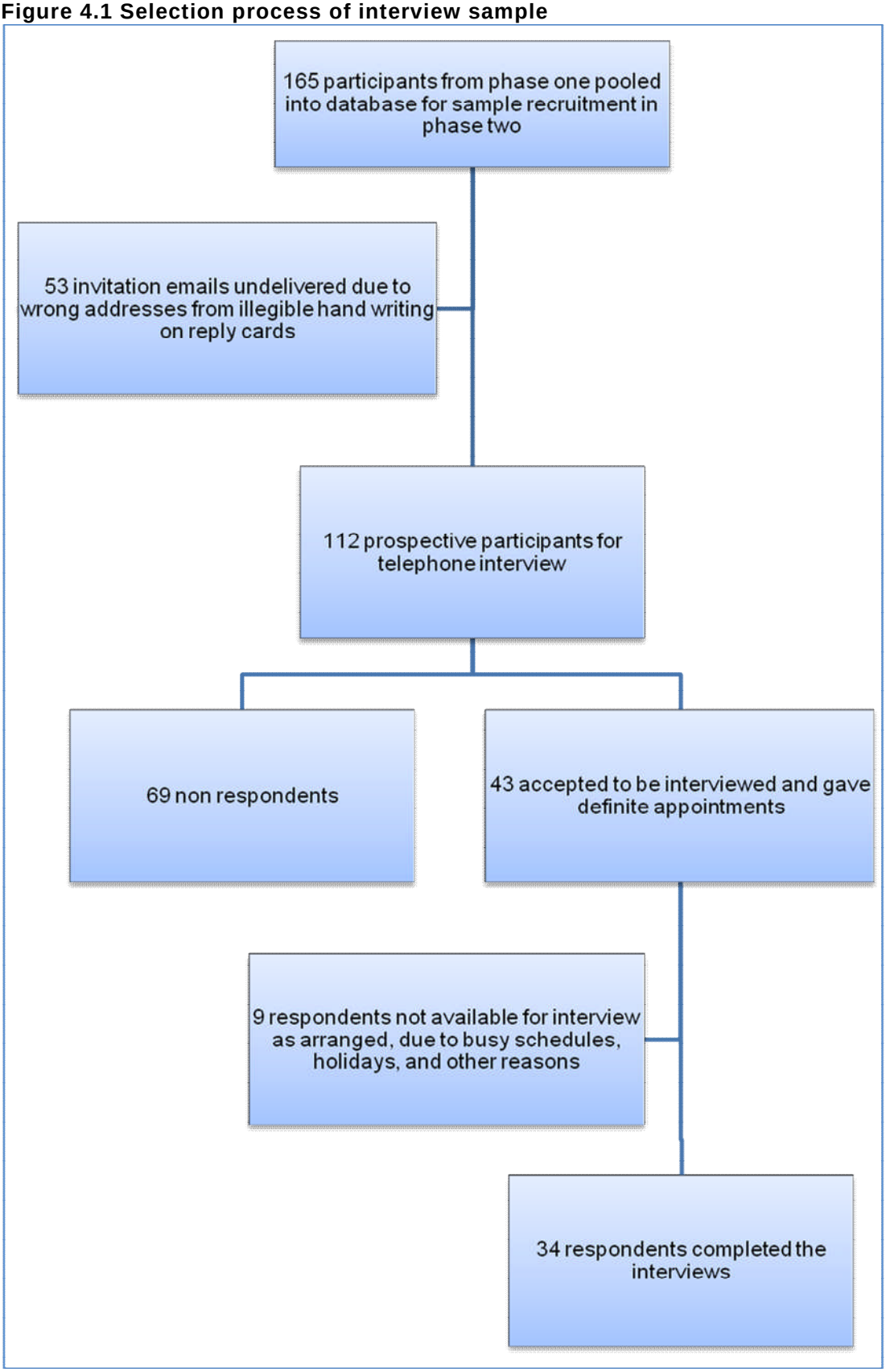
4.5 Findings from the qualitative interviews

This section presents findings from analysis of the in-depth telephone interview transcripts. It begins with a description of demographic characteristics of interview participants, followed by narratives explaining the themes and sub-themes that emerged from the interviews. Verbatim quotes have been used to illustrate themes and to aid interpretation of the data. Findings were structured around objectives of the telephone interview phase as follows: factors associated with the implementation of prescribing by pharmacists; factors clarifying the prescribing roles of pharmacists; and exploring developments, and the future of prescribing implementation by pharmacists.

4.5.1 Characteristics of interview participants

In Phase 1 of the project 165 pharmacist prescribers completed and returned reply cards agreeing to participate in the telephone interview phase. They each received an email invitation for the purpose of recruiting the interview sample. Email delivery failure was reported for 53 respondents, because of illegible hand writing, which resulted in the wrong email addresses being used. Selection of the interview sample from the remaining 112 addresses is summarised in Figure 4.1.

Figure 4.1 Selection process of interview sample



Thirty-four pharmacist prescribers (twenty based in England and fourteen based in Scotland and none were based in Wales) participated in the interviews conducted one-to-one over the telephone. Interviews had an average duration of 20 minutes, and ranged from fifteen to forty minutes. Twenty-four female and 10 male participants reflecting a similar pattern on the GPhC registers (146). The composition of pharmacist prescribers interviewed provided diverse professional and personal characteristics, representing a wide range of views and opinions. Participants had between 8 and 46 years experience of working as pharmacists, mostly in GP surgeries and hospitals with a few in community pharmacies. There was at least one participant from settings such as Primary Care Trusts (PCT) or Health Boards, prisons, drug misuse clinics and those who split their work between two settings.

Whereas differences in the delivery of health services between England and Scotland are acknowledged, which may deter from direct extrapolation of participants' experiences across the two jurisdictions, the experiences narrated by interview participants were mainly similar in the two countries. Therefore, the practice setting and country in which participants are based have been provided along with the quotes, so that these can be read in context. Table 4.3 gives a summary of the personal, professional and prescribing characteristics of interview participants. Twenty-nine participants had commenced prescribing managing a wide range of conditions (mainly cardiovascular and respiratory) across different settings (mainly general medical practices and hospital).

Table 4.3 Personal characteristics of interview participants

Characteristics	Number of participants
Age group (years)	
30-39	14
40-49	11
50-59	7
≥ 60	2
Sex	
Female	24
Male	10

Table 4.4 Professional characteristics of interview participants

Characteristics	Number of participants
Year(s) of experience as a pharmacist	
5-10	4
11-15	9
16-20	3
21-25	9
26-30	4
≥ 31	5
Practice setting as pharmacist	
GP practice	13
Hospital	8
Community pharmacy	5
Other settings (settings listed in the text)	8
Country of participants' practice as pharmacist	
England	20
Scotland	14
Wales	Nil

Table 4.5 Prescribing characteristics of interview participants

Characteristics	Number of participants
Year(s) of experience as a prescriber	
1	6
2	6
3	17
4	4
5	1
Time in hours/ week spent prescribing	
Not prescribing	5
1-4	9
5-8	11
9-12	6
Above 13	3
Patient load/week	
Not prescribing	5
1-10	11
11-20	11
21-30	4
Above 30	3
Therapeutic group(s) managed by pharmacist prescribers	
Cardiovascular	18
Respiratory	8
Central nervous system	5
Endocrine	3
Others	7

4.5.2 Factors associated with the implementation of pharmacist prescribing

In Phase 1 of the research, analysis of questionnaire responses, identified and quantified factors associated with the implementation of prescribing by pharmacists. These factors, as observed in Chapter 3 were often antonymic, in the sense that the same factor influenced prescribing implementation both as a facilitator or barrier, depending on the circumstances in which the factor operated. Data from the interviews provided further insight into the interaction of these factors to facilitate or challenge prescribing implementation. Interview participants described their perceptions and experiences of prescribing practice. The following sections provide details on the key themes and subthemes that emerged from the interviews, but first a summary is presented in Table 4.6

Table 4.6 Summary of key themes and sub-themes from the analysis of telephone interviews

Objective categories	Themes	subthemes
4.5.2 Factor associated with pharmacist prescribing practice	4.5.2.1 Support for pharmacists implementing prescribing	A. Clinical support B. Administrative support C. Organisational support
	4.5.2.2 Consistent patient contact for prescribing activities	
	4.5..2.3 Regulatory issues	
	4.5.2.4 Lack of clarity about pharmacists' prescribing role	A. Lack of clarity among pharmacist prescribers B. Lack of clarity among other health care professionals C. Lack of clarity among patients and the general public
4.5.3 Strategies for successful prescribing practice	4.5.3.1 Identify or create niche areas for pharmacist prescribing	
	4.5.3.2 Promote pharmacist prescribing activities	
	4.5.3.3 Increased uptake of prescribing by pharmacists	
	4.5.3.4 Agreed formal prescribing roles and boundaries	
4.5.4 Clarifying the role of pharmacists and developments in prescribing practice	4.5.4.1 Ideal structures for pharmacist prescribing 4.5.4.2 Ideal prescribing roles of pharmacists	
	4.5.4.3 developments in pharmacist prescribing practice A. Training	i. Issues with the current training of pharmacist prescribers ii. Training pharmacy undergraduates for prescribing
	B. Practice priority for pharmacist prescribers	
	C. Benefits of pharmacist prescribing	i. Patient related benefits ii. Professional benefits

4.5.2.1 Support for pharmacists implementing prescribing

Interview participants narrated various experiences that enhanced or diminished support, and the outcome of that support in their prescribing practice. Pharmacist prescribers described support for implementing prescribing as clinical, administrative and organisational support. Where available, participants considered adequate support a key facilitator, and inadequate support a challenge to the implementation of prescribing practice.

A. Clinical support

Clinical support was described by interview participants in terms of the feedback or advice they received from doctors regarding specific issues about the management of patients. They perceived that clinical support facilitated their prescribing practice through the enhanced confidence they gained after dealing with difficult cases. Interaction with, and feedback from other clinicians created the atmosphere for them to reflect on their prescribing decisions. Clinical support was particularly valued in the early days of pharmacists implementing prescribing; then as their confidence improved with time, so did their competence in prescribing.

> *"... but you need somebody to talk your cases over with, and challenge you to think about how you are practising. So I think clinically you need to have somebody to support the work you do and be able to talk about particular patients ..."*

(Interviewee 2- Male, nineteen years experience as a pharmacist in England, prescribing for drug dependence in a drugs misuse clinic over three years)

> *"... I think if you don't have the support of certainly the doctors involved in the care or management of the patient you are seeing, it makes it very difficult to prescribe with confidence ... and then generally if you are not prescribing in a supportive environment then that makes it quite difficult for a newly established profession in terms of prescribing to flourish. I think it has to have at least some support from key professionals dealing with that area be it primary care or secondary care."*

(Interviewee 17- Male, sixteen years experience as pharmacist in England, prescribing in hospital chronic renal failure over one year)

Participants based in hospitals or GP practice settings for their primary role as pharmacists, perceived that they had adequate clinical support because of the

pre-existing good working relationship they already enjoyed with other health care professionals who worked in the same setting. Similarly, those based in the community pharmacy setting, narrated their experiences of clinical support if they prescribed in general medical practices. Some, who prescribed in both GP practice and community pharmacy settings, confirmed that prescribing was easier in the GP practices, because of clinical support among other reasons. Cordial working relationships and good communication with other health care professionals minimised inter-professional conflicts, and antagonism to the new role of pharmacists in prescribing. It was the view of participants that clinical support ensured all members of the health care team pursued common goals in the best interest of patients. In this regard, patients were referred among different health care professions based on which profession had the most appropriate skills to intervene.

> *"Team working gives you much more information about the patient, and it gives you much more support if you need it; and I have a good working relationship with the GPs ... I have referrals from the practice nurse; I have referrals from the doctor...So I think the close working relationship in the team is the best part"*

(Interviewee 23- Female, twenty-nine years experience as a pharmacist in Scotland, prescribing for asthma/COPD in a GP practice)

B. Administrative support

Interview participants recognised the supportive role of administrative and managerial staff that provided the necessary logistic arrangements for the smooth running of pharmacists' prescribing activities. Administrative support was frequently described by interview participants in terms of the logistics of actually setting up and running prescribing services.They perceived that administrative support enhanced the efficiency of prescribing, and freed pharmacist prescribers to concentrate on clinical roles including the prescribing of medicines.

> *"... I also think the practice staff, the reception team is very supportive of prescribing and my role in it so …"*

(Interviewee 8- Female, eleven years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over four years)

Initial logistic difficulties for some interview participants included the lack of dedicated space for patient consultation and insufficient time for prescribing activities. Similarly, limited access to patient medical records and information technology (IT) facilities were considered major hindrances for pharmacists delivering prescribing services. On the other hand, interview participants who succeeded in implementing prescribing were those who worked in environments with a minimum of such logistic challenges.

> *"I do think that the GP setting at the moment is the best for non medical prescribing because you have all the information and patient details in front of you and you are not going to miss anything.... outside GP clinics, I can see a setting in health centres because it is quite likely, that records would be available there as well..."*
>
> (Interviewee 29- Male, thirty-nine years experience as a pharmacist in England, prescribing for hypertension and hyper-lipidemia in a GP practice over one year)

Administrative support in terms of organising the logistics of prescribing services was mentioned more by interview participants based in hospitals and general medical practices. They perceived that it was less likely to obtain the same level of support in community pharmacies. Some of them even suggested that prescribing was only possible for pharmacists based in GP practices and hospitals.

> *"... if pharmacists want to be prescribers at the moment, they would have to base themselves in GP practices and not in the community pharmacy ... I know one pharmacist who renders review services, and consultation for COPD within a pharmacy, but her problem is that she has to go to the GP practice to get patient notes and other necessary logistic support ... whether that can work I don't know"*
>
> (Interview 14- Male, twenty one years experience as a pharmacist, prescribing for hypertension in a GP practice over four years)

> *"I would prefer to see pharmacists prescribe in a GP setting because then you have access to the computer, you have access to paper notes, you have access to nurses, GP colleagues etc, I would find doing my job very difficult in the community pharmacy."*
>
> (Interviewee 1- Female, twenty-two years experience as a pharmacist in Scotland, prescribing for hypertension in a GP practice, over one year)

Indeed, respondents who prescribed in both GP practice and community pharmacy settings affirmed that the logistics were easier in the GP setting.

Practice staff and receptionists handled the administrative tasks in the GP setting, whereas they had to deal with those tasks themselves in the community pharmacy.

> *"... where possible it will be good to have these things [prescribing services] in the community pharmacy ... I think there is a lot of benefit to having them in there, but of course there are practical elements and logistics which means that it does become a problem working within the community".*

(Interviewee 7- Male, nine years experience as a pharmacist in Scotland, prescribing in a GP surgery and running a smoking cessation service in community pharmacy over four years)

Interview participants based in community pharmacies also mentioned the challenge of physical distance from other health professionals, who were often located in GP practices. Such distance, they perceived, lead to communication difficulties between them and the GP practices. Some described their frustration at being isolated and detached from the supportive environment of a multi-disciplinary health care team.

> *"Yes the admin side was a nightmare, we have no IT connections with the surgeries, so you have to see the patients in the shop, gather all your information, walk up to the surgery, put it all in the computer. That all takes time, so that limits you to where you can go…, I do actually run a couple of clinics in the surgeries and that is so much easier because, you have the computer up in front of you, you have all the records of the patient so you put it straight on to the computer, it makes life so much easier."*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

It appeared from the interviews that administrative and logistic problems which were present at the inception of pharmacist prescribing had not been solved after so many years of implementing prescribing by pharmacists.

> *"I hope we can have IT links with the surgeries, but until that happens, and we have been talking about this for how long? Ten years at least to my knowledge, maybe a bit longer, and every year they keep saying it will be up and running and here we are, we are still ... so it is just an absolute nightmare and I think it is extremely difficult to expand the service in any meaningful way unless we have IT connection ..."*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

The sort of administrative problems that have persisted seemed to be those related to policy and strategies initiated at the organisational level for implementation of pharmacist prescribing. Hence, interview participants considered organisational support a key factor in their implementation of prescribing practice.

C. Organisational support

Strategic policies and priorities of NHS Trusts, Health Boards and GP practices were described by interviewees as having direct bearings on the administration and logistics of pharmacist prescribing services. Interview participants emphasised the issue of funding the prescribing activities of pharmacists. Some expressed concern about the workability of prescribing in community pharmacies, considering the apparent lack of budgetary provisions in that sector.

"… well it is not my problem but I really wonder and worry how pharmacists who are trying to do prescribing in a community pharmacy setting manage, because they don't have a budget I mean I worked in the community pharmacy myself and I can't see how it would work, you would have to have amazing set up with PCTs or surgeries or something that you would be allowed to prescribe for people"

(Interviewee 20 - Female, thirty-five years experience as a pharmacist, prescribing for chronic kidney disease in a GP practice over three years)

In addition, those in the community pharmacy setting felt that existing funding mechanisms for prescribing services did not include any financial benefits to community pharmacy businesses.

"I think the funding stream is still a bit of a problem; you know we don't really get anything to drive pharmacy businesses to do it ... Very often, pharmacist prescribers would be doing stuff in the doctor's surgery which makes QOF points for the surgery and extend remuneration for that surgery; but the only way of getting that remuneration for our own businesses is to try and negotiate with the surgeries ... so I think some sort of directive that when a pharmacist is into partnership with a surgery then there is some sort of sharing of the funding that the partnership generates ..."

(Interviewee 7- Male, nine years experience as a pharmacist in Scotland, prescribing in a GP surgery and running a smoking cessation service in community pharmacy over four years)

Funding and budgetary issues were not however, restricted to the community pharmacy setting. Interview participants from all practice settings narrated experiences of funding limitations in their organisations. Funding problems were described in relation to administrative and logistic problems as explained above. On a personal note, pharmacist prescribers felt strongly that they were not adequately compensated financially, despite having to deal with increased costs of indemnity insurance and registration with the professional regulatory body.

"...basically we need additional funding from the GP practice or within the NHS department to fund that extra, because I am not going to come for half a day and have to pay child care etcetera with no payment. Unfortunately we have to be practical."

(Interviewee 21- Female, twelve years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

"... if the organisation, the NHS were willing to pay the indemnity insurance to support people to take on the extra role, then obviously I would be happy to take on prescribing independently; but because you would actually get worse off having to pay more insurance, then it is not worth my personal while to do that ..."

(Interviewee 6- Female, ten years experience as a pharmacist in Scotland, prescribes for hypertension in a GP practice over three years)

Interview participants also perceived that organisations could support implementation of prescribing by formulating clear frameworks of career progression for pharmacist prescribers. For example, respondents based in hospitals and GP practices suggested a banded structure for pharmacist prescribers, depending on their skills and experience, up to the consultant grade.

"I suppose it is the pay structure really, I don't think it is particularly clear. I would probably go through all that training and not actually see any benefits, I mean we are not just doing it for money but it would be quite nice to think that you are sort of being paid according to skills … Well, yeah just sort of being able to say you expect to be a grade whatever as supplementary then, I mean similar to those of the GP system … just to have like a ladder where you are sort of aiming, and you are ultimately paid according to your expertise and obviously the extra work you have to put in to get there really."

(Interviewee 31 - Female, twenty-four years experience as a pharmacist, prescribing for neurology and cardiovascular conditions in hospital and GP practice settings over three years)

Although administrative and logistic difficulties were described by pharmacist prescribers in all settings, they frequently noted many of the issues were surmounted as more pharmacists engaged in prescribing practice. Consistent engagement in prescribing practice was therefore mentioned as one of the key factors associated with the implementation of prescribing.

4.5.2.2 Frequent patient contact for prescribing activities

Frequent patient contact was regarded by interview participants as essential in developing prescribing competence and confidence. Respondents frequently alluded to the idea that 'practice makes perfect'. Therefore, they identified space for patient consultation as one of the essential structures that facilitated prescribing practice.

> *"The fact that the clinic is running regularly, I think has made the thing sort of successful. I do know of colleagues who had problems getting rooms, had problems getting space you know, had problems with support and all the rest of it …"*

(Interviewee 31 - Female, twenty-four years experience as a pharmacist, prescribing for neurology and cardiovascular conditions in hospital and GP practice settings over three years)

Availability of dedicated space and regular scheduled times for patient consultation facilitated continuity of care in pharmacist prescribing. In those circumstances, pharmacist prescribers follow up patients in the long term; and regular contact with the same group of patients allows them to develop competence, before gradually expanding the role.

> *"... if you are not examining patients on a regular basis you quickly lose the skills, you lose your confidence. It is better to focus on a small suite care and do a lot of it regularly and gradually expand the role"*

(Interviewee 17- Male, sixteen years experience as pharmacist in England, prescribing in hospital chronic renal failure over one year)

Some participants contrasted regular prescribing sessions with their experiences in the early periods of prescribing practice, which they described as 'ad hoc'. Prescribing services were said to be organised, and managed in a

manner that did not permit appropriate follow-up of patients. Appointments were often inconvenient for patients, who had to make multiple visits to different prescribers. Similarly, those participants who worked part-time, or who were in rotational posts, perceived that irregular working practices had negative impact on their prescribing practices. Prescribing sessions had to be arranged around the prescribers' schedules which were not always convenient for patients, and that often caused them to miss appointments.

> *"… The referrals to the clinic initially were a bit inappropriate, so that was an issue with the clinic set up, and patients were not that keen to come, certainly in the early days not keen to come to an additional clinic."*

(Interviewee 17- Male, sixteen years experience as pharmacist in England, prescribing in hospital chronic renal failure over one year)

> *"... the negative side of things is that patients get frustrated that they have to see the doctor for one issue, then they have to see me for the review and they have to see the nurse for the bloods so you do get occasional patients who are frustrated that they have to attend three things rather than one but that is more of an admin issue rather than you know …"*

(Interviewee 14- Male, twenty-one years experience as a pharmacist in England, prescribing for hypertension in a GP practice over four years)

The importance of a practice environment that is conducive for consistent patient contact was highlighted by a participant that prescribed within the prison setting. This participant attributed success in prescribing practice to the fact that all the necessary support structures were accessible, and that patients always turned up to the prescribing sessions.

> *"Well because it is a prison, the patients always turn up, they are here, so they are just brought across by the officer and the doctors are here, the medical notes are here, everything is here and I can get access to everything I want. I can get a room to hold the clinic in..., there is nothing really that I need because everything is here at the moment, so this is perfect ..."*

(Interviewee 11- Female, twenty-one years experience as a pharmacist in Scotland, prescribing for asthma in a prison setting over one year)

4.5.2.3 Regulatory issues

The requirement for using clinical management plan (CMP) in supplementary prescribing was frequently mentioned as a critical factor associated with the

implementation of prescribing. The CMP which is meant to provide a safeguard for non medical prescribers requires that the pharmacist obtains written agreements for a named patient, and include disease conditions and rugs to be used in managing the condition (see Chapter 1). Some participants were of the view that CMPs were impractical and cumbersome, particularly for managing categories of patients like those admitted in acute hospital settings. In particular there were issues raised about getting the required agreement from all parties. Such statutory requirements for the CMP often lead to delays in the process of prescribing and drug administration.

> *"The biggest barrier, the biggest problem I have with the work that I do is still with controlled drugs (CDs), how I can only prescribe them through supplementary prescribing arrangement. I am confident and competent to deal with controlled drugs, but I still have to go through the process of being a supplementary prescriber ... I suppose one of the issues raised is that it makes the response time between seeing a patient and getting his methadone prescription longer. If I didn't have to do that..., I am supposed to get the guy or the girl the treatment a lot quicker than I can at the moment, because it necessitates me having a discussion with my clinical supervisor and agreeing on the CMP"*

(Interviewee 2- Male, nineteen years experience as a pharmacist in England, prescribing for drug dependence in a drugs misuse clinic over three years)

Although independent prescribing does not require the use of CMPs, the prescribing of controlled drugs (CDs) by pharmacists still has to be done using CMPs as described in Chapter 1 under supplementary prescribing. CMPs entail pharmacist prescribers agreeing with doctors and patients in writing, individual therapeutic plans covering specific disease conditions and the drugs or classes of drugs to be used (16). Consequently, pharmacists whose practice involved the prescription of CDs, including those using CDs for the management of pain, regretted the limitations imposed on their practice as a result of these regulatory issues.

> *"It is difficult getting clinical management plans individually signed off for the patients; and it is also hard to explain to a patient and the medics, that yes I can prescribe this, this and this; but I am afraid those (controlled drugs) can only be prescribed by yourself, or we have to have a clinical management plan ..."*

(Interviewee 26- Female, fourteen years experience as a pharmacist in England, prescribing for cardiovascular conditions and elderly care review in a GP practice over three years)

Many participants were, however, optimistic that restrictions on independent prescribing of controlled drugs would soon be removed. They also expressed the opinion that it was more appropriate for CDs to be prescribed by pharmacists, because their professional training gives them better knowledge about drugs than nurses. Some described past experiences in which their expertise was applied successfully to manage patients with CDs.

> *"... four years ago I ran a benzodiazepine reduction clinic where I saw patients and got them off mainly nitrazepam, temazepam and lorazepam; doing all the prescribing and seeing the patients on a monthly basis and gradually weaning them off. The patients had nearly 50% success rate which is excellent …"*
>
> (Interviewee 29- Male, thirty-nine years experience as a pharmacist in England, prescribing for hypertension and hyper-lipidemia in a GP practice over one year)

Apart from regulatory issues, interview participants narrated challenges related to an apparent lack of clarity in the prescribing role of pharmacists.

4.5.2.4 Lack of clarity in the pharmacist prescribing role

It was apparent throughout the interviews that some features of pharmacist prescribing were unclear to different stakeholders in the prescribing process. Interview participants perceived that lack of clarity resulted in confusion that undermined the smooth running of pharmacist prescribing services.

A. Lack of clarity among pharmacist prescribers

Some interview participants appeared not to be very clear about their own prescribing roles. This was conveyed in the way they described their prescribing roles relative to that of nurses. They frequently narrated experiences of competition between practitioners of the two professions, resulting from a lack of clear distinction in their roles. Pharmacist prescribers felt they lost out on many prescribing opportunities because nurses provided the same services at cheaper rates.

> *"I did have issues with one particular nurse in one particular practice who made things very difficult because she had never heard of the concept of pharmacists coming in to prescribe, and she saw it as a threat and this really made it difficult ..."*

(Interviewee 31 - Female, twenty-four years experience as a pharmacist, prescribing for neurology and cardiovascular conditions in hospital and GP practice settings over three years)

Some respondents compared their consultation styles with those of nurses and GPs in a sense that portrayed each of the health professions had the same objectives in prescribing.

"...the practice that I work in has three nurses to deliver a range of clinics; hypertension clinics, diabetic clinics things like that so it is important that I don't duplicate their work but that I work in conjunction with them so it took a little time to work out what was the best role for me..."

(Interviewee 9- Female, twelve years experience as a pharmacist in Scotland, prescribing for cardiovascular conditions in a GP setting and runs a pilot project managing minor infections in a community pharmacy, over three years as a prescriber)

"Effectively, we could do what nurses are doing, run asthma clinics for GPs, run diabetes clinics for them, run pain clinics and hypertension clinics, COPD clinics..., so yes I think pharmacist and nurse prescribers are interchangeable. For those pharmacists who have actually made the attempt to go and do the extra courses I think they are interchangeable..."

(Interviewee 16- Female, twenty five-years experience as a pharmacist in England, qualified as a prescriber in diabetes over two years, practised in community pharmacy and academia but not prescribing)

Similarly, interview participants based in the hospital setting, introduced the argument that the prescribing role of pharmacists could potentially deskill junior doctors. What emerged from this argument seemed to suggest that pharmacist prescribers and the junior doctors performed the same roles in the prescribing of medicines.

"We were very aware on the in-patient side in the ward that the junior doctors might then say oh we have got pharmacists prescribers we don't have to do certain things..."

(Interview 12- Female, twenty four years experience as a pharmacist prescribing for HIV in a hospital over three years)

"I think the only negative is that junior doctors become a bit deskilled; and because we don't provide a service seven days a week, so when they are left to themselves at the weekend I think they become…, it creates a bit of a risk … and in future that might become even more difficult for them"

(Interviewee 3- Female, Twenty-six years experience as a pharmacist in England, prescribing in renal impairment in a hospital over three years)

The apparent confusion around the prescribing role of pharmacists manifested in the divergent views about the scope of conditions they can manage. The predominant view among interview participants was that pharmacist prescribers' main expertise related to the management of multiple co-morbidities. Participants with this view suggested that pharmacist prescribers had no useful role in the management of 'simple' and 'straight forward' conditions. They preferred instead, that nurses were left to handle those simple conditions; and pharmacists could then apply their expertise and skills in managing patients who need multiple drugs for co-morbidities.

> *"I don't think we necessarily have a role to play, prescribing in mono disease areas for example asthma, infections, family planning and that kind of thing. I think those are the kind of things a nurse prescriber can deal with. I think the only areas within general practices that the pharmacist has the advantage is in long-term conditions and multiple co-morbidities. Cardiovascular disease is the most common one, a lot of the cardiovascular diseases overlap, and what you need is quite a good pharmacological knowledge of different agents in terms of their interactions and certainly adverse reactions will occur if you are prescribing multiple agents for different conditions. I think that goes well beyond what a nurse can manage in a prescribing clinic."*

(Interviewee 18- Male, thirteen years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

On the contrary, others felt the complexities of co-morbidities presented a challenge to pharmacist independent prescribers. This category of respondents preferred that pharmacists managed what they described as 'simple' and 'uncomplicated' cases.

> *"I mean I have never gone through independent because I have problems with the issues of co-morbidities, and I think people did and did not feel confident prescribing for co-morbidities ..."*

(Interviewee 5- Female thirty-three years experience as a pharmacist in Scotland, PCT prescribing advisor, registered as prescriber over five years, prescribed for a while in a GP practice but had to stop)

B. Lack of clarity among other health professionals

Interview participants described lack of understanding and clarity of pharmacists' prescribing role among other health care professionals, especially doctors and nurses. They perceived that lack of understanding lead to

antagonism and resistance to pharmacists implementing prescribing. Some narrated experiences where doctors or nurses felt threatened by pharmacists prescribing. One participant, who was not using the prescribing qualification, explained that it was because her GP colleagues were not happy about the prescribing role of pharmacists. This participant reported that some GPs regarded pharmacist prescribers as 'half-baked doctors'. Indeed, other participants repeatedly mentioned that some doctors perceived pharmacist prescribers as 'second grade' alternatives to themselves. Some interview participants narrated stories of personal encounters with doctors, in which the doctors expressed the view that pharmacist prescribing, had an underlying Government agenda to replace GPs with pharmacist prescribers as cheaper alternatives.

> *"... biggest problem the biggest barrier we have is a lack of understanding of what role the pharmacist would play when they prescribe. There is very little clarity on the part of GPs' understanding ... There is a lot of myth and untruths about what pharmacist prescribing is all about because they think there is an underlying government agenda … one GP said to me 'there is an underlying government agenda to take our work from us so that they can cut down on the number of GPs ..."*

(Interviewee 16- Female, twenty five-years experience as a pharmacist in England, qualified as a prescriber in diabetes over two years, practised in community pharmacy and academia but not prescribing)

Some interview participants described how institutions implemented pharmacist prescribing policy, portraying lack of understanding on the part of managers and administrators. Some hospital administrators applied the same criteria for implementing nurse and pharmacist prescribing, without considering the peculiarities of the two professions.

> *"... The way that hospitals have implemented non medical prescribing (NMP) for nurses is to come up with a personal formulary, and they can only prescribe from that list of medicines. Hospitals try to implement pharmacist prescribing in the same way. If you look at the way nurse prescribing is implemented, they usually work within a specialty, so it might be a diabetic nurse, for example, or heart failure nurse; they are going to be quite specific about the list of medicines they want to prescribe for their patients. However, if you look at that role of pharmacist prescribing the patient's usual medicines on admission, that is quite a wide range of medicines that could be prescribed; so it would be difficult to come up with a personal formulary that would allow you to do that."*

(Interviewee 34- Male, ten years experience as a pharmacist in England, qualified as prescriber in a hospital for more than one year but was not prescribing)

C. Lack of clarity among patients and the general public

Interview participants emphasised the importance of patients' awareness and understanding of the prescribing role of pharmacists. Some were of the view that patient confidence in the prescribing process increased when they understood the role of the pharmacist prescriber. They even perceived that such awareness and understanding could translate into patient acceptance of, and adherence to, their medication. However, interview participants described their experiences of patients being surprised and having no expectations of being referred to a pharmacist prescriber. Some reported instances of patients initially being reluctant to discuss their medical issues. Some patients demonstrated confusion, referring to pharmacist prescribers as doctors.

> *"I think what has not worked well is that … you know some medical practices you have to find where you fit in within the health care team and sometimes patients can't understand why I should be discussing medical stuff with them ... They didn't understand why they should be talking to me, and some patients didn't want to discuss their issues with me because I am not a doctor ..."*

(Interviewee 14- Male, twenty-one years experience as a pharmacist in England, prescribing for hypertension in a GP practice over four years)

Some of the confusion appeared to be the consequence of the apparent inadequate understanding among other health care professionals of the pharmacist's prescribing role. Some interview participants narrated their experiences of other health care professionals inappropriately referring patients to them, even when the interventions needed were not those of a pharmacist.

> *"... we were involved with some of the prescribing around things like long acting reversible contraceptives, and these sort of jobs which were given to me by the surgery probably don't really sit well in the true spirit of supplementary prescribing or independent prescribing because I think they are almost minuscule tasks, or the clinic tended to be more about information and not really about prescribing"*

(Interviewee 7- Male, nine years experience as a pharmacist in Scotland, prescribing in a GP surgery and running a smoking cessation service in community pharmacy over four years)

The situation as described by some interview participants based in the hospital setting was that such inappropriate use of pharmacist prescribers' skills devalued the role.

> *"We need to get more pharmacists doing it, and doing it appropriately. I don't think we want pharmacists just writing up drug charts on the wards because you just end up working as a clerk"*

(Interviewee 30- Male, twenty years experience as a pharmacist in England, prescribing for rheumatology and dermatology in a hospital over three years)

On a positive note, it appeared that the lack of understanding of the prescribing role of pharmacists among stakeholders was a short-term challenge during the initial implementation of the pharmacist prescribing concept. Interview participants perceived that most of the problems of lack of understanding had been resolved with time and experience. In addition, pharmacist prescribers described some of the strategies they had adopted to overcome other challenges they faced in the implementation of prescribing.

> *"Yes initially it was lack of awareness from patients and the GPs. There was suspicion about what it was going to be, now that seems to have gone from my own practice because the GPs and the patients I work with all know me well"*

(Interviewee 23- Female, twenty-nine years experience as a pharmacist in Scotland, prescribing for asthma/COPD in a GP practice)

4.5.3 Strategies for successful prescribing practice

Pharmacist prescribers narrated their experiences of implementing prescribing, including steps taken to overcome some of the initial challenges. They described some general strategies they had adopted in their individual practices. For example, many of them said they capitalised on and maximised relevant stakeholder support for pharmacist prescribing. In addition, they had utilised every opportunity for consistent patient contact to improve their confidence. In other words, interview participants were of the opinion that overcoming the challenges of prescribing implementation required the systematic exploitation of the unique advantages of each practice environment. Pharmacist prescribers expressed specific ideas, through the interviews, on how to overcome the challenges of prescribing implementation.

4.5.3.1 Identify or create niche areas for pharmacist prescribing

Identifying or creating niche areas was proffered by pharmacist prescribers as a strategy for overcoming the challenges of prescribing implementation. Essentially, they identified gaps in existing practices around the prescribing of medicines, and presented pharmacist prescribing to fill such gaps. Practice areas, such as travel medicine and supervised consumption of methadone, were described by interview participants as under-developed or neglected. They perceived that GPs had little interest in those areas hence pharmacists could easily be supported to prescribe for those conditions.

> *"One of the reasons that I get some support in what I do at the moment is the fact that a lot of the surgeries don't really want to have the drug users accessing the surgery as much as they do ..."*
>
> (Interviewee 10- Female, twenty-five years experience as a pharmacist in England, running a supervised drugs consumption/travel clinic in a community pharmacy over two years)

Beyond the neglected areas however, interview participants frequently identified niche areas in mainstream patient care that related to pharmacists' expertise in medicines and medicines management. For example, many pharmacist prescribers identified sub-optimal management of chronic conditions in oncology and cardiovascular medicine, as potential gaps that could benefit from their intervention. They said such opportunities enabled them to apply their specialist knowledge of medicines to deal with complex medication issues.

> *"... Right across the board (Health Board) we have got people who are saying why should we employ or train up a pharmacist prescriber as opposed to a clinical nurse specialist? Well if you pick up the right disease area then there is no reason why a pharmacist shouldn't be more comfortable with the complexity of the drugs that are being prescribed well and beyond the nurse."*
>
> (Interviewee 17- Male, sixteen years experience as pharmacist in England, prescribing in hospital chronic renal failure over one year)

Identifying these gaps involved negotiating the pharmacist's prescribing role with key stakeholders concerned with the management of patients. Interview participants noted that, finding niche areas fostered understanding among health care professionals of the role of pharmacists in prescribing. Improved understanding was achieved because prescribing services were established

based on the local needs of the population, rather than the personal preferences of pharmacist prescribers.

> *"It was by first of all whether there is worth for it? I chatted up the lead consultant based on what I saw as the problem, these were the possible solutions and then we worked from it, we asked the other consultants and they said yeah, we see this as team work where we fit in, and that was how we got a good team in place"*

(Interview 30- Male, twenty years experience as a pharmacist, prescribing for rheumatology and dermatology in a hospital over three years)

> *"If you run your small local pharmacy, there are certain services you won't offer because you can't manage it or there is no need for that service. You know, not everywhere has methadone consumption because there may not be methadone addicts you know, so it is really ..."*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

It was the view of interview participants that identifying gaps in practice ensured they channelled their training and skills appropriately. However, interview participants felt that identifying gaps was not enough. They advocated active promotion of pharmacist prescribing practice by individuals and organisations.

4.5.3.2 Promote pharmacist prescribing activities

Interview participants appeared critical of their own prescribing practices, noting that they had not adequately promoted the service. They made comments suggesting that health care professionals, patients and the general public were not taking full advantage of pharmacist prescribing, mainly because they were not aware that such services existed. Consequently, it emerged from the interviews that a useful strategy to enhance pharmacist prescribing practice, needed to involve programs targeted at creating awareness about the role. Interview participants felt that individual pharmacists should advertise their prescribing practice, by talking about it to health professionals and patients.

> *"... make sure everybody knows that you are doing it, why you are doing it and then you get lots of referrals so that you are getting to be properly used in the right way and also let people know how you are doing because I don't think I am very good at that, I am just kind of working away in my clinic, I am not kind of advertising it, but I need to probably advertise that I am doing it more"*
>
> (Interviewee 11- Female, twenty-one years experience as a pharmacist in Scotland, prescribing for asthma in a prison setting over one year)

Promoting pharmacist prescribing was described as pointing out the benefits and unique advantages of pharmacists in managing patient medication. This involved talking to relevant stakeholders, such as consultant physicians, GPs and representatives of patient groups, producing a multiplier effect as the stakeholders then promoted pharmacists prescribing services in their respective organisations.

> *"I think this is the same issue that affects pharmacy in general; it is about promoting what we are good at, and what benefits we bring above and beyond other professionals and thereby showing that pharmacists are safe prescribers. We are still probably not very good at that in terms of promoting what we are good at.... I am as guilty as any one in terms of promoting what we do and...we owe a duty to ourselves to promote our practice and not just within pharmacy circles I think we need to promote it wide…, yeah so as a renal pharmacist I think we should promote it to nephrologists rather than to pharmacy groups so that they get the message that it is a good thing and then they are more inclined to go back and promote it in their own centres."*
>
> (Interviewee 17- Male, sixteen years experience as pharmacist in England, prescribing in hospital chronic renal failure over one year)

Apart from individuals promoting their prescribing practices, interview participants shared the view that a multilevel approach involving the Government, PCTs, Health Boards and the Royal Pharmaceutical Society (RPS) was required. The interviews emphasised the role of these organisations in developing effective strategies to put pharmacist prescribing on top of the health services agenda. Some were of the view that the government should commission the evaluation of pharmacist prescribing in more sites, in order to demonstrate the beneficial outcomes of implementation. Similarly, interview participants felt that the new professional body for pharmacists (RPS) should employ every available means at their disposal to make sure the patients and the general public were made aware that pharmacists could prescribe. On the

contrary, pharmacist prescribers perceived that the government, NHS trusts, and the RPS had often not done enough to make the public aware of pharmacist-led services, such as prescribing and the minor ailment scheme.

> *"The profession is not exactly advertising itself; for example the minor ailment service started in Scotland five years ago; it was not publicised whereas as a national contract all pharmacies are providing it, therefore, everybody should be talking about this change… therefore, it should be made well-known and well-publicised by the Scottish Government, by the Scottish professional board, by the new professional body that this is something that the pharmacist can do"*

(Interviewee 25- Female, thirteen years experience as a pharmacist in Scotland, prescribing for diabetes in a GP practice over two years)

4.5.3.3 Increase uptake of prescribing by pharmacists

It emerged from the interviews that increasing the number of pharmacist prescribers would enhance the implementation of prescribing services. Some perceived that higher numbers of prescribing pharmacists would establish this as a routine and expected role of pharmacists. Participants who held this view believed that once pharmacist prescribing became common place, funding for services would be more likely. They thought that pharmacists in all settings needed to train as prescribers.

> *"We need to get more pharmacists doing it; if it becomes the norm then it becomes part of the accepted job that if you are a pharmacist you will be doing a certain amount of clinic work including prescribing and things like that. That is just like once when pharmacists were not accepted in the wards and now it is part of the job for pharmacists to be in the wards*

(Interviewee 30- Male, twenty years experience as a pharmacist in England, prescribing for rheumatology and dermatology in a hospital over three years)

In addition, participants observed that increasing the number of pharmacist prescribers was likely to counter the negative impact created by lack of understanding, as more health care professionals experienced pharmacist prescribing first hand. Interview participants narrated their own experiences whereby sceptical GPs and other health care professionals gradually developed confidence in pharmacists, once they demonstrated competence in prescribing.

> *"I think doctors need to not be threatened by it (pharmacist prescribing), I think if we roll out the prescribing and it is becoming common practice, then those concerns by the medics will dissipate. I know there were concerns in my area by medics about doing prescribing as pharmacists but actually once it was in practice they were happy to support it"*
>
> (Interviewee 13- Female, twenty-two years experience as a pharmacist in England, prescribing for cancer in a hospital, more than three years as a prescriber)

Importantly, interview participants emphasised that increased number of pharmacist prescribers also meant increased opportunities for networking and peer support.

> *"I supposed it would be easier if there were more opportunities for networking and finding other people who worked within some more areas ... and possibly sharing the knowledge would be useful"*
>
> (Interviewee 9- Female, twelve years experience as a pharmacist in Scotland, prescribing for cardiovascular conditions in a GP setting and runs a pilot project managing minor infections in a community pharmacy, over three years as a prescriber)

However, interview participants also pointed out some possible negative consequences of increasing the number of pharmacist prescribers. They made reference to the high proportion of pharmacists who were qualified, but were not using the qualification in practice.

> *"I think we have made the same mistakes that nurses made originally because every one was allowed to train without necessarily a prescribing role at the end of it so we have exactly the same situation; we have a whole list of prescribers who aren't actually prescribing which I think is a real waste of resource, I think that is a problem that we have got too many who aren't working, so they have probably paid for training without having anything at the end of it ..."*
>
> (Interviewee 8- Female, eleven years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over four years)

4.5.3.4 Agree formal prescribing roles and boundaries

Definite agreements between pharmacist prescribers on one hand, and GP practices or NHS trusts on the other about prescribing roles, was described as a key element of successful prescribing practice. Interview participants felt that such agreements set out in concrete terms boundaries and scope of prescribing activities to be implemented by pharmacists. They emphasised the need for pharmacists to develop clear plans for prescribing practice, prior to obtaining

the prescribing qualification. Participants said that such plans should include firm commitments from employers that they would use the prescribing skills of pharmacists in their organisations.

> *"... Get an agreement with your Health Board or the GP surgery that you can actually run the clinic and have a clinic up and running once you are finished. I really do think you have to have a clear plan of what they want to do at the end of it"*

(Interview 32- Male, thirty years experience as a pharmacist prescribing anticoagulants in community pharmacy over three years)

> *"I think it would be more a case of making sure there was a firm agreement before they came into the course so that the mentor who is training them is actually going to commit to using their service. This is six months very hard course and if their skills are not being used it is a lot of money being wasted and a lot of time being wasted training up people that are not using their skills ..."*

(Interview 16- Female, twenty-five years experience as a pharmacist, qualified as a prescriber in diabetes over two years, practised in community pharmacy and academia but not prescribing)

Interview participants perceived that agreeing formal roles and setting clear boundaries enhanced the implementation of pharmacist prescribing by fostering understanding of pharmacists' contribution in the prescribing process. This they said minimised unnecessary inter-professional tensions about role encroachment. Similarly, participants thought it was necessary to agree how pharmacists' prescribing services were covered during holidays, and other periods of absences. Some pharmacist prescribers used the idea of the CMP to agree their prescribing roles and boundaries with their employers, notwithstanding that they were independent prescribers. In their view, written agreements provided them with a means of keeping prescribing audit trails.

> *"You have to have, whether you are independent or supplementary, a clinical management plan. I know legally, you don't need one, but I think you are very foolish if you don't have one because it sets out what you are doing, what drugs you are going to be prescribing; you know, I don't put specific drugs I put the BNF chapters ... I just have a generic CMP for each group of patients"*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

Interview participants proffered solutions to lack of clarity in the prescribing role of pharmacists. They defined what they considered ideal prescribing role of pharmacist prescribers in their individual practices; and for the pharmacy profession in general. These descriptions are presented in the next section.

4.5.4 Clarifying the role of pharmacists and developments in prescribing practice

It emerged from the interviews that a clear prescribing role was necessary for a successful implementation of prescribing. Participants commonly described two types of ideal as they attempted to define what they considered a clear prescribing role of pharmacists. First, they described ideal structures for implementation of prescribing. In this regard, they raised issues related to the setting and facilities that supported optimal pharmacist prescribing practice. Secondly, they described the ideal functions of pharmacist prescribers in relation to those of other health care professionals involved in the prescribing process, such as clinical examination, diagnosis and dispensing. The issues raised appear to repeat the factors associated with prescribing (section 4.5.2). However, in this case, participants described what they perceived as ideal and not actual experiences of prescribing implementation.

4.5.4.1 Ideal structures for pharmacist prescribing

The environment, facilities and structural influences of different settings on the implementation of prescribing were described by pharmacist prescribers. As a result, many interview participants were of the opinion that the GP practice and hospital settings were ideal for implementing pharmacist prescribing. This view was corroborated largely by interview participants based in community pharmacy setting, but who were prescribing in GP practices.

> *"If I could access patient records from the shop on my computer, you know, a separate computer system; then life would just be a breeze quite frankly ... So I want a computer in my consultation room in the shop that I can just switch on and, up comes the records and it would be just like prescribing in the surgery which is what I do with some of the clinics, and it is just like being a doctor or a nurse or whoever works in the surgery it is so much easier ..."*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

The perceived suitability of hospitals for implementing prescribing was highlighted by the case of a pharmacist who had a clinical role, and was writing prescriptions for doctors to sign (prescribing by proxy) before qualifying as a prescriber. The same individual qualified as a prescriber, then moved to a community pharmacy setting and never got the opportunity to prescribe. Interestingly, some participants based in GP practices and hospitals perceived their community pharmacy colleagues as less suitable prescribers, doubting their clinical abilities. They also cited the pressure on community pharmacists' time, which they perceived impeded their capacity to prescribe.

> *"I think at the moment community pharmacy is the place where we would want to see pharmacist prescribing occurring. I don't think they have got the attitude to be able to reflect, I don't think they have got the time and sometimes I don't think they have got the clinical knowledge to be able to manage these patients so I think at the moment prescribing can only be in secondary care. When I talk about secondary care I am not talking about prescribing on the wards I am talking about prescribing in outpatient clinics"*
>
> (Interviewee 18- Male, thirteen years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

It was recognised that even within the hospital setting, prescribing was more suitable in out-patient clinics because of the nature of acute cases presented in the wards. Also, the unique advantages of the community pharmacy setting were highlighted in section 4.5.2. Therefore, it became obvious from the interviews that no single approach was suitable for implementing pharmacist prescribing in all settings.

4.5.4.2 Ideal prescribing roles of pharmacists

Pharmacist prescribers were almost unanimous in stating that their role was not in diagnosis, even when they practised independent prescribing. Rather, interview participants considered their ideal role in prescribing as one of partnership with doctors. They thought that doctors should ideally concentrate on diagnosis, while pharmacist prescribers handle prescribing. They noted that pharmacist prescribers possess extensive professional expertise on medicines. Hence, they held the view that pharmacists took a more holistic approach to the management of patients' use of medicines.

> *"... doctors spend four, five, six, seven, eight, nine, ten years learning to diagnose patients appropriately, we spend five years learning how to use medications so GPs and doctors in general have an expertise and a skill in that area and we have a skill in actually prescribing medication ..."*

(Interviewee 18- Male, thirteen years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

> *"I think that it should be the norm that doctors diagnose and pharmacists prescribe..., we (pharmacists) are the experts in medicines, and we do a really good job prescribing medicines, knowing all about medicines I think that should be recognise., If we are the experts in medicines then surely we are the experts that would know what medicine is best to treat what particular condition"*

(Interviewee 19- Female, eleven years experience as a pharmacist in Scotland, prescribing for a smoking cessation service in a community pharmacy over three years)

Participants clarified the difference in roles of the health professions involved in the prescribing process. This is in contrast to what was described earlier about the perceived competition and role encroachment by health professionals in prescribing. They emphasised that a prescribing role for pharmacists was not about encroaching the boundaries of doctors or nurses. Instead, it was about utilising the best potential of pharmacists. They pointed out the role of doctors as supervisors of the health team, whose specialty was diagnosis. They noted the clinical skills of nurses in physical examination, taking samples, providing lifestyle advice, general treatment, and prescribing within protocols for single disease states. Pharmacist prescribers' skills were perceived as the management of patients with chronic conditions and multiple co-morbidities based on pharmacists' extensive knowledge of pharmacology, pharmacokinetics, drug interactions and adverse effects.

> *"Well every profession has its strengths isn't it? So to me a GP should be defining what is wrong with a patient and that should be their main role; to assess the patient and say right: Mrs Smith definitely has got this and Mrs Smith has definitely got that or whatever and deal with more complicated patients. So I think the doctor is dealing much more with the acute, seriously acute not over-the-counter acute; and the nurses fit in there as well, because they are far better at examination skills than we are, they are more hands on so they are doing the treatments, the dressings, the bloods all those sorts of things. Pharmacists are definitely better at medication and prescribing and pharmacists are trained to deal with medication."*

(Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

"Well, obviously we are not trained in our degree in diagnosis and that is something where pharmacists' competency may not be up to scratch so I think that in the area that I work, the patients are already diagnosed so it is really prescribing in a supportive care … so I think the doctors are in the best position for diagnosis, the pharmacist for prescribing and clinical examination either by the doctor or the nurse."

(Interviewee 13- Female, twenty-two years experience as a pharmacist in England, prescribing for cancer in a hospital, more than three years as a prescriber)

Interview participants made comments to shed light on the frequent comparison among GPs, pharmacist and nurse prescribers. They noted that differences in pay scales meant that nurse prescribers would always be cheaper than pharmacist prescribers. However, they emphasised the relative advantage of each profession, and that it was potentially more cost effective to exploit the strengths of the professions for some prescribing services more than others. For example, hospital-based participants thought that the follow-up of patients with chronic conditions in out-patient clinics was more cost effective if led by pharmacist prescribers than registrars or consultants. Registrars and consultants could concentrate on new cases while discharging chronic patients to pharmacist care. Similarly, some noted that annual reviews of patients, which mostly involved lifestyle recommendations and advice, was more cost effective if performed by nurses than by pharmacists. In other words, interviewees were of the opinion that each profession should recognise unique strengths and refer patients appropriately.

"I think the ideal prescribing role for pharmacists is in managing long term stable conditions. It seems to be waste of resources having highly trained senior consultants do it, when pharmacists can do it to help the financial situation. I also think there is a role for pharmacists in patients that are not necessarily stable, but where the problem is actually drug-related, or because it is a difficult drug like anticoagulant clinics, or diabetic clinics where it is very drug-focused. I think there is a real future for pharmacist prescribers there."

(Interviewee 12- Female, twenty-four years experience as a pharmacist in England, prescribing for HIV in a hospital over three years)

> *"...let us say we have a patient who has been on the same antihypertensive treatment for a couple of years, the blood pressure has always been round about let us say 130/80 and let us say there is no change, this is cheaper to have the nurse do the six-monthly reviews than for the pharmacist to do the six-monthly reviews because of the differences in pay scale. If it is only a matter of checking blood pressure, then a health care assistant can do it cheaper than the nurse and then if they aren't satisfied they refer up from there to the next in line"*

(Interviewee 29- Male, thirty-nine years experience as a pharmacist in England, prescribing for hypertension and hyper-lipidemia in a GP practice over one year)

Interview participants identified roles in which pharmacist prescribers performed functions related to, but distinct from, those of other health care professionals, including non-prescribing pharmacists. They described such functions to include acting within the multi-disciplinary health team as experts on the use of medicines or "drug clinicians" as some of them put it.

> *"I think pharmacists have that side which is where I am going, that is they become..., if you like drug clinicians ..."*

(Interviewee 4- Female, eleven years experience as a pharmacist in Scotland, prescribing for respiratory diseases in a GP surgery over three years)

Interview participants were of the opinion that these specialist roles should be developed, and pharmacists could delegate routine dispensing to checking technicians.

4.5.4.3 Developments in pharmacist prescribing

Prescribers discussed the future of prescribing in terms of their individual priorities and expectations. They all expressed a desire to further develop prescribing services. Many had undertaken further training post-prescribing qualification and acquired additional skills to allow expansion of prescribing services. Expansion for some, related to new therapeutic areas, while others wanted to expand prescribing in the areas they were currently managing. All participants emphasised different aspects of prescribing implementation that they considered the most important, by prioritising what they felt as key advice for new pharmacist prescribers. Issues perceived as crucial in the development of pharmacist prescribing are presented in this section under the themes of training, safety, and benefits of pharmacist prescribing.

A. Training

The training of pharmacists to prescribe was explored as one of the key developments likely to shape the implementation of prescribing by pharmacists in GB. The main issues raised by interview participants related to the structure and content of the prescribing course; and possible integration of the prescribing course into the undergraduate pharmacy curriculum.

i. Issues with the current training of pharmacist prescribers

Many expressed reservations about the current training for pharmacist prescribers; they observed that the training lacks sufficient diagnostic components. This was despite them consistently holding that it was not the role of the pharmacist prescriber to diagnose patients. They also conveyed in the interviews perceptions that the course components relating to patient assessment skills were inadequate and needed to be reviewed, with emphasis on patient contact and hands-on experience.

> *"Well, I think perhaps a bit more in diagnosis would have been useful, I think we did one face-to-face session at X (university) and that was kind of it, although we may refer to the consultant or other people for final diagnosis … I mean we are diagnosing aren't we? Even in community pharmacies and stuff, you are giving your diagnosis on the features that are presented, so I think probably diagnosis would have been a bit … not be an expert but at least to have a bit more background information"*

(Interviewee 31 - Female, twenty-four years experience as a pharmacist, prescribing for neurology and cardiovascular conditions in hospital and GP practice settings over three years)

> *"I am not particularly impressed by the training for independent or the conversion for it that is why I have never done it because I don't think that it gives you the skills and the confidence in diagnosis. That is why … I don't feel that … I don't want to be an independent prescriber because ... I think you need a lot more experience and you can get it on the job but that is not monitored. GPs are not paid supervisors and therefore they don't arrange any training, it is very much a 'hit and miss' approach"*

(Interviewee 5- Female thirty-three years experience as a pharmacist in Scotland, PCT prescribing advisor, registered as prescriber over five years, prescribed for a while in a GP practice but had to stop)

An aspect to be reviewed was post-qualification training. They stressed that there were no specific continuing professional development (CPD) programmes targeting pharmacist prescribers. In addition, they felt that current procedures to demonstrate competence through CPD required extensive documentation and paperwork. This, they claimed, was cumbersome and failed to accurately assess the prescribing competence of individuals.

> *"Pharmacist prescribing is strictly controlled with CPD and maintaining it. Unfortunately, you have got to prove that you have done it rather than just … well, before, I would just put down the number of hours, but now you have to give more details … it is going to make it harder as the years go by … when you have been prescribing for a while, when you have been doing medication reviews for ten years in a GP practice then I would be more competent to prescribe, more than my competence actually reads. If there were ways that you could show your competence other than doing CPD, for example a system where you can have a GP mentor who says yes or no to a particular skill rather than having to go through the rigmarole of extending competence by producing paper work"*

(Interviewee 29- Male, thirty-nine years experience as a pharmacist in England, prescribing for hypertension and hyper-lipidemia in a GP practice over one year)

Similarly, interview participants expressed divergent opinions on the issue of incorporating prescribing training within the undergraduate curriculum, so that pharmacists could graduate as prescribers.

ii. Training of pharmacist prescribers in the undergraduate curriculum

Participants who supported the qualification of undergraduate pharmacy students as prescribers considered logistic benefits for pharmacists, especially community pharmacists, to access and attend training. In addition, this approach would resolve training funding issues, again particularly for community pharmacists. Resources released could be channelled to other areas of health care and prescribing provision. However, these participants were unsure of aspects such as impact on training course content and duration. There were also issues to consider around providing adequate patient contact and experience. Suggestions included covering the prescribing curriculum only during the undergraduate degree and undertaking the period of learning in practice post graduation.

> *"It would probably be better to do the prescribing training during the undergraduate degree course; because it seems an awful waste of all these people trained and not using it whereas if it was part of the degree course it would not be, you know the money could be used for other trainings...., Like I have done my undergraduate course and I did not have it and it was extra to go and do it …"*
>
> (Interviewee 33- Female, twenty-one years experience as a pharmacist in Scotland, initially prescribed for asthma in a prison as part of a contract arrangement between community pharmacy employers and the prison service; but is no longer prescribing)

The alternate opinion centred on the need for pharmacists to gain experience before venturing into prescribing. There were also those who felt training all pharmacists for prescribing could be a waste of resources since there would be those who would not or could not practise as prescribers.

> *"I think there should be some time, between qualifying and when you are allowed to do the prescribing course. I wouldn't like to see prescribing become part of the undergraduate degree course. I think you need experience as a pharmacist and experience in applying clinical knowledge and having clinical judgement because that is absolutely crucial when it comes to making prescribing decisions. Everything is not black and white, everything is not text book and fortunately we have a lot of guidance but still you need clinical judgement and I don't think when you come out of university first of all as a pharmacist, you necessarily have that level of judgement. You have a lot of knowledge but it is the ability to apply that knowledge to a situation*
>
> (Interviewee 21- Female, twelve years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

Interview participants emphasised the importance of pharmacists gaining practice experience for a few years, before they ever engage in actual prescribing. This is irrespective of whether or not the prescribing training was incorporated into the undergraduate curriculum.

> *"... I do think that it is a good idea to qualify, to do your pre-registration year and may be getting some practice under your belt before you rush off to do the prescribing ..."*
>
> (Interviewee 27- Female, thirty-two years experience as a pharmacist in Scotland, prescribing for cardiovascular and respiratory conditions in community pharmacy and GP practice over three years)

B. practice priority for pharmacist prescribers

Prescribers identified safety and quality of prescribing as key priorities. They emphasised a cautious approach to prescribing throughout the interviews. Many commented on the considerable time and effort they expended on double checking and confirming their decisions, especially when they were unsure about such decisions. Safety considerations were top on the list of advice participants had for new pharmacist prescribers. They reflected on the need for new pharmacist prescribers to be aware of their own competences and limitations. Some suggested supplementary prescribing as a starting point to develop their skills and confidence, before progressing to independent prescribing.

> *"Make sure that you know as much about the condition as possible, and get as much training as possible from a consultant, sit in his clinics, shadow him more ... I think it is very important that you are able to justify everything that you do and if you can't then that is the point where you need to know whether you should be referring."*
>
> (Interviewee 24- Male, forty-six years experience as a pharmacist in England, prescribing for diabetes and respiratory conditions within a GP practice over two years)

Similarly, pharmacist prescribers emphasised the need for continuous professional development (CPD) for safe and effective prescribing practice.

> *"I would like all pharmacists who are prescribing for patients to make an effort to keep up to date with the latest guidelines in their own area and the protocols for the practices they work with, and also to take it slow to begin with, get comfortable and don't be afraid to chat to the other health care workers … Prescribing is not something you can learn, it is not something you do one course and that is you. If you are not going to go to any follow-up sessions or peer review sessions things like that, then you should think twice about it, you can't just tick the box you have done prescribing course and then carry on ..."*
>
> (Interviewee 23- Female, twenty-nine years experience as a pharmacist in Scotland, prescribing for asthma/COPD in a GP practice)

The emphasis of interview participants on safety and quality assurance measures appeared to relate their practice behaviours with perceived benefits and outcomes of implementing pharmacist prescribing.

C. Benefits of pharmacist prescribing

Participants repeatedly described perceived benefits of their prescribing practice. Main benefits were categorised into patient benefits and professional benefits.

i. Patient-related benefits

One key benefit was optimal medicines management. Participants throughout commented that pharmacist prescribers applied in-depth knowledge and expertise on medicines to achieve specific outcomes for patients. These ranged from basic knowledge of appearance of medicines and medicine names, to more specialised outcomes related to pharmacist skills in the application of pharmacokinetics and pharmacodynamics.

> *"I mean if you look at most of the GPs doing a medication review, often they will click the button was everything else on the clinical system? Yes that is fine; medication review done? Yes, you know click the buttons. Whereas, I think pharmacists we are going into checking how they were taking it, any side-effects you know that level of interrogation didn't seem to go with most of the GPs that I was with, but I think we do a lot more of in-depth of medication…, well we do I am sure, medication questioning and…, you know I have picked up people who would start on a statin, take it for a month and then stop because they thought it was a one off course in their specific ailment, you know, people taking simvastatin in the morning and…, you know, really basic things that probably had gone on for so long without somebody pointing it out…."*
>
> (Interviewee 31 - Female, twenty-four years experience as a pharmacist, prescribing for neurology and cardiovascular conditions in hospital and GP practice settings over three years)

Participants noted that implementing prescribing by pharmacists granted patients quicker access to medicines. Participants based in the hospital setting, compared pharmacist prescribing with previous practices when they could only recommend and wait for doctors to prescribe. They perceived that in-patients got access to medicines quicker, and were less likely to miss any doses on admission.

> *"What happens at the moment is that patients would come in, they will have the medical clerking and part of that is the drug history but when pharmacists go to verify that, it is often wrong and that is not just in my hospital, but it is widely documented throughout the UK.*

> *So what we would usually do is that we will confirm their usual list medicines, write them in the notes then ask the doctor to prescribe them. So why not take out that step and ask the pharmacists to prescribe? You know they are competent, they want those medicines to be prescribed; why not do it themselves? Plus they are doing it quicker, they can deal with it more quickly and the patient is less likely to miss many doses."*
>
> (Interviewee 34- Male, ten years experience as a pharmacist in England, qualified as prescriber in a hospital for more than one year but was not prescribing)

Community pharmacy and GP practice-based prescribers interviewed thought also that patients gained quicker access to medicines, often without the need for GP appointments. GP practice-based pharmacist prescribers typically identified potential patients that could benefit from their prescribing. Community pharmacy-based prescribers highlighted the advantage for patients in terms of accessibility, particularly over the weekend.

> *"Normally patients are referred to me from nurses or doctors themselves where for instance, somebody's blood pressure is not on target or there are complex medication issues involved. They would like me to review those patients, and one or two patients actually phoned the surgery to say that, they gained a lot from my consultation, so they are seeing the value of pharmacists being part of the medical practice and the advantages that has for them because sometimes they have medication issues and rather than deal with the pharmacist and refer to the local community pharmacist they have got an expert on site."*
>
> (Interviewee 14- Male, twenty-one years experience as a pharmacist in England, prescribing for hypertension in a GP practice over four years)

Participants from all settings considered that pharmacist prescribing gave patients more choice in terms of the professional they consulted.

ii. Professional benefits

Interviewees identified professional benefits of pharmacist prescribing. They thought that pharmacist prescribing ensured that the most appropriate professional prescribed, allowing pharmacists to deal with complex medication issues and freeing other health care professionals to concentrate on their specialised roles.

> *"I suppose there would be a week where the GPs are seeing patients in parts of other clinics or the practice nurse takes patients as part of a chronic disease clinic you know like diabetic reviews, and if they discover that their blood pressure is not controlled they would refer them to me then I can take over the consultations and prescribing until they are stable, their conditions managed then I can discharge them back to the normal care with the GP; so it helps free up some of their time and it also gives patients a bit more time to go through their medication, and not just for the hypertension but for all the other medications as well."*

(Interviewee 6- Female, ten years experience as a pharmacist in Scotland, prescribes for hypertension in a GP practice over three years)

In addition, participants reported increased job satisfaction as prescribers, taking responsibility for selecting appropriate drug regimens. Many participants acknowledged that prescribing was difficult and involved a lot of hard work, but they often concluded that it was personally rewarding for them.

> *"I enjoy seeing the patients from diagnosis right through to managing their conditions, and being able to get their conditions under control and by having the responsibility to do that, writing prescriptions to control their conditions this gives me justification as a professional pharmacist"*

(Interviewee 15- Female, twenty-eight years experience as a pharmacist in England, prescribing for hypertension in a GP practice, over two years)

Participants recognised the value of teamwork and collaboration with other health care professionals.

> *"Within the practice that I work, nurses actually refer patients, where there is a cardiovascular issue they refer them through to me for assessment; then I have to manage them appropriately and likewise I would refer patients to the nurses if I thought there was a respiratory issue. Whereas, if I thought there were some other issues for example smoking cessation where there are experts in those areas that they would be referred appropriately …"*

(Interviewee 18- Male, thirteen years experience as a pharmacist in England, prescribing for cardiovascular conditions in a GP practice over three years)

4.6 Summary of qualitative findings

This study established that funding and administrative support lead to better logistic arrangements for pharmacist prescribing. In addition, clinical supervision and feedback resulted in confident pharmacist prescribers, who were better equipped to prescribe. Conversely, a perceived lack of clarity about the prescribing role of pharmacists, problems with the use of CMPs in supplementary prescribing, and regulatory restrictions on independent prescribing of controlled drugs, all made prescribing by pharmacists difficult. Participants in the study described various strategies they adopted in practice to prescribe successfully. They identified niche areas, agreed formal prescribing roles, and set clear boundaries for their prescribing activities. For the future development of prescribing however, they advocated an increase in the number of pharmacists taking on the prescribing role. They also suggested aggressive advertisement and promotion, to raise awareness and understanding of pharmacists' prescribing role, among stakeholders in healthcare.

Interview participants advanced descriptions of what they considered the ideal role of pharmacists in prescribing. From their descriptions, two 'ideal' types relating to structures (facilities) and functions emerged. Other issues arose in the interviews related to the current and future training of pharmacist prescribers; also safety priorities and benefits of having pharmacists prescribe. Implications of these findings on policy and practice of pharmacist prescribing will be discussed in the next section.

4.7 Discussion

In this section findings of the qualitative phase will be discussed. The discussion will begin with a recap of the aim and objectives of the qualitative phase followed by a summary of the key findings of the qualitative phase highlighted under specific objectives. The discussion will then reflect on the research methods focusing on trustworthiness, reflexivity and researchers' background, before a consideration of the strengths and limitations of the qualitative methods applied for data generation and analysis. The discussion of key findings will provide an interpretation of interview findings, in terms of the implication on policy and practice of pharmacist prescribing in GB.

4.7.1 Recap of Phase 2 objectives

The aim of the qualitative phase was to explore further and provide richness to the key findings of the quantitative phase; applying qualitative methodologies and methods to probe the views, perceptions, and experiences of respondents regarding prescribing practice. The intention was to provide a deeper insight into the issues involved in the implementation, and possible factors that may facilitate the development and implementation of pharmacist prescribing practice and policy. The semi-structured telephone interview method was utilised to meet the following specific objectives:

1. To clarify from the perspective of pharmacist prescribers why and how factors identified from the quantitative phase enhanced, or impeded their prescribing practice.
2. To describe measures already adopted by individual pharmacist prescribers, and their views of the strategies needed for successful implementation of pharmacist prescribing practice.
3. To define and clarify the pharmacist's prescribing role from the perspective of pharmacist prescribers themselves; and to explore their perceptions of developments in the pharmacist's prescribing role.

4.7.2 Key findings

One hundred and twelve out of 165 pharmacist prescribers, who responded to the questionnaire survey in Phase 1, were invited to participate in Phase 2 of the project. Of these, 34 were interviewed. For the sake of clarity, the key findings are summarised in relation to the specific objectives.

1. To clarify from the perspective of pharmacist prescribers why and how factors identified from the quantitative phase enhanced, or impeded their prescribing practice.

   Key findings

Available and adequate clinical, administrative and organisational support was identified as the main factor that enhanced the prescribing practice of respondents.

A. Clinical support

- Clinical supervision by doctors enhanced pharmacist prescribers' confidence in prescribing practice; this was especially the case in hospitals and GP practices where pharmacist prescribers had pre-existing working relationships with other health-care professionals.
- Cordial working relationships and good communication with other health care professionals minimised inter-professional conflicts around prescribing.

B. Administrative support

- Administrative staff in hospitals and general medical practices arranged patient appointments, thereby allowing pharmacist prescribers to focus on patient consultations and prescribing; this was support was lacking in the community pharmacy setting.

C. Organisational support

- Strategic policies and priorities of NHS Trusts, Health Boards and GP practices were perceived by respondents as having direct bearings on the administration and logistics of pharmacist prescribing services.
- Funding of pharmacist prescribing was perceived as inadequate especially in community pharmacies, where respondents expressed concern about the lack of budgetary provisions for prescribing.

2. To describe measures already adopted by individual pharmacist prescribers, and their views of the strategies needed for successful implementation of pharmacist prescribing practice.

Key findings

Pharmacist prescribers adopted various measures to prescribe despite the challenges they encountered in practice. In addition, they described strategies needed for successful implementation of prescribing practice by pharmacists.

A. Measures taken to overcome challenges to prescribing practice

- Frequent patient contact facilitated by availability of dedicated time and space for patient consultation was mentioned by pharmacist prescribers as one of the factors that allowed them to follow patients up long-term and develop competence in managing conditions in their chosen field of practice.
- Participants identified niche areas and gaps in the prescribing of medicines; such as, travel medicine, supervised consumption of methadone and sub-optimal management of chronic cardiovascular conditions. Pharmacist prescribers apply specialist knowledge of medicines to solve complex medication problems associated with these conditions.

B. Strategies needed for successful prescribing implementation

- NHS organisations, the RPS and individual prescribers should actively create awareness about the role of pharmacists in prescribing.
- Pharmacist prescribers should agree with their organisations, the scope and clear boundaries of the prescribing services they intend to deliver, before undergoing the prescribing course.
- Key regulatory issues around the prescribing of CDs under the IP model need to change, in order to facilitate prescribing practice in areas such as palliative care and substance misuse.

3. To define and clarify the pharmacist's prescribing role from the perspective of pharmacist prescribers themselves; and to explore their perceptions of developments in the pharmacist's prescribing role

Key findings

A. Clarifying the prescribing role of pharmacists

- 'Ideal' structures for pharmacist prescribing require that the focus of prescribing be defined and specified in each setting, taking cognisance of differences in settings and facilities.

- Pharmacist prescribing should be a partnership with other health professionals, which capitalises on the pharmacist's extensive skills and knowledge of pharmacology, pharmacokinetics, drug interactions and adverse effects to prescribe; following established diagnosis by a doctor.
- This partnership, it was perceived, would work best in the management of patients with chronic conditions and multiple co-morbidities that often require the use of multiple medicines.

B. Developments in pharmacist prescribing

- Issues perceived as crucial in the development of pharmacist prescribing were: training of future pharmacist prescribers, patient safety priority of pharmacist prescribers, and the benefits of pharmacist prescribing to patients, pharmacists and other health professionals.

4.7.3 Reflections on the research method

4.7.3.1 Trustworthiness of the qualitative phase of the project

The main cited criticism of qualitative research, especially in the field of health services research, is the seeming lack of 'scientific rigour'. The argument has often been that qualitative research merely collects personal opinions, clouded with strong researcher bias; and that qualitative methods lack the necessary quality indicators of reliability and validity commonly used to assess the strength of quantitative research (172). Whereas reliability and validity (see Chapter 3) were key considerations for questionnaire development in Phase 1, these concepts cannot be applied in a similar manner to asses the quality of qualitative research. Indeed, there are concerns that some qualitative researchers have inappropriately used reliability and validity to portray 'good' qualitative research (173). Alternatively, qualitative researchers argue that it is impractical to judge the quality of qualitative research using concepts of validity and reliability. These quantitative concepts derive from different ontological and epistemological perspectives; hence, qualitative researchers have replaced these quantitative indicators of rigour with the 'more-appropriate' concept of 'trustworthiness' (109). Lincoln and Guba suggested four criteria for assessing the 'trustworthiness' of qualitative research: credibility, transferability, dependability, and confirmability (see Chapter 2). These criteria, as applied in

the qualitative phase of the current project, will be presented here briefly to provide the basis for judging the trustworthiness of the current research findings.

‘Credibility’, the qualitative equivalent for internal validity in quantitative research, provides confirmation that qualitative findings reflect the phenomena being investigated. According to Lincoln and Guber, establishing the ‘credibility’ of qualitative research should answer the question of whether or not the research findings truly reflect the experiences and contexts of research participants (109). Qualitative researchers adopt various strategies to ensure the credibility of their research findings. Shenton (174), lists 14 of these strategies, by which qualitative researchers may confidently assert that their findings accurately reflect the phenomenon investigated. The strategies listed are: the use of already established methods to gather data, developing familiarity and rapport with the environment and culture to be investigated, random sampling, triangulation of data from different sources, tactics to ensure honesty of informants, iterative questioning negative case analysis, frequent debriefing sessions, peer scrutiny of research projects, reflective commentary, background qualification and experience , member checks, thick descriptions of phenomena and examination of previous research finding. (174). All of the credibility steps outlined by Shenton (except random sampling and member checks see later for explanation) were applied in various stages of this research. Specifically, the research student engaged in a series of field visits to pharmacist prescribers in various settings at the outset of the project. This provided the research student with the opportunity to gain familiarity with the culture and context of prescribing practice.

The research student also ensured the credibility of the research by triangulation of the interview data with the quantitative results of Phase 1 (detail in Chapter 5). Moreover, the interviews generated data on the views of participants from a wide range of prescribing backgrounds which provided the opportunity to test developing themes with respondents that had different professional or personal characteristics. Significantly, the analysis considered opposing or negative views, and the entire process iteratively tested new ideas to be sure they were supported by the views of participants, rather than

representations of the research student's ideas. In the course of the interviews and data analysis, the research student frequently discussed developing ideas and concepts with research supervisors (two of whom were not pharmacists). The supervisory team members thus provided guidance and direction based on their varied academic expertise and experience. These frequent 'debriefing sessions' (174), helped to ensure credibility of the qualitative phase of the project. In addition, internal and external training sessions were arranged to sufficiently equip the research student with necessary skills in qualitative data generation, analysis and interpretation. These steps, applied at different stages throughout the entire project, were reflected in the methods section in sufficient detail so that it may be possible to extrapolate the findings beyond the current research (transferability).

'Transferability', the qualitative equivalence of external validity or 'generalisability' in quantitative research, is the 'criteria that provides other researchers with the confidence to extrapolate qualitative research findings to other situations outside the immediate context of the research'. It should be acknowledged that qualitative research does not primarily aim to produce findings that are necessarily 'generalisable' as is the case in quantitative research. Instead, the goal of qualitative research is to gain understanding of the complexities underlying phenomena (109). Transferability is achieved by providing in-depth description of the study context which may explain the meaning of particular views or experiences narrated by research participants (175). In this way, other researchers can judge whether the context of the research is sufficiently similar to their own, to warrant the application of the findings. In the current project the context of the research was specified in Chapter 1, where detail background on NMP and SP/IP implementation by pharmacists in GB was provided. Therefore, the views and experiences provided by research participants and the analysis and interpretation provided by the research student should be viewed within this context.

'Dependability', the qualitative equivalence of reliability in quantitative research, seeks to show that the research findings are stable over time (109). Unlike reliability, which stipulates that another researcher using the same methods under the same conditions should arrive at the same results (92), 'dependability'

is more concerned with whether or not another person reading the qualitative research report would agree that the process which led to the findings were carried out in a reasonable manner (176).This requires that the research process is described in sufficient detail to provide a basis for judging the extent to which good research practices were followed, and if need be, allow other researchers to repeat the work (174). In the current project, a detailed account of the qualitative method was provided. Moreover, a member of the project supervisory team, experienced in qualitative interviews, 'audited' the research process by checking the interview transcripts against digital recordings to ensure the accuracy of transcription. In addition, transcripts were checked against coding categories and emerging themes to ensure that the themes and sub-themes accurately reflected the accounts provided by interview participants. This process also ensured the 'confirmability' of the qualitative findings.

'Confirmability', the qualitative equivalence of 'objectivity', ensures that as far as possible research findings truly represent the views and perceptions of research participants, and not the ideas and preferences of the researcher (174). 'Confirmability' is established through 'reflexivity', which makes explicit the researcher's influence on the research process, including how data was generated, analysed and interpreted (173). Qualitative researchers are encouraged to embrace 'subjectivity' with regards to personal and professional backgrounds which largely determines their emotional response to data generated; this also impacts on the analysis and interpretation of data (96,177). According to Searle, failing to embrace 'subjectivity' puts the qualitative researcher at risk of being restricted to participants' words, without gaining understanding of what the words mean to the participant in the context of the research topic (173). Hence, the researcher's personal and professional backgrounds may be harnessed to serve as a resource in gaining what Barbour calls 'analytical purchase' (96). Therefore, a reflexive account detailing the research student's professional and personal background are presented in the next section to allow readers of this thesis to make informed judgements of the credibility of research findings.

4.7.3.2 Reflexivity and researcher's background

The researcher is a trained pharmacist from Nigeria, without prior experience of the British health care system. His previous experience of issues connected with implementation of pharmacy services were those gained from years of practice in Nigeria and from reading the literature. At the start of the PhD programme, the researcher visited several pharmacist prescribers to observe their practice. In the course of discussion with these pharmacists, the researcher was made aware of professional issues (such as low remuneration of pharmacists relative to medical colleagues) confronting pharmacy in Britain, which were in many ways similar to those in Nigeria. These discussions may have influenced the researcher's disposition; however, deliberate efforts were taken as outlined above to ensure the 'trustworthiness' of the research process. Some of these issues will be considered further under strengths and limitations of the qualitative phase of the project.

4.7.3.3 Strengths and limitations of the qualitative phase

In Chapter 2, the general strengths and limitations of qualitative research methods were reviewed. In particular, advantages and disadvantages of semi-structured telephone interviews were presented. However, specific strengths and limitations of the qualitative phase of this project are now presented.

4.7.4 Strengths

The qualitative phase of the current research was the first to interview pharmacist prescribers based in England and Scotland since the implementation of IP. In addition, participants were recruited from all practice settings which provided an opportunity to explore views and experiences of pharmacist prescribers across diverse backgrounds and contexts of prescribing practice, including pharmacist prescribers who were not using their prescribing qualification. This rich sample mix contributed to the quality and depth of data generated. In contrast, other qualitative research published in the UK, indicate that researchers have either selectively recruited participants from England, Scotland, Wales or NI, or focused their studies on either SP or IP. Cooper *et al.* relied on semi-structured interviews with 43 stake holders across the UK, which included 8 pharmacist prescribers, to investigate stakeholders' views of UK nurse and pharmacist SP (178). However, their study was primarily concerned

with the evaluation of SP by pharmacists and nurses in England (140,178), and there was no indication that any of the 8 pharmacist prescribers they interviewed were from outside England.

Participants in the current study arranged to be interviewed at their convenience. This, along with the short duration of interviews, ensured minimal disruption to the already busy schedules of pharmacists, and allowed them to contribute maximally to the interview data. Shenton has argued that research involving participants who are genuinely willing to freely give information, ensures the 'credibility' of the resultant data (174). Moreover, Shenton proposed 'iterative questioning' involving the use of probes to elicit details on issues raised by participants, in the hope that contradictions or deliberate falsehoods may be identified, as a means of further establishing the trustworthiness of the resultant data. This approach was applied in the current project for individual interviews and the whole process of data generation. Therefore, conceptual ideas formed from the accounts of interview participants were thoroughly tested in subsequent interviews and those that were not supported by information from the research participants were discarded. Hence, current findings are credible representations of participants' views and experiences of pharmacist prescribing practice in GB.

Conducting telephone interviews had the advantage of avoiding logistic and cost challenges that would otherwise have been involved in arranging face-to-face interviews with 34 pharmacist prescribers across GB. Musselwhite *et al.* argue that telephone interviews allow respondents to relax in the familiarity of their own environment and freely volunteer information on the topics being discussed. The authors in their discussion paper on the telephone interview method of data collection in clinical and nursing research, provided evidence from a review of the literature suggesting that absence of face-to-face contact in telephone interviews is, in fact, advantageous to the research process. They report both interviewer and interviewee as being potentially less affected by non-verbal expressions such as facial approval or disapproval of information provided (179). Similarly, in the study by Cooper *et al.* the authors did not consider the possibility of less interaction and lack of rapport associated with telephone interviews to be of concern (178). Reviewing the apparent neglect of

telephone interviews in the qualitative research literature, Novick argues that non-verbal cues when present are not always necessary, especially in projects like the current study, where data analysis is focused more on interview transcripts and the ideas and concepts from these, rather than behavioural aspects of practice which would require observational field notes (117).

A further strength of the qualitative phase of the project relates to the application of the 'framework' approach to data analysis. The strength of this approach is described in terms of 'transparency' and 'accessibility' which provided a means of re-considering and refining ideas as they were formed during the analysis (101). Whilst the research student was solely responsible for transcribing, analysing and interpreting the data, the analytical process made it possible for coding categories, emerging themes and sub-themes to be independently checked for appropriateness by members of project supervisory team.

4.7.5 Limitations

In terms of limitations, the recruitment of pharmacists was lower than anticipated and hence research was limited to all those who agreed to be interviewed. In the purposive sampling strategy planned, it was anticipated that more pharmacist prescribers would accept the invitation in order to permit a selection of the individual who are eventually interviewed. This notwithstanding, more interviews were conducted than earlier planned (see methods for explanation). Moreover data saturation occurred in the analysis of interviews findings whereby subsequent interviews did not yield new coding categories (180). Thus confirming adequacy of the sample recruited for the current research (171,180).

The relatively short duration of interviews (15-20 minutes) may have limited the depth of data generated. While some qualitative researchers suggest that this duration would not permit full exploration and in-depth discussion of the issues under investigation (117,118), the literature review by Novick (117) did not find sufficient evidence to support this claim. Irrespective of the duration of interviews, Sturges and Hanrahan directly compared face-to-face interviews with telephone modes of data generation in their study of interactions between

prison officers and visitors in three prison facilities in the USA. The authors concluded that the depth and quality of data generated was similar for both telephone and face-to-face modes of interview (119).

Findings of the current study were based on views and perceptions of individuals, and should be interpreted with caution. Issues such as recall and social desirability bias, which may present a threat to the 'trustworthiness' of the data should be noted (174). Social desirability bias may have been minimised by the use of telephone rather than face-to-face interviews (117,118).

'Member checking' or participant validation, which involves cross-checking emerging conceptual ideas with interview participants, was not employed in this study (174). Whilst such member checks may enhance the credibility of qualitative findings, it was considered by the research team to impose excessive demands on pharmacist prescribers. Moreover, the value of such checks is still debatable as Mays and Pope argued; research participants usually approach the issues from their individual perspectives, which may contradict the overall perspective provided by the researcher from the accounts of different participants (111). Barbour, also points out that member checks in projects such as the current study situated in the field of health services research, which require cross-sectional collection of data may add more trouble than value to the research (181).

4.8 Interpretation of findings

The key findings of the qualitative phase of the research will be discussed in terms of their implications for the policy and practice of pharmacist prescribing in GB. The discussion is organised according to the specific objectives of Phase 2. The impact of facilitators and barriers identified in Phase 1 on the practice of prescribing pharmacists will be considered along with strategies adopted by pharmacist prescribers, in overcoming challenges.

4.8.1 Implementing prescribing practice

'Lack of opportunities' to prescribe was described in the quantitative phase by around one third of those who had not prescribed. Data from the qualitative phase suggests that this lack of opportunity arose from several key barriers,

including: administrative procedures, the need for CMPs in SP, the legal restrictions of prescribing CDs under IP, funding limitations, lack of support, and inadequate IT facilities for prescribing in the community pharmacy setting. Administrative and organisational structures necessary for implementing pharmacist prescribing practice appeared not to have been adequately developed for optimum service delivery, particularly in the community setting. Professional and physical isolation from other health professionals and prescribers may have contributed to low prescribing practice implementation in community pharmacy.

Professional and physical isolation of the pharmacist prescribers in the community pharmacy setting had earlier been acknowledged by Weiss *et al.* (182). The authors utilised semi-structured interviews with 23 SP pharmacists to explore the implementation of pharmacist prescribing in England and Scotland. They supplemented this approach with observational case studies of five SP pharmacists who were prescribing, and one diary study of a pharmacist prescriber who had not started SP practice. They found additional difficulties with SP implementation in community pharmacies arising from: lack of access to patients' medical records, physical distance from the independent prescriber, and lack of budgetary provisions to commission pharmacist prescribing services (182). Others have reported similar findings. Lloyd and Hughes conducted focus group discussions with 47 pharmacists enrolled in the first four cohorts of SP course in Northern Ireland, to explore their views and professional contexts, prior to the start of SP training (54). They repeated the interviews 12 months after the pharmacists had qualified as prescribers (70). These qualitative studies revealed that little progress had been achieved by pharmacist prescribers based in the community setting.

There are key differences between the current project and the studies cited above. The study by Weiss *et al.* was conducted at a time when pharmacist independent prescribing policy was only being considered, and did not include pharmacist prescribers from Wales. Lloyd and Hughes, on the other hand, conducted their study in NI which was not within the scope of this research. However, findings indicate that little progress has been made across GB and four years post-implementation of pharmacist independent prescribing.

Moreover, whilst the earlier cohorts of pharmacist prescribers perceived that the introduction of IP would resolve most of the implementation challenges of SP (54, 70,182), findings of the current study show that isolation of the prescriber based within community pharmacies, continues to pose challenges to both SP and IP models of practice. Perhaps, more worrying is the fact that these challenges had been previously well recognised while implementing enhanced patient centred clinical roles in the community setting (158,183). A systematic review by Bond *et al.* to determine the contribution of community pharmacists in the provision of enhanced clinical services in the NHS identified several research papers from different countries on the subject. The authors reported barriers to the adoption and implementation of pharmaceutical care practice philosophies in the community setting, arising from isolation of community pharmacists, which hindered their access to the patient medical record (157). Pharmacist prescribers based in the community setting are also encumbered by potential conflict of interest arising from business pressures and the ethical dilemmas of sometimes having to dispense their own prescriptions.

Whereas the papers reviewed were published at a time when pharmacist prescribing had not been implemented into practice, it is clear that the issues involved are the same for all cognitive roles of the pharmacists that require access to patients' medical records from the community pharmacy setting. In contrast, most of the challenges to prescribing practice identified in hospitals have been resolved over time, according to Dawoud *et al.* who conducted pairs of interviews with 17 SP pharmacists, three and six months after they registered as prescribers in Southern England. (46). Indeed, findings of the current study show that prescribing by pharmacists seems to more integrate within the healthcare system in GP practices and hospitals than in community pharmacies. In addition to professional support, prescribing in these settings also reflects the availability and adequacy of facilities, administrative and clinical support. Thus it could be argued, that pharmacists prescribing will only achieve meaningful success when practitioners based in the community setting are fully integrated with other health professions delivering services in the NHS. Such developments are key factors in achieving quicker and safer access to medicines as described within the aims of non-medical prescribing (35). It is interesting that interview participants in the current study, elaborated extensive

safety precautions they observe in delivering prescribing services. This was also reported by Latter *et al*. who reviewed the evidence on the quality and safety of nurse and pharmacist independent prescribing in England (184). The same authors reported both pharmacist and nurse prescribing conforming to safety and appropriateness indices (139,184)

4.8.2 Integrating pharmacist prescribing into 'mainstream' patient care

Findings revealed a perception among pharmacist prescribers based in general medical practices and hospitals, that prescribing 'worked well' because they practised in environments that they considered to be 'fully integrated'. Integration was described in terms of good working relationships with other health professionals, administrative and other support staff. In addition, facilities such as space for patient consultation and adequate IT for access to patients' medical records in these settings are more likely to support pharmacist prescribing practice. Full integration of pharmacist prescribers requires a close working relationship between prescribers in community pharmacies and other health professionals. The study by Weiss *et al.* reported SP as working extremely well in environments with clear lines of communication and responsibility, with effective relationships and understanding between SP and other health professionals, and clearly defined roles for pharmacist prescribers. (182). However, the relationship between GPs and community pharmacists has often been defined by competitive and sometimes antagonistic attitudes towards the expansion of pharmacists' roles (5). The RPS and RCGP both acknowledge that innovations which have expanded the role of pharmacists from dispensing to patient-centred clinical roles over the last two decades, have often been introduced without integration with GP services, hence limiting the potential for enhanced patient benefits (185).

Despite efforts of the government to integrate community pharmacist into the primary health team in Britain, the relationships between the GPs and community pharmacists has remained significantly under-developed with little co-operation between them (186). Bradley *et al.* investigated inter-professional collaboration between pharmacists and GPs to determine the factors that impeded integration of their services (187). The authors showed that a good working relationship between pharmacists and GPs was a prerequisite to

pharmacists' performance of enhanced clinical roles. In addition, they found that having both the pharmacists and GPs located together fostered a greater level of integration of community pharmacists' services. Although Bradley *et al.* were not specifically concerned with pharmacist prescribers, their findings are relevant for pharmacist prescribing. Interview participants perceived that outside hospitals and general medical practices, the prescribing environment in prisons, health centres and other such specialised health institutions represented the most integrated settings which supported the optimal delivery of prescribing services. *Bradley et al.* described a conceptual model of collaboration between community pharmacists and GPs. They interviewed GPs and community pharmacists involved in the provision of local pharmaceutical services in England, and used findings to describe three levels of collaboration: 'isolation', 'communication' and 'collaboration' (188). Isolation represents the lowest level of integration; characterised by physical separation which does not permit close relationship and trust between the two groups of professionals, as experienced by participants in the current interview who were based in the community pharmacy setting. It is a welcomed development therefore, that both the RPS and the RCGP have issued a joint statement detailing over 60 specific recommendations on working together to break down the barriers between community pharmacists and GPs in order to improve patient care (185).

In terms of practice, integration of pharmacist prescribers based in the community setting may initially require pharmacists to implement prescribing practice within GP practices, as described by those active community pharmacist prescribers. In addition, community pharmacy based prescribers will require access to patient's medical records held by GPs. This requires a major policy initiative on the part of Government and NHS organisations providing the impetus to develop pharmacist prescribing facilities, especially the IT link across all practice settings. This was also recognised as a key building block for change that would allow joint access and responsible sharing of patient information for improved efficiency, safety and cost effectiveness of patient care across the NHS in GB (185). It is particularly reassuring that the Scottish Government in its second 'eHealth Strategy' for the NHS in Scotland, has shifted emphasis from the procurement and development of IT infrastructure to harnessing optimal benefits from existing technologies. The

Government's strategy is to encourage the use of existing IT facilities to facilitate easier and more efficient collaboration among healthcare providers involved in the delivery of health services across Scotland by 2014 (189).

4.8.3 Appropriate IT facilities for pharmacist prescribing practice

Inadequate or lack of IT facilities for access to patients' medical records in the community pharmacy setting, not only hinder integration of pharmacist prescribing practice into the 'mainstream' of patient care, but also contradicts 'best practice' recommendations for the implementation of pharmacist prescribing. Policy documents guiding the implementation of pharmacist prescribing in GB, require that pharmacist prescribers enter detailed information about their consultation and prescribing into the shared medical records of the patients immediately after the encounter (38,190). By stipulating this guideline for the implementation of pharmacist prescribing, the Department of Health and the Scottish Executive had pre-supposed that pharmacist prescribers would have access to patients' medical records, and share same with other health professionals. However, this has not turned out to be the case, especially for prescribers based in the community pharmacy setting. Consequently, the majority of participants in the current study who were based in community pharmacies only managed to utilise their prescribing qualification in GP practices. Participants who prescribed in community pharmacies described the process as cumbersome and inefficient, with reports of pharmacist prescribers travelling specifically to access patient records, before and after the consultation. This does not encourage prescribing in the setting that has the highest potential for achieving enhanced access of patients to medicines envisaged by the Crown committee (16). Hence, participants perceived that providing the necessary IT facilities for access to patients' medical records, was one of the biggest steps that could be taken to enhance their practice as prescribers. They argued that such a strategic initiative would fully integrate community pharmacies into the mainstream of patient care and facilitate electronic prescribing.

In Scotland, the basic IT infrastructure for delivering NHS services which could integrate community pharmacies has been created in the form of a central database. This database contains Emergency Care Records (ECR) which are

electronic summaries of medical information about all individuals registered with GP surgeries under the NHS (191). This integrated system created in 2006 is automatically updated twice daily, with prescribing information and adverse reaction from all GP practices in Scotland. A cross-sectional questionnaire survey of 1,210 patients registered in one GP surgery in Scotland, achieved a response rate of 23% (n=283). The study found that a majority of the patients did not remember being informed about the central database, but they did not mind their records being uploaded to the central database once they read the information about it (192). Although this was a small study of patients in only one GP surgery, feedback from clinicians who have accessed the Scottish ECR has been overwhelmingly positive. Libby *et al* in a letter response to an article in the British Medical Journal, commented on the success of the ECR, and reported that by 2010, health professionals in Scotland had accessed the database more than 5 million times, including the increasing use of these records by hospital pharmacists for medicines reconciliation (193).

Although the report did not specifically evaluate the use of the ECR database for prescribing by pharmacists, the report indicates potential benefits for prescribers. It is particularly encouraging that the Scottish Government in its second 'eHealth Strategy' 2011-2017, plans to expand the ECR with Palliative Care Summary (PCS) and Key Information Summary (KIS), which contain detailed information on diagnosis, anticipatory plan of action for use during emergencies. Perhaps even more relevant, is the plan of the Scottish Government to ensure that by 2014, all Health Boards are using clinical portals or electronic windows which will make the necessary patient information available to all health professionals at the point of care (189). When achieved, this level of information access will significantly enhance the practice of pharmacist prescribers within the community setting. Unfortunately, such IT access is less advanced in the English NHS.

The DoH had for many years planned to introduce an integrated National Health Service records system to allow NHS staff get easy access to accurate medical histories of patients. Consequently, the government embarked on a 'National Programme for Information Technology' with a proposed investment of £12.7 billion over 10 years beginning from 2002 (194). According to the original

timetable of the DoH, everyone in England and Wales was to have their own electronic health records containing: contact details of the patient and their registered GP, previous and ongoing conditions, current medication and allergies by March 2005 (195). The NHS care record is expected to create two sets of information: the 'national summary care records' which contain basic information with limited clinical data, could be accessed nationally by patients and authorised NHS staff. The second set of records, the 'detailed care records', is to contain more comprehensive clinical information, to allow local organisations to share clinical information for services like prescribing (196).

However, the development of the IT backbone for creating a central electronic medical record for all patients in England has been problematic and the government no longer intends to replace all NHS computer systems, meaning that it is no longer possible to integrate records in all NHS organisations (194). This has serious implications for pharmacist prescribers, particularly those in the community setting.

4.8.4 Strategies for successful prescribing practice

Objective 2 of the interview phase centred on strategies adopted by participants to overcome challenges in their prescribing practice. Successful strategies may be of importance to further pharmacist prescribing. Respondents reported 'identifying niche areas', 'increased promotion' or 'advertisement', 'increased number of pharmacist prescribers' and 'agreeing formal prescribing roles'. Active promotion and advertisement of developments and services was also noted by Lloyd *et al* (70),who argued that advertisement of pharmacist prescribing made the role more visible to patients and other health professionals thus enhancing its acceptability. Similarly, the study by Weiss *et al.* emphasised the importance of creating awareness and understanding about the benefits and rationale for introducing pharmacist prescribing (182).

Findings from the interviews suggest that pharmacist prescribing practice can be best promoted by focusing on specific niche areas of practice. Courtenay *et al.* have similarly shown that non-medical prescribing practice is facilitated by having well defined prescribing roles, with a well defined set of patients or conditions that are agreed between pharmacist or nurse prescribers and their

managers (197). The authors, who conducted semi-structured interviews with 28 NMP leads in one strategic heath authority in England, also noted that lack of evidence on the benefits of commissioning prescribing services hampered the development of prescribing services in areas like community pharmacy (197). This may explain the perception by the current research participants that promoting pharmacist prescribing practice could be achieved through research, to demonstrate favourable outcomes of pharmacist prescribing. Outcomes such as improved patient care and better use of pharmacists' skills were mentioned as benefits in the current study.

However, there is little published research evidence in the literature to demonstrate positive clinical outcomes of pharmacists prescribing. Most research to date has focused on prescribing processes and patients' satisfaction with, or perceptions of pharmacist prescribing. One survey of 127 patients attending a pharmacist-led hypertension clinic achieved a response rate of 87%, of which 57% perceived that pharmacist prescribers offered better standards of care than they had received from their usual carers (75). Similarly, Stewart *el al*. had previously demonstrated positive views of patients and the general public towards pharmacist prescribers. Patients particularly were reported to have high regard for the knowledge and skills of pharmacist prescribers, whom they thought offered better medicines management than nurses (73, 74). Humanistic and economic outcomes also deserve attention; the study by Latter *et al.* included discreet choice experiments and economic evaluations to compare NMP with GP prescribing (139). The authors used a hypertension vignette to determine the benefits of patient derived utility from GP prescribing and pharmacist IP services. They found that patients equally preferred prescribing services offered by their own GPs and pharmacist prescribers, above prescribing by any available doctor in the GP practice. They reported higher cost saving to the practice in the combined model of GP and pharmacist prescribing for hypertension than traditional GP prescribing alone (139). Despite these positive reports, there remains the urgent need for outcome studies to contribute to the evidence base in support of pharmacist prescribing.

The suggestion from the interview participants to increase the number of pharmacist prescribers is noteworthy. Ironically, Stewart *et al.* while investigating the intention of 4,300 GB pharmacists to participate in prescribing training, achieved a response rate of 55% and found that a majority of pharmacists who described themselves as 'venturesome', 'innovators' and 'role models' had not even thought about training to become prescribers two years after the introduction of SP (63).There is a lack of strategic direction on the selection of pharmacists to undertake training and the issue of specialist versus standard practice remains unresolved. There are parallels with innovations in clinical pharmacy and pharmaceutical care. These concepts revolutionised the practice of pharmacy only when individual practitioners increasingly changed their daily practices in line with these philosophies (198). Similarly, development of the 'practice pharmacist' role in GP surgeries and PCTs in the UK, which started opportunistically, has by increased involvement of pharmacists become the norm in practice (199).

Silcock *et al.* noted that the engagement of pharmacists in primary care began with a few 'privileged' pharmacists capitalising on opportunities to manage drug budgets allocated by health authorities. However, as more pharmacists got involved, the pharmacy profession took the initiative, negotiated and agreed formal roles with the Department of Health; and currently, the role of 'practice pharmacist' transcends the management of drug budgets, and is also concerned with overall prescribing quality. This role has so developed and become integrated, that it is now the norm for 'practice pharmacist' to set the agenda for prescribing and medication review for PCTs and GP practices (199). This also reflects the general progression of pharmacy practice, from the compounding and advisory roles of apothecaries, through the age of industrialisation and product-centred dispensing role of pharmacists and finally, the patient-centred age of clinical pharmacy practice (3, 5).

4.8.5 Clarifying the prescribing role of pharmacists

Objective three focused on defining the prescribing role of pharmacist from the perspective of interview participants. From the narratives, precise prescribing roles and responsibilities often appeared to be unclear, largely attributed to poor understanding of the role by stakeholders, e.g. health professionals and

patients. Others have reported similar findings in which stakeholders were either unaware or lacked understanding of the role of pharmacists in prescribing. Cooper *et al.* reported a perception that lack of awareness and understanding of pharmacist prescribing among pharmacists, doctors, patients, and even commissioners of prescribing services, constituted a major barrier to the implementation of pharmacist prescribing practice (178). Similarly, Lloyd *et al.* reported three main barriers to pharmacist prescribing implementation to include a 'lack of awareness' among other health professionals (70).

Participants in the current study thus described their own ideas of well-defined roles and responsibilities for pharmacist prescribers. They proposed that the 'ideal' prescribing role of pharmacists as one in which pharmacists apply their expertise and skills in the management of patients with disease conditions that require multiple drugs, with high potential for medicines mismanagement (significant pharmacokinetic and pharmacodynamic issues). They consider that this would be appropriate use of skills in pharmacotherapy. Participants delineated clinical examination and diagnosis to nurses and doctors. It should be noted that these findings were based on the perceptions of pharmacist prescribers only, as the study population did not include nurse prescribers or doctors. However, Weiss and Sutton, drawing on findings of 23 semi-structured interviews with pharmacist prescribers in England and Scotland, reported a similar perception among the early cohorts of SP pharmacists (68).

The exclusion of diagnosis from the prescribing responsibilities of pharmacists in this study, contrasts with the official definition of a pharmacist independent prescriber "An independent prescriber is responsible for the assessment of patients with undiagnosed and diagnosed conditions and for decisions about the clinical management required, including prescribing" (16). Moreover, Weiss points out that clinical reasoning underlie decisions about diagnosis, management and referral of patients; thus suggesting that diagnosis and prescribing decisions are inter-wound in the same clinical reasoning process (200). Yet interview participants stated categorically that diagnosis was the responsibility of doctors. This finding supports other work which indicated that doctors and pharmacist prescribers were more comfortable with independent prescribing in conditions that had already been diagnosed (70); as obtained in

the SP model. Ironically, pharmacist prescribers in this and other studies, have also reported substantial limitations in their practice of SP, generally preferring IP practice (49, 50). Consequently, the ideal role proposed by interview participants raises two issues:

i. Aligning these ideal roles within the framework of SP and IP
ii. Relative contribution of pharmacist prescribers compared to other non-medical and medical prescribers

In terms of policy, it is expedient to identify how the ideal prescribing role of pharmacists fits within the existing framework of SP and IP. Cooper *et-al.* queried whether both models were needed because of the apparent tension arising from the differences between them. They argued that flexibility in the IP model, without the statutory requirement for the use of CMPs presents an advantage that could improve access of patients to medicines. However, such flexibility comes at the expense of the security and patient safety assurance inherent in the CMP requirement of SP (178). Interestingly, for pharmacist prescribers in this study, IP was reported as 'freeing' them from unnecessary bottlenecks and excessive documentation required in SP; but did not necessarily translate to independence in diagnosis and prescribing. It is clear from the narratives of interview participants that pharmacist prescribers preferred the flexibility and freedom of IP, but still wanted diagnosis to remain the responsibility of doctors, similar to the situation in SP. Therefore, the findings may suggest development of a hybrid role that combines features of the current SP and IP models.

The second issue reiterates the need for clearly defined inter-professional working around the prescribing process. Interview participants suggested a collaborative working arrangement, in which health professionals worked in partnership with each other. This supports the argument by Weiss and Sutton, that prescribing is an integrated process involving different components that potentially require inputs from different health professions (68). In this respect, the ideal prescribing role advocated by pharmacist prescribers is a multi-disciplinary cooperation, harnessing the unique knowledge and skill of each member of the health team. A good working relationship among health professions has been identified as an important factor for the successful

implementation of pharmacist prescribing (70). Indeed, some GPs have been highly supportive and positive towards pharmacist prescribing, viewing it as an opportunity for GPs to focus on more specialised diagnostic roles.

The prescribing partnership suggested by interview participants echoes the Government's objective articulated in the NHS plan. The plan aimed to remove unnecessary inter-professional boundaries and introduce new ways of delivering services in the NHS (159,201).

4.8.6 Developments in pharmacist prescribing practice

One key issue in the implementation of pharmacist prescribing is delivering a sustainable workforce with the capacity to meet patient and healthcare needs. The training of future pharmacist prescribers has been noted by others. Cooper *et al.* reported the views of stakeholders that prescribing will eventually become an integral role of pharmacists and be encompassed within the training of pharmacy undergraduates. Interview participants in the present study, noted the significance of training on the development of pharmacists prescribing practice. However, the low level of planned participation in prescribing training identified by Stewart *et al.* among pharmacists (63) may impose a direct limitation on the development of pharmacist prescribing practice in GB.

Furthermore, participants in the current study emphasised the value of clinical examinations and patient consultation skills acquired during the period of learning in practice; but they were sceptical about the consultations skills aspect of current prescribing training courses. They pointed out, that the consultation skills component of pharmacist prescribing training course was currently inadequate in terms of 'hands-on' practical experiences. This limitation in the prescribing course had been noted previously by several researchers (60-62). Thus, any future training of pharmacist prescribers should prioritise the issue of developing expertise in clinical assessment and diagnosis where such is relevant to the eventual role of the pharmacist in prescribing. Weiss suggests that the traditional model of medical training, which combines basic biomedical science with engagement in patients' clinical problems, is only one way of developing expertise in diagnosis (200). It is therefore useful that some universities have focused research on developing this aspect of pharmacist

prescribers' training. Stewart *et al.* have developed and validated a tool for the assessment of competence and performance of pharmacist prescribers with regard to patient consultation (57). These authors adapted and modified the tool used for the assessment of GP consultation competencies and skills. Such tools will become increasingly valuable in the development of pharmacist prescribing, by ensuring the continued competence of pharmacist prescribers post-qualification, through CPD activities.

Important to the process of prescribing is the continuing professional development and training of pharmacist prescribers. Qualitative findings revealed a lack of focused CPD activities for prescribing practice. Participants perceived that available CPD programmes were more generic for pharmacy and not particularly tailored towards developing competencies in prescribing practice. Moreover, pharmacist prescribers felt that there was too much emphasis on documenting CPD, which according to them was not of much practical help to their practice. Cooper *et al.* noted similar concerns in their study, which pointed out that training often failed to equip pharmacist prescribers with the latest clinical knowledge (178). Therefore, as pharmacist prescribing becomes more enshrined in the patient care culture in the NHS, it may be expedient to develop specific programmes and opportunities for pharmacists (and other non-medical and medical prescribers) to extend their competency in prescribing.

4.9 Summary and conclusion

In the qualitative phase of the project, the views, experiences and perceptions of pharmacist prescribers on the implementation of prescribing practice were explored in semi-structured telephone interviews. This work showed that limited prescribing opportunities identified in Phase 1 are compounded for prescribers based in community pharmacies because of the geographical location of their practice environments, which are isolated from other health professionals. In addition, lack of appropriate IT facilities hinder remote access to patients' medical records for effective prescribing from the community setting. Thus, participants who have succeeded in prescribing practice, have done so in environments which provide adequate clinical and administrative support,

enhanced by pre-existing relationship and good communication among health professionals.

Results of the quantitative phase of the research on the apparent lack of clarity in the prescribing role of pharmacists were also explored. Participants provided detailed accounts of their views and perceptions and proffered descriptions of ‘ideal’ roles of pharmacists in the prescribing process. This emphasised the application of pharmacist expertise in the management of chronic, co-morbid conditions which often depend on the use of multiple medicines. Application of the current findings into practice, and specific recommendations for policy and research will be provided in Chapter 5. Findings of both quantitative and qualitative phases are brought together to draw an overall conclusion to the research project.

Chapter Five: General Discussion

In this final chapter, key findings of the two phases will be integrated to provide the basis for conclusions and recommendations. The discussion will provide a recap of the overall research aim and critically evaluate projects as to whether the research objectives were met. This will lead into a discussion of key findings from both phases of the research to highlight contributions of the project to the knowledge base on the research topic. Recommendations for policy and application of key findings to practice will lead into a discussion of further research before drawing an overall conclusion to the project.

5.1 Recap of the project aim

The aim of the research was to explore developments in SP and IP since implementation; focusing on an investigation of the structures and processes of prescribing practice by pharmacists in Great Britain. To achieve this aim, a two-phased project utilising the 'sequential-mixed methods' strategy (86) was designed. The initial quantitative phase applied a cross-sectional questionnaire design to survey all pharmacist prescribers (n=1643) registered with the RPSGB as of January 2009. The aim in this phase was to identify facilitators and barriers associated with pharmacists' prescribing practice and to quantify the relationship between them. In the subsequent qualitative phase, the research student conducted semi-structured telephone interviews with 34 pharmacist prescribers out of 165 who indicated interest from the quantitative phase. Qualitative interviews explored in-depth, the views; perceptions; and experiences of participants with prescribing practice to provide deeper insight into the structures and processes of pharmacist prescribing practice.

Quantitative results in Phase 1 identified significant association between the pharmacy practice setting of respondents and their engagement in active prescribing practice. Thus it became apparent from Phase 1, that experiences of pharmacist prescribers in one setting could be extrapolated and applied to practice in other settings. This provided the rationale for expanding the research focus in Phase 2 to also include pharmacist prescribers in secondary care hospitals (details in Chapter 4).

5.2 Critical appraisal of the research process

The specific strengths and limitations of the quantitative and qualitative methods employed in this project are discussed in Chapters 3 and 4 respectively. Either of these methods was considered sufficiently robust, and contributed to the understanding of the prescribing practice of pharmacists in GB. However, the main strength of the project was the utilisation of a mixed methods approach which permitted the triangulation of both quantitative and qualitative data to achieve a comprehensive understanding of the research topic. Results of the quantitative phase added to the present evidence-base, by providing an update on the nature and extent of prescribing activities currently undertaken by pharmacists in GB. This phase also provided the quantitative evidence for the importance of IT facilities, and the pharmacy practice setting as predictors of prescribing practice. In contrast, the qualitative phase elaborated the identified challenges, and revealed that, most of the challenges associated with prescribing practice were related to a seeming lack of clarity in the prescribing role of pharmacists, which was expressed by study participants. The iterative nature of the qualitative phase also allowed the in-depth exploration of the views, perceptions and experiences of interview participants to identify strategies already adopted by pharmacist prescribers, possible future solutions for overcoming the challenges to prescribing practice.

Thus, each phase provided a unique and distinct perspective to the project. However, both phases were related and connected at all stages of the project. At the design stage, it was apparent that adopting a mixed-methods design was a pragmatic choice to meet the research aims (see Chapter 2). Combining quantitative and qualitative methods produced a comprehensive explanation of the structures and processes of pharmacist prescribing in GB. This was achieved in two ways: firstly, qualitative findings complemented the statistical results of the quantitative phase by offering explanations of pharmacists' experiences with prescribing implementation, and thus enhancing the credibility of the research process (202). Secondly, both quantitative and qualitative methods converged in some of the findings, hence the qualitative data corroborated and confirmed (120), the quantitative results. Analysis of open questionnaire responses yielded 'lack of defined prescribing roles' as the central challenge to prescribing practice of pharmacist; this was supported by similar

findings from analysis of interview transcripts, which further strengthened the overall research outcome. Therefore the integrated findings may be translated and applied to improve the general implementation and practice of pharmacist prescribing in GB (see recommendation for policy and practice) .

In terms of limitations, it was not possible to sustain the initial focus of the research on pharmacist prescribers based in primary care settings. This was due to minimal prescribing activities being implemented in the community setting. George *et al*. investigated early experiences of pharmacist prescribers and also showed that the level of prescribing in the community pharmacy setting was low (48, 58). However, their study was conducted during the early periods post implementation of SP; therefore, it was understandable that there would be initial implementation challenges. The assumption at the outset of the current project was that passage of time and the subsequent introduction of IP might have changed and advanced prescribing practice in community pharmacies, hence the initial focus on the primary care setting. Expanding the focus in Phase 2, of the project means that the quantitative results missed process data such as information about therapeutic areas managed, and the number of patients served by pharmacist prescribers in secondary care. However, this does not invalidate the conclusions drawn in the current study as, the key findings were based on complete data provided by participants in all practice settings.

Another limitation of the project concerns the focus on only the perspective of pharmacist prescribers themselves. This excludes stakeholders e.g. doctors, nurses, non-prescribing pharmacists, and NHS managers responsible for implementing the policy. Others excluded are: academics responsible for training pharmacist prescribers, patients and the general public. Therefore, it should be recognised that the findings are not irrefutable evidence of the structures and processes of pharmacists prescribing. Some of the issues raised by pharmacist prescribers were often conjectures and perceptions about the roles of other stakeholders in the prescribing process. Such issues can only be sufficiently addressed by the relevant stakeholders; for instance, pharmacist prescribers while attempting to clarify their own role in prescribing, also specified some responsibilities to other health professionals. Whilst such

findings meet the specific objectives of the current project, they also raise questions that can only be answered with further research to explore other stakeholders' perspectives in the implementation of pharmacist prescribing (see later).

5.3 Integration of key findings from the two phases of the research

In this section, the original findings of the current doctoral project which extend the knowledge base, in the subject of pharmacist prescribing in GB will be presented. This will be organised around the issues raised in the literature review (Chapter 1) which highlighted the gaps in knowledge, as follows:

5.3.1 Barriers and challenges to implementation of prescribing practice

The literature review in Chapter 1 established that SP implementation encountered several challenges. Pharmacists who were responsible for implementing SP thought the challenges were more in general medical practices than hospitals (46, 47). However, a survey of the qualified pharmacist prescribers showed that more of prescribers were active prescribing in primary care than in hospitals (48). At the time of the current study it was not evident whether those initial implementation challenges had been resolved.

This study provides statistical evidence of the relationship between pharmacy practice setting, facilities such as IT links and the extent of prescribing activities. The project is the first to identify by means of factor analysis, that pharmacy practice setting more than other demographic characteristics, predicts the prescribing practice of pharmacists. Similarly, this project has for the first time; provided the quantitative evidence to support previous anecdotal assertions, that facilities in community pharmacy setting are insufficient to support optimal implementation of pharmacist prescribing practice. The qualitative findings revealed further, that inadequate facilities in the community setting mainly implied the lack of IT infrastructure, necessary for access to patients' medical records and electronic prescribing, in addition to problems associated with the lack of dedicated space, and adequate privacy for patient consultation and prescribing in most community pharmacies.

In addition, quantitative and qualitative findings of the current project have provided an update on the status of pharmacist prescribing implementation in GB, to show that the facilitators and barriers of pharmacist prescribing practice identified in earlier studies, have not changed much, after more than five years of pharmacist prescribing implementation. The development of structures for pharmacist prescribing practice appears to lag behind progress in the implementation of pharmacist prescribing practice, especially in the community setting. Where pharmacist prescribers have overcome challenges to succeed in prescribing practice, they have achieved this by identifying a niche area of practice where they apply specialised knowledge to solve complex medication problems. Pharmacist prescribers have maintained frequent patient contact and follow-up of patients allowing them to develop competence in these therapeutic areas of practice.

5.3.2 Progression from SP to IP

Information from the literature review in Chapter 1 indicated the difficulties of using the CMP in SP practice, which made that prescribing model too cumbersome and many of the early cohorts of pharmacist prescribers viewed SP only as a ‘stepping-stone’ to IP practice(46). Pharmacist prescribers generally perceived IP as more flexible and thought it would be much easier to implement than SP (46, 48, and 54).Thus with the introduction of IP, it became necessary at the outset of the current project to update the status of pharmacist prescribing practice in GB.

Quantitative results in the current project have shown that barriers to pharmacist prescribing practice include: lack of opportunity, administrative procedures, resource limitations and lack of defined prescribing roles. Qualitative findings further revealed that the prescribing role of pharmacists is not often clearly understood and supported by relevant stakeholders in the prescribing process. Hence, the current study finding suggest that that pharmacist prescribers should firmly agree with their organisations, the scope and clear boundaries of the prescribing services they intend to provide before embarking on the prescribing course.

Furthermore, the currents study participants described the ‘ideal’ prescribing role of pharmacists: as one that utilises the expertise and skills of pharmacist prescribers in the management of patients with conditions which require concomitant use of multiple drugs. Thus, current study participants appear to favour a ‘hybrid’ prescribing model which combines features of SP and IP. Under this ‘hybrid’ prescribing model, pharmacist prescribers embrace the flexibility of IP which does not need the cumbersome patient specific CMPs, but at the same time they seemed to prefer prescribing within the defined boundaries of diagnosed conditions as is the case in SP.

5.3.3 Inter-professional perspectives

The literature review in Chapter 1 identified opposition and resistance to pharmacist prescribing implementation. This was especially reported among some doctors who perceived the new role of pharmacist as a threat to their professional status in the care of patients (65, 66). Other researchers who investigated the early implementation of pharmacist prescribing argued that doctors were more likely to accept the SP than IP model of practice, because they could maintain overall control under SP (54, 69, 70). Therefore, it was necessary to study pharmacist prescribing processes in terms of their interaction with doctors and other health professionals post implementation of IP

Current study findings found that the cooperation and support of doctors is vital to the successful implementation of pharmacist prescribing, as was shown to be the case in hospitals and GP practices. In contrast, prescribing practice appeared to be greatly hindered in the community pharmacy setting, where pharmacist prescribers are professionally and physically isolated. In this environment pharmacist prescribers lack the formal support of doctors. Moreover, current study findings indicate that prescribing practice is easier to implement in settings such as: prison health centres and other such specialised health institutions which provide pharmacist prescribers with the opportunity for face-to-face contact and easy communication with doctors. In addition to the support and cooperation of doctors, the support of other healthcare staff in administrative functions such as arranging patient appointments made the difference between the ease of prescribing practice in hospitals and GP

practices, compared to the hindered and difficult prescribing practice in community pharmacies despite the ease of access to patients and better opening times in this setting (see Chapter 3).

5.3.4 Development of pharmacist prescribing

Literature review had shown evidence of the benefit of pharmacist prescribing training, especially the PLP on the implementation of SP (58-60). The literature review also revealed evidence of some dissatisfaction on the part of pharmacist prescribers with the content and mode of delivery of the prescribing course (61,62). Therefore, it was imperative at the outset of the current research to investigate the impact of prescribing training on practice.

The current study findings showed that development of pharmacist prescribing practice is to a large extent hinged on increasing the size of pharmacist prescribing workforce as described by interview participants. However, the pharmacist prescribing workforce may only increase dramatically if pharmacy undergraduates are trained to qualify as prescribers on graduation. This idea generated mixed opinions from the current study participants. Whilst the majority of study participants opposed the idea of pharmacy students graduating from University qualified to prescribe, there seemed to be consensus of opinion that the taught elements of the prescribing course could be introduced in the undergraduate programme, leaving the PLP to be undertaken post graduation. However, there is no sufficient evidence in the current findings to support definite conclusions hence the issue of training pharmacy undergraduates for prescribing will need to be investigated further.

Apart from the key findings summarised above which extend the knowledge base on the subject of pharmacist prescribing, a unique contribution of the current project was in application of a ‘sequential-mixed methods’ strategy in the study (86). According to Phillips and Pugh, there are nineteen different ways to define originality in a PhD thesis, one of which is to use a different methodological approach to address a research problem (203). Many of the previous studies on the subject of pharmacist prescribing have either relied on qualitative or quantitative approaches to study one dimension of the problem. When a mixed methods approach has been used, researchers have always

applied qualitative methods to explore the topic and generate questions to be addressed in subsequent quantitative surveys. However, in the current project, the 'sequential-mixed-methods' strategy allowed key issues of prescribing practice identified by means of statistical analysis of data in the initial quantitative phase, to be explained by in depth qualitative methods. Using this approach, it has been possible, for example, to translate statistical significance of the products of factor analysis into practical relevance for prescribing practice (see Chapter 3).

5.4 Application of key findings to policy and practice

The relevance of key findings will be described under specific recommendations for policy and for practice

5.4.1 Recommendations for policy

5.4.1.1 Recommendations for Government

Findings of the current research emphasised the problem of community pharmacy prescribers' access to patients' medical records, which results from the inadequate IT infrastructure in the NHS. In terms of pharmacist prescribing, it is essential that the IT infrastructure is developed with a plan to link community pharmacies with other NHS service providers. In Scotland, where a national data base already exists, the Government should consider community pharmacies, along with accidents and emergency units and out-of-hour services among the points for receiving un-planned care, and the pharmacist prescriber authorised to access the summary care records (191). The recent publication of the Scottish Government's 'eHealth strategy 2011-2017' (189), presents a golden opportunity to provide community pharmacies with remote access to patients' medical records. This will improve practice, and also enhance research in patient outcomes by making it possible to link the dispensing data of medicines with specific diagnosis in the summary care records. On the other hand, England may need to re-appraise its strategy on the abandoned national rollout of the IT backbone which was intended to central electronic medical records of all patients (194). The DoH should embark on a critical evaluation of the current programme of IT development for the national database of health records with a view to completing the project. This should include education of

the public about the potential benefits, while addressing the security concerns related to the privacy of personal records. When this is done, the project will generate enough public support to justify any possible financial investments.

5.4.1.2 Recommendations Policy makers

In terms of policy, it is essential that NHS managers and organisations critically review their strategies for implementing pharmacist prescribing. It may be necessary to plan separate strategies for different settings, for example providing additional incentives to motivate community pharmacies to invest in the creation of appropriate facilities such as dedicated clinic space and time for pharmacist prescribers to engage in prescribing practice. As the number of pharmacist prescribers continues to grow, NHS managers should ensure that needs are properly assessed and clear demands for pharmacist prescribing services exist before more pharmacists are sponsored for prescribing training. Similarly, the roles these pharmacists will perform in prescribing practice should be clearly stated at the outset of any services commissioned by the NHS. This way, time and resources committed to the training are guaranteed to be utilised. In the short term, NHS managers should identified qualified pharmacist prescribers in their organisations who are not prescribing, and create the enabling environment for them to immediately begin to apply their prescribing skills in practice.

NHS managers should promote integration and team work among health professionals, by commissioning services according to skills so as to optimise the potentials of all professional; for example, where a community pharmacist prescriber is commissioned to undertake medication reviews for a GP practice, the input of the pharmacy in meeting the QOF target should be recognised and any financial incentives should be shared between the practice and the community pharmacy.

The relevant agencies need to formulate clear guidelines for practice especially as regards the prescribing and dispensing of medicines by pharmacist prescribers based within community settings.

5.4.1.3 Recommendations for the RPS

The RPS should articulate clear roles and responsibilities for pharmacists in prescribing, and develop a position paper, to serve as a basis for negotiating future contractual frameworks for delivering enhanced pharmaceutical services such as prescribing in the NHS. The RPS should also intensify the promotion and advertisement of pharmacy services to other health professional groups like specialty registrars and consultants in various medical conditions. Such promotion should include disseminating results of research that demonstrate favourable outcome of pharmacists in the prescribing process. The RPS should also capitalise on the high accessibility of community pharmacies to reach the general public with the message of pharmacist prescribing being publicised with printed leaflets, posters and media campaign.

The RPS should encourage individual pharmacist prescribers to participate in research by providing them with incentives; this could be achieved by negotiating with the GPhC to accept a certain level of participation in research for CPD purposes. In addition, pharmacist prescribers should be encouraged to, access grant opportunities such as those provided by the Pharmacy Practice Research Trust, to engage in practice based research. This will provide them with the opportunity to demonstrate the value of their involvement in prescribing, as way of promoting their services.

5.4.2 Recommendations for practice

In terms of practice, existing pharmacist prescribers should actively seek gaps in service delivery and expand their practice into new therapeutic areas. Qualified prescribers who are not using the prescribing qualification in practice should identify niche areas to develop prescribing practice; this may involve seeking opportunities where prescribing is more likely, such as the GP practice and health centres. In addition, pharmacist prescribers should document details of their prescribing practices and procedures, so that examples of good practice could be indentified and used to promote the pharmacist prescribing services. Individual pharmacist prescribers should also continue to seek new practice frontiers by constantly assessing needs and putting forward business case for pharmacist prescribing to NHS commissioners. Pharmacists should also become involved in prescribing networks to provide peer support and mentoring

to colleagues that may be taking up prescribing newly, or those that may be encountering challenges in their practice.

5.5 Discussion of further work

Most of the previous research on pharmacist prescribing has focused on views, attitudes and perceptions of pharmacist prescribers, other health professionals and patients. The present study has extended the evidence and contributed significantly to the understanding of issues involved in prescribing implementation. However, the study has also raised some issues that will require further investigation.

5.5.1 Clarifying the role of pharmacists in the prescribing process

Findings of the current research suggest a need for clarifying the roles and responsibilities of pharmacists in relation to those of other health professionals in the prescribing process. Since this conclusion reflected the views and perceptions of pharmacist prescribers only, it is necessary to include key experts and opinion leaders representing a wide range of stakeholders, including pharmacists (prescribers and non-prescribers), doctors, nurses, NHS managers, academics and representatives of patient groups. The aim will be to define and develop consensus around the specific responsibilities for pharmacists in the prescribing process, in relation to the functions already performed by doctors and nurses.

The Delphi technique would be a suitable method for this investigation. The method has been used to define professional roles in health services which in this case, would be to clarify the specified responsibilities of each health profession in the prescribing process. This technique would permit the application of qualitative approaches to derive quantitative estimates of agreement among expert stakeholders in the prescribing process (204). This process will define clear, specific and mutually agreed roles for pharmacists, which could be implemented either as the proposed ‘hybrid’ prescribing model, or within the existing models of SP or IP.

5.5.2 The evidence-base to promote pharmacist prescribing

The current study findings emphasise the need for strong research evidence of benefits of pharmacists prescribing relative to other non-medical and medical prescribing, the question is whether patients managed by pharmacist prescribers experience different clinical outcomes than those managed by other prescribers? The aim will be to compare the 'effectiveness' of pharmacists as prescribers with other health professional prescribers in selected disease conditions.

This aim could be achieved by applying comparative effectiveness study designs to test a hypothesis, that no difference exists in the desired clinical outcome of patients managed by different categories of prescribers. Data for matched cohorts of patients managed by different category of prescribers will be collected prospectively or retrospectively from clinical data recorded in the routine care of patients. Such practice data should capture key patient characteristics, consultation and other components of the prescribing process delivered by each profession that may affect patient outcome. Applying multivariate statistical procedures, it will be possible to identify differences in chosen clinical end points in groups of patients that are attributable to the prescribers managing them (205).

5.5.3 Integrating pharmacist prescribing in the community setting

The current study has established that minimal prescribing is currently implemented in the community pharmacy setting compared with the other settings. Considering the potentials of this sector on overall prescribing practice, it is necessary to study in-depth the structures and process that community pharmacists have adopted to prescribe despite the challenges identified in the current study.

This will apply in-depth qualitative case studies approaches that combine non-participant observations with interviews in selected community pharmacies where prescribing is working well, to investigate specific details of prescribing practice in these sites.

5.6 Overall conclusion

In this research project, the author has applied a quantitative method to update the status of prescribing implementation in GB. This has revealed that the structures of pharmacists prescribing practice are still evolving; many barriers to prescribing implementation have persisted more than five years after the introduction of the policy. The study has highlighted limitations in the structures, especially within the community pharmacy sector which may be detrimental to the development of pharmacist prescribing. Similarly, the processes around the delivery of pharmacist prescribing services still require further development, in order to enhance the implementation of pharmacists prescribing policy; towards increasing the access of patients to medicines and making better use of pharmacist skills, as intended by the introduction of the NMP policy in GB.

The qualitative phase of the project provided deeper insights into the facilitators and barriers of pharmacists' prescribing practice. This led to comprehensive explanations of the prescribing process, and highlighted the need for further research to clarify the roles and responsibilities for all health care professionals to be implemented in the IP/SP models or patient care. Applying these findings in practice will require bold and decisive policy initiatives that may change the way health services are currently delivered in the NHS. Importantly, the findings of the current research provide the background information for appraising pharmacist prescribing implementation to further develop the policy. Ultimately, this should result in the prescribing service that is fit for purpose; enhancing the quality of patient care.

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Appendices

Appendix 1 Research Student Project Ethical Review (RSPER) Form

(TO BE COMPLETED AND APPENDED TO A RESEARCH STUDENT REGISTRATION APPLICATION)

SECTION A: TO BE COMPLETED BY STUDENT

Before completing this section, please refer to the *Research Ethics Policy* and *Research Governance Policy* which can be found online at *http://www.rgu.ac.uk/policies*. The research student's supervisor is responsible for advising the research student on appropriate professional judgement in this review.

Please ensure that the statements in **Section C** are completed by the research student and supervisor prior to submission to the Head of School/Centre.

Project Title:	INVESTIGATING PRESCRIBING BY COMMUNITY PHARMACISTS IN SCOTLAND
Student:	DAPAR LONGJI MAXWELL PATRICK
School/Centre:	PHARMACY
Supervisor:	DOROTHY MC CAIG, SCOT CUNNINHAM, LESLEY DIACK
Start Date:	FIRST FEBRUARY 2008

SECTION B: ETHICS REVIEW CHECKLIST - PART 1

To be completed by research student

		Yes	No
1.	Is approval from an external Research Ethics Committee required/being sought?	√☐	☐
2.	Is the research solely literature-based?	☐	√☐
If you answered YES to 1 and/or 2 please go to the Ethics Review Checklist - Part 2			
3.	Does the research involve the use of any dangerous substances?	☐	√☐
4.	Does the research involve ionising or other type of dangerous "radiation"?	☐	√☐
5.	Could conflicts of interest arise between the source of funding and the potential outcomes of the research?	☐	√☐
6.	Is it likely that the research will put any of the following at risk:		
	(i) living creatures?	☐	√☐
	(ii) stakeholders?	☐	√☐
	(iii) the environment?	☐	√☐
	(iv) the economy?	☐	√☐
7.	Does the research involve experimentation on any of the following?		
	(i) animals?	☐	√☐
	(ii) animal tissues?	☐	√☐
	(iii) human tissues (including blood, fluid, skin, cell lines)?	☐	√☐
8.	Will the research involve prolonged or repetitive testing, or the collection of audio, photographic or video materials?	☐	√☐
9.	Could the research induce psychological stress or anxiety, cause harm or have negative consequences for the participants (beyond the risks encountered in normal life)?	☐	√☐
10.	Will financial inducements be offered?	☐	√☐

11.	Will deception of participants be necessary during the research?	☐	√☐
12.	Are there problems with the participant's right to remain anonymous?	☐	√☐
13.	Does the research involve participants who may be particularly vulnerable (such as children or adults with severe learning disabilities)?	☐	√☐

SECTION B: ETHICS REVIEW CHECKLIST - PART 2

To be completed by research student

Please give a summary of the ethical issues and any action that will be taken to address the issue(s). If you believe there to be no ethical issues please enter "NONE" into the box.

THE ETHICAL ISSUES ARE THOSE RELATED TO CONFIDENTIALITY OF RESPONDENTS AND THEIR RIGHTS OF INFORMED CONCENT. IT WILL BE ECPLAINED TO THEM THAT THEY CAN REFUSE TO PARTICIPATE OR TO WITHWDRAW AT ANY TIME DURING THE RESEARCH. DATA WILL BE COLLECTED USED AND STORED ACCORDING TO THE DATA PROTECTION ACT.

SECTION C: STATEMENT BY RESEARCH STUDENT

I believe that the information I have given in this form on ethical issues is correct.

Signature: Date: _____

SECTION D: SUPERVISOR RECOMMENDATION ON THE RESEARCH PROJECT'S ETHICAL STATUS

Having satisfied myself of the accuracy of the research project ethical statement, I believe that the appropriate action is:

The research project proceeds in its present form	
The research project proposal needs further assessment under the School Ethics procedure*	
The research project needs to be returned to the research student for modification prior to further action*	

* The School is reminded that it is their responsibility to ensure that no project proceeds without appropriate assessment of ethical issues. In extreme cases, this can require processing by the University's Research Ethics Sub-Committee or by external bodies.

AFFIRMATION BY PRINCIPAL SUPERVISOR

I have read this Ethical Review Checklist and I can confirm that, to the best of my understanding, the information presented by the research student is correct and appropriate to allow an informed judgement on whether further ethical approval is required.

Signature: _____ Date: _____

INSTRUCTIONS FOR RESEARCH STUDENT:

Once the School is satisfied with the ethical check surrounding your research work, please attach original signed copy of this form to your Registration Application Form (RDR). Once your RDR form is complete, signed and has all appropriate attachments, you should then forward it to the Research Degrees Office, AB44, Schoolhill.

Appendix 2 project information sheet Phase 1

05 December 2008

THE ROBERT GORDON UNIVERSITY ABERDEEN

Factors Influencing Change: Supplementary and Independent Prescribing by Pharmacists in Great Britain

Participant Information Leaflet

Dear Pharmacist

I am writing to invite you to participate in a study to investigate factors influencing change in supplementary and independent prescribing by pharmacists in Great Britain. The study is being conducted as part of a PhD project in Pharmacy Practice at The Robert Gordon University; supervised by Drs: Dorothy McCaig, Lesley Diack, Scott Cunningham and Derek Stewart. Before you decide whether or not to take part, it is important for you to understand why the research is being undertaken and what it will involve. Feel free to discuss this with others or ask us if there is anything that is not clear or if you would like more information. Thank you for reading this.

Background
Non medical prescribing (both supplementary and independent) aims to improve patient access to medicines, clinical care and maximise the use of health professionals' skills. Several studies have shown that significant numbers of pharmacists are practising as prescribers in various settings. We are now keen to investigate factors which influence change in these processes

What is the purpose of the study?
The study is to determine changes that have taken place since implementation of supplementary and independent prescribing; examine and compare factors influencing implementation and development of prescribing services and explore prescribing pharmacists' views on the future of pharmacist prescribing.

Why have I been chosen?
We are studying all pharmacist prescribers in Great Britain and hence you have been selected because you are registered as either a supplementary or independent prescriber.

Do I have to take part?
Participation in the study is voluntary and your decision to participate will not influence your relationship with The Robert Gordon University or the research team.

What will happen to me if I take part?
If you are willing to take part, you will be asked to complete the enclosed questionnaire which should take around 10-15 minutes. At the end of the questionnaire you will be given the option of discussing some of the issues with the researcher over the telephone. This interview will take place at a time convenient to you. You do not have to do this. You can choose to complete the questionnaire and not participate in the interview.

What are the possible benefits of taking part?
There will be no direct benefit for you from participation in this study. However, it is likely that findings from this study will be of relevance to prescribing pharmacists in Great Britain and their patients/ clients.

Will my taking part in this study be kept confidential?
All the information provided by you will be confidential and all computer files will be password protected. All data reported or published will be anonymous bearing no direct link to you. On completion of the study, all your contact details and other records will be destroyed.

What will happen to the results of the research study?
Results of the study will be disseminated at conferences and submitted for publication in health care journals. A report will be submitted to our sponsors. You will be provided with a short report on the study if you so wish. Progress on the study will also be available on the School of Pharmacy and Life Sciences website.

Who is organizing and funding the research?
This project is being organized by the School of Pharmacy and Life Sciences, The Robert Gordon University Aberdeen. Funding was provided by Community Pharmacy Scotland.

Who has reviewed the study?
This study has been approved by The Robert Gordon University, Aberdeen. The North East of Scotland Research Ethics committee has advised that a full ethics submission is not required.

For further information contact: Mr. Maxwell Dapar m.l.p.dapar@rgu.ac.uk 01224262559

Thank you in advance

Appendix 3 NoSREC advice for questionnaire survey in Phase 1

North of Scotland Research Ethics Committees
Summerfield House
2 Eday Road
Aberdeen
AB15 6RE

Telephone: 01224 558480
Facsimile: 01224 558609
Email: nosres@nhs.net

NHS Grampian

27 November 2008

Mr M Dapar
School of Pharmacy and life Sciences,
The Robert Gordon University
Schoolhill
ABERDEEN
AB10 1FR

Dear Mr Dapar

Requirement for ethical approval

I am writing with regard to our recent e-mail correspondence.

The Ethics Committee do not usually request a full ethics application for projects which involve anonymous questionnaires or in certain cases anonymised questionnaires. However, the interviewing of NHS staff for research purposes would require a full ethics application.

You have indicated that NHS staff will be asked to complete anonymised questionnaires, linked only for the purposes of sending reminder letters and will not be participating in any interviews.

Therefore, based on the information provided, a full ethics application to the North of Scotland Research Committees is not required, in this specific case.

If you require any further information please do not hesitate to contact the ethics office.

Yours sincerely

Dr Julie Kelly
Scientific Advisor & Manager
North of Scotland Research Ethics Service

Appendix 4-First draft of questionnaire

Factors Influencing Change Questionnaire

Please tick or write in the spaces provided as appropriate

Section A. This section contains some questions about you and your practice

1. What sex are you?

☐ Male ☐Female

2. What age are you?

☐ <29 ☐ 30-39 ☐40-49 ☐ 50-59 ☐ 60-64 ☐>64 years

3. How many years have you been registered as a pharmacist?

☐ <6 ☐ 6-10 ☐ 11-15 ☐16-20 ☐ >20 years

4. Which is your main practice setting as a pharmacist?

☐Community ☐Primary care ☐Hospital ☐Other (please specify)

5. Please complete the following table about your supplementary and/or independent prescribing practice

	Supplementary prescriber (SP)	**Independent prescriber (IP)**
When did you register as?	Month/year ☐☐/☐☐☐☐	Month/year ☐☐/☐☐☐☐
When did you write your first prescription (months post registration)?	☐ Not prescribing **(please go to question 6)**	
	☐0-5 ☐6-11 ☐12-17 ☐≥18months	☐0-5 ☐6-11 ☐12-17 ☐≥18months
Which is your main prescribing setting?	☐ Community ☐ Primary care ☐ Hospital ☐Other (Please specify)	☐ Community ☐ Primary care ☐ Hospital ☐Other (Please specify)

Q5 (Cont)

	Supplementary prescriber (SP)	Independent prescriber (IP)
Approximately how many hours per week do you practise as a prescriber?	☐<10 ☐10-19 ☐20-29 ☐ 30-39 ☐>39 hours	☐<10 ☐10-19 ☐20-29 ☐ 30-39 ☐>39 hours
Approximately how many patients do you see per week as a prescriber?		
Which patient group(s) or therapeutic area(s) are you managing?		
How did you choose your patient group(s)? (tick all that apply)	☐ My area of expertise ☐Recommended by the healthcare team ☐ Based on a pharmaceutical needs assessment ☐ Other (please specify)	☐ My area of expertise ☐Recommended by the healthcare team ☐ Based on a pharmaceutical needs assessment ☐ Other (please specify
Are you?	☐currently taking an independent prescribing course ☐considering an independent prescribing course	

6. If you are **not currently prescribing** please tell us why?

If you are not prescribing within primary care or community pharmacy please go to the reply information on last page

Section B. This section is about your current practice as a supplementary/independent prescriber.

7. As a prescriber, how are potential patients identified for you? (tick all that apply)

☐They are identified by the doctor ☐They refer themselves ☐You identify them

☐They are identified by other members of the healthcare team

☐Other (please specify)

8. How much access do you have to the patients' medical records?

☐All the time ☐Just when needed ☐ Never

☐Other (please specify)

9. a. When do you make entries in the patients' medical records?

☐During patient consultation ☐After each patient consultation

☐At the end of a clinic ☐Other (please specify)

b. How do you communicate with other members of the healthcare team?

10. Do you have any involvement in dispensing the prescription you write?

☐ No ☐Yes (please give details of your involvement)

11. Do you have a standard operating procedure that covers your prescribing practice?

☐ No ☐ Yes (please give details of main areas covered)

12. Do you have professional indemnity for prescribing?

☐ No ☐Yes

Section C. This section is about changes to your prescribing practice

13. Has your prescribing practice altered in any way since you registered as a prescriber?

☐No ☐Yes (please give details of what has changed and reason(s) for the change)

14. Have the patient group /therapeutic areas you managed altered in any way since you registered as a prescriber?

☐No ☐Yes (please describe the changes)

15. What prescribing related continuing professional development (CPD) have you undertaken since registering as a prescriber? (tick all that apply)

☐Higher education course ☐Local course ☐Job shadowing

☐Attendance at conference/meeting ☐Peer support ☐Other (please specify)

16. How many **hours** of CPD have you completed in the last 12 months?

☐<6 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30

☐>30 hours

17. Do you get feedback from your patients regarding your prescribing role?

☐No ☐Yes if yes, is this? (Tick all that apply)

☐Formal (such as questionnaire) ☐Informal (such as spoken communication)

☐At each consultation ☐Occasional ☐Other (please specify)

18. Do you receive feedback on your prescribing from other health professionals (including non prescribing pharmacists)?

☐ No ☐ Yes (if yes please state how you get this feedback)

19. Are you involved in a prescribing group or committee?

☐ No ☐ Yes (please name the group or committee)

20. Has your prescribing role lived up to your expectations?

☐ Yes ☐ No (please explain)

21. Do you feel satisfied with your role as a prescriber?

☐ Yes ☐ No (please describe how it could be enhanced?)

Section D. This section is about factors that influence your supplementary/independent prescribing practice

22. Please indicate the strength of your agreement or disagreement with each of the following statements

Statement	strongly agree	agree	unsure	disagree	strongly disagree
I have adequate administrative support for my prescribing practice	☐	☐	☐	☐	☐
I am remunerated appropriately for my prescribing practice	☐	☐	☐	☐	☐
My access to information technology is adequate for my prescribing practice	☐	☐	☐	☐	☐
It would be convenient for patients to get medicines prescribed in a community pharmacy	☐	☐	☐	☐	☐
I have sufficient access to patients' medical records for my prescribing practice	☐	☐	☐	☐	☐
Independent prescribing will/does facilitate my prescribing practice	☐	☐	☐	☐	☐
I have inadequate peer support for my prescribing practice	☐	☐	☐	☐	☐

Q22 (cont)

Statement	strongly agree	agree	unsure	disagree	strongly disagree
My other health professional colleagues do not fully support my prescribing practice	☐	☐	☐	☐	☐
I have adequate communication with doctors in relation to my prescribing service	☐	☐	☐	☐	☐
I have adequate communication with other pharmacist prescribers	☐	☐	☐	☐	☐
My prescribing has had no impact on patients' access to medicines	☐	☐	☐	☐	☐
My prescribing practice has had a positive clinical impact on patient care	☐	☐	☐	☐	☐
My professional line manager has little awareness and understanding of non-medical prescribing	☐	☐	☐	☐	☐
My professional line manager is supportive of my prescribing practice	☐	☐	☐	☐	☐

23. Are there any positive factors that contribute to your prescribing practice?

☐ No ☐ Yes (please give details)

24. Are there any other factors that hinder your prescribing practice?

☐ No ☐ Yes (please give details)

25. Have any of the factors above changed since you registered as a prescriber?

☐ No ☐ Yes (please give details)

Section E. this section is about the future of prescribing

26. Do you have any plans to develop your prescribing practice in the future?

☐ No ☐ Yes (please give details)

27. In your opinion, what is the single most important factor that would promote the future development of prescribing by pharmacists in general

28. What is the single most important factor that would hinder the future development of prescribing by pharmacists in general?

29. In your prescribing practice what is the single most important factor that would enhance your prescribing role?

30. What in your prescribing practice is the single factor most limiting the future development of your role?

31. Do you think that pharmacy undergraduates should complete the prescribing curriculum and graduate as prescribers?

☐ No ☐ Yes

Please give any comments

32. Please give any other comments on pharmacist supplementary or independent prescribing.

Thank you for taking the time to answer this questionnaire.

Please return the questionnaire in the enclosed reply paid envelope to addressee.

Appendix 5 final version of questionnaire

Factors Influencing Change: Investigating Supplementary and Independent Prescribing by Pharmacists in Great Britain

THE ROBERT GORDON UNIVERSITY ABERDEEN

Please tick or write in the spaces provided as appropriate

SECTION A: Factors that may influence your prescribing practice

1. **Which type of prescriber are you?** ☐ Supplementary only ☐ Independent only ☐ Both
2. **Have you written a prescription?** ☐ Yes ☐ No (if no, please tell us why? **Then go to section B)**

3. **What is your main prescribing setting?** ☐ Community pharmacy ☐ Primary care (medical practice) ☐ Hospital ☐ other (please specify)

4. **Please indicate the strength of your agreement or disagreement with each of the following statements**

Statement	strongly agree	agree	unsure	disagree	strongly disagree
I have adequate administrative support for my prescribing practice	☐	☐	☐	☐	☐
I am remunerated appropriately for my prescribing practice	☐	☐	☐	☐	☐
My access to information technology is adequate for my prescribing practice	☐	☐	☐	☐	☐
I have sufficient access to patients' medical records for my prescribing practice	☐	☐	☐	☐	☐
Independent prescribing will/does facilitate my prescribing practice	☐	☐	☐	☐	☐
I have inadequate peer support for my prescribing practice	☐	☐	☐	☐	☐
My other health professional colleagues do not fully support my prescribing practice	☐	☐	☐	☐	☐
I have adequate communication with doctors in relation to my prescribing practice	☐	☐	☐	☐	☐
I have adequate communication with other pharmacist prescribers	☐	☐	☐	☐	☐
My prescribing has had no impact on patients' access to medicines	☐	☐	☐	☐	☐
It would be convenient for patients to get medicines prescribed in a community pharmacy	☐	☐	☐	☐	☐
My prescribing practice has had a positive clinical impact on patient care	☐	☐	☐	☐	☐
My professional line manager has little awareness and understanding of non-medical prescribing	☐	☐	☐	☐	☐
My professional line manager is supportive of my prescribing practice	☐	☐	☐	☐	☐
My prescribing role has lived up to my expectations	☐	☐	☐	☐	☐
I feel satisfied with my role as a prescriber	☐	☐	☐	☐	☐

5. Are there any factors that facilitate your prescribing practice?

☐ No ☐ Yes **(If yes, please give details)**

6. Are there any factors that hinder your prescribing practice?

☐ No ☐ Yes **(If yes, please give details)**

SECTION B: Your current prescribing practice

	Supplementary	Independent
1. When did you register as a prescriber?	**200__**	**200__**

If you are not prescribing within community pharmacy or primary care (medical practice) please go to section E

2. Approximately how many patients do you manage as a prescriber per week? _____

3. Which patient group(s)/therapeutic area(s) are you managing?

4. How did you choose your patient group(s)/therapeutic area(s)?

☐ Recommended by healthcare team ☐ Based on a pharmaceutical needs assessment

☐ My expertise ☐ Other (please specify)

5. How are potential patients identified for you? (tick all that apply)

☐ They are identified by the doctor ☐ They refer themselves ☐ You identify them

☐ They are identified by other members of the healthcare team ☐ Other (please specify)

6. How do you communicate with other members of the healthcare team?

7. Do you have any involvement in dispensing the prescriptions you write?

☐ No ☐ Yes (If yes, please give details of your involvement)

8. Do you have a standard operating procedure that covers your prescribing practice?

☐ No ☐ Yes (If yes, please give details of the main areas covered)

9. Do you have professional indemnity for prescribing?

☐ No ☐Yes

SECTION C: Changes to your prescribing practice since you first registered

1. **Has your prescribing practice altered in any of the following ways?** (Tick all that apply)

☐ Added patient group/therapeutic area ☐ Moved to a different patient group/therapeutic area

☐ Increased the number of patients ☐ Changed prescribing setting

☐ Changed referral process ☐ Implemented IP

☐ Other (please specify)

2. **What prescribing related continuing professional development (CPD) have you undertaken since registering as a prescriber? (tick all that apply)**

☐ Higher education course ☐ Local course ☐ Job shadowing

☐ Attendance at conference/meeting ☐ Peer support ☐ Other (please specify)

3. **How many hours of CPD have you completed in the last 12 months?**

☐ <6 ☐ 6-10 ☐ 11-15 ☐ 16-20

☐ 21-25 ☐ 26-30 ☐ >30 hours

4. **Please comment on any issues you have related to CPD for your prescribing role**

5. **Do you get feedback from your patients regarding your prescribing role?**

☐ No ☐ Yes If yes, is this? (Tick all that apply)

☐ Formal (such as questionnaire) ☐ Informal (such as spoken communication)

☐ At each consultation ☐ Occasional

☐ Other (please specify)

6. **Do you receive feedback on your prescribing from other health professionals (including non prescribing pharmacists)?**

☐ No ☐ Yes (if yes please state how you get this feedback)

7. **Are you involved in a prescribing group or committee?**

☐ No ☐Yes

SECTION D: The future of prescribing

1. **Do you have any plans to develop your prescribing practice?**

   ☐ No ☐ Yes (please give details)

2. **What is the one most important factor that would enhance your prescribing role?**

3. **What is the one factor that would limit the development of your prescribing role?**

4. **Do you think that pharmacy undergraduates should complete the prescribing curriculum and graduate as prescribers?**

   ☐ No ☐ Yes

   Please give any comments

5. **Please give any other comments on pharmacist supplementary or independent prescribing.**

SECTION E: About You

1. **How many years have you been registered as a pharmacist?**

   ☐ <6 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ >20 years

2. **Which is your main practice setting as a pharmacist?**

   ☐ Community pharmacy ☐ Primary care (medical practice)

   ☐ Hospital ☐ other (please specify)

3. **What age are you?**

   ☐ <29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60-64 ☐ >64 years

4. **What sex are you?** ☐ Male ☐ Female

Thank you for taking the time to answer this questionnaire

Please return the questionnaire in the enclosed reply paid envelope

Appendix 6 questionnaire survey information sheet final version

21st March, 2009

Factors Influencing Change: Supplementary and Independent Prescribing by Pharmacists in Great Britain

Participant Information Leaflet
Dear Pharmacist

I would like to invite you to participate in a study to investigate factors influencing change in supplementary and independent prescribing by pharmacists in Great Britain. The study is being conducted as part of a PhD project in Pharmacy Practice at The Robert Gordon University. Before you decide whether or not to take part, please read through this leaflet to understand why the research is being undertaken and what it will involve. Feel free to discuss this with others or ask us if there is anything that is not clear or if you would like more information. Thank you for reading this.

Background
Non medical prescribing (both supplementary and independent) aims to improve patient access to medicines, clinical care and maximise the use of health professionals' skills. Several studies have shown that significant numbers of pharmacists are practising as prescribers in various settings. We are now keen to investigate factors which influence change in these processes.

What is the purpose of the study?
The aim of the study is to determine changes that have taken place since implementation of supplementary and independent prescribing; examine and compare factors influencing implementation and development of prescribing services and explore prescribing pharmacists' views on the future of pharmacist prescribing.

Why have I been chosen?
We are studying all pharmacist prescribers in Great Britain and hence you have been selected because you are registered as either a supplementary or independent prescriber.

Do I have to take part?
Participation in the study is voluntary and your decision to participate will not influence your relationship with The Robert Gordon University or the research team.

What will happen to me if I take part?
If you are willing to take part, then please complete the enclosed questionnaire which should take around 10-15 minutes. At the end of the questionnaire you have been given the option of discussing some of the issues with the researcher over the telephone. This interview will take place at a time convenient to you. You do not have to do this. You can choose to complete the questionnaire and not participate in the interview. Please return the completed questionnaire on or before the 11th of April, 2009 in the reply paid envelope provided.

What are the possible benefits of taking part?
There will be no direct benefit for you from participation in this study. However, it is likely that findings from this study will be of relevance to prescribing pharmacists in Great Britain and their patients/ clients.

Will my taking part in this study be kept confidential?
All the information provided by you will be confidential and all computer files will be password protected. All data reported or published will be anonymous bearing no direct link to you. On completion of the study, all your contact details and other records will be destroyed.

What will happen to the results of the research study?
Results of the study will be disseminated at conferences and submitted for publication in health care journals. A report will be submitted to our funders. You will be provided with a short report on the study if you so wish. Progress on the study will also be available on the School of Pharmacy and Life Sciences website.

Who is organizing and funding the research?
This project is being organized by the School of Pharmacy and Life Sciences, The Robert Gordon University Aberdeen. Funding was provided by Community Pharmacy Scotland.

Who has reviewed the study?
This study has been approved by The Robert Gordon University, Aberdeen. The North East of Scotland Research Ethics committee has advised that a full ethics submission is not required.

Thank you in advance

Maxwell Dapar
Research Student

Appendix 7 Poster summary of information sheet

Factors Influencing Change: Investigating Supplementary and Independent Prescribing by Pharmacists in Great Britain

THE ROBERT GORDON UNIVERSITY ABERDEEN

Pharmacist supplementary and independent prescribers

- **We are investigating factors which may influence change in your professional practice of supplementary and/or independent prescribing.**
- **If you are interested please read the information overleaf then fill out the enclosed questionnaire.**
- **Please return the completed questionnaire on or before the 11th of April, 2009 in the reply paid envelope provided.**

For further information contact:
Maxwell Dapar
m.l.p.dapar@rgu.ac.uk
01224262559

Research supervisors, Drs: Dorothy McCaig, Lesley Diack, Scott Cunningham and Derek Stewart

School of Pharmacy and Life Sciences, The Robert Gordon University, Aberdeen, AB10 1FR

Appendix 8 Reply card for indication of interest in Phase 2 of the project

For further information contact:
Maxwell Dapar
m.l.p.dapar@rgu.ac.uk
01224262559

Research supervisors:
Drs Dorothy McCaig, Lesley Diack,
Scott Cunningham and Derek Stewart

We are interested in exploring some of your views further. If you would like to participate in a **telephone interview of 15–20 minutes** please provide your contact details.

Name_____

Telephone_____

email_____

Preferred day and time to contact you

☐Mon ☐Tue ☐Wed ☐Thurs ☐Fri ☐Sat ☐Sun

☐ 9–12 am ☐ 12–2 pm ☐ 2–5 pm ☐ 5–9 pm

Thank you for your participation.

Please return this card separately by freepost to addressee, The Robert Gordon University, Schoolhill,

Appendix 9 Factor correlation matrix for attitudinal statements related to prescribing

	I have adequate administrative support for my prescribing practice	I am remunerated appropriately for my prescribing practice	My access to information technology is adequate for my prescribing practice	I have sufficient access to patients' medical records for my prescribing practice	Independent prescribing will/does facilitate my prescribing practice	I have adequate peer support for my prescribing practice	My other health professional colleagues fully support my prescribing practice	I have adequate communication with doctors in relation to my prescribing practice	I have adequate communication with other pharmacist prescribers	My prescribing has had an impact on patients' access to medicines	It would be convenient for patients to get medicines prescribed in a community pharmacy	My prescribing practice has had a positive clinical impact on patient care	My professional line manager has good awareness and understanding of non-medical prescribing	My professional line manager is supportive of my prescribing practice	My prescribing role has lived up to my expectations	I feel satisfied with my role as a prescriber
I have adequate administrative support for my prescribing practice	1.000	**.299**	**.281**	.193	.176	.130	.232	.219	.182	.103	.119	.090	.231	**.249**	**.310**	**.361**
I am remunerated appropriately for my prescribing practice	.**299**	1.000	.195	.031	.096	.053	.204	.058	.092	.012	-.004	-.109	.178	.230	.137	.173
My access to information technology is adequate for my prescribing practice	.**281**	.195	1.000	**.449**	.164	.126	.199	.**272**	.146	.007	-.019	.017	.099	.154	.195	.244
I have sufficient access to patients' medical records for my prescribing practice	.193	.031	.**449**	1.000	.235	.042	.206	.253	.067	.068	-.116	.135	.053	.133	.240	.220

Sufficiently strong correlations (close to .3 and above) shown in bold

Appendix 9 cont'd, Factor correlation matrix for attitudinal statements related to prescribing

	I have adequate administrative support for my prescribing practice	I am remunerated appropriately for my prescribing practice	My access to information technology is adequate for my prescribing practice	I have sufficient access to patients' medical records for my prescribing practice	Independent prescribing will/does facilitate my prescribing practice	I have adequate peer support for my prescribing practice	My other health professional colleagues fully support my prescribing practice	I have adequate communication with doctors in relation to my prescribing practice	I have adequate communication with other pharmacist prescribers	My prescribing has had an impact on patients' access to medicines	It would be convenient for patients to get medicines prescribed in a community pharmacy	My prescribing practice has had a positive clinical impact on patient care	My professional line manager has good awareness and understanding of non-medical prescribing	My professional line manager is supportive of my prescribing practice	My prescribing role has lived up to my expectations	I feel satisfied with my role as a prescriber
Independent prescribing will/does facilitate my prescribing practice	.176	.096	.164	.235	1.000	-.032	.159	.189	.083	.167	.013	.189	.097	.137	.241	.235
I have adequate peer support for my prescribing practice	.130	.053	.126	.042	-.032	1.000	.194	.076	.106	.060	.009	.021	.140	.207	.157	.201
My other health professional colleagues fully support my prescribing practice	.232	.204	.199	.206	.159	.194	1.000	.343	.227	.217	-.053	.128	.227	**.313**	**.377**	**.359**
I have adequate communication with doctors in relation to my prescribing practice	.219	.058	**.272**	**.253**	.189	.076	**.343**	1.000	**.253**	.178	-.001	.200	.037	.138	**.294**	**.329**

Sufficiently strong correlations (close to .3) shown in bold

Appendix 9 cont'd, Factor correlation matrix for attitudinal statements related to prescribing

	I have adequate administrative support for my prescribing practice	I am remunerated appropriately for my prescribing practice	My access to information technology is adequate for my prescribing practice	I have sufficient access to patients' medical records for my prescribing practice	Independent prescribing will/does facilitate my prescribing practice	I have adequate peer support for my prescribing practice	My other health professional colleagues fully support my prescribing practice	I have adequate communication with doctors in relation to my prescribing practice	I have adequate communication with other pharmacist prescribers	My prescribing has had an impact on patients' access to medicines	It would be convenient for patients to get medicines prescribed in a community pharmacy	My prescribing practice has had a positive clinical impact on patient care	My professional line manager has good awareness and understanding of non-medical prescribing	My professional line manager is supportive of my prescribing practice	My prescribing role has lived up to my expectations	I feel satisfied with my role as a prescriber
I have adequate communication with other pharmacist prescribers	.182	.092	.146	.067	.083	.106	.227	**.253**	1.000	.122	.056	.049	.226	.143	.199	**.248**
My prescribing has had an impact on patients' access to medicines	.103	.012	.007	.068	.167	.060	.217	.178	.122	1.000	.003	**.295**	.058	.094	**.318**	**.287**
It would be convenient for patients to get medicines prescribed in a community pharmacy	.119	-.004	-.019	-.116	.013	.009	-.053	-.001	.056	.003	1.000	.079	.100	.132	.035	.111
My prescribing practice has had a positive clinical impact on patient care	.090	-.109	.017	.135	.189	.021	.128	.200	.049	**.295**	.079	1.000	-.032	.107	**.312**	**.321**

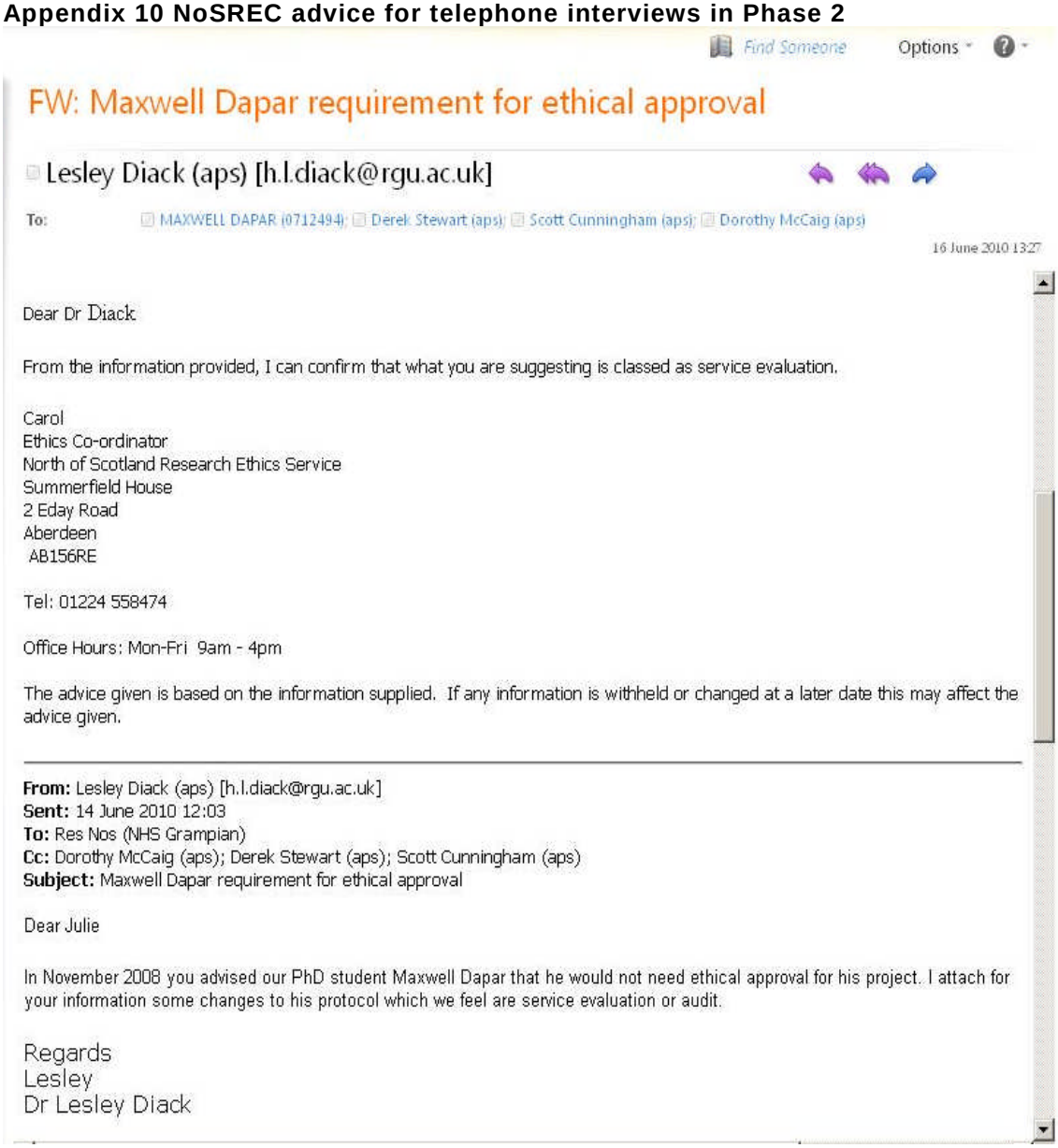
Sufficiently strong correlations (close to .3) shown in bold

Appendix 9 cont'd, Factor correlation matrix for attitudinal statements related to prescribing

	I have adequate administrative support for my prescribing practice	I am remunerated appropriately for my prescribing practice	My access to information technology is adequate for my prescribing practice	I have sufficient access to patients' medical records for my prescribing practice	Independent prescribing will/does facilitate my prescribing practice	I have adequate peer support for my prescribing practice	My other health professional colleagues fully support my prescribing practice	I have adequate communication with doctors in relation to my prescribing practice	I have adequate communication with other pharmacist prescribers	My prescribing has had an impact on patients' access to medicines	It would be convenient for patients to get medicines prescribed in a community pharmacy	My prescribing practice has had a positive clinical impact on patient care	My professional line manager has good awareness and understanding of non-medical prescribing	My professional line manager is supportive of my prescribing practice	My prescribing role has lived up to my expectations	I feel satisfied with my role as a prescriber
My professional line manager has good awareness and understanding of non-medical prescribing	.231	.178	.099	.053	.097	.140	.227	.037	.226	.058	.100	-.032	1.000	**.414**	.077	.098
My professional line manager is supportive of my prescribing practice	**.249**	.230	.154	.133	.137	.207	**.313**	.138	.143	.094	.132	.107	**.414**	1.000	**.348**	**.369**
My prescribing role has lived up to my expectations	**.310**	.137	.195	.240	.241	.157	**.377**	**.294**	.199	**.318**	.035	**.312**	.077	**.348**	1.000	**.762**
I feel satisfied with my role as a prescriber	**.361**	.173	.244	.220	.235	.201	**.359**	**.329**	**.248**	**.287**	.111	**.321**	.098	**.369**	**.762**	1.000

Sufficiently strong correlations (close to .3) shown in bold

Appendix 10 NoSREC advice for telephone interviews in Phase 2



Find Someone Options

FW: Maxwell Dapar requirement for ethical approval

Lesley Diack (aps) [h.l.diack@rgu.ac.uk]

To: MAXWELL DAPAR (0712494); Derek Stewart (aps); Scott Cunningham (aps); Dorothy McCaig (aps)

16 June 2010 13:27

Dear Dr Diack

From the information provided, I can confirm that what you are suggesting is classed as service evaluation.

Carol
Ethics Co-ordinator
North of Scotland Research Ethics Service
Summerfield House
2 Eday Road
Aberdeen
AB156RE

Tel: 01224 558474

Office Hours: Mon-Fri 9am - 4pm

The advice given is based on the information supplied. If any information is withheld or changed at a later date this may affect the advice given.

From: Lesley Diack (aps) [h.l.diack@rgu.ac.uk]
Sent: 14 June 2010 12:03
To: Res Nos (NHS Grampian)
Cc: Dorothy McCaig (aps); Derek Stewart (aps); Scott Cunningham (aps)
Subject: Maxwell Dapar requirement for ethical approval

Dear Julie

In November 2008 you advised our PhD student Maxwell Dapar that he would not need ethical approval for his project. I attach for your information some changes to his protocol which we feel are service evaluation or audit.

Regards
Lesley
Dr Lesley Diack

Senior Lecturer in Elearning/Education Research Group Convenor/School Research Ethics Committee Convenor
PB15
School of Pharmacy and Life Sciences
Faculty of Health and Social Care
The Robert Gordon University
Schoolhill
Aberdeen
AB10 1FR
Tel: 01224 262511
Fax: 01224 262555
email: h.l.diack@rgu.ac.uk

Appendix 11 Participants' information sheet- telephone interview

27th January 2010

Exploring developments in Supplementary and Independent Prescribing by Pharmacists in Great Britain
Participant Information

Dear Pharmacist,
In responding to my earlier questionnaire investigating supplementary and independent prescribing by pharmacists in Great Britain, you indicated that you were willing to participate in a subsequent telephone interview to explore in detail points that were raised in the questionnaire. Please read the following additional information before consenting to be interviewed.

This telephone interview phase is a continuation of my PhD project in Pharmacy Practice at Robert Gordon University. Information in this leaflet is to help you understand why the research is being undertaken and what it will involve if you agree to participate. Feel free to discuss this with others or ask us if there is anything that is not clear or if you would like to clarify any thing further. Thank you for reading this.

Background
Preliminary findings from the questionnaire survey indicate that the main prescriber characteristic associated with writing a prescription is the pharmacy practice setting of the prescriber. About one third of qualified pharmacist prescribers registered with the RPSGB have not written a prescription. In the same way, many of those who have written prescriptions face challenges with lack of sufficient access to patient records and appropriate IT facilities. This was especially the case in the community pharmacy setting. Furthermore, adequate understanding and support for the pharmacists' prescribing role together with appropriate remuneration and logistics were considered essential factors in the successful delivery of pharmacist prescribing services.

What is the purpose of the study?
This telephone interview stage will explore in-depth your views and perceptions of developments in pharmacist prescribing practice.

1. To clarify why and how specific factors facilitate and/or hinder implementation and further development of prescribing practices of pharmacists
2. To ascertain and clarify the aspirations of pharmacist prescribers regarding their individual prescribing roles and possible developments in those roles.
3. To explore the views of pharmacist prescribers in terms of the general development of pharmacist prescribing.

A secondary objective is to make appropriate recommendations to relevant stakeholders to improve the implementation of pharmacist prescribing in GB

Who is organizing and funding the research?
This project is based in the School of Pharmacy and Life Sciences, Robert Gordon University Aberdeen. Funding was provided by Community Pharmacy Scotland.

Why have I been chosen?
The research covers all pharmacist prescribers in Great Britain. However you have been chosen for this telephone interview phase based on your response to my earlier questionnaire and your willingness to help in exploring in detail, issues raised in the questionnaire.

Do I have to take part?
Participation in the interview is voluntary and your decision to participate will not influence your relationship with Robert Gordon University or any of the research team.

What will happen to me if I take part?
If you are willing to take part, then please click on the following link to complete the online consent form. You will also need to fill in your preferred day and time of the week for me to telephone you for an interview which should take about 15-20 minutes. This interview will be audio recorded if you agree and then transcribed for analysis. You may refuse permission for the recording of your interview; in this case I will need to take detailed notes and may have to ask you to repeat things for the sake of clarity. This may require a slightly longer time for the interview

What are the possible benefits of taking part?
There will be no direct benefit for you in participating in the interview. However, it is likely that the findings will be of relevance to stakeholders in the planning and implementation of pharmacist prescribing policies in Great Britain, the prescribing pharmacists and their patients/ clients.

Am I guaranteed confidentiality?
All the information provided by you including any notes and digital audio recording of the interview will be confidential and kept in a locked cabinet and on a password protected computer. All data recorded or published will be anonymised with no direct link to you. On completion of the study, all your contact details and other records will be destroyed in accordance with the Data Protection Act.

What will happen to the results of the research study?
Results of the study will be disseminated at conferences and submitted for publication in health and social care journals. A report will be submitted to our funders. You will be able to access and read progress on the study if you so wish from the School of Pharmacy and Life Sciences website.

Who has approved the study?
This study has been approved by Robert Gordon University, Aberdeen. The North East of Scotland Research Ethics committee has advised that a full ethics submission was not required.

Thank you in advance

Maxwell Dapar
Research Student

Appendix 12 detailed interview guide Phase 2

Exploring Developments in Supplementary and Independent prescribing by pharmacists in Great Britain Interview schedule			
*****SWITCH ON DIGITAL RECORDER*****	**Name of Prescriber**	**Date**	**Time**
A. Introduction Hello, can I speak to [name of pharmacist], please?			
IF NO: OK, I had arranged to call at this time. Should I call again in ten minutes or email them to re-schedule?	Write the outcome in your diary chart and take the appropriate action (call back, email)		
Hello, [name of pharmacist]. I'm [student's name], the pharmacy student from Robert Gordon University ringing to interview you about the transition from supplementary to independent prescribing. Are you still okay to do the interview now? It will take around ten to fifteen minutes.			
IF NO: That's okay. When would you like me to call back? (offer to email if pharmacist is not sure) Thank pharmacist	Write the new day/date/time here and in diary chart:		
IF YES thank pharmacist and continue:			

Appendix 12 cont'd detailed interview guide Phase 2

B. Housekeeping

As you are aware from the information sheet, this conversation is being audio recorded to make sure that I don't miss important points by relying on my memory or notes. If you find this uncomfortable at any stage, just ask me to stop recording. I would emphasise that the interview is confidential and the audio record will be destroyed once the interview has been transcribed. The transcript is also coded to protect your identity. If you decide after the interview you no longer wish to be a part of the research, please let us know within the next seven days. The contact details are on the information sheet. Is that all okay?

IF NO:	Reminders:
That's fine. I won't use the audio recorder but I'll need a bit more time to write down notes as we go through the sections and I may ask you to repeat some answers	• Make sure the audio recorder is switched off • Take time to write detailed notes • If in doubt, ask the pharmacist for clarification before you move on to the next section

***** IF YES, CHECK THAT DIGITAL RECORDER IS WORKING*****

In case of technical problem! Explain, apologise and rearrange interview day/date/time

Appendix 12 cont'd detailed interview guide Phase 2

SECTION 1; Demographic questions					
Note Sex of interview participant			MALE	FEMALE	
OK, [name of pharmacist], firstly I'd like to ask a few details about you.					
How long have you been registered as a pharmacist?		**When did you register as a prescriber?** (get details of type of prescriber)		SP	IP
Ask for age range					
What is your main practice setting as a pharmacist? **Is this also your prescribing setting?** If not probe why they prescribe here and not in main practice setting	Hospital	primary care medical practice	community pharmacy	Other settings (ask for specifics)	
Pleas tell me approximately how many hours of your working week is spent prescribing?		**Approximately how many patients do you prescribe for, in a week?** (clarify to exclude medication review)			
Which patient groups do you manage as a prescriber?		**In case of multiple groups ask for main one and why that was chosen**			

SECTION 2; Questions to clarify why and how specific factors facilitate and/or hinder implementation and further development of prescribing practices of pharmacists

Please tell me what works well in your prescribing practice? - Probe for what they consider as the key or most important thing that works for them in their prescribing practice?

What did you or the other health professionals do to make this experience successful? Probe: What was the outcome of this encounter?

Why is (factor discussed above) important to your prescribing practice? – Probe for how this factor works

How can you tell that (factor mentioned) is working well? Probe for specific examples of how the mentioned factor worked and clarify their perception of a successful prescribing practice

Appendix 12 cont'd detailed interview guide Phase 2

Section 3; Question to ascertain and clarify their aspirations, and possible developments of their prescribing role

What would you consider the ideal role for you as an individual in prescribing practice? (Probe for specific examples)

If given the opportunity, what would you like to do differently in the way you prescribe? -Probe for how and why they would change what they mentioned

What would you consider the ideal prescribing role for pharmacists in general? (Probe for details on the role of the pharmacist in a multi-disciplinary team

Please tell me about your views about patient consultation diagnosis and prescribing for pharmacist? (Probe for details about how they are doing it now)

What advice would you give a new pharmacist prescriber?

Appendix 12 cont'd detailed interview guide Phase 2

SECTION4 Questions to explore their views on the development of pharmacist prescribing role in general

What do you consider the key developments in pharmacist prescribing? Probe for details

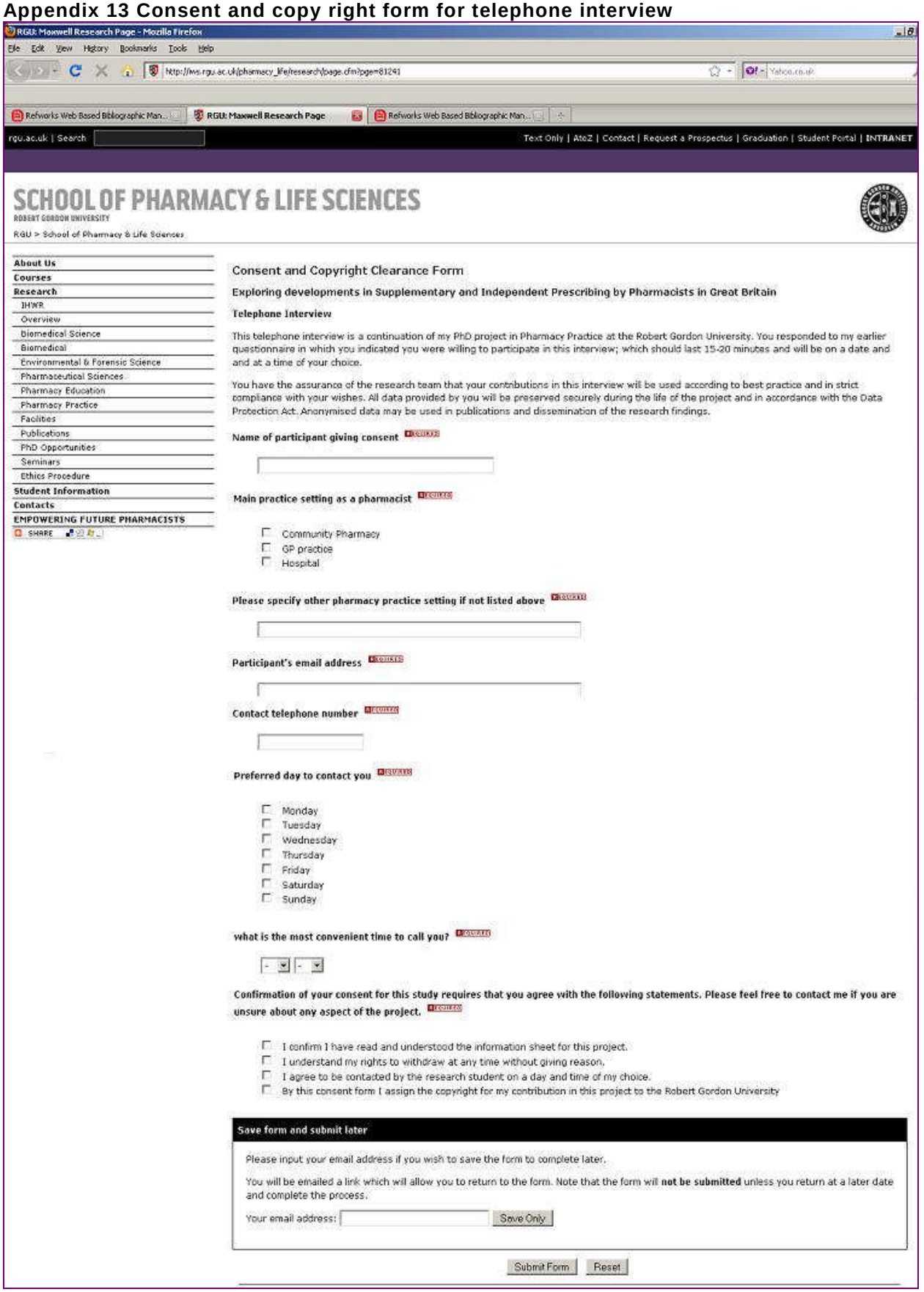
What is your view on the future training of Pharmacists for prescribing? (Probe when to train PG or UG, mode of training)

Are there any other developments in the practice of pharmacist prescribing you want to discuss?

Well that's all of my questions. You've been very helpful and I appreciate you taking the time to speak to me. If you think of anything else you would like to add, please get in touch.

Thank pharmacist and say Goodbye!

Appendix 13 Consent and copy right form for telephone interview



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Exploring developments in Supplementary and Independent Prescribing by Pharmacists in Great Britain

Telephone Interview

This telephone interview is a continuation of my PhD project in Pharmacy Practice at the Robert Gordon University. You responded to my earlier questionnaire in which you indicated you were willing to participate in this interview; which should last 15-20 minutes and will be on a date and and at a time of your choice.

You have the assurance of the research team that your contributions in this interview will be used according to best practice and in strict compliance with your wishes. All data provided by you will be preserved securely during the life of the project and in accordance with the Data Protection Act. Anonymised data may be used in publications and dissemination of the research findings.

Name of participant giving consent REQUIRED

Main practice setting as a pharmacist REQUIRED

- Community Pharmacy
- GP practice
- Hospital

Please specify other pharmacy practice setting if not listed above REQUIRED

Participant's email address REQUIRED

Contact telephone number REQUIRED

Preferred day to contact you REQUIRED

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

what is the most convenient time to call you? REQUIRED

Confirmation of your consent for this study requires that you agree with the following statements. Please feel free to contact me if you are unsure about any aspect of the project. REQUIRED

- I confirm I have read and understood the information sheet for this project.
- I understand my rights to withdraw at any time without giving reason.
- I agree to be contacted by the research student on a day and time of my choice.
- By this consent form I assign the copyright for my contribution in this project to the Robert Gordon University

Save form and submit later

Please input your email address if you wish to save the form to complete later.

You will be emailed a link which will allow you to return to the form. Note that the form will **not be submitted** unless you return at a later date and complete the process.

Your email address: Save Only

Submit Form Reset

Appendix 14 sample interview transcript

Please can you talk me through your experience of implementing pharmacist prescribing in terms of what has worked really well?

I haven't had any real problems, the patients are all quite happy, the doctors are all quite happy the surgeries are all very happy that some body else is doing their work for them. So I think I really don't have very many issues; as far as that goes on the positive side, on the negative side setting it up took a bit of time, getting the admin took quite a lot of time, and the admin problems were the main ones, getting the patients booked in etcetera. Once I got that sorted out and somebody else was doing that for me that worked very well, you really can't do your own admin, you can't get time

So if you had to choose one factor as the most important that has worked for you what would that be?

It has to be cooperation from other health care professionals in the surgery, cooperation from the surgeries have been exceptionally good

Why would you consider that the most important?

Well if you don't have cooperation, you are just not going to get anywhere at all; you can't work on your own.

Ok talking about the things that have not worked well can you say more about the admin problems please?

Yes the admin side was a nightmare, we have no IT connections with the surgeries, so you have to see the patients in the shop, gather all your information, walk up to the surgery, put it all in the computer that all takes time, so that limits you to where you can go…, I do actually run a couple of clinics in the surgeries and that is so much easier because you are sitting in the surgery, you have the computer up in front of you, you have all the records of the patient so there is no paper work because you put it straight on to the computer, it makes life so much easier.

Has anything been done to resolve this problem?

It is a political thing, it is funding, so it is getting the IT up and running so it is really a Scottish Executive level there is nothing that can be done locally because you have got all the IT staff, but sharing the patients' records and confidentiality etcetera, has to be a national agreement, it is really way above my head I have to say

So at the moment you work by…,

I see some of the patients in the pharmacy I see some in the surgery it all depends on how we can organise them. We have to go for the best option for each surgery and it is certainly different for some of them. I have two surgeries that the patients come to the shop and that works very well apart from the fact that I have then got to go up to the surgery to put up the records myself.

Can you tell me a bit more about your prescribing practice in the community pharmacy?

I run two clinics a Friday morning and a Friday afternoon for two different surgeries. The patients are contacted by the surgery and they get a letter to say they are coming to see me in the shop, so they know that already, but the appointments and all the arrangements are made by the surgery; and on the Thursday I get the list down and I get the patient summary, just the same as the doctor would use….so I get a copy of that and the patient will come up at the set time, and I will see them and I will use the summary for the interaction as it were to have the consultation and I have data collection sheet that I use to make sure that I have asked them all the right questions and covered the right ground , take a note of all that, do the…, well most of the spirometry ones I do the spirometry test for the respiratory patients take the results back and my information back up to the surgery, and I put it on to the computer; so that all has to fit into a four hour clinic because that is what you are paid for so you can't go over that which means that I only see about five or six patients generally if it is too many then it is more than that, spirometry takes about half an hour.

So with the advantage of doing clinics in the two settings what could would you say is needed to make prescribing work all through?

I hope we can have IT connection. If I could access patient records from the shop on my computer, you know, a separate computer system; then life would just be a breeze quite frankly. But until that happens and we have been talking about this for how long? Ten years at least to my knowledge maybe a bit longer, and every year they keep saying…..will be up and running and here we are, we are still……so it is just an absolute nightmare and I think it is extremely difficult to expand the service in any meaningful way unless we have IT connection. You know that the new pharmacy contract, chronic medication service, we are supposed to have some sort of IT website we can go to, to put the information on the patient…, we wont actually have access to patients records but we will be able to fill out some so sort of data collection sheet that would automatically go to the surgery and upgrade the surgery. Well, that apparently is not working so heaven only knows when that is really going to come in; but that is the first step, we really need to share patient records; and there has been this idea of: oh it is confidential information, but I find that rather…straight away, you are telling me that I cant be trusted to know what a patient is on or what is happening to them. They are going to tell us anyway, we

know what they are on, we already have a lot of these information and patients will tell you what is wrong with them so I really don't see what the issue is; I understand that it is central that the IT is very robust and that can't ne hacked into etcetera but you know from my point of view that is not my problem, somebody else should be doing it. I am delivering a clinical service here and I am being held back because of a lack of IT connection. So I really don't know what the answer to that is to be quite honest.

So what would be the ideal prescribing role for you as an individual prescriber?

Well, it is exactly what I just said; I want a computer in my consultation room in the shop that I can just switch on and patient would have a mark card or something to give me authority to access their records or some way of doing that a password or something basic with a CHI number for example and I can just go on to that and up comes the records and it would be just like doing it in the surgery which is what I do with some of the clinics and it is just like being a doctor or a nurse or whoever works in the surgery it is so much easier; and then you have all their records, their referral letters and all the rest of it, you know everything about them and that is much safer isn't it?

What do you thing should be the goal for the pharmacy profession in terms of prescribing?

I think we should have such a situation where patients can come in and be seen by us for chronic diseases, which is this new CMS is coming along so we should be able to prescribe for those people. So if you have somebody like me that is also a prescriber there must be some way of amalgamating the fact that we are doing a chronic management service and we are doing some sort of patient medication programme, or profile or whatever for these patients and an action plan for them and should be able to prescribe as well within your competencies. Now that is the difficult one because I could put up a notice and say: right asthma patients come and see me and I can deal with you, but if they come in with heart disease I might have to say: oh sorry I don't deal with that, you would have to go to the guy down the road for that, so you can see that, that is quite a difficult concept isn't it? If we had drop in centres which were manned by a group of people, so there will be a doctor, a nurse and a pharmacist a bit like a mini GP practice but in town working at the weekend, evening and that sort of thing, I think that would be great, but not every pharmacy could do that. I work in a big town centre pharmacy that is one thing but how would you do that in a small rural shop? It wouldn't work would it? so I don't really have one answer, but I do think that if we are able to prescribe then we should be able to run specific clinics; so I could may be say I would do an asthma clinic for patients in this locality, any asthma patient should be able to come to me from any surgery and I should be able to deal with it as long as I keep the surgery informed of what I am doing. I guess if I had my IT connection that would be easy. I am not sure where we are going with this to be honest. It is a difficult one to see how we can all do it; I think you are going to have specialism, aren't you? You have to do

the training for the independent prescribing and not every body wants to do that

Taking you back to the drop in centre you mentioned, how do you envisage the roles of different professions would play out in practice against the background that each is presumably qualified to diagnose and prescribe for patients?

Well every profession has its strengths isn't it? So to me a GP should be defining what is wrong with a patient so they should be deciding on what illness they have got and that should be there main role; to assess the patient and say right: Mrs Smith definitely has got this and Mrs Smith has definitely got that or what ever and deal with more complicate patients. People like me can prescribe for the patients that we have been trained for, so I could be doing diabetes, I could be doing heart failure but with chronic disease situations. So I think the doctor is dealing much more with the acute, seriously acute not over the counter acute; and the nurses fit in there as well, because they are fare better at examination skills than we are, they are more hands on so they are doing the treatments, the dressings, the bloods all those sorts of things. I could train up to take bloods but what is the point of me wasting time doing that when I am definitely better at medication and prescribing? so I think we have all got strengths so if you got us all working together as I do already in the surgery, that works very well so we all know what we all are doing, and the doctors know what I can do and what I can not do, and they send me patients for assessment for example they would say I think this patient had got asthma, I think this patient has got COPD, can you have a look and then see what you think? Then I give them a report back and say well, in my opinion it is X, Y and Z and we discuss it and we end up with a diagnosis, or we refer them on if we are not happy and that works extremely well; and if I want the bloods done, or I want the patients examined…, you know, I can listen to chests my self for that matter but there are more advanced skills that nurses have that we don't have. I am not going to train up as a nurse, I do not have time, and I see that as a complete waste of my time to be honest; because that is not what I trained for, I am trained to deal with medication. So often you will get nurses running clinics for example where I am sitting they will do a hypertension clinic; a hypertension clinic for a nurse consist of taking the blood pressure and talking about health , they don't look at the medication apart for saying are you taking your medication, are you happy on it any side effects? But they don't manipulate the dosages, they don't initiate new drugs or stop drugs, any of that they would have to go back to the GP where as I can do all that. So that is the crosses over between professions, some of the surgeries have a nurse led clinic and then the patient goes straight through to the pharmacist for the drugs and that works very well. There are a few practices in XXX that do that and they have been extremely successful. There is a GP in the background should a patient be identified as being seriously ill, say we find one or two heart block patients with their pulse rates were down thirty something and they automatically get passed to see the doctor to assess because that is really outwit our remit, we are dealing with the stable chronic essentially.

So what is happening with the pharmacy profession taking this scenario forward?

I suppose one of my worries is that we could have a two tier system couldn't we? We would have pharmacists that wouldn't do too much and other pharmacists that are more specialised and I think it will be extremely difficult to have everybody working at the level at which I work at; and if every was working at my level, who on earth is doing the prescriptions? So that is why you need the checking technicians. I am a firm believer in checking technicians, I think they are wonderful and I really can not understand why pharmacists haven't embraced that aspect of the modern pharmaceutical service. Possibly if you are in a small rural pharmacy and can't afford to pay a checking technician and there is only two of you anyway, then it is not relevant; but for the bigger stores, I think it is a wonderful idea and we really are going to have different layers of service…, I think that is true anyway, isn't it? If you run your small local pharmacy, there are certain services they won't offer because they can't manage it or there is no that need. You know, not every where has methadone consumption because there may not be methadone addicts you know, so it is really…, we have to be flexible and I think every pharmacy has to have the capability of stepping up and doing something more. A lot of the private guys, small individual pharmacies supply a wonderful service; they have walk in centres for…, drop in centres for various diseases…, smoking cessation is a typical example, that is relatively new, it wasn't around when I started and now we have people queuing up to do smoking cessation and we have proved that we can do that; and then you have got the diets now and all these diet things are coming out because you have got obesity clinics, you can have a hypertension clinics relatively easily, although manipulating drugs and sort blood test results, that is the more difficult stuff that is why you do need the IT, but you could do it to a certain level, you can certainly take blood pressures and check for glucose in urine and finger pricking tests and all the rest of them. There is a lot we could do but whether we want to be doing that? We don't really want to become mini doctors, we are pharmacists, so there is the danger there isn't it? We might go too far and that…, I suppose at the moment it is very interesting just now because we are not sure what we are going to do, we are trying things out; so what I do is unusual as in not as a pharmacist; but I have proved that you can do it, it is possible, and we have the training or we can get the training, some of us have the facilities and the patients are quite happy to come and some of them are extremely enthusiastic about coming into the pharmacy because it is so much easier for them; and we are open on a Saturday and a Sunday when the surgeries are not and for me that is a big plus.

This picture you have painted is interesting; but I suppose one of the things that may come up is that pharmacists don't run the service all the time, so what happens in the time the pharmacist is off?

Well, I see…, Right…, it is just like any other clinic in the surgery, what happens when the doctors is off? Or what happens when the nurse is off? They simply don't run the clinic…, if you are doing a wafarin clinic and the patient needs testing every week then you have a serious

problem, but if you are doing an asthma clinic the fact that you are not there for two weeks is irrelevant because if the patient comes in with an acute asthma attack they wouldn't be seeing a pharmacist any way, they would be seeing the doctor. So it runs very well because the clinics I do at the surgery, when I was on holiday they simply don't run and the patients are not booked in an there is no problem so I don't see that as an excuse; you will always get somebody criticising but in actual sense it is not relevant, because it doesn't stop the surgeries functioning so why should it stop us functioning.

So in the light of this, what are your thoughts about the training of future pharmacist prescribers?

Well I gathered that a lot of it is now actually embedded into the undergraduate course but unfortunately the society has not recognised those ran by some institutions; so they are leaving, they have actually done the course work of independent prescribing but they are still going to have to do the week's course and pass the sort of assessment so I think it is very unfortunate that if you have done the work what is the point of redoing it? I do think however, that it is a good idea to qualify, to do your pre registration year and may be getting some practice under your belt before you rush off to do the prescribing. That depends on what level you are doing prescribing because if you think about over the counter prescribing like minor ailment scheme, that is prescribing in a sense, well it is prescribing but not just at that advanced level and every pharmacist does it, and some of them are very good and you horn your interpersonal skills don't you? When you are doing that type of thing; you usually find that most pharmacists are extremely good at that type of thing, because that is so much a part of the job being able to communicate; but whether I would want a newly qualified, pre registration, just finished, just qualified, finding their feet suddenly turns around and say oh by the way you are running a clinic every week at such and such a level and you need to upgrade your skills so that you can do that, that might be a bit too fast for some of them because it is all about confidence. I don't think there is a pharmacist anywhere in the country who is qualified who could not run an asthma clinic for example, it is not rocket science, it is a question of knowing what you are suppose to be assessing, knowing how to assess it, doing it in a logical manner based on the guidelines which are freely available and there is lots of paper work etcetera and then knowing what the computer system at the surgery wants to know, knowing what box to be ticked so that they get their QOF point which is another sore point of course, that they are getting paid for all this and we are doing the work which is another point; so really anybody could do it but not every body wants to do it, some people maybe just don't fancy that type of thing, they don't want to be a prescriber because it is a lot of responsibility to have your signature on it, I think a lot of pharmacists are not happy about taking on that responsibility, that is the impression that I get.

Should we in that case expect prescribing to become the mainstream activity of pharmacy?

You have really got me on that one…, I enjoy doing it, but I worry I suppose that if we move into prescribing totally, we have then moved away from medicines haven't we? We have become like mini doctors and I do think our knowledge of drugs is our strength, that is what we have been trained for, that is our knowledge base isn't it? and much bigger extent than anybody else, so I would be unhappy about just being a prescriber I think you need to balance it up with other things and the likes of CMS where they come up with a clinical management plan for the patients, that means discussing all of the medication not just for a little area. It is a much better beef that is a wider base we are dealing with every medicine. My worry is that we become so specialised so I can only speak on…, if you are not asthmatic I can't talk to you and that would seriously worry me. I do have a broad background, I feel as a pharmacist I can function with any disease to a certain level, I won't necessarily be able to run a detailed clinic but I should be able to sit down with anybody who is on repeat medication and discuss every single drug on that list at some level and I do think that is our strength and I really would fight to keep that

So in this prescribing model…,

Certainly I am bringing in the medication side plus a bit of the diagnosis when you ask patients these questions and you can work well with a nurse you can work well with the doctor depending on what model you set up you can go either way and I think the GPs are very appreciative of what we do and certainly the feedback that I get…, I don't think it is because they are being nice to me, if they thought I wasn't doing a good job they would tell me because patient safety is out there isn't it? And the nurses are…, the nurses don't like taking responsibility for prescribing because if you look back and see when nurses were given prescribing rights, it was before ours and yet they haven't made as much success of it as I would have expected. I know overall professionally there are a lot of nurses prescribing far more than pharmacists, but if you thing of the number of nurses, it is a huge profession the biggest health care profession in the country far more than the doctors for example; so for the fact that only a small proportion of them are prescribing surprises me, I would have thought they would have grasped that a lot of them don't want to know, they don't want the responsibility assigned. I don't know what the recently qualified ones are like but certainly, the ones that are working in practice at the moment are not that keen.

What key advice would you give a pharmacist who is about to start prescribing?

You have to have…, whether you are independent or supplementary, because I suppose everybody is coming in as independent now although you can also practice as supplementary, have a clinical management plan. I know legally, you don't need one, but I think you are very foolish if you don't have one because it sets out what you are doing, what drugs you are going to be prescribing; you know, I don't put specific drugs I put the BNF chapters I would just say I am doing all the inhaled corticosteroids for example and I just put BNF chapters because to sit down and go through every single drug you are going to use, will take ages and I just have a

generic CMP for each group of patients ,I don't do individual ones because again that is too time consuming, it is a nightmare; and it changes so often because patients may need a change and you have to write another one ….but the reason you need a CMP is that you know what you have agreed to do, the doctor knows what you have agreed to do and what you are happy to do, you have agreed with the GP how you are going to function, what you are going to be doing and what level you are going to work, and every body knows as well, because the CMP is either in the protocol book that everybody has got or it might be attached to each individual patient you see, which ever way of doing it is up to your self. But if the GPs want to know what I do, all they have to do is look at that and say X is capable of doing this or she can prescribe that; that is fine I can give her that patient; and the nurses also know what you are doing and it then means that if somebody asks you to do something outwit your remit and say couldn't you just do this, couldn't you just do that? You can say: well, no actually I am not comfortable with that; that is the level I am at; but you can always change your CMP as you acquire new skills you can add to it. It is constantly moving.

Is there any other issue you thing is important in pharmacist prescribing that should be brought to light?

Well I suppose it is the funding because at the moment the clinics which have been running were funded by the Scottish Executive and that funding has been stopped from this September coming, that will no longer exist and there is no proviso, no mechanism to keep it going unless the surgeries are prepared to pay for it out of there own pockets and I just don't see that is going to happen. So I suspect we will all suddenly find ourselves not prescribing; you have trained all these people up and you have left them nimble what are they going to do? Now what mu surgery has done, I am paid for by the xxx health board so the clinics that I run for the surgeries with my xxx hat on, will still continue because that money comes from somewhere else, but the clinics which I run with my community pharmacy hat on, are at serious danger of stopping and I think it is a great pity that we haven't got the funding streams for it, they haven't thought this through. They brought us in as a pilot which, has been running for five or six years now and then all of a sudden they are going to pull a tape on it and all of a sudden everybody thinking oh wait a minute we are not sure about that, so you feel you have done all that work, you have done all that training and then you are not going to be able to do it

If the Executive is paying for it, and the GPs are getting the services what does the community pharmacy get?

Nothing at the moment apart from the fact that my time is paid for, so they get compensated for my time but they don't make a profit out of it; it was seen very much as a bridge building exercise :

A. to try and get pharmacists trained up and to give them the confidence to do these

clinics

B. the other side was, get used to doctors using pharmacists and knowing that pharmacists can run these clinics to a certain level and they would be clinically responsible for what they were doing and then provide a bit of an improved service and we have proved that but no body has thought what we are going to do with it in the future,

So here we are we have suddenly come to the end of the clinics and we are all floundering around and no body really knows what is going to happen and all very unfortunate; and although the CMS is coming in, that is not to the level that I work at; that is all very much sitting there saying hello Mrs Smith, you have got six items here, and have you any side effects? Do you not like the taste of your gaviscone? Well, we could change that and do all that sort of thing and you need pain killers or I don't like pain killers.., oh we could give you something else if you have got side effects, that is not the level that I work at, I am diagnosing asthmatics, COPD patients, I am doing spirometry testing, with the hypertension we are looking at blood test results, we are manipulating drugs etcetera and that is all going to disappear because you can't do that in the shop it is certainly not going to work, so I think it is most unfortunate and I am not sure what is going to happen so we have proved that we can do things and then there is no continuity. By the time you have written up your research, things might have changed of course (she laughs) but at this precise moment in time we are [peaky] in the middle.

Let us hope things change for the better…,

Well…, XXX, you know XXX? She works for XXX, have you bumped into her? Right run up to her room and ask her about that, she works for YYY so she will be more in the know, so you can pin her to the wall

Thank you very much; I am very sorry I have taken longer…,

Oh it is alright don't worry, I am quite happy to talk

All the same I am very grateful thank you

Appendix 15 Abstract Oral presentation at the Royal Pharmaceutical Society conference London-UK, September 2010

Oral Session 3- access to medicines

15 Training undergraduate pharmacy students for prescribing: views of primary care based pharmacist prescribers in Great Britain

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Focal points

- Incorporating prescribing training in the undergraduate curriculum may be one way to prepare future pharmacists for prescribing practice.
- We surveyed pharmacists who were actively prescribing in primary care for their views regarding prescribing training for pharmacy undergraduates.
- A majority of pharmacist prescribers had concerns about the risk and safety implications of new graduates prescribing.

Introduction

One key aim of non-medical prescribing is to improve patient access to medicines.[1] To help achieve this, it is desirable for more pharmacists to participate in prescribing training and for prescribing to become a standard element of pharmacy practice. However, a published national survey of pharmacists' planned participation in supplementary prescribing (SP) training identified that only a minority had any training plans.[2] One other factor which may hinder involvement in prescribing training is that The Royal Pharmaceutical Society of Great Britain (RPSGB) stipulates a minimum of two years post registration experience prior to enrolling in prescribing training.[3] The aim of this study was to determine the views of qualified pharmacist prescribers working in primary care, regarding the prescribing training of pharmacy undergraduates.

Method

Design: Cross sectional questionnaire survey mailed to all pharmacist prescribers registered with RPSGB (n = 1653 in April 2009), with two reminders at monthly intervals. Pharmacists who indicated that they were actively prescribing in primary care (general medical practice and community pharmacy) settings were asked their views on undergraduates completing prescribing training as part of the undergraduate course. The North of Scotland Research Ethics committee advised that formal approval was not required.

Results

The response rate was 42.3% (695/1653). Of these, 333 (47.9%) were based in primary care and 68.5% (n = 228/ 333) were actively prescribing. A majority (69.3% n = 158/ 228) of these had concerns about the introduction of pharmacist prescribing training at the undergraduate level; with only a fraction (23.7% n = 54/228) supporting this development; the remaining (7.0% n = 16/228) did not make comments. Key themes from the analysis of open comments are given below:

1. Risk and patient safety: Pharmacist prescribers generally felt that the processes of prescribing were associated with responsibilities such as ensuring safe and effective prescribing. This requires experience and maturity which new graduates may not necessarily have.
2. Image and prestige: Prescribers, who supported the idea of prescribing training for undergraduates, argued that prescribing was the future of pharmacy. They expressed the opinion that pharmacists graduating as prescribers would enhance the image of the profession structure the implementation of prescribing contrary to what they described as the current 'piece meal' approach. They pointed out that prescribing needed to be 'demystified'. Conversely, those who objected tended to comment that prescribing was an exclusive activity and not suitable for all pharmacists. They felt that prescribing would be devalued if every pharmacist were to prescribe. Some expressed the fear that new graduates as prescribers could tarnish the image of pharmacy.

3 Logistics of the training course: Those supporting undergraduate training alluded to the ease of studying the course at that level. However, those objecting noted the waste of time and resources if no immediate prescribing roles were available.

Conclusions

Views and concern about incorporating prescribing training in the undergraduate curriculum have been presented from the perspective of pharmacist prescribers in primary care only and hence may be biased. Issues raised require in-depth qualitative research to inform future training plans and processes.

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Appendix 16 Abstract of oral presentation at the 16th International Social Pharmacy Workshop Lisbon-Portugal, August 2010

Communications

Oral communications
Main conference

com-088

CURRENT STATUS OF PRESCRIBING BY PHARMACISTS IN GREAT BRITAIN

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Pharmacist prescribing has been implemented in Great Britain (GB) since 2003. Access to medical records, clinical governance issues around clinical management plans and communication were identified as key factors influencing the successful implementation of supplementary prescribing (SP). Most research has focused on pharmacists' views and experiences in the early years post implementation of prescribing practice. However, key innovations such as the subsequent introduction of pharmacist independent prescribing and seven years of SP experience makes it imperative to update the status of pharmacist prescribing in GB.

Objective

To define the level of implementation into practice of pharmacist prescribing and to identify factors associated with implementation.

Methods

Design: Cross sectional questionnaire survey.
Population: All pharmacist prescribers registered with the Royal Pharmaceutical Society of Great Britain (n=1653). The questionnaire was mailed in April 2009, with two reminders at monthly intervals. Main outcome measures were prescribing activities and influencing factors. Data relating to prescribing practice were reported using descriptive statistics. Chi square was used to test for association between demographic variables and prescribing activity.

Results

Response rate was 42.3% (n=695). A majority of the respondents 68.1% (n=473), had written prescriptions. Respondents in hospital (H) and general medical practices (GP) settings were more likely to have prescribed than those in community pharmacies (CP) (χ^2 12.10 $P<0.01$). There were however, no significant differences between the two groups of pharmacist prescribers in terms of sex, age and length of experience as pharmacists.
The ratio of prescribing in each setting was H 44.1% (n=211) GP 42.1% (n=201) and CP 7.9% (n=38) and other settings 5.9% (n=28). Most prescribers based in H and GP prescribed within the same setting. However, half of the pharmacists based in CP prescribed in GP the setting.

Conclusion

Pharmacy practice setting is the main determinant of respondents engaging in prescribing practice.

com-094

Appendix 17 Abstract of poster presentation at the 16th International Social Pharmacy Workshop Lisbon-Portugal, August 2010

Communications

Poster communications

com-089

PHARMACIST PRESCRIBING IN GREAT BRITAIN: WHY DO QUALIFIED PHARMACISTS NOT PRESCRIBE?

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Since the introduction in Great Britain of pharmacist prescribing, studies have focused on structures and processes of its implementation. However, data suggest that one in three qualified pharmacist prescribers are currently not prescribing.

Objective

To explore why qualified pharmacist prescribers do not prescribe.

Methods

Design: Cross sectional questionnaire survey of all registered pharmacist prescribers in GB (n=1653). Respondents who had not prescribed gave open comments on their reasons. The themes emerging from these were categorised using framework analysis.

Results

The two main themes and their sub themes are discussed below:

Procedural factors: Aspects of clinical governance, such as the lack of defined roles and insufficient resources in terms of inadequate funding and facilities; poor remuneration; and a lack of sustainability of pharmacist prescribing services once commissioned were the main procedural factors impeding prescribing.

Some pharmacist prescribers had to 'invent' prescribing roles for themselves, sometimes confusing patients and other healthcare professionals. Similarly, inadequate facilities and strategies for implementing pharmacists' prescribing at the level of the Trusts and Health Boards often deterred many qualified prescribers from using their skills. For example, there were issues around prescribing quality assurance, such as the audit of prescriptions written by pharmacists and legal restrictions on prescribing of items, such as unlicensed medicines compounded from licensed ingredients.

Personal factors: Most qualified pharmacist prescribers who were not using their qualification cited lack of opportunities, due to their personal circumstances, including: maternity leave; change of job or practice setting; and enrolling in further educational programmes. Moreover, many pharmacist prescribers had extensive managerial duties and responsibilities competing for attention with patient focused clinical duties including prescribing.

Conclusion

This study has identified both procedural (external) and personal (internal) factors that may explain why some pharmacists that qualify as prescribers are not able to integrate prescribing into their routine practice.

com-091

Appendix 18 abstract of poster presentation at the Health Services and Pharmacy Practice Research conference Manchester-UK, April 2010

Poster Sessions

50 Facilitators and barriers to pharmacist prescribing: Exploring the association of pharmacy practice setting

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Introduction

Research on pharmacist prescribing has mainly centred on early experiences related to supplementary prescribing (SP). George et al. [1] and Weiss et al. [2] first identified facilitators and barriers to successful implementation of SP. Among others, lack of access to patients' medical records (PMR) was noted as a barrier particularly in community pharmacy. Further research focussing on practice setting is warranted post introduction of independent prescribing (IP). The aim of this study was to explore the association of practice setting on facilitators and barriers in relation to their prescribing practice.

Methods

Validated and pre-piloted postal questionnaires comprising five sections: factors that may influence prescribing, current prescribing practice, changes to prescribing practice since initial registration as a prescriber, the future of prescribing and demographic characteristics were mailed to all prescribers on the register of the Royal Pharmaceutical Society of Great Britain (n = 1653) in April 2009. Only the attitudinal facilitators/barriers and demographic characteristics are reported here.

Results

Response rate was 42% (n = 695); 73% (n = 498) female, 70% (n = 493) between ages 30 and 49 years. Almost 50% (n = 307) had more than 20 years experience as pharmacists. More than 68% (n = 472) had written a prescription with those working in GP surgeries or hospitals more likely than those in community pharmacy setting (x^2 = 12.1 P <0.01).

Table 1 Attitudinal facilitators and barriers of pharmacist prescribing in relation to their practice setting

	CP (%)		GP (%)		HOSP (%)	
	Disagree/	Agree	Disagree/	Agree	Disagree/	Agree
I am remunerated appropriately for my prescribing practice	51.3	28.2	49.3	35.2	51.9	37.4
I have sufficient access to patients' medical records for my prescribing practice*	20.3	75.9	3.5	95.8	2.4	96.1
Independent prescribing will/does facilitate my prescribing ractice*	11.8	72.4	5.6	89.4	4.4	89.2
My other health professional colleagues fully support my prescribing practice*	21.5	69.6	10.6	79.6	9.7	81.1
I have adequate communication with other pharmacist prescribers	39.2	50.6	33.6	50.3	29.6	58.1
It would be convenient for patients to get medicines prescribed in a community pharmacy**	1.3	91.1	15.5	53.5	17.9	50.7
I feel satisfied with my role as a prescriber	14.1	71.8	13.9	74.3	13.5	72.0

CP, Community pharmacy; GP, General medical practice; HOSP, Hospital. *Chi square significant at P < 0.05; **Chi square significant at P < 0.01. Total response for each practice setting less than 100%; remaining fractions were neutral.

Respondents agreed across pharmacy practice settings that they had adequate administrative and peer support, and that their prescribing roles made positive impacts on patients' access to medicines. However, they disagreed that they were appropriately remunerated for prescribing. Issues of access to PMR, support of other health professionals and convenience of patients getting prescribed medicines elicited greater differences (Table 1).

Conclusion

This study has shown the importance of practice setting in relation to the implementation of pharmacist prescribing, with barriers identified more in community pharmacy compared with other settings. Qualitative research is required to gain more insight. It is important that facilitators are harnessed for future prescribers and barriers resolved to enhance the uptake into prescribing training and practice. Findings should be interpreted with caution due to the low response rate which limits generalisability.

References

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Appendix 19 A poster presented at the Celtic Pharmacy Festival, Edinburg-UK March, 2010

ROBERT GORDON UNIVERSITY•ABERDEEN

THE NATURE AND EXTENT OF PRESCRIBING BY PHARMACISTS IN PRIMARY CARE SETTINGS IN GREAT BRITAIN

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Background

Pharmacist prescribing aims at improving patients' access to medicines and make best use of pharmacists' clinical skills.[1] An earlier survey of all pharmacist prescribers observed progress in the implementation of supplementary prescribing (SP). This was more likely in general medical practices (GP) than community pharmacies (CP) and hospitals[2].

It is important to evaluate progress in the implementation of prescribing primary care (CP and GP) as this is the setting of most prescribing, drug consumption and pharmacist activity.

Aim

To determine the nature and extent of prescribing by pharmacists in primary care settings

Methods

Design: cross sectional questionnaire survey

Sample: Pharmacist prescribers working in CP and GP settings were identified from a survey of all pharmacist prescribers registered in Great Britain as of January, 2009 (n= 1653).

Respondents completed sections of the questionnaire relating to their current prescribing practice and demographics.

Questionnaires were mailed in April, 2009 with two reminders at four weekly intervals.

Data analysis: Descriptive statistics for current prescribing activities. Main outcome measures were the patient load and the processes of prescribing adopted by pharmacists.

Results

Response rate was 42.3% (695/1653). Of these, 333 (47.9%) worked in primary care as their main pharmacy practice setting. Of those working in primary care settings, 68.5% (n=228) had prescribed mainly in the GP setting (81.6%, n=186) and only a small fraction prescribed in CP.

Prescribers in GP settings managed a mean patient load of 17 per week compared to a mean patient load of 12 per week managed by prescribers in CP. Mean difference of 5, t = 2.46 df 197, p =0.02, 95% CI(1 - 9). Table 1 gives details of prescribing activities of pharmacist and table 1a compares attitudinal responses of pharmacist prescribers in primary care settings to some of the factors influencing prescribing practice.

Table 1 Aspects of current pharmacist prescribing in primary care settings (n= 228)

Aspect	number of prescribers	(%)
Rationale for choice of therapeutic area		
Recommended by health team	87	38.5
Based on pharmaceutical needs assessment	28	12.4
Pharmacist expertise	69	30.5
Other reasons	32	14.2
Prescribing patient group/therapeutic area*		
cardiovascular diseases	156	69.0
Respiratory diseases	77	34.1
Diabetes mellitus	35	15.5
Analgesia	21	9.3
Smoking cessation	13	5.8
Substance misuse	13	5.8
Method of patient reorultment*		
By doctor	140	61.9
Patient self referral	62	27.4
By pharmacist prescriber	127	56.2
By other members of the health team	140	61.9
Other referral processes	199	88.1
Any involvement in dispensing own prescriptions		
Yes	42	18.6
No	174	77.0
Prescribing within defined standard operating proceduresc		
Yes	71	31.4
No	140	61.9
Patient load of prescribers per week		
≤7	71	31.4
8-15	71	31.4
≥15	63	27.9

*Total > n (228) >100% because of multiple response by pharmacists that use more than one patient recruitment method and/or prescribe in more than one therapeutic area

Table 1a Comparison of community and general medical practice pharmacist prescribers' response to attitudinal statements

Statement	% Disagree CP	% Disagree GP	% Agree CP	% Agree GP	p- value
My access to information technology is adequate for my prescribing practice	17.9	6.1	76.9	91.8	< 0.05
I have sufficient access to patients' medical records for my prescribing practice	20.3	3.4	75.9	95.9	< 0.01
Independent prescribing willdoes facilitate my prescribing practice	11.8	5.5	72.4	89.7	< 0.01
I have adequate communication with doctors in relation to my prescribing practice	3.8	6.2	86.1	89.0	< 0.05
It would be convenient for patients to get medicines prescribed in a community pharmacy	1.3	15.2	91.1	53.8	< 0.01

Conclusion

This study identified further progress in the implementation of pharmacist prescribing within GP and community pharmacy settings.

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We thank Community Pharmacy Scotland for providing funding for the research, we also thank pharmacists who completed the questionnaire.

Appendix 20 A poster presented at the Celtic Pharmacy Festival, Edinburg-UK March, 2010

ROBERT GORDON UNIVERSITY•ABERDEEN

Supplementary and Independent Prescribing by Pharmacists in Great Britain: current status of implementation

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Background

Pharmacist prescribing has been implemented in Great Britain (GB) since 2003. Most published research has focused on pharmacists' views regarding the prescribing course and early implementation of prescribing practice[1]. Now with seven years experience of pharmacist prescribing, it is necessary to review and update on the current status of implementation.

Aim

To define the level of implementation into practice of pharmacist prescribing in GB

Methods

Design: Cross sectional questionnaire survey.

Population: All pharmacist prescribers registered with the Royal Pharmaceutical Society of Great Britain in January 2009 (n=1653). The questionnaire was mailed in April 2009, with two reminders at monthly intervals.

Data relating to current prescribing practice of pharmacists were reported using descriptive statistics. The main outcome measures were the proportion of prescribers that had written prescriptions and the setting in which they prescribed.

Results

Response rate was 42.3% (n=695). There were fewer community pharmacist (CP) prescribers compared to their proportion among the general population of British pharmacists[2]. Table one compares the demographics of those with and without prescribing experience.

A majority of the respondents 68% (n=473), had written prescriptions, and the determinant was their main pharmacy practice setting. This relationship was statistically significant ($\chi 2$ 12.10 P<0.01).

Figure 1 shows the relationship between the main pharmacy practice setting and the prescribing practice setting of pharmacists prescribers that had prescribed. About 86% of pharmacists that had written prescriptions were distributed in almost equal proportions between hospital (H) and general medical practices (GP) with only 8% prescribing in CP settings.

Conclusion

This study has shown the pharmacy practice setting to be the main determinant of respondents engaging in prescribing practice. The majority of respondents who said their main practice base was H or GP prescribed within the same setting while CP respondents tended to prescribe more in the GP setting.

References

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Acknowledgements

We thank Community Pharmacy Scotland for providing funding for the research, we also thank pharmacists who completed the questionnaire.

Table 1 Demographic characteristic of qualified prescribing pharmacists comparing those prescribing and those not prescribing

Characteristic	Number prescribing	%	Number not prescribing	%
Age (years) n= 686 χ^2 = 7.21, p-value (0.206)				
Less than 29	13	59.1	9	40.9
30-39	159	63.6	91	36.4
40-49	172	71.1	70	28.9
50-59	117	71.8	46	28.2
60-64	5	83.3	1	16.7
Above 64	3	100.0	0	0.0
Sex n=685 χ^2 = 2.34 p-value (0.125)				
Male	138	73.0	51	27.0
Female	332	66.9	164	33.1
Main practice setting as a pharmacist n= 688 χ^2 = 12.10*, p-value (0 .007)				
General medical practice	146	74.9	49	25.1
Hospital	211	70.3	89	29.7
Community pharmacy	80	58.8	56	41.2
Other practice settings	34	59.6	23	40.4
Experience as a pharmacists (years) n= 688 5.9, p-value (0 .206)				
Less than 6	6	54.5	5	45.5
6-10	68	60.7	44	39.3
11-15	88	67.7	42	32.3
16-20	88	68.8	42	31.2
Above 20	88	72.0	40	28.0

* Chi square significant at p<0.05
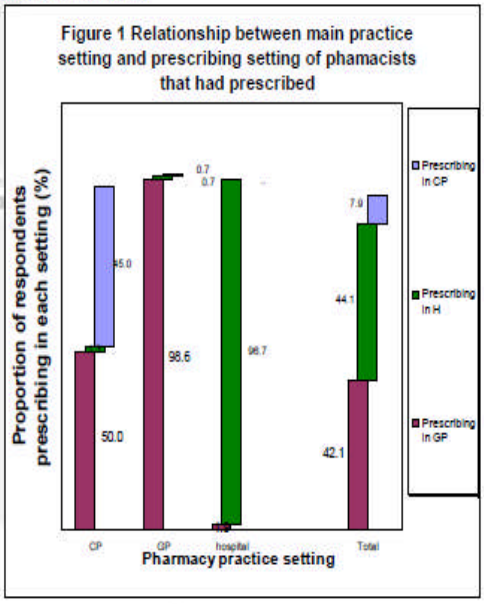
Figure 1 Relationship between main practice setting and prescribing setting of phamacists that had prescribed