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Identifying community pharmacists' skill sets to address the public's needs

Submitted by
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Impact of COVID-19

The COVID-19 pandemic had a significant impact on my doctoral degree. The pandemic started in the middle of the 3rd year of my PhD during the data collection phase. Therefore, making changes to the original study protocol was impossible. However, my supervisor and I decided to terminate the data collection which was the main impact the pandemic on my PhD.

The situation during the pandemic directly impacted participant recruitment. A few interview participants cancelled before the lockdown in the United Kingdom (the first lockdown began on 23 March 2020). Furthermore, the original study protocol included interviewing the community pharmacist so that they could comment on the participants' results and give views on the set of the skills they would need in the future. However, this step was not an option during 2020 due to the huge pressure on community pharmacist's services and difficulties with recruiting participants.

Most of the research objectives were about people understanding the expansion of the community pharmacist's roles, which was already in place because of the impact of COVID-19 on general practitioners' service delivery. Also, digitising community pharmacy services was one of the changes necessitated by the pandemic. All these changes made terminating the study an ideal option because the participants' views and opinions would have been dramatically influenced by the extraordinary situation. I conducted the data analysis considering the COVID-19 pandemic by considering its impact on community pharmacy services. I also considered how some of my study results might no longer be relevant since more people would have had exposure to community pharmacy services

during the pandemic, so their opinions may have changed. Moreover, I highlighted throughout my thesis how we can apply the results of this study to a post-pandemic context.

On a personal level, I found it stressful and challenging to complete this thesis during the lockdown and travel restrictions, regardless of the support provided by the University of Nottingham and my supervisors. Adapting to the new, sudden situation had a dramatic impact on my productivity and progress. Also, the inability to have face-to-face discussions or training programs, as only an online training program was available, impaired my learning process. I would like to acknowledge that this experience has strengthened my self-learning skills and made me a more independent researcher.

Abstract

Introduction: Community pharmacists are skilled healthcare professionals with knowledge and experience that might be put to greater use. Policymakers in the United Kingdom have recognised the potential of community pharmacists as a possible contributor to relieve pressure on other sectors of the NHS. In the past few years, there has been growing support for expanding the role of community pharmacists so that they can provide more advanced services.

Reviewing the literature shows that these extended community pharmacy services have positive effects (Boardman and Avery, 2014; Brown et al, 2014; Buchanan et al, 2020; Corlett and Krska, 2016; Ingram et al, 2018), there has been a lack of awareness and utilisation of the CP services among the public. Understanding public views regarding these services is thus beneficial for future community pharmacy service planning and development. Therefore, this PhD aims to identify the public's perceptions of their needs from community pharmacist and developing a skill set to address these needs.

Methods: This PhD project consists of three main stages: a scoping review, mixed-methods studies, and finally skill mapping. Firstly, the scoping review was conducted according to Arksey and O'Malley's (2005) framework and Levac et al. (2010). Then, the results were used to inform mixed-methods research using validated online surveys and telephone interviews. This research was undertaken between October 2019 and mid-March 2020 (before and during the COVID-19 pandemic). Data was analysed using descriptive statistics and thematic analysis. Skill mapping was conducted through a framework analysis. Ethical approval was obtained for this study from the research ethics committee at the School of Pharmacy (reference number: 015-2019).

Results: The scoping review shows that community pharmacy accessibility and convenience are the main reasons behind people using community pharmacy services, while time constraints and funding were real challenges for pharmacists. The review also lists the mechanisms underpinning the successful implementation of community pharmacy services which include acquiring skill and knowledge, accessibility to CP, adequate resources, marketing, collaboration and public trust and confidence. This review offers a hypothesis about how these mechanisms might play out differently in different contexts and account for the success or failure of delivering new services through community pharmacy.

From the questionnaire results, the majority of participants had visited a community pharmacy more often than a general practitioner. However, participants' awareness of the current services delivered in community pharmacy varied. Regarding the expansion of the community pharmacist's roles, the participants were positive. The services that the public wished to see in community pharmacy included pharmacists as independent prescribers, advice to improve selfcare, and screening services (i.e., illness detection services).

With regards to the qualitative results, 12 people participated in semi-structured telephone interviews. Overall, the participants were positive about expanding the community pharmacist's roles, and emerging codes were mapped to the 7Ps marketing framework: product, price, place, promotion, people, process, and physical evidence.

Additionally, the findings of the previous two stages were used to identify the set of skills that community pharmacists will need in the future. Five skills were identified: intrapersonal skills, interpersonal skills, advanced clinical skills, marketing skills, and digital skills.

Conclusion: Overall, the participants in this study had a positive attitude towards the changing roles of the community pharmacist. However, the participants perceived several barriers that should be addressed to improve service utilisation and provide tailored services based on their needs. Community pharmacists need to acquire the correct set of skills to ensure that the quality of services provided fits with current and future need. The proposed set of skills will benefit both the existing and future community pharmacy workforce. This research is useful since it prepares policymakers and pharmacy professional organisations for future planning and development, but consideration should be taken as to how the results should be interpreted since the data was collected before the pandemic and subsequent lockdown in the United Kingdom.

Conferences and Symposia

Suha Alharbi, Tracey Thornley, Claire Anderson. Public attitudes toward digitising community pharmacy service. 2021

Presented as an oral presentation at the Universitas 21 Health Sciences Group Annual Meeting (U21), 2021, virtual event, 13th – 15th September 2021.

Suha Alharbi, Tracey Thornley, Claire Anderson. Exploring public attitude toward using community pharmacy for management minor Aliments. 2021

Presented as a poster presentation at The 49th annual scientific meeting of the Society for Academic Primary Care (SAPC), virtual event, 30th June, and 1st July 2021

Suha Alharbi, Tracey Thornley, Claire Anderson. Exploring public attitudes towards community pharmacy services in Cardiff: A pilot study.2020, Pharmacy Education, 20 (3) p.102

Presented as a poster presentation at the International Pharmaceutical Federation (FIP) virtual event, 4th - 25th September 2020.

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Finally, a special thank you to all those who proofread for me.

List of Abbreviations

AC	Available Case Analysis
ACP	Average Congruency Percentage
CCG	Clinical Commissioning Groups
CFIR	Consolidated Framework for Implementation Research
CMO	Context-Mechanism-Outcome
CPCF	Community Pharmacy Contractual Framework
CPCS	Community Pharmacist Consultation Service
CPs	Community Pharmacies
CVD	Cardiovascular Disease
DALY	Disability-adjusted life years
GBD	Global Burden Disease
GDP	Gross Domestic Product
GPs	General Practitioners
GRAMMS	Good Reporting A Mixed Method Study
HBM	Health Belief Model
HCP	Health Care Provider
HIV	Human Immunodeficiency Virus
HLP	Healthy Living Pharmacy
HSC	Health and Social Care
HSCB	Health and Social Care Board
ICSs	Integrated Care Systems
IMD	Index of Multiple Deprivation
IT	Information Technology
KTA	Knowledge to Action framework
LCGs	Local Commissioning Groups
LHBs	Local Health Boards
LSOA	Lower-layer Super Output Area
LTCs	Long Term Conditions
MAR	Missing At Random
MCAR	Missing Completely At Random
MH	Mental Health

MMR	Mixed-methods research
MNAR	Missing Not At Random
NHS	National Health Services
N/A	Not Applicable
NI	Northern Ireland
PCNs	Primary Care Networks
PHE	Public Health England
STI	Sexually Transmitted Infection
STPs	Sustainability and Transformation partnership
TDF	Theoretical Domains framework
UK	United Kingdom
UTCs	Urgent Treatment Centres
UTI	Urinary Tract Infection

Table of Contents

Impact of COVID-19 ..... **II**

Abstract ..... **IV**

Conferences and Symposia ..... **VII**

Acknowledgements ..... **VIII**

List of Abbreviations ..... **X**

Table of Contents ..... **XII**

List of Figures ..... **XVII**

List of Tables ..... **XIX**

Chapter 1. Introduction, background, and scope **1**

1.1 Introduction **1**

1.2 Background **3**

1.2.1 Country Context 3

1.2.2 Healthcare in UK 6

1.3 Scope (Community Pharmacy (CP)) **28**

1.3.1 Overview of the community pharmacy in the UK 28

1.3.2 Brief historical background 29

1.3.3 Current role of community pharmacist 31

1.3.4 Funding of community pharmacy 36

1.3.5 Planning for future role of community pharmacist 38

1.4 Literature review **41**

1.4.1 Stakeholders' perceptions towards extending role of the CP 41

1.4.2 Using digital tool in providing CP services 45

1.4.3 Stakeholders' perception towards community pharmacist skills and abilities 48

1.5 Project Rationale **50**

1.6 Aim and objectives **55**

1.6.1 Aim 55

1.6.2 Objectives 55

1.7 Thesis Organisation 56

1.8 Summary 57

Chapter 2. Methodology and Methods 58

2.1 Introduction 58

2.2 General design 58

2.3 Research paradigm 59

2.3.1 Pragmatism 61

2.4 Phase one: Scoping review 63

2.4.1 Methods 64

2.4.2 Analysis 70

2.5 Mixed Methods 74

2.5.1 Explanatory sequential mixed method 75

2.5.2 Rationale for choosing a mixed method design 76

2.5.3 Research Rigour 78

2.6 Phase two: Quantitative method (Survey research) 80

2.6.1 Survey design 81

2.6.2 Participants 96

2.6.3 Setting and data collection 101

2.6.4 Analysis 104

2.7 Phase three: Qualitative method (semi- structured interview) 109

2.7.1 Rationale for Using the 7Ps Marketing Mix 111

2.7.2 Interview design 117

2.7.3 Conducting the Interviews 119

2.7.4 The interview procedure 120

2.7.5 Piloting the semi-structured interview 121

2.7.6 Participants 122

2.7.7 Recording and transcribing interview 123

2.7.8 Analysis 123

2.8 Phase four: Skill mapping 130

2.8.1 Method 131

2.8.2 Analysis 136

2.8.3 Validity 149
2.9 NVivo and qualitative data analysis 150
2.10 Reflexivity 151
2.10.1 Epistemological reflexivity 152
2.10.2 Personal reflexivity 152
2.11 Ethical considerations 155
2.12 Summary 157
Chapter 3. Scoping review 158
3.1 Introduction 158
3.1.1 Scope of the research 158
3.2 Results 160
3.2.1 Study characteristics 161
3.2.2 Critical appraisal 161
3.2.3 Themes 162
3.2.4 Mechanisms 173
3.3 Discussion 181
3.3.1 Key findings 181
3.3.2 Strengths 183
3.3.3 Limitations 183
3.4 Summary 184
Chapter 4. Results of the quantitative research 186
4.1 Introduction 186
4.2 Study I: A pilot study 187
4.2.1 Results 188
4.2.2 Discussion 191
4.3 Study II: Public attitudes towards CP services 196
4.3.1 Results 197
4.3.2 Discussion 202
4.4 Study III: Pharmacy users' attitudes towards CP services questionnaire 207

4.4.1 Results 208
4.4.2 Discussion 216
4.5 Summary 220
Chapter 5. Results of qualitative research 221
5.1 Introduction 221
5.2 Results 222
5.2.1 Participants' characteristics 222
5.2.2 Themes 222
5.3 Discussion 240
5.3.1 Key qualitative findings 240
5.3.2 Comparison with literature 241
5.3.3 Strengths and limitations 245
5.4 Summary 248
Chapter 6. Results of skills mapping 249
6.1 Introduction 249
6.2 Results 252
6.2.1 Skills related to the CP services 252
6.2.2 Skills to address facilitators and barriers 269
6.3 Discussion 271
6.3.1 Key findings 271
6.3.2 Comparison with literature 271
6.3.3 Strengths and limitations 276
6.4 Summary 277
Chapter 7. Summary, implications, and conclusion 278
7.1 Introduction 278
7.2 Summary of the key findings 280
7.3 What this PhD adds to knowledge 282
7.4 Strengths and limitations 283
7.5 Implications 286

7.5.1 Implications for community pharmacy 286
7.5.2 Implications for healthcare practice 288
7.5.3 Implications for healthcare policy 289
7.5.4 Implications for future research 291
7.6 Conclusion 293
References 295
Appendices 323
Appendix I: A summary table of included studies 323
Appendix II: Determine public attitude toward community pharmacy services (Questionnaire) 335
Appendix III: Determine pharmacy user attitude toward community pharmacy services (Questionnaire) 345
Appendix IV: Invitation email 352
Appendix V: Interview topic guide 353
Appendix VI: Participant information sheet 357
Appendix VII: Participant Consent Form 360
Appendix VIII: Application for research ethics review 361

List of Figures

Figure 1:1 Population growth of the UK between 2018 and 2019 3
Figure 1:2 Top ten risk factors for both death and disability in 2019 and percentage of change between 2009 and 2019. 5
Figure 1:3 Top ten causes of deaths in 2019 and percentage of change between 2009 and 2019 5
Figure 1:4 Healthcare system structure in England 11
Figure 1:5 Healthcare system structure in Wales 12
Figure 1:6 Healthcare system structure in Scotland 14
Figure 1:7 Healthcare system structure in NI 16
Figure 1:8 Total current healthcare expenditure by financing scheme, UK, 2018 17
Figure 1:9 Total healthcare expenditure in UK between 2008 and 2018 18
Figure 1:10 CP services in England 32
Figure 1:11 CP services in Wales 33
Figure 1:12 CP services in Scotland 34
Figure 1:13 CP services in Northern Ireland 35
Figure 1:14 Thesis organization 56
Figure 2:1 Development stage of research study 59
Figure 2:2 Study flow chart 76
Figure 2:3 Good Reporting of A Mixed Methods Study (GRAMMS) 79
Figure 2:4 The process of developing the questionnaire 83
Figure 2:5 Flow diagram describing the process of content validity evaluation of the questionnaire 86
Figure 2:6 The English Indices of Multiple Deprivation (IMD), 2019 103
Figure 2:7 Definition of 7Ps marketing mix 115
Figure 2:8 Mapping topic guide to "7Ps marketing mix" 118
Figure 2:9 Preparation, organisation, and data analysis process 126
Figure 2:10 Stages of data analysis in the framework approach 137
Figure 2:11 Extracted skills from RPS Advance Pharmacy Framework 142
Figure 2:12 Extracted skills from RPS advanced pharmacy framework 144
Figure 3:1 Scoping review flow chart 160
Figure 3:2 A summary of the challenges to provide expanded CP services 167
Figure 3:3 Key mechanisms identified from synthesis evidence 174

Figure 4:1 Reasons to visit a CP 189
Figure 4:2 Awareness about the current CP services 190
Figure 4:3 Geographical distribution of the participants 197
Figure 4:4 Reasons to visit community pharmacy 198
Figure 4:5 Number of visits to GP and CP over last six months 198
Figure 4:6 The top three sources of advice about minor ailments 199
Figure 4:7 Familiarity with CP services 200
Figure 4:8 Frequency of visiting CP among the pharmacy users 209
Figure 4:9 Participants distribution based on their normal CP and preference 210
Figure 4:10 Perception about ability of CP team to help participants 211
Figure 4:11 Previous reasons for using CP services 212
Figure 5:1 Conceptual framework developed from mapping themes/subthemes onto 7Ps marketing mix components 223
Figure 6:1 Describing role of the community pharmacist 253
Figure 6:2 Intrapersonal skills empirical framework 257
Figure 6:3 Interpersonal skills empirical framework 260
Figure 6:4 Advanced clinical skills empirical framework 263
Figure 6:5 Digital skills empirical framework 265
Figure 6:6 Marketing skills empirical framework 268
Figure 6:7 Empirical framework to address skills in relation to facilitators and barriers 270

List of Tables

Table 1:1 Number of the CP across the UK 29
Table 1:2 A summary of the policy documents that explore the future role of the CPs in UK 39
Table 2:1 Characteristics of some selected paradigms 60
Table 2:2 A comparison between scoping and systematic reviews 64
Table 2:3 Selected CP services 66
Table 2:4 Final search strategy used for the scoping review 69
Table 2:5 Measurement related to questionnaire validity 85
Table 2:6 IDM classification for area of the selected CPs 103
Table 2:7 Methods summary for three questionnaires 104
Table 2:8 The purpose of using different frameworks 112
Table 2:9 Product versus service 114
Table 2:10 7Ps marketing mix in relation to the CPs 117
Table 2:11 Final search strategy used for the document analysis 135
Table 2:12 Key themes from all the data sets at the familiarization stage 138
Table 2:13 Framework Identification in the qualitative and quantitative dataset for understanding the public need and CP services to fulfil it. In addition to barriers and facilitators to delivering the CP services 140
Table 2:14 Extracted digital and marketing skills from literature 145
Table 4:1 Participants' characteristics 188
Table 4:2 Participants' characteristics 197
Table 4:3 Breakdown of participants who consent to use CP services according to their age 201
Table 4:4 Participants' characteristics 209
Table 4:5 Participants' opinions regarding their health needs and relationships with their pharmacists 213
Table 4:6 Crosstabulation age group versus public health advertising 214
Table 5:1 Demographic characteristics of the interview participants 224
Table 6:1 Definitions of intrapersonal skills 256
Table 6:2 Definitions of interpersonal skills 259
Table 6:3 Definitions of clinical skills 262
Table 6:4 Definitions of digital skills 265

Table 6:5 Definitions of marketing skills 267
Table7:1 Meeting of objectives by Chapter 279

Chapter 1. Introduction, background, and scope

1.1 Introduction

Globally, healthcare systems face challenges. It is a major priority for policy-makers to transform healthcare provision to meet the rapidly changing needs of healthcare services (Maniatopoulos et al., 2020). In the United Kingdom (UK), the healthcare system is facing huge pressures due to epidemiological and demographic changes (i.e., the expanding population, the increasing numbers of people suffering from chronic conditions and the increasing numbers of older people within the population) (Murray, 2016; Office for National Statistics, 2020b; Office for national statistics, 2021). There is a necessity to reduce inequalities and improve healthcare service outcomes through providing high-quality and sustainable services, irrespective of financial stringency and uncertainty (i.e., the COVID-19 pandemic). However, the COVID-19 pandemic has forced some changes in health service provision through better use of digital health, such as automated transfer of prescriptions and teleconsultations. This study was undertaken before and during the early stages of COVID-19 (before the UK lockdown), suggesting the pandemic has not influenced the study's findings. The results will therefore be presented with this assumption considered. However, when discussing the findings in chapters three, four, five, and six, the pandemic will be taken into account.

In this context, healthcare systems need to deal with continuously rising challenges and changing patterns of demand. Thus, a transformation of healthcare service delivery is required to reduce pressure and support health service provision. This PhD will focus on the role of the community pharmacy within healthcare service delivery

and demonstrate how community pharmacies (CPs) contribute to the overall healthcare agenda (Department of Health, 2008). In the UK, the role of the CP has evolved and pharmacists are now expected to address national healthcare priorities, in addition to their regular responsibilities linked to medications (Halsall et al., 2012). Community pharmacists are now able to support patients in managing their own health through promotion of self-care. This allows people to make health decisions without consulting their General Practitioners (GPs) on matters ranging from adopting a healthy lifestyle to managing minor conditions. Community pharmacists have also helped patients with chronic conditions and have effectively filled in for urgent and emergency treatment (Nichols et al., 2019; Seston et al., 2020; Twigg et al., 2019; Wright et al., 2015). These changes outlined affect both patients and health professionals, consequently resulting in redefining the role of the community pharmacist and their set of skills.

The literature suggests the skill set of a pharmacist should include a wide range of skills to ensure that patients receive safe and accurate guidance regarding their issue(s) (Sinopoulou et al., 2017). Furthermore, pharmacists must pursue and sustain lifelong learning in order to assure the quality of patient care and the safe and proper use of medications, as well as enhanced public health (Royal Pharmaceutical Society, 2019). Given the importance of the increasing demands on healthcare, there is now a greater focus on the healthcare professional workforce, education and training across the UK (NHS Scotland, 2019; Pharmaceutical Services Negotiating Committee et al., 2019; Royal Pharmaceutical Society Scotland, 2021; Welsh Pharmaceutical Committee, 2019).

1.2 Background

This section provides essential background information which informed this research includes country profile, disease burden, overview about healthcare, healthcare structure and government expenditure.

1.2.1 Country Context

1.2.1.1 Population profile

Understanding the population characteristics is vital for planning and delivering healthcare services. Therefore, I will summarise the information about the population within the UK and how it has changed over time. According to the Office for National Statistics (2021), the UK had an estimated population of 66.8 million at the mid of 2019 with growth rate 0.5% than the previous year. See **Figure 1:1** for more details about the population of the four nations.

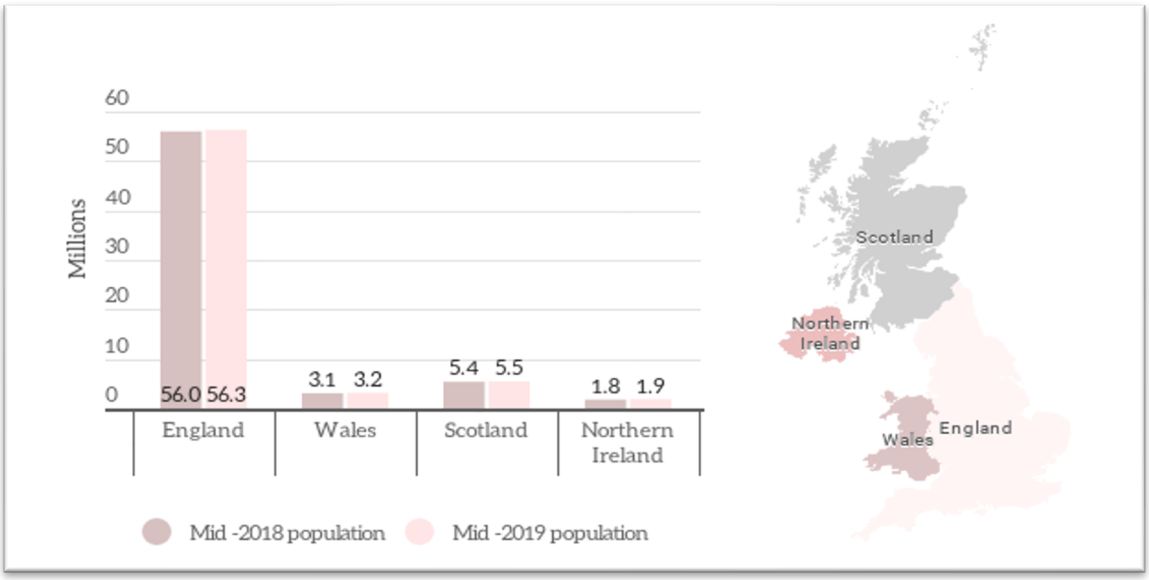


Figure 1:1 Population growth of the UK between 2018 and 2019

Source: Adapted from (Office for national statistics, 2021)

Population size and structure are mainly determined by trends in fertility and death (Office for national statistics, 2021). In the UK, the population grows at a slow rate;

considering the fertility rate in 2019 showed that 1.68 was the average number of children per woman, which decreased from 1.91 in 2008 (Office for national statistics, 2021). However, the highest life expectancy figures were recorded between 2017 and 2019, when it was 79.4 years for males and 83.1 years for females (Office for national statistics, 2021) .

With regard to the population segment of 65 years old and over, the trend in the UK is similar to other countries (Office for national statistics, 2021). In the UK, a combination of declining fertility rates and mortality rates has led to a shift in the population structure with an older average age. In 2019, the data shows that approximately one in five people were aged 65 years and over, and this is estimated to increase to one in four by 2050 (Office for national statistics, 2021).This could have a serious impact on health services delivery.

1.2.1.2 Disease's burden

The Global Burden of Diseases (GBD) is an indicator which aims to provide the comparative estimates of diseases worldwide (Steel et al., 2018). Globally, the GBD date has impact on both public health policy and medical care delivery. In the UK, the data generated in the GBD studies was extensively used at the national level to inform health policy and affect healthcare services in the UK (Steel et al., 2018).

According to a recent systematic review, ischemic heart disease is the main cause of death and disability in the UK (Abedi et al., 2020). See **Figure 1:2** for more information about the top ten causes of death with percentages of change between

2009 and 2019. With regard to disability-adjusted life years (DALYs), ischemic heart disease is on the top of the list. Further details are shown in **Figure 1:3**.

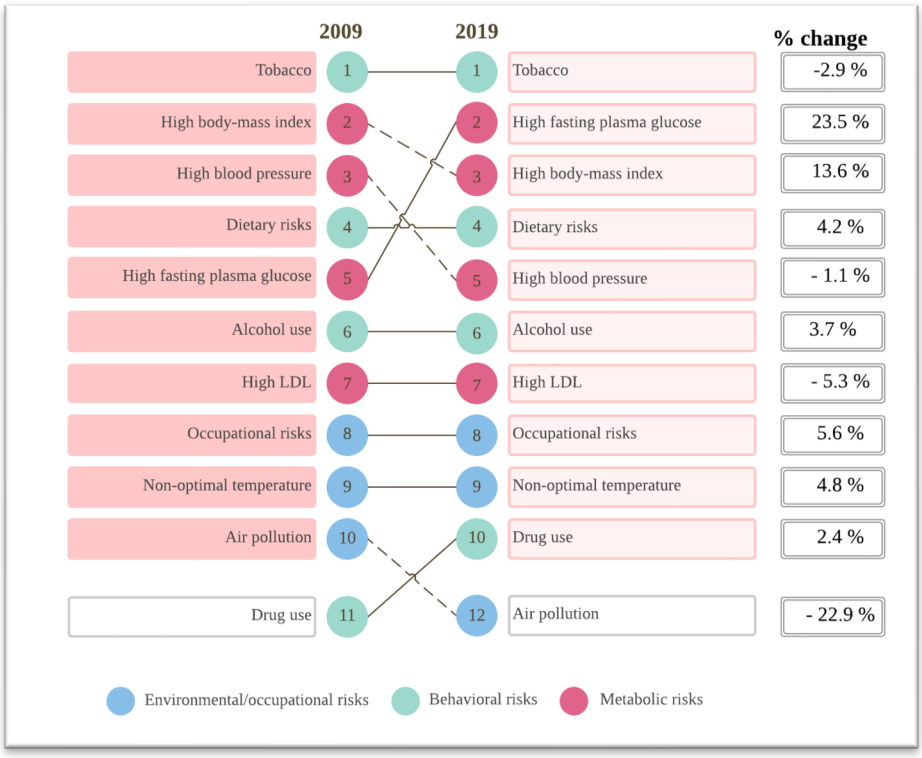


Figure 1:2 Top ten risk factors for both death and disability in 2019 and percentage of change between 2009 and 2019.

Source: Adapted from (Abedi et al., 2020)

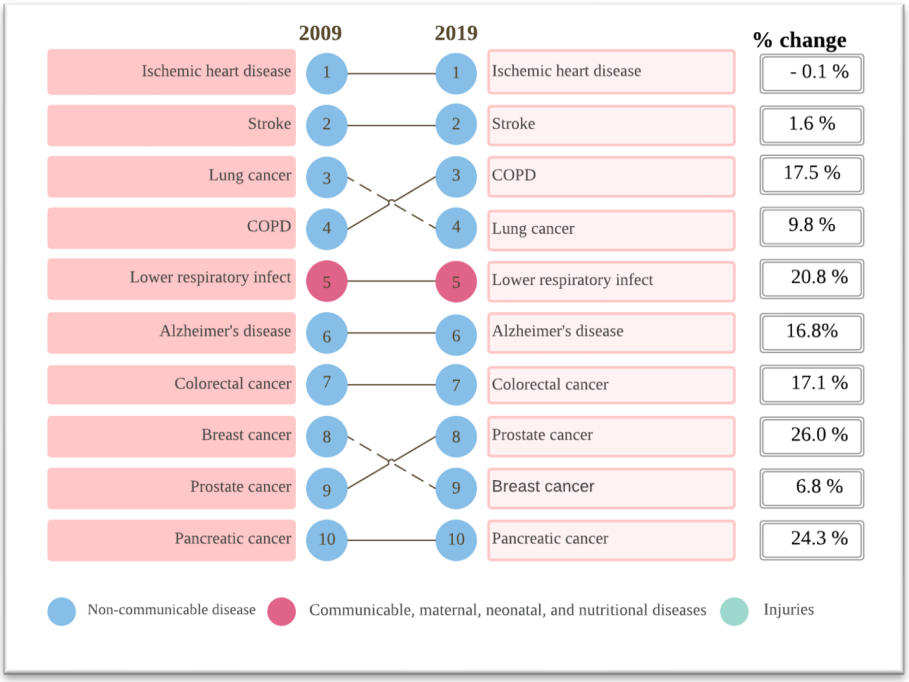


Figure 1:3 Top ten causes of deaths in 2019 and percentage of change between 2009 and 2019

Source: Adapted from (Abedi et al., 2020)

1.2.2 Healthcare in UK

1.2.2.1 Overview of the healthcare system

The National Health System (NHS) is free at the point of use and funded through taxation. Each country in the UK has its own NHS body (i.e., NHS England, NHS Wales, NHS Scotland, and Health and Social Care in Northern Ireland) (Cylus et al., 2015). Each nation has a distinct structure and organisation. There is also a smaller private healthcare sector that available to access (Cylus et al., 2015).

1.2.2.1.1 Historical background

In 1948, the NHS was established to deliver healthcare services in the UK (Anderson, 2005; Cylus et al., 2015; Geoffrey, 2021; Grosios et al., 2010). The whole nation was run in a similar way except in Northern Ireland (NI), which was semi-autonomous until 1972 when it began to be directed by the UK government (Cylus et al., 2015). Throughout the 1950s and 60s, the NHS focused on the modernisation of facilities and technologies. In 1973, the NHS Reorganization Act in England and Wales led to the creation of Family Practitioner Committees and health authorities - both regional and local (Anderson, 2005; Cylus et al., 2015; Geoffrey, 2021). The main aim of this Act was to establish organisations with defined responsibilities towards English and Welsh citizens, and also to address problems in the healthcare system through integrating different types of services.

The situation changed in 1980s from Area Health Authorities to District Health Authorities for more efficient services. However, in 1990 the Community Care Act was introduced, which set apart the purchasing and provision of healthcare services. This aimed to increase the efficiency of health provision and quality of services

(Cylus et al., 2015). This arrangement led to hospitals, community and mental health services providers being grouped into semi-independent organisations called NHS Trusts. The situation in 1999 totally changed due to the devolution of the NHS, which led to decentralised power and moved control from the UK parliament to the national government in Wales, Scotland, and NI. This resulted in increasing diversity of health systems in the UK (Bevan et al., 2014). In the next section, more details about each country will be provided.

1.2.2.2 Healthcare structure

Following devolution, health services were delivered differently across the UK. As a result, decisions regarding services delivery and policy are made at national level for each country (i.e., devolved governments) except for England which is the responsibility of central government (Grosios et al., 2010). Regardless of the diversity of the systems (i.e., how the healthcare system is organized in each country), all operate in line with the UK regulatory standards. Overall, the healthcare system in the UK comprises of two sections:

- Sections responsible for management, policy, and strategy of healthcare.
- Sections responsible for providing physical medical care, which divided into three sectors:
    - Primary care (General Practitioner (GPs), dentists, community pharmacists, community care, etc.).
    - Secondary care (hospital-based care).
    - Tertiary care (specialist hospitals).

In the next section, I will briefly demonstrate the organisation of the healthcare system in each country.

1.2.2.2.1 England

The structure of the healthcare system in England is complicated and runs at a large scale (Bevan et al, 2014). It is led by Department of Health and Social Care, which responsible for shaping and funding healthcare in England (Cylus et al., 2015). The Department aims to support the people in living better and longer. For more details about the organisation of healthcare system in England see **Figure 1:4.**

NHS England

The fixed budget of the NHS is used to provide services for the whole population (Cylus et al., 2015). The main challenge faced by NHS England is optimising outcomes for the individual and public using the available resources (NHS England, 2019). Therefore, the responsibility of planning and purchasing of healthcare services are delegated to third parties (i.e., commissioners) (Cylus et al., 2015). They are responsible for carrying out needs assessments of local populations and purchasing the highest quality services within reasonable prices (Powell, 2020).

NHS England commissions services at national level which are not appropriate for local commissioning level, such as specialized services (rare diseases) and some services from the armed forces and offender healthcare (Doheny, 2015). They are also responsible for commissioning primary care which includes GPs (Doheny, 2015). NHS England is leading the coordination between key bodies in local areas (Clinical Commissioning Groups (CCGs) and local authorities) to encourage them to collaborate in the planning and structuring of the healthcare service (Cylus et al., 2015).

At the population level, the responsibility for commissioning healthcare services is delegated to the CCGs to provide a more organizational infrastructure (Cylus et al., 2015). Therefore, all GPs must be a member of a CCG which can help GPs to work with other Health Care Providers (HCPs) in commissioning services for their local communities. There are many services commissioned by CCGs such as hospital care, rehabilitation, most of community health services, mental health, emergency care, maternity services and learning disability services (Cylus et al., 2015).

Generally, local authorities and CCGs plan their commissioning decisions with the aid of Health and Wellbeing Boards (Cylus et al., 2015). When the decision is made to buy a health service from a specific provider, the contract has to include all the details about what the provider must deliver to meet the standards of NHS (Cylus et al., 2015). Also, the commissioners must review the performance of providers and check the quality of services.

Public Health England (PHE)

PHE is an operational independent agency of the Department of Health and Social Care in England which provides support for local authorities to improve the health of the public (Doheny, 2015). Nationally, their main responsibility is to protect the public from major health risks (Cylus et al., 2015). Additionally, some national public health services are commissioned from the NHS (Powell, 2020).

Local authorities (councils) have a wide spectrum of responsibilities to their populations, which is not restricted to public health but also extends to social care (Powell, 2020). Local authorities aim to enhance both health and wellbeing outcomes

for their local communities. Both CCGs and local authorities have the option to commission public health services together, which could improve the quality of work (Fisher et al., 2021). By law, local authorities have the power to scrutinize anything associated with the planning or operation of the health services in their area (Powell, 2020). This facilitates reviews of the quality of the services and allows them to put forward plans for changing these services.

Integrated Care Systems (ICSs)

ICSs were proposed by the NHS Long Term Plan to enhance the coordination between services providers, whilst also developing Sustainability and Transformation Partnerships (STPs) (NHS England, 2019). It aimed to improve efficiency of the healthcare system, prevent illness, and tackle any changes facing ICSs by 2021(NHS England, 2019). ICSs are an advanced level of partnership between local health care services to improve the healthcare services provision for their local communities (Powell, 2020). Primary Care Networks (PCNs) were established in England; these are groups of GPs working together with other providers of healthcare and social care services to support in their local communities (Powell, 2020). Usually, PCNs cover between 30,000 and 50,000 people and the number of PCNs in England around 1,300. Furthermore, the NHS Long Term Plan proposed a new way of contracting for the future which was called Integrated Care Provider (ICP) (Powell, 2020). This will enable commissioners to provide a single contract for the integrated service to the providers who are responsible for the service provision (i.e., GP, wider NHS, and local authority).

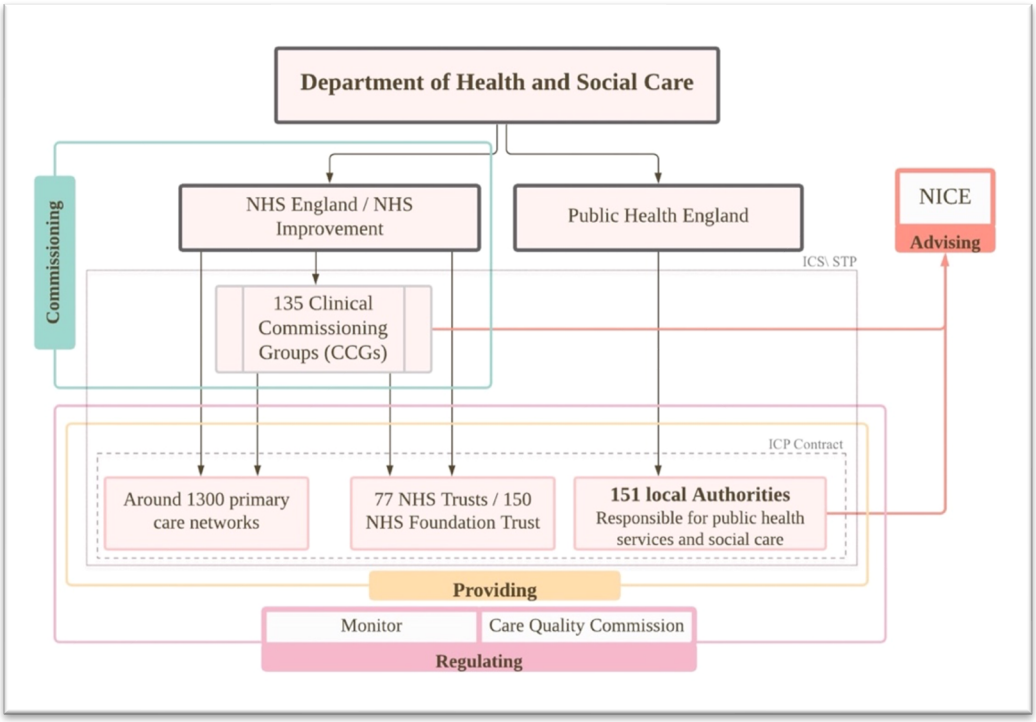


Figure 1:4 Healthcare system structure in England

1.2.2.2.2 Wales

In Wales, the responsibility for delivering healthcare and social care services lies with the Department of Health and Social Care (Doheny, 2015). The core of the Welsh healthcare system is Local Health Boards (LHBs) and NHS Trusts. The main responsibility of LHBs is planning and providing healthcare services for the population in their geographical area. Under these boards, there are primary care clusters (n= 64); each of these are responsible for between 30,000 and 50,000 people (Welsh Government, 2018). These clusters develop healthcare services plans based on the needs of their communities. They also play a vital role in estimating the potential future demand (Welsh Government, 2018). Meanwhile, NHS Trusts are responsible for delivering healthcare services nationally (Doheny, 2015).

Generally, Trusts and LHBs are delivering care based on targets set by the Welsh Government and NHS bodies, which receive advice and support from the National Advisory Board (Doheny, 2015). The responsibility for providing advice on developing and delivering policy lies with the National Advisory Group. They base their recommendations on clinical and medical guidance, and advice taken from the All-Wales Medicines Strategy Group and NICE (Doheny, 2015).

Specialised health services are legally the duty of LHBs, but they are supported by the Wales Health Specialised Services Committee at a national level (Doheny, 2015). Overall, regulation and inspection of the Welsh NHS is done by Community Health Councils (responsible for inspecting premises of the NHS) and Healthcare Inspectorate Wales (responsible for inspecting both independent healthcare organisations as well as all NHS providers) (Doheny, 2015). Meanwhile, public health services are provided by all NHS organisations in the country, led by Public Health Wales (Doheny, 2015). See **Figure 1:5** for more details about the healthcare structure in Wales.

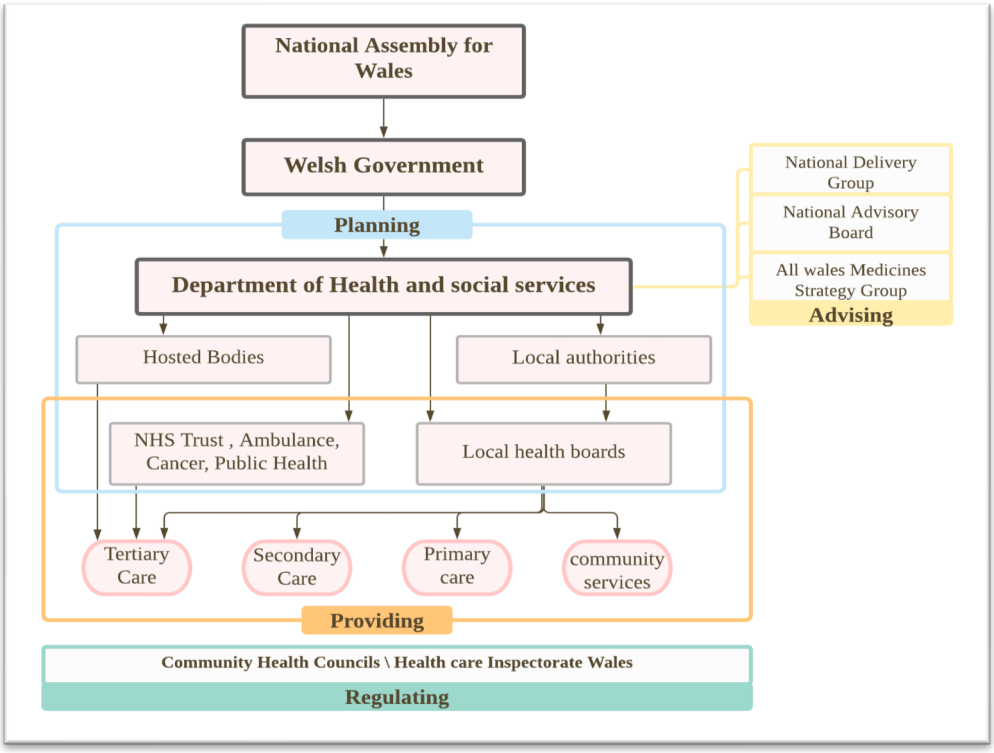


Figure 1:5 Healthcare system structure in Wales

1.2.2.2.3 Scotland

The Scottish Government's Health and Social Care Directorate is responsible for managing the Scottish NHS, setting health policy, providing healthcare in the community setting and providing some of the social work (Cylus et al., 2015). Some of these responsibilities are delegated to 14 NHS health boards and local authorities based on defined geographical areas (Cylus et al., 2015). Both health boards and local authorities are responsible for planning and funding for both healthcare and social care services through Integration Joint Boards; for more details see **Figure 1:6**. Moreover, the Directorate transfer some of their responsibilities to Special Health Boards to provide support and advice to the Scottish NHS (Doheny, 2015). These boards include (Doheny, 2015):

- NHS Health Scotland – responsible for supplying essential services that include health protection, blood transfusion and information.
- NHS Education Scotland – responsible for the quality of education.
- NHS National Waiting Times Centre – responsible for improving access to first-class treatment.
- NHS24 – responsible for providing advice and information.
- Scottish Ambulance Service – responsible for responding to emergency situations in addition to taking patients to or from hospital.
- The State Hospitals Board – responsible for providing assessment, treatment, and healthcare for the individuals with special security conditions due to being dangerous or violent.
- Healthcare Improvement – responsible for providing support to deliver evidence-based care and providing assurances to the public regarding the quality and safety of healthcare.

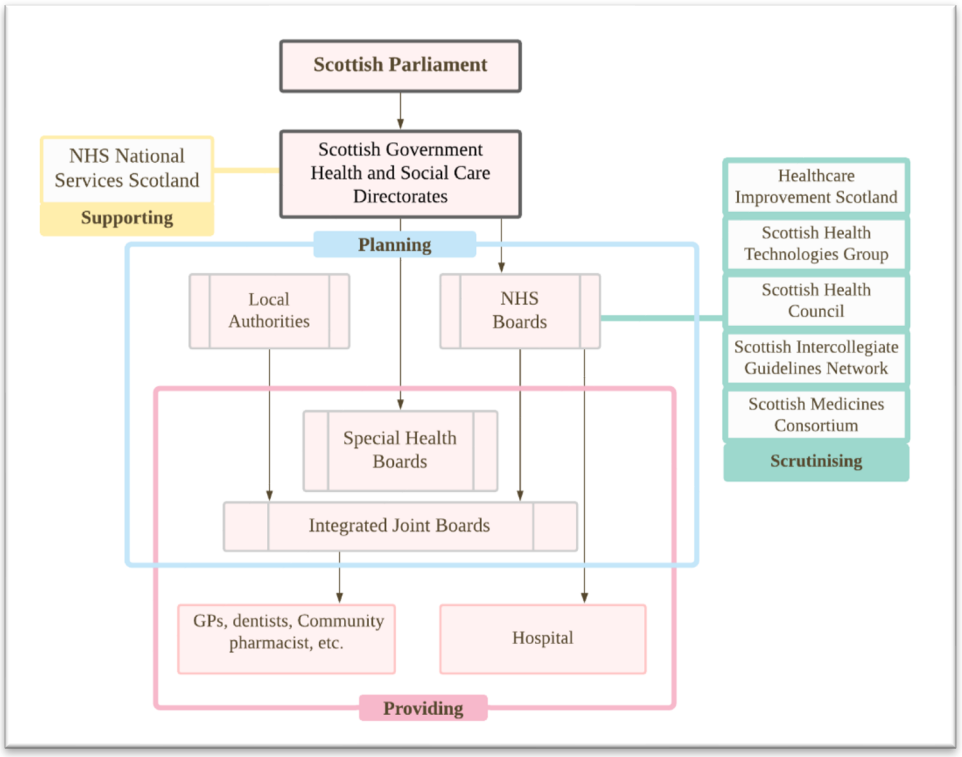


Figure 1:6 Healthcare system structure in Scotland

1.2.2.2.4 Northern Ireland (NI)

In NI, the healthcare system is organised in a way which merge both market and bureaucratic levers (Doheny, 2015). This means that the NI Executive has control over the NHS. However, there is some freedom for NHS organisations to provide and fund health services (Doheny, 2015). This freedom was introduced to help the NHS to cope with changes to provide patient centred and use the resources of the system more efficiently. The main responsibility of the Department of Health, Social Services and Public Safety is operating the system in NI (i.e., funding and delivering care) (Doheny, 2015). However, the Department transfers these responsibilities to Health and Social Care Board (HSCB) (Doheny, 2015), which is considered to be the centre of the healthcare system in NI (see **Figure 1:7**).

The HSCB receives assistance from five Local Commissioning Groups (LCGs) to run five geographic Health and Social Care (HSC) Trusts and the Ambulance Service, and to commission their services. The HSC and LCGs are responsible for assessing local health and social care needs and planning how to meet these needs (Doheny, 2015). At the same time, securing the delivery of care suited the population needs (Doheny, 2015). Meanwhile, for the patients, clients and carers, there are five regional Patient and Client Councils to provide support for patients, clients and carers, regarding any health and social care issues (Doheny, 2015).

In NI, all the organisations in the healthcare system are receiving support from the Business Services Organisation which includes personnel, legal services, financial and procurement services, and information technology (Doheny, 2015). Finally, regulation is the responsibility of Regulation and Quality Improvement Authority which help to ensure the accessibility of health and social care services, in addition to ensuring all the healthcare services are well managed and meet the requirements e.g., NICE guidance (Doheny, 2015). In terms of public health, in NI it is the responsibility of the Public Health Agency, which aims to develop services that are related to improving health and well-being (Doheny, 2015).

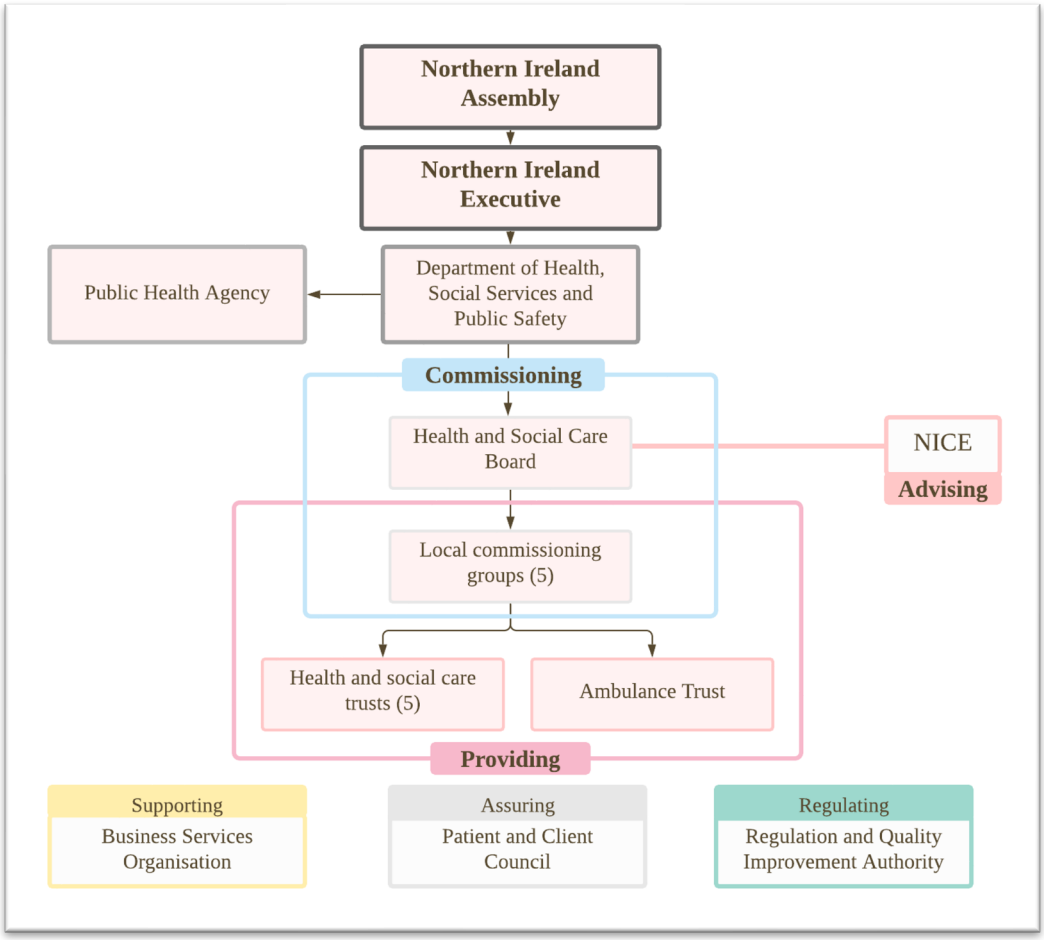


Figure 1:7 Healthcare system structure in NI

After exploring the structure and health system organization in four countries, it is important to understand the funding structure. The next section will provide all the information related to the expenditure on healthcare in the UK.

1.2.2.3 Expenditure on healthcare in UK

In 2018, the total expenditure on healthcare was £214.40 billion (Pett et al., 2020). See **Figure 1:8** for more information about the expenditure breakdowns. Most of that sum came from national government, which represented almost four-fifths of expenditure on healthcare services. In relation to the whole economy (i.e., gross domestic product (GDP)), the expenditure on healthcare represented 10 % of British GDP in 2018, with the growth rate increasing by 5.3% since the previous year (Pett et al., 2020). See **Figure 1:9** for more information about the healthcare expenditures in last ten years.

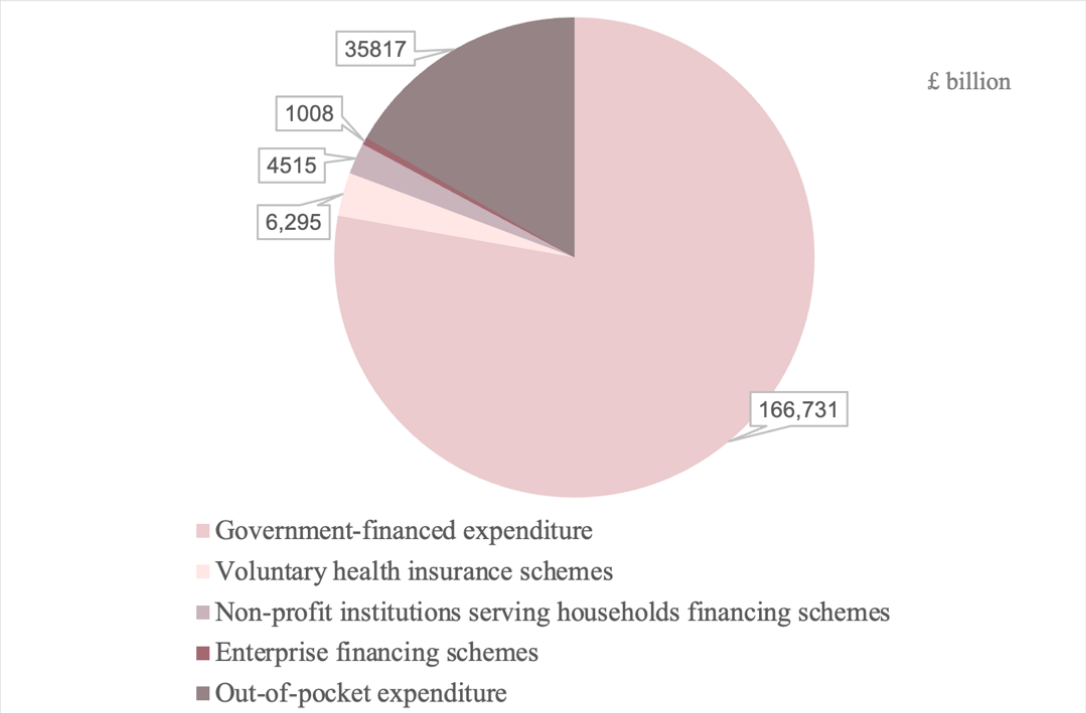


Figure 1:8 Total current healthcare expenditure by financing scheme, UK, 2018

Source: Office for National Statistics – UK Health

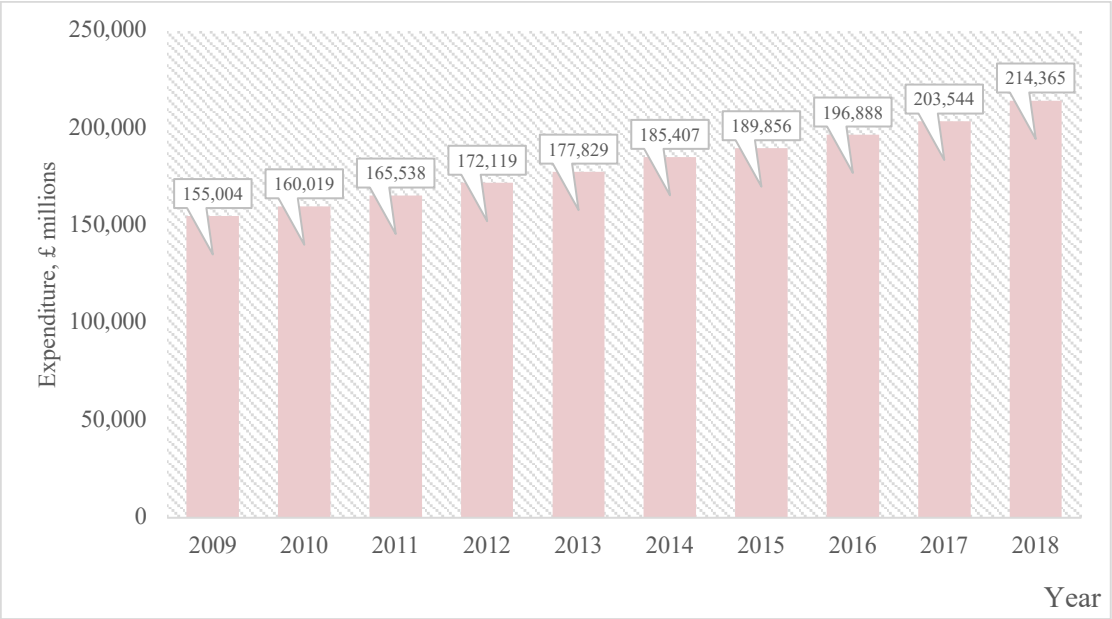


Figure 1:9 Total healthcare expenditure in UK between 2008 and 2018

Source: Office for National Statistics – UK Health Accounts

In response to the Covid-19 pandemic, a different budget allocation was set up to support the UK government. This measure was taken to help the government control the spread of the Covid-19 virus, minimise the damage and help the British economy. In this regard, the British government has spent above £280 billion in 2020. However, the Spending Review 2020 confirmed a further £113 billion was to be spent by the Government in 2020-21 across the UK to support public services, with £55 billion allocated for the following year (HM Treasury, 2020).

Following the demonstration of healthcare spending and the government's response to the pandemic, the increase in funding mitigated the negative impact of the pandemic on the healthcare sector, and heavily impacted future policies and planning; these specific issues are a fundamental aspect of the planning and development of this thesis. The next part will provide a brief overview of the policies document, which are concerned with the future provision of healthcare in the UK.

1.2.2.4 Planning of the NHS

The healthcare system in the UK does not have a formal plan because England, Scotland, Wales, and Northern Ireland each have their own planning systems in place. However, planning is focused on health requirements rather than inputs such bed numbers or employment levels. Generally, the systems are moving towards new models of healthcare to ensure that population get more options, best healthcare support, and provide safe and optimal integrated care. In this section, I will briefly represent the policy documents in the four countries which show the roadmap of the future of healthcare in the UK.

England

In 2019, the NHS Long Term Plan was published (NHS England, 2019). This plan was built on the previous policy documents (i.e., the NHS Five Year Forward View) that highlighted the urgent need to integrate healthcare services to satisfy the population needs. The document identified ICSs as the main operational tool to achieve integrated care across England (NHS England, 2019).

The plan focuses on enhancing care outside hospitals through improving primary care and services in the community setting (NHS England, 2019). Therefore, as explained earlier, PCN will have a single fund which consists of multidisciplinary teams, including GPs, community pharmacists, district nurses, social care staff and other HCPs working across primary care to deliver fully integrated community-based services.

Regarding urgent care, the Long Term Plan aimed to decrease the pressures on the hospital emergency departments and provide patients with quick access to urgent care (NHS England, 2019). The plan commits to providing services such as Urgent Treatment Centres (UTCs), accessed through NHS 111, where appointments will be booked if patients do not need to see an expert at emergency departments (NHS England, 2019). The plan also recommended that multidisciplinary teams be part of NHS 111 to provide a clinical assessment service to the patient over the phone (NHS England, 2019).

Additionally, the plan aimed to strengthen the NHS contribution on the prevention of ill-health and health inequalities (NHS England, 2019). Therefore, funding prevention programmes was set to maximise the impact of the NHS in changing behaviour. The program will be influenced by the risk factors identified on the GBD study (Steel et al., 2018) which was discussed on **Section 1.2.1.2**. However, ICSs will help deliver prevention programmes through coordination and partnership between all sectors to improve public health (NHS England, 2019). In delivering these programmes, the plan commits to using a systematic approach to tackle health inequalities (NHS England, 2019). From a clinical services perspective, the plan prioritises a specific group of clinical services to improve on; these have been selected based on their effect on the population's health: cardiovascular diseases, stroke, cancer, mental health, maternity and neonatal health, diabetes and respiratory care (NHS England, 2019). Funding will be provided to enable service expansion and faster access to services.

Finally, technology and innovation will be used to enable selfcare (NHS England, 2019). The NHS application will provide an access for people to their care plan or to

communicate with health professionals (NHS England, 2019). Additionally, it will facilitate access to patient records for all NHS staff.

Wales

In 2018, A Healthier Wales was published, which set out NHS Wales vision for the next ten years (Welsh Government, 2018). The plan aimed to deliver both health and social care services that focused on preventing disease and promoting well-being in light of prudent healthcare principles which are (Welsh Government, 2016):

- Equal partnerships between the public, patients, and professionals to achieve health and well-being through co-production.
- Effective use of all skills and resources to deliver healthcare for those with the greatest need firstly.
- Doing only what patients needed, no more, no less safely.
- Using evidence-based practice to reduce inappropriate variation and maintain transparency and consistency.

According to this vision, the government is attempting to implement seamless services through primary care clusters, health boards, and local authorities. The models of care will be delivered based on integration between healthcare and social care, which consists of six key elements (Welsh Government, 2018):

- Ensuring everyone living in Wales has a long, healthy, and happy life.
- Developing an approach for delivering healthcare and social care services.
- Delivering equitable healthcare services for all people.

- Delivering seamless services as a single package of care, tailored to the patients' needs and closer to home. Also, delivering these services through different healthcare providers.
- Minimising the hospitalisation rate as well as changing the type of services delivered in Welsh hospitals and supporting patients to recover quickly.
- Increasing use of technology to support quality of services and maintain hospital environments more sustainably.

Scotland

In late 2016, the Health and Social Care Delivery Plan was published, setting out the framework for health and social services in the country (Scottish Government, 2016). It is aimed at enhancing quality of the services, support selfcare, and focuses on prevention and early intervention. It focuses on three aims (Scottish Government, 2016):

- Better care – focusing on improving the quality of care through improving services to provide high quality and effective services for the entire population.
- Better health – focusing on improving health and wellbeing for everyone in Scotland through adopting prevention and self-care approaches.
- Better value – focusing on increasing the value from services and maintaining financial sustainability through efficient and consistent use of the resources.

To meet the triple aim, a new series of programmes and action will be commissioned and conducted:

- **Integration of health and social care** (Scottish Government, 2016): This project will change the methods of service provision to maintain coordination and partnerships between healthcare and social care, so as to ensure everyone

gets the proper care, at the correct time and place. Partnerships between the healthcare system and social care system aim to increase spending on primary care services and support the capacity of community care.

- **The National Clinical Strategy** (Scottish Government, 2016)**:** This project sets out a framework for reforming healthcare across the country for the upcoming 10 to 20 years, focusing on enhancing service provision in the primary, secondary and acute care settings.
- **Public Health Improvement** (Scottish Government, 2016)**:** This project aims to improve population health through targeting particular health behaviours. In addition, to take action to reduce harm and illnesses by adopting a preventative approach and early intervention with treatment.
- **NHS Board Reform** (Scottish Government, 2016)**:** In order to change the service model, health bodies should be changed to reflect this. Reforming NHS boards will be useful for better response to the needs of local communities, better collaboration between NHS boards, and improving quality of the services.

In 2017, another strategy was published, which focuses on improving the quality of health in Scotland (Healthcare Improvement Scotland, 2017). The five-year strategy has these priorities:

- Patient empowerment to take informed decisions about their own medical condition.
- All organisations involved in healthcare and social care will be supported to improve their services.
- Sharing knowledge to provide evidence-based services to help people get the best healthcare services.

- Providing quality assurance to increase public confidence in healthcare services and support service providers to continuously improve.
- Effective use of all the resources.

(Healthcare Improvement Scotland, 2017)

Integrating healthcare and social care will shift services to be more focused on prevention and early intervention, which will require an increase in the capacity of the workforce. In 2019, an action plan was published to shape training programmes (NHS Scotland, 2019). The plan focused on increasing the amount of time spent in community settings to gain valuable experience that might affect the trainee's future employment in the community.

Northern Ireland

Like other countries, Northern Ireland planned to transform healthcare to face specific challenges. In 2016, a ten-year plan was published which emphasised the need to support everyone to have healthy lives, as well as changing the focus of services (i.e., how, and where the services are delivered). The plan focuses on:

- Building capacity in communities to decrease health inequalities.
- Supporting primary care to improve prevention and early detection of disease and provide treatment for any problems.
- Reforming both community and hospital services.
- Effective use of the resources.

(Department of Health, 2016)

In order to achieve these changes, the strategy proposed five approaches (Department of Health, 2016):

- **Partnership Working**: Providing real partnerships with people who use and deliver services (i.e., patients, service users, families, staff, and politicians) to co-produce change which benefits everyone. Co-production will empower everyone to design the system, develop and expand services based on peoples' needs, and make partnerships with patients to increase self-management, especially for people with chronic conditions.
  - **Safety and Quality:** Improving quality and safety are fundamental priorities in designing and delivering healthcare and social care services. Establishing infrastructure will help to facilitate and drive the improvements.
  - **Workforce:** Investing in workforce is critical to delivering sustainable health and social care.
  - **Leadership and Culture:** Developing a cultural change programme, underpinned by a new approach of collective and system leadership i.e., developing leadership at all levels.
  - **eHealth and Care:** Making better use of technology to enhance health and wellbeing by determining potential and opportunities offered by information technology to enhance outcomes for service users and free up staff.

As previously stated, all planning strategies in the UK have intended to provide health and social care in community settings rather than hospitals, as much as is feasible. As a result, the next section will carry out a brief overview of the primary healthcare system.

1.2.2.5 Primary care

In the UK primary care is considered the starting point of contact to access healthcare when people need it (Cylus et al., 2015). The term 'primary care' not only refers to GPs, but also includes pharmacists, nurses, midwives, and other healthcare professionals who work in the community setting (Cylus et al., 2015; Grosios et al., 2010). In the UK, the entire population can register with a GP and can get consultations free of charge (Cylus et al., 2015). Generally, primary care is based on providing caring for individuals rather than for particular diseases (Cylus et al., 2015). For example, GP surgeries provide a wide range of services, such as managing chronic conditions, prescriptions, diagnostic services, minor surgery, preventive services, family planning, antenatal care, sickness certification, health promotion, and referrals to specialised care (Cylus et al., 2015).

Overall, the statistics show that 80% of patient contact with NHS happens through primary care, while 62% of that percentage is the share of the local GP (Walley et al., 2019). Notably, there is a growing concern about the GP ability to manage the continuous increase in demand (Dayan et al., 2014; Walley et al., 2019). There are many reasons for this limited access to the GPs, which are related to demand and capacity. Additionally, issues associated with managing patient schedules and challenges that are associated with GP enrolment. Data coming from England shows that the number of the GPs in 2020 was 33,515 (Full-time equivalent) (NHS Digital, 2020). This has decreased by 1.8% (600) since June 2019 (NHS Digital, 2020). This is coupled with the significant increase in the demand due to increasing numbers of the elderly, increasing numbers of people with long term Conditions (LTCs), shifting

healthcare from hospitals to the community setting, and increasing public expectations (Baird et al., 2016).

In the UK policymakers across the four nations recognise the issue and they have started to shift to a concrete strategy to increase the capacity of the primary care. This could happen through empowering other healthcare teams to share responsibilities with GPs (Ham et al., 2018). For example in Scotland, the Community Pharmacy (CP) is currently the first point of contact regarding minor aliments through providing NHS Pharmacy First Scotland (Royal Pharmaceutical Society Scotland, 2021). In this PhD, I will focus on both the CP and the community pharmacist potential role that could be useful in reducing the pressure on the healthcare system as a whole and in increasing public access to healthcare services.

1.3 Scope (Community Pharmacy (CP))

Community pharmacists are highly trained healthcare professionals with great potential to provide high quality services to their patients. At the same time, this potential could be used to meet challenges that affect the healthcare system in the UK. Unfortunately, community pharmacists' potential are still under-utilised (Murray, 2016). However, policymakers recognise their potential and, in all four nations, there are plans to unlock this to deliver improved healthcare in the future.

There are plans to utilise the community pharmacist's skills and knowledge to play a greater role in the health agenda and to provide more clinical services (i.e., for management of both minor and chronic conditions). Whilst the supply of medicine will remain at the core of the community pharmacist's role, the shift of the role will not be an overnight transformation. However, the impact of the COVID-19 pandemic could accelerate changes. During the pandemic, the community pharmacists provided access to healthcare for the whole population, while many GPs were closed or only accessible via online appointments. In the next section, I will explore the history of community pharmacist and how the role of the community pharmacist has evolved over time. Then, I will give an overview of the policy documents that focus on the planning of the future role of the community pharmacist.

1.3.1 Overview of the community pharmacy in the UK

CP services are a vital part of the primary care system, which provides direct access to healthcare in the community. The number of CPs across the UK is around 13,996; with an average of 21.1 pharmacies per 100,000 people (Northern Ireland Statistics and Research Agency, 2020). See **Table 1:1** for a breakdown of information about each country. Every day, CPs across the UK have both ill and healthy visitors for

various reasons: in England alone, there are 1.6 million visits per day to the CP (Anderson and Sharma, 2020).

There are different types and sizes of CPs, such as large chains and small independent pharmacies (Anderson and Sharma, 2020). CP teams usually consist of at least one pharmacist and the pharmacy support staff, which include: pharmacy technicians, dispensing\pharmacy assistants, medicines counter assistants and accredited checking technicians. Traditionally, the community pharmacist role involved dispensing prescriptions, but over time it developed into a more clinical role. The role of the community pharmacists and CP services will be discussed in more detail throughout this chapter.

Table 1:1 Number of the CP across the UK

Country	**Number of CP**	**CP per 100,000 population**
England	11,500	20.6
Northern Ireland	531	28.3
Scotland	1,250	23.1
Wales	715	22.8

Source: (Northern Ireland Statistics and Research Agency, 2020)

1.3.2 Brief historical background

Before the development of modern medicine in Britain, remedies were provided by Peppers and Spicers (Anderson, 2005). Over time, the role of the apothecary was developed to apothecaries, which are involved in prescribing and compounding medicine. In 1815, The Apothecaries Act allowed apothecaries to take on more of a general practitioner role (Anderson, 2005). Along with this, dispensing of medicines became the work of the chemists and druggists.

In 1868, The Pharmacy and Poisons Act stated that "*It shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding medicines, or to assume or use the title chemist and druggist, or chemist, or druggist, or pharmacist, or dispensing chemist in any part of Great Britain unless such person shall be registered under this Act*" (Anderson, 2005, p.120).

The founding of the NHS in 1948 made healthcare services free to everyone (Anderson, 2005). This had a huge effect on pharmacists; the number of prescriptions increased significantly from 70 million in 1947 to 250 million in 1949 (Anderson, 2005). However, private prescriptions and sales of medicine decreased rapidly. To accommodate this, dispensary areas were enlarged, and dispensing assistants were recruited (Anderson, 2005).

Throughout the 1950s and 60s, the number of marketed readymade-medicines rose while extemporaneous dispensing declined (Anderson, 2005). Half of the community pharmacists' income came from the dispensing of prescriptions. However, the situation changed in 1985, when it was decided that only specific medicines could be prescribed on the NHS (Anderson, 2005). This decision had a negative impact on both patients and drug manufacturers.

In 1986, the Nuffield report come out with many recommendations related to extending the role of the community pharmacist (Anderson, 2005). Another report came out few years later in 1992 - Pharmaceutical Care: The future of Community Pharmacy (Anderson, 2005). Most of the recommendations from this were slowly adopted by community pharmacists.

Over the last decade, there has been a rapid transformation of CP practice in the UK. The new role of community pharmacists, such as prescribing and providing consultations for patients, is similar to the traditional apothecary's role. Also, the differentiation in registration requirements between pharmacists and technicians parallels the registration of pharmaceutical chemists, chemists, and druggists between 1868 and 1954. More information will be provided at the following section.

1.3.3 Current role of community pharmacist

The roles of community pharmacists have developed in recent years. Across the UK, they have expanded to include more clinical services in addition to their traditional role (i.e., dispensing medication). Despite the expansion of services, dispensing remains the core function of community pharmacy. In the following section, I will explore all the services that community pharmacists deliver across the four nations.

1.3.3.1 Service delivered in CP

In England, the NHS pharmaceutical services in the CP are contracted through the Community Pharmacy Contractual Framework (CPCF) (Baird and Beech, 2020; Pharmaceutical services Negotiating Committee, 2021). The CPCF consists of three types of services:

- **Essential services**: all pharmacies must provide these services and they are nationally commissioned. See **Figure 1:10** for more information.
- **Advanced services:** optional services which could be provided by all pharmacies after certain criteria have been met. These are also commissioned nationally by NHS England. See **Figure 1:10** for more information.

- **Locally Commissioned Services:** optional services commissioned locally to satisfy certain needs of the local population by local authorities, local NHS England teams and CCGs.
- **Private services:** services not commissioned by public bodies, for example travel health advice (Baird and Beech, 2020).

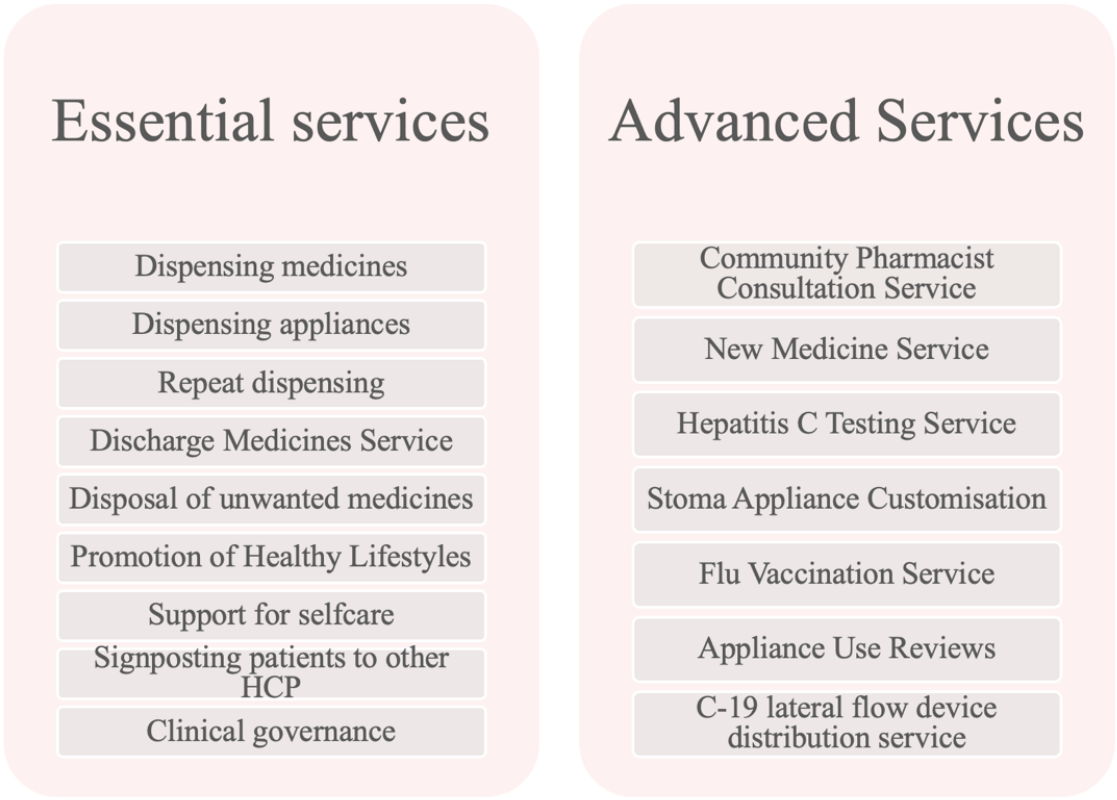


Figure 1:10 CP services in England

(Source: (Pharmaceutical services Negotiating Committee, 2021))

In Wales, the situation for CP service delivery is similar to England; here NHS pharmaceutical services are also delivered through the CPCF and are divided into: Essential, Advanced, and Enhanced services (Gething, 2020). The Commissioning of essential and advanced services happens at a national level. Enhanced services reflect local population needs and are commissioned by local authorities through local health boards (Welsh Government, 2020). **Figure 1:11** summarises the CP services in Wales.

Essential services

- Dispensing
- Repeat dispensing
- Disposal of unwanted medicines
- Promotion of healthy lifestyles
- Support for self-care

Advanced services

- Medicine use reviews
- Discharge medicines reviews
- Appliance user reviews
- Stoma customisation service

Enhanced services

- Additional hours services
- Blood borne virus screening service
- Common ailments service
- Directly observed therapy
- Independent prescribing service
- Inhaler review service
- Medicines management in domiciliary care
- Minor ailment/injury schemes
- Pharmaceutical advice to care homes
- Palliative care
- Provision of emergency contraception
- Respiratory rescue medicines service
- Seasonal flu vaccination service (SFV)
- Smoking cessation level 2 & 3
- Sore throat test and treat
- Supervised administration of prescribed medicine (substance misuse)
- Tuberculosis medicine compliance services
- Waste reduction scheme
- Syringe and needle exchange

Figure 1:11 CP services in Wales

In Scotland, the situation is quite different. The local NHS Scottish Board is responsible for ensuring the residents have appropriate access to NHS Pharmaceutical Care Services. CP contractors provide a range of NHS services, categorised into core, local and national services (Community Pharmacy Scotland, 2021)**. Figure 1:12** summarises the services that are delivered in Scottish CPs.



Figure 1:12 CP services in Scotland

In NI, commissioning pharmaceutical care services is the responsibility of the Health and Social Care board. Here, the services provided by CP were extended to enhance the CP role after the publication of Making it Better Through Pharmacy in the Community (Community Pharmacy in Northern Ireland, 2014). This vision aimed to ensure effective, safe, and high-quality services. A brief description of CP services is presented in **Figure 1:13**.

Also in NI, the Living Well Service is provided through CP. This supports improving public health in NI through addressing the risk factors which contribute to the disease burdens. The CP and pharmacy team role is to display and provide information on public health issues to pharmacy visitors.



Figure 1:13 CP services in Northern Ireland

1.3.4 Funding of community pharmacy

The funding of the CP services across the UK relies on negotiation between CP representatives in the country and the government. In England, Scotland, and Wales the agreement was made for multiple years to ensure consistency and a stabilised market. Meanwhile in the NI, the financial agreement is released annually. More details will be provided in the next section.

England

In 2019, an agreement between the Government and the Pharmaceutical Services Negotiating Committee secured the CPCF for five years. This will help provide stability and reassurance to the CP sector. The government committed to spend almost £13 billion (£2.592 billion per year for the next five financial years) for CPCF (Department of Health and Social Care et al., 2019).

Wales

In 2020, the representatives of community pharmacies and the Welsh Government reached an agreement for CPCF for three years. The global sum for 2020-21 will be £148.3 million, rising to £151.2 million in 2021-22 and £154.2 million in 2022-23. Additional funding equal to £18.3 million will be added to the CP sector by 2022-23 (Gething, 2020). This plan is to provide long-term certainty for all CP services in Wales. Also, an additional £9.1 million will be invested to support the role of CP throughout the COVID-19. Finally, CP staff are now eligible for the £500 bonus payment, as with other NHS workers (Welsh Government, 2021).

Scotland

In 2020, the Community Pharmacy Scotland Board finalised a three-year funding deal with the Scottish government and NHS Health Boards providing stability and

predictability for the CP network in the country. Additionally, it allowed adequate time and space to develop pharmaceutical care services. The settlement consists of a global sum component which will increase by 2.5% each year (starting from £188.148 million in 2020/2021) and a fixed non-global sum of £1.3 million (Taylor, 2020). The global sum is to be used for funding core CP services. An additional £10 million will be invested by Scottish Government for the new NHS Pharmacy First service (Osprey, 2020). Meanwhile, the non-global sum will be used to support increasing the independent prescribing workforce in community pharmacies.

Northern Ireland (NI)

In 2020/21, the commissioning plan for CP services in NI aimed to ensure that the public have safe access to medicine, advice and support for well-being. The financial package consisted of recurrent and non-recurrent funding as follows (Department of Health in Northern Ireland, 2020) :

- Allocated recurrent funding: £112.4 million.
- Additional non-recurrent funding: £20.75 million (for COVID-19 response during 2020/21).

1.3.5 Planning for future role of community pharmacist

As mentioned, there is an urgent need to transform the UK healthcare system to meet of multiple challenges. Community pharmacists have the potential to play a greater role in delivering high-quality services. In **Table 1:2**, I will provide a brief description of the policy documents that discuss the future role of community pharmacists in each constituent nation of the UK. Generally, the vision aims to shift healthcare from the hospital to the community through greater collaboration across all health and social sectors to improve patient experience and safety. Therefore, healthcare services provision should change to meet public needs. To do this, community pharmacists must proactively support people throughout the whole of their lives, and across the country. Pharmacy teams also need to make an extra effort to reach people with the greatest needs to tackle health inequalities. Regarding the accessibility of healthcare, the goal is to provide a direct referral between the CP and other healthcare providers, social care and third sector services. All CP teams will be able to improve access to other health services through direct referral and social prescribing.

Across the UK, there is tendency to increase use of digital tool resources by completely digitising medication-related activities in the interest of increasing efficiency and safety. However, these documents highlighted the need to developing the workforces by providing access to education and training for career development.

The next section will highlight the evidence related to, firstly, the stakeholders' perception and confidence about pharmacist skills, secondly, the use of digital tools in the delivery of CP services, and thirdly why it is important to address this topic.

Table 1:2 A summary of the policy documents that explore the future role of the CPs in UK

Country	Document	Brief description of the proposed plan
England	(Department of Health and Social Care et al., 2019)	The main focus was on: • **Urgent Care:** o The Community Pharmacist Consultation Service (CPCS): The community pharmacist takes referrals from NHS 111, GPs, and emergency services. CPCS aims to help relieve pressure on the wider NHS. • **Prevention:** o Healthy Living Pharmacy Framework will continue to focus on the major public health issues. o The Testbed programme for providing prevention and detection services. • **Medicines Optimisation and Safety:** o Further development of the pharmacist role to support medication safety. o An expansion of the New Medicine Service will also be considered to include further indications and conditions.
Wales	Pharmacy: Delivering a Healthier Wales (Welsh Pharmaceutical Committee, 2019).	• **Enhancing patient experience** o Prevent avoidable harm from medicines. o There will be an independent prescriber in every CP. o CP teams will be the first point of contact for common ailments. o Increase focus on prevention and early detection of illness. • **Pharmaceutical care services:** Integrate CP services into cluster networks and increase the CP focus on medicines optimization, health, and wellbeing. • **Innovation and Technology** o Patients' central electronic medical records are accessed by pharmacy team. o Consultations facilitated by Telehealth. o Supply of medicines is automated and supported by artificial intelligence.

Scotland	Pharmacy 2030: a vision for community pharmacy (Royal Pharmaceutical Society Scotland, 2021)	• **Improving the safe and effective use of medicines :** Through adapting person-centred holistic care
		• **Treating common clinical conditions:**
		  o Expansion of Pharmacy First concept.
		  o Clinical examination and prescribing as standard seen as first port of call by public.
		• **Managing long term conditions:**
		  o Targeted brief interventions and providing regular conversations.
		  o Use of independent prescribing.
		• **Improving access to locally delivered services:** Providing patient choice for how medicines are supplied (collected and delivered) and to whom consultations are offered (face to face and virtual).
		• **Addressing health inequalities and wellbeing:** through planning services based on needs of the local population for preventing ill.
		• **Modernising medicines supply**
		  o Process managed by pharmacy technicians and dispensing fully supported by technology.
		  o Technology-assisted accuracy checking

Northern Ireland	Dispensing Health: Community Pharmacy's Solution for the Health and Social Care System (Community Pharmacy in Northern Ireland, 2016)	• Minimising medication-related issues (i.e., adverse effects and admissions). • Helping people understand their medication. • Providing emergency supplies of medication. • Supporting self-care. • Supporting people with chronic conditions through medication optimisation. • Provision of public health services.

1.4 Literature review

1.4.1 Stakeholders' perceptions towards extending role of the CP

Understanding stakeholders' perceptions of CP services is crucial for assessing the outcomes and for the future planning of services. At the same time, it could influence policy development which usually considers the needs and perception of stakeholders. Stakeholders have been defined as "*an individual or group who is responsible for or affected by health- and healthcare-related decisions*" (LeClair et al, 2020, p2). This includes, for instance, patients, the public, healthcare professionals, and policymakers. The perspectives of three stakeholders — the public, community pharmacists, and GPs — about the growing role of CP will be provided in order to create a baseline knowledge.

1.4.1.1 Public

The public has positive attitudes towards services provided by the pharmacist (Eades et al., 2011). They value the input from community pharmacists in relation to public health services, but perceive pharmacists as experts on drugs only and they will generally not seek advice from the pharmacist about broader health issues (Saramunee et al., 2014).

In the UK, many studies show a lack of awareness regarding the CP extended services among the public (Hindi et al., 2018). Many people think the CP is only for dispensing prescriptions or for purchasing over the counter medicines. A survey conducted in England shows that 85.1% of the participants frequently go to the CP for dispensing prescriptions (Rodgers et al., 2016). In the qualitative research, all the participants in the study agreed that the lack of awareness among public and patients

was due to a lack of publicity (Kember et al., 2018; Saramunee et al., 2014). Also, a lack of exposure to CP services could be another contribution to this issue (Hindi et al, 2018).

Furthermore, underutilization of some advanced and enhanced CP services could be explained by low public awareness. A survey conducted in Scotland about weight management services in CP demonstrated that 84.9% of the participants had never used any weight management service in CP (Weidmann et al., 2012). Meanwhile, qualitative research conducted in Wales showed variation in the level of awareness regarding advance services (Kember et al., 2018). However, there are a few issues which could affect the patients' willingness to go to the pharmacy; these are discussed in detail in **Chapter 3**.

Regarding CP itself, many studies shows that some features of the CP, such as convenience, accessibility and flexibility help to provide services related to public health (Eades et al., 2011; Hindi et al., 2018). Additionally, one qualitative study shows that the participants were highly satisfied with taking a Chlamydia test at the CP due to the short waiting time and anonymity (Eades et al., 2011).

Overall, most of these findings cannot be generalised to the whole population of the UK, due to issues related to the small sample sizes used in the surveys or to the inherent nature of the qualitative research.

1.4.1.2 Community pharmacists

Generally, the pharmacists were optimistic about extending their services, which include both medicines-related services and public health services. A study conducted

in England shows that the pharmacists valued opportunities to utilise their experience in terms of engaging with patients to provide clinical services (Lucas and Blenkinsopp, 2015). Another study highlighted the impact of providing clinical services in the CP in promoting the pharmacy's image (Mantzourani et al., 2016).

Regarding public health, most of the Scottish pharmacists who participated in one quantitative study agreed or strongly agreed on the importance of public health to their practice, while 48% of the participants classified themselves as public health practitioners and said they felt confident to provide services related to public health (Cooper and Tsoneva, 2017; Eades et al., 2011). A study conducted in England found that pharmacists believed providing public health services to be personally rewarding, and that it increased their motivation, knowledge, skills, and confidence (Brown et al., 2014; Cooper and Tsoneva, 2017). Another qualitative research study showed that most of the pharmacists were confident about their competency to provide public health services (Saramunee et al., 2014). In contrast, an earlier Scottish study showed that around 27% of pharmacists felt that they were not competent to protect population health and 66.6% of the pharmacists felt they did not have enough knowledge to provide public health services (Pfleger et al., 2008). However, many pharmacists consider this a barrier to extending their role: further information is provided in **Chapter 3**.

The findings of these studies should be used with caution because they were at times unrepresentative of the community pharmacy population in the country (i.e., sample characteristic or size). Additionally, some positive results generated in the quantitative questionnaires could be influenced by the social desirability (i.e., participants tendency to give socially desirable responses that are not reflective of the true

situation). Qualitative studies, for their part, cannot always be transferable to different settings due to structural and organisational differences between the four countries.

1.4.1.3 General Practitioners (GPs)

In terms of CP extended services, studies show a low awareness among GPs (Agomo et al., 2017). Additionally, GP attitudes towards extended CP services were less positive (Atkins et al., 2016; Latif et al., 2016). Some GPs were not convinced about the impact of the CP services on reducing workload for GP practices (Atkins et al., 2016; Hindi et al., 2019a; Latif et al., 2016). Even in situations where GPs had been supportive of extending pharmacist roles, it was accompanied by suggestions about supervising and authorising the pharmacists' activities (Hindi et al., 2019a).

However, the results represented above should be considered with caution due to multiple limitations (i.e., small sample size, low response rates and limited sampling frame). These could mean that the view of GPs was unrepresentative. When reviewing the literature, we should also consider that the CP was isolated in the era that these studies were conducted, and the role of the CP was not fully recognised by other healthcare providers. Therefore, further studies should be conducted after CPs become more fully integrated into primary care.

1.4.2 Using digital tool in providing CP services

Digital health services are becoming more widely available as more people utilise the Internet (Andreassen et al., 2007). As a result, health authorities have begun to place a larger focus on digital health services such as electronic health cards, electronic patient records, and health portals like the English NHS 111 Online. The stakeholders have mixed views regarding the digital health tool. The Internet has been seen to have the potential to empower patients and enhance patient involvement in improving self-care (Andreassen et al., 2007; Andreassen et al., 2006; Crilly et al., 2019b). Possible risks such as erroneous information transmission and improper usage have been highlighted (Andreassen et al., 2007). In light of the role of digital tool in delivering CP services, many studies have highlighted the use online pharmacy, use of digital tool to communicate or to deliver public health services (Baines et al., 2018; Bansal et al., 2022; Cain et al., 2010; Crilly et al., 2019b; Crilly and Kayyali, 2020; Long et al., 2022a; Orizio et al., 2011).

In term of online pharmacy, the trend of buying medications online has been growing after 2005 (Orizio et al., 2011). A recent preliminary study show that 83.2% of the study participants were aware of online pharmacy services, however, the majority of them (69%) preferred to buy medication in person (Bansal et al., 2022). The results of this study should be interpreted with caution due to its small sample size. With regard to the reasons for using an online pharmacy, a recent systematic review shows that unwillingness of physicians to provide specific prescriptions was one of the main reasons driving respondents' decisions to buy medicines online (Long et al., 2022a). Other reasons linked to online medication purchases include the lack of a physician

fee and the desire to get medicines such as opioids (engendering concerns regarding misuse) (Long et al., 2022a). Several studies have revealed that some websites sell medications without a prescription (Long et al., 2022a). When it comes to medication quality, researchers frequently discovered improper packing and labelling, and chemical compositions that were not as predicted in a minority of study samples (Long et al., 2022a; Orizio et al., 2011). To maximise the benefits of online pharmacy while minimising the risks, Orizio et al. (2011) has suggested: (1) developing legislation, with rules governing the online pharmacies on a global scale; and (2) improving health literacy, which is essential for making good health decisions, identifying threats, and making the best decision about medicines.

As regards communication, the pharmacist needs to adapt new techniques, particularly in light of the COVID-19 pandemic. In addition, when experiencing a period of social distancing, community pharmacists need to think about how they may continue to provide public health interventions that result in beneficial health outcomes. Recent studies have underlined the continuous importance of pharmacy teams in improving public health and have examined how digital technology might help them do that (Cain et al., 2010; Crilly et al., 2019a; Crilly et al., 2019b). Telehealth tools, for their part, have been demonstrated to be effective in a variety of settings and for a variety of public health challenges (Crilly and Kayyali, 2020). Social media, in particular, offers many properties that might help pharmacists in their public health responsibilities. These include the opportunity for a pharmacist to connect with a patient or customer remotely, a high level of accessibility by all members of the public regardless of demographics, and the ability to enhance the health of those who would not normally visit a CP (Crilly and Kayyali, 2020). Several

studies have looked at how technology has been used to help people quit smoking, lose weight, and reduce alcohol intake (Baskerville et al., 2016; Benetoli et al., 2015; Chang et al., 2013). Community pharmacists reported in a mixed methods study that using social media and mobile health applications would help them to have a beneficial influence on public health (Crilly et al., 2019a). This study should be interpreted cautiously since the demographics in terms of gender and ethnicity were not entirely representative of community pharmacist in London and England. Moreover, as 54% of those surveyed were under the age of 35, they were consistently more enthusiastic about the use of social media in healthcare than those over the age of 35 surveyed. This might have skewed the results in favour of social media's utilization in pharmacy public health. Another qualitative study showed that the general population would use digital public health tools if they were provided by CP teams (Crilly et al., 2019b). However, the study's results should be interpreted with caution because it is self-reported research and bias cannot be ruled out. Also, the study's authors mentioned that the sample demographic were not representative of for the whole population. Therefore, it is critical for pharmacists to develop their digital skills to help their patients and customers benefit from technological advancements aimed at improving their health (Crilly and Kayyali, 2020). An important element of digital skills is online professionalism, which is useful to ensure a positive representation of the HCPs (Benetoli et al, 2017; Crilly et al, 2019).

1.4.3 Stakeholders' perception towards community pharmacist skills and abilities

A skill refers to the ability to do something well and can be created by providing training for skills development. Appropriately skilled pharmacists are essential to providing safe, effective, and patient-centred services. Research shows that extending the role of the community pharmacist will lead to increased personal or professional satisfaction due to better utilisation of pharmacist knowledge and skills (Shaw et al, 2014; Wells et al, 2014). However, the results about this aspect varied among the pharmacists. A study conducted in Scotland highlighted that around 33.3% of pharmacists feel they are not competent to protect population health or promote health change and 66.6% of the pharmacists felt they do not have enough knowledge to provide public health services (Eades et al, 2011). In contrast, qualitative research conducted in England shows that most of the pharmacist participants were confident about their competences to provide public health services (Saramunee, 2014).

Furthermore, GPs and the public have concerns regarding pharmacists' lack of skills (Agomo et al., 2017; Butt and Ream, 2016; Dare et al., 2017; Hossain et al., 2017a; Knox et al., 2016; Kritikos et al., 2010; Ogunbayo et al., 2017; Saramunee et al., 2014; Sohanpal et al., 2016; Tordoff et al., 2012) to conduct services beyond dispensing. However, a study about the management of diabetes found that patients' perceptions about the ability of pharmacists changed significantly after exposure to their service (Eades et al., 2011). Moreover, some studies showed that the participants were generally confident about pharmacist independent prescribers (Hindi et al., 2018). Meanwhile, qualitative research conducted in Scotland revealed concerns from participants about the pharmacists' knowledge and training (Gidman and Cowley, 2013).

Reviewing the literature shows that there were wide range of skills that the community pharmacist needs to develop. In many studies pharmacists reported a needs to develop their clinical (Girvin and Wilson, 2018) and non-clinical skills, such as communication and consultation skills (Dare et al., 2017; Hossain et al., 2017a; Jacobs et al., 2018; Luetsch and Rowett, 2016; Newlands et al., 2011; Ogunbayo et al., 2017). Two studies showed that the pharmacist's consultation skills need to improve to engage with patients effectively (Jalal et al., 2019; Latif et al., 2011). Furthermore, the pharmacists mentioned an urgent need to develop a competency standard for delivering CP services (Um et al., 2013) to ensure that only competent staff would be involved in service delivery (McNaughton et al., 2011).

However, many studies have identified interpersonal skills as facilitators in providing CP services (Dare et al, 2017; Hossain et al, 2017; Ogunbayo et al, 2017; O'Reilly et al, 2015). The participants in one mixed method study identified leadership, team-work and delegation skills was identified as helpful skills for the community pharmacist in order to address some facilitators and barriers (Irwin and Weidmann, 2015). Participants in one quantitative questionnaire declared themselves confident about their delegation skills (Barnes et al, 2018). The results of this study should be applied with caution due to the low sample size and the possibility of social desirability bias. Intrapersonal skills have been recognised as an essential influence on successful collaboration between public health and primary care organisations (Valaitis et al, 2018). Finally, to address the lack of awareness, one study indicates that importance of adapting marketing skills in ensuring the sustainability of healthcare services (Lega, 2006). According to Elrod and Fortenberry (2020), developing a marketing communications mix is essential for healthcare providers.

1.5 Project Rationale

There are growing challenges that face healthcare systems in the UK, thus all the resources that are available should be utilised. In this context, the CPs are the most frequently visited healthcare venues (Department of Health, 2008) due to the nature of CP environments, which offer extensive operating hours and non-appointment-based treatments (Aly et al., 2019; Atkins et al., 2016; Hindi et al., 2019b; Shaw et al., 2014; Stewart et al., 2018). Community pharmacists are accountable for patient-cantered care, medication safety, and preventing and managing diseases. In recent years, the emphasis has shifted from traditional pharmacy services, such as medication dispensing, to a more holistic strategy that enables pharmacists to acquire and demonstrate a variety of competencies. Across the UK, the potential for the community pharmacist has been recognised by the policy makers as a possible way to help in reducing the pressure on other parts of NHS (i.e., Emergency department and GPs) (Agomo, 2012; Smith et al., 2013). While data shows that these expanded CP services have favourable outcomes (Boardman and Avery, 2014; Brown et al., 2014; Buchanan et al., 2020; Corlett and Krska, 2016; Ingram et al., 2018), awareness and utilisation of the CP services has been poor (Rai and Wood, 2018).

The different local governments in the UK have recently announced plans to expand CP services (NHS Scotland, 2019; Pharmaceutical Services Negotiating Committee et al., 2019; Royal Pharmaceutical Society Scotland, 2021; Welsh Pharmaceutical Committee, 2019). Considering recent government actions, it is critical to figure out the demand for CP services as well as how to increase awareness and utilisation. Little is known regarding public attitudes of present and planned CP roles. A systematic review was undertaken in 2011 to assess the views of CP users regarding public

health advice offered by pharmacists, which showed that the majority of CP users do not anticipate or get public health advice from pharmacists (Eades et al., 2011). Users were also unsure whether CPs were qualified to offer public health advice (Eades et al., 2011). A qualitative study was carried out to investigate public perceptions of pharmacy services in Scotland, which found that participants still choose to see their GP rather than use community pharmacy services (Gidman et al., 2012). A systematic review published in 2018 indicated that while both patients and the general public have favourable attitudes regarding CP services, awareness upon these services and recognition of pharmacists' clinical skills remain low (Hindi et al., 2018). Therefore, the aim of this PhD is to define the public need from CP services, as well as the set of skills that pharmacists must develop to perform these roles.

To support understanding of the CP and the nature of the community pharmacist role, a scoping review was conducted to explore stakeholders' opinions of the CP and pharmacist role, as well as the mechanisms that may result in successful service implementation. Then, the results were used to inform sequential explanatory mixed methods research. I focused on the public's perspectives because their views' can help to enhance processes, outcomes, and satisfaction (Michel and Glyn, 2003). In addition, it could be useful in providing public-oriented services, enhancing CP services utilisation, and helping the development of future policies. Therefore, three questionnaires were conducted to determine the public's attitudes towards CP services. Further in-depth exploration of participants' attitudes and requirements were conducted and employed the 7Ps marketing framework for analysis. Marketing theory was chosen for data analysis since it has been shown to be beneficial in health research for a variety of reasons. Firstly, it helps to understand consumer behaviour and how they make health-related decisions (Corbin et al., 2001). Second, it enables

you to establish the most effective strategies for providing health information to customers, which involves recognising the target audience, choosing appropriate communication channels, and tailoring information to the audience's need (Kotler and Lee, 2006). Lastly, it gives insights on how healthcare services might be delivered to be more successful (Kotler and Lee, 2006).

Generally, marketing theory encompasses several theories that incorporate various aspects of marketing that focus on researching and analysing customer behaviour and understanding how people make decisions about the items or services they consume (Kotler et al., 2016). Marketing theory is derived from psychological, economic, and sociological principles, and others (Baker and Saren, 2016; Ferrell, 2014; Kotler et al., 2016) to have a solid understanding of individuals' basic needs and motivations, whether they are the stakeholders, employees, or consumers (who are often viewed as being of the greatest priority) (Ferrell, 2014). The goal of marketing theory is to help organisations in identifying their users' need(s) and developing product(s)\ service(s), and marketing strategies to satisfy those needs. Hence, effective marketing initiatives need an awareness of the public's decision-making processes, as well as the emotions, motivations and behaviour that shape those processes (Ferrell, 2014). According to the theory of planned behaviour (Ajzen, 1985), people's intentions to engage in a behaviour are influenced by their attitudes, subjective norms, and perceived behavioural control. The public's attitudes, beliefs, customs, and lifestyles are crucial factors in determining the success of marketing initiatives (Ferrell, 2014).

Considering this research, community pharmacists must comprehend how the public perceives their services in order to develop successful marketing strategies. This could be useful in linking the community pharmacist with people on a personal level,

developing stronger relationships, increasing public satisfaction, and achieving economic growth (Kotler et al, 2016). Additionally, knowing people's values, beliefs, and needs is critical for community pharmacists to provide services that will relate with their needs.

When it comes to offering CP services or adapting new roles, identifying the need from them alone is not enough. There is also a requirement to identify and develop the skills required to enable them to succeed. Therefore, the results of previous studies were used to conduct skill mapping. Identifying appropriate skill sets are essential to provide safe, effective and patient-centred services (Royal Pharmaceutical Society, 2019). Skills are arguably the most critical subset of community pharmacist competencies. The reason is that skills are the practical application of knowledge and beliefs, and they are required to transform knowledge and beliefs into action that can be applied in real-world circumstances, allowing pharmacists to offer high-quality patient care (Gloria and Sandberg, 2006). As a result, skill mapping is crucial since it helps organisations in identifying the skills that their employees possess and those that they need to develop in order to achieve their objectives (Mittal et al., 2019) which can be addressed through targeted training (Serhal et al., 2022). Additionally, the value of a healthcare professional's skills has been recognised in the literature as critical to the best possible patient management and outcome (Lane, 2010; Ohtake et al., 2013; Pucher et al., 2014). While many studies have identified a lack of relevant skills as a barrier to providing CP services that go beyond dispensing (Agomo et al., 2017; Butt and Ream, 2016; Dare et al., 2017; Hossain et al., 2017a; Knox et al., 2016; Kritikos et al., 2010; Ogunbayo et al., 2017; Saramunee et al., 2014; Sohanpal et al., 2016; Tordoff et al., 2012). It is important to explore these issues in depth and

understand the underpinning evidence to why and what roles the pharmacy team can play from public\pharmacy user perspective. This project will provide evidence to the potential roles of the community pharmacist and the set of skills required to undertake these roles during times of healthcare reform across the UK.

1.6 Aim and objectives

1.6.1 Aim

Identify the public's perceptions of their needs from community pharmacist and developing a skill set to address these needs.

1.6.2 Objectives

- **Objective one:** Identify stakeholders' perceptions regarding the current role of the community pharmacist.
- **Objective two:** Explore the public's awareness of the current community pharmacist's roles and community pharmacy services.
- **Objective three:** Identify perceived outcome(s) from extending the community pharmacist's role.
- **Objective four:** Identify stakeholders' perceptions about facilitators and barriers to using the community pharmacist's services.
- **Objective five:** Explore the public's attitudes towards the ability of the community pharmacist to extend their role.
- **Objective six:** Identify the public's attitudes toward using digital tools to deliver community pharmacy services.
- **Objective seven:** Explore the public's perceptions about their needs from community pharmacists.
- **Objective eight**: Identifying and developing a set of skills for community pharmacists to meet current and future public needs.

1.7 Thesis Organisation

To achieve the aim and objectives of this PhD, I conducted a scoping review, a set of quantitative studies (three questionnaires), qualitative interviews and skill mapping. **Figure 1: 14** below summarises flow and the aim of each part of this project.

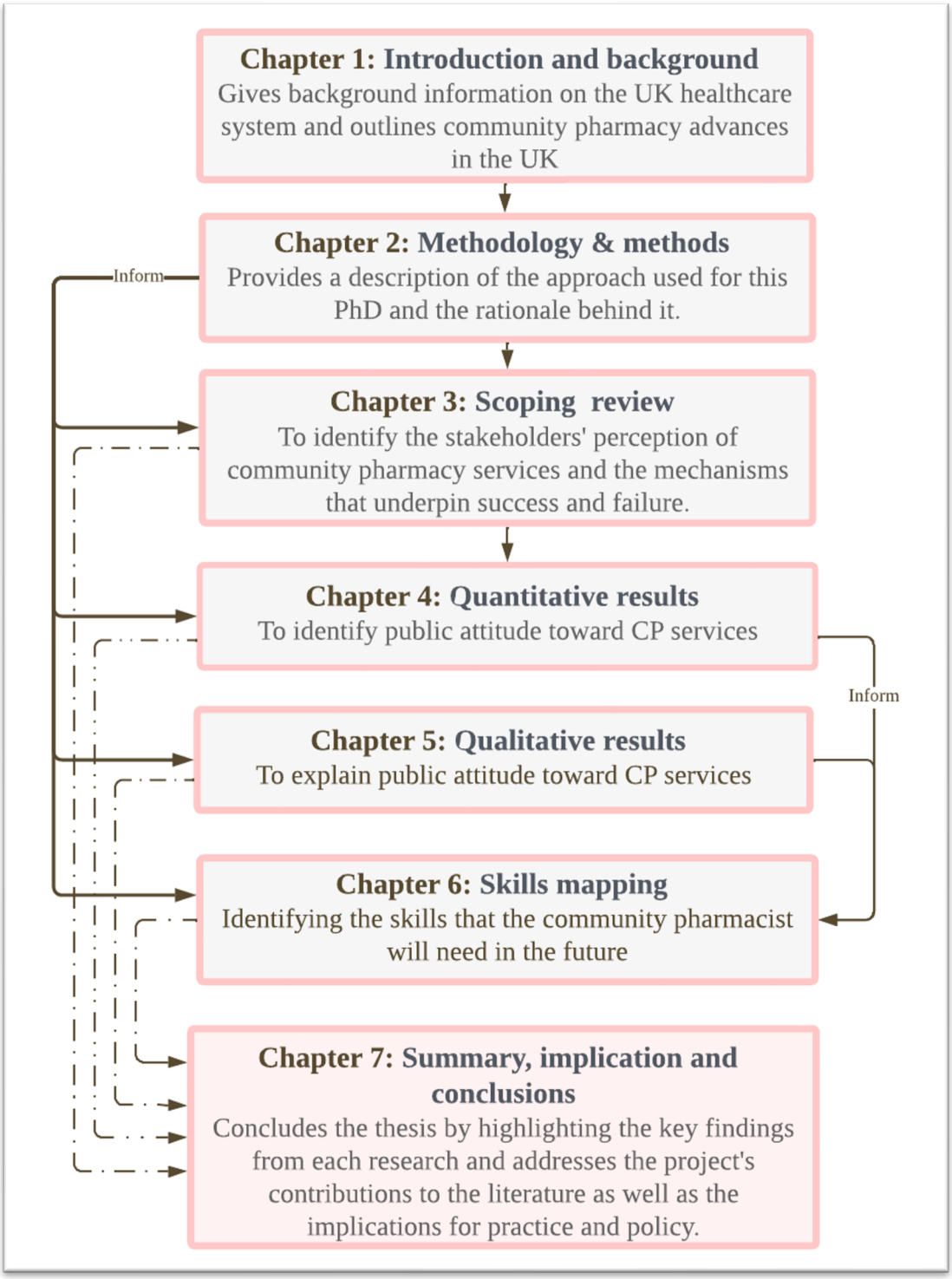


Figure 1:14 Thesis organization

1.8 Summary

Health services are delivered differently throughout the UK, although all four regional governments adhere to the UK's regulatory standards. Healthcare systems are encountering problems as the population, the number of individuals living with LTC, and the ageing population all continue to grow. As a result, there is an urgent need to restructure primary care sectors to gain long-term advantages through improved utilisation of current staff, increased health promotion, and self-care. Policymakers in the UK have recognised the potential of community pharmacist to assist addressing the health requirements of the public while reducing the strain on the healthcare system.

The majority of the research suggests that patients' and the public's perceptions regarding CP services are positive. However, the general public's knowledge of CP services other than dispensing prescription remains low. Furthermore, patients and physicians must recognise and value pharmacists' clinical skills for the community pharmacist's role to be expanded. The next chapter discusses the methodology and methods used for this PhD and the reasoning behind each approach used.

Chapter 2. Methodology and Methods

2.1 Introduction

This chapter gives details on the methodology employed for this PhD and the justification for using this approach. The chapter begins with an overview of epistemological and ontological considerations for the research, followed by an explanation of the context of the study. In addition, information about the study design, tools for data collection, sampling, analytic strategy, and ethical considerations will be presented.

2.2 General design

To support valid, reliable, and efficient answers, a sequential explanatory mixed methods approach was used. However, the development of the research design is dictated by the researchers' epistemological understanding of the world. Creswell and Plano (2018) mentioned that four elements underpin the development of research (see **Figure 2:1**). The philosophical assumptions consider the broadest level of research development, which concern issues such as how the researcher gains knowledge. Philosophical assumptions then inform social theory, which articulates a methodological approach to frame the research design. Methodology incorporates the method, which is the technique used for data collection, analysis, and data interpretation. Each of these elements will be discussed in detail in this chapter.

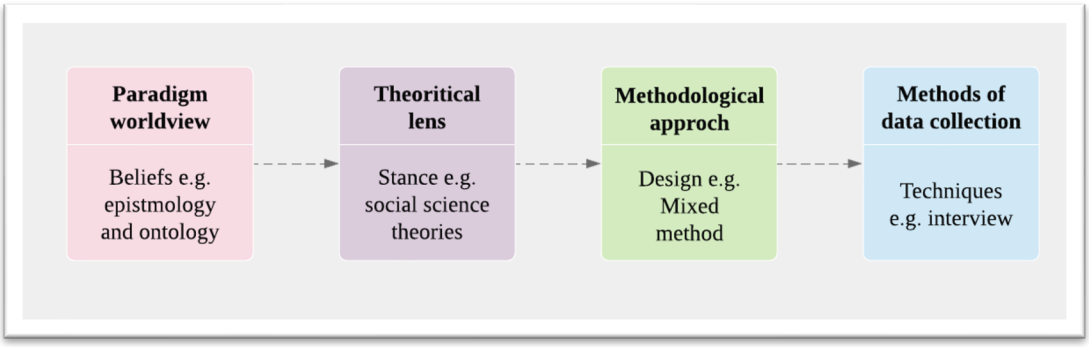


Figure 2:1 Development stage of research study

Source: Adapted from Creswell and Clark (2018)

2.3 Research paradigm

It is important for social researchers to take a position which affirms their view about the world and the best way to understand it. This concept is represented as the research paradigm, which is defined as: *"A cluster of beliefs and dictates which, for scientists in a particular discipline, influence what should be studied, how research should be done and how result should be interpreted"* (Bryman, 2012, p.630). There are three main assumptions underlying research paradigm which are: ontology (the nature of reality (Byrne, 2016)); epistemology (the nature of knowledge of that reality (Byrne, 2016)); and methodology, which is described as the framework of the research and is influenced by a particular theory (Braun and Clarke, 2013).

The philosophical stances influence the ways of researching, through affecting how the questions are asked and answered (Morgan, 2007). Four prominent positions are widely discussed in the literature: post-positivism, transformative, constructivism and pragmatism (for more information, see **Table 2:1**) (Creswell and Clark, 2018).

Although reviewing social theory in detail is beyond the scope of this research, it will be discussed briefly. It starts with post-positivist epistemologies, which are concerned with causes to determine effects or outcomes. Generally, it is more compatible with quantitative than qualitative research (Creswell and Clark, 2018). In contrast, a constructivist epistemology is described as interpretivism through developing

subjective meanings from the researcher's experiences (Creswell and Poth, 2018; Gray, 2014), and is associated with qualitative research. An alternative theory for both post-positivism and constructivism is transformative, which is considered knowledge not to be neutral (i.e., influenced by human interests) and aims to construct the knowledge to help people improve their society (Creswell and Creswell, 2018; Creswell and Poth, 2018). Finally, there is pragmatism, which is less concerned with philosophy and assumptions (Creswell and Creswell, 2018). Pragmatism allows the use of different assumptions as well as different forms of methods of data collection and analysis.

Table 2:1 Characteristics of some selected paradigms

Post positivism	Constructivism	Transformative	Pragmatism
• Determination • Reductionism • Empirical observation and measurement • Theory verification	• Understanding • Multiple participant meaning • Social and historical contraction • Theory generation	• Political • Power and justice oriented • Collaborative • Change- oriented	• Consequences of action • Problem-cantered • Pluralistic • Real world practice oriented

Source: Adapted from (Creswell and Creswell, 2018)

2.3.1 Pragmatism

My PhD project adheres to pragmatism, which considers truth to be "what works" (Creswell and Creswell, 2018; Hesse-Biber and Johnson, 2015; Morgan, 2014). According to Creswell and Creswell (2018), pragmatism as a worldview comes from actions, situations, and consequences. It highlights creating knowledge throughout inquiry and proper sequence of action. In pragmatism, there are many different ways of conducting research and interpreting results (Robson and McCartan, 2016). Therefore, from a pragmatic perspective, there is not a single viewpoint that can give the complete picture of a particular phenomenon. Generally, pragmatism allows the researchers to explore rather than just follow the framework of research methodologies.

The pragmatic approach adopts the pluralistic perspective to address research problems, which means it can accommodate many scientific investigation techniques when they are suitable and leads to useful outcomes (Creswell and Creswell, 2018; Johnson and Onwuegbuzie, 2004; Tashakkori and Teddlie, 2010). It also allows the researcher to address questions of multi-purpose research, when it is not entirely comfortable with a quantitative or qualitative approach and at the same time, valuing both subjectivity and objectivity (Creswell and Clark, 2018; Feilzer, 2009; Robson and McCartan, 2016; Shannon-Baker, 2016). Studies that adopt pragmatism can combine both positivist and interpretivist positions within a study based on the research question, which will be useful in bridging the gap between the two positions (Johnson and Onwuegbuzie, 2004). The ability of pragmatism to assimilate two or more research approaches within the same research study was utilised in this thesis through using qualitative and quantitative methods together.

In pragmatic research philosophy, there is not a formal theory that informs research as there is in other worldviews. Instead, to connect theory to data in pragmatism, the abduction approach was used, defined as *"inference to the best explanation"* (Hesse-Biber and Johnson, 2015). It is characterised by a weaving between induction (data-driven) and deduction (theory-driven) (Morgan, 2014; Shannon-Baker, 2016). Using abduction reasoning will allow the researcher to convert what they observe into theories then action. In pragmatism, there is an emphasis on generalisability and workability for others (Morgan, 2007; Shannon-Baker, 2016).

Another characteristic of pragmatism is a problem-oriented approach through focusing on the methods and using all available strategies to understand the social phenomena (Feilzer, 2009). In addition, pragmatism has an emphasis on communication to produce practicable solutions to social phenomena (Shannon-Baker, 2016). This feature of the pragmatism paradigm will provide a more interpretive and varied approach that would assist in determining the set of skills that community pharmacists would need in the future. Pragmatism is considered appropriate for conducting this research to determine the skillset that community pharmacists will need in the future because it allows for various ways of understanding a complicated phenomenon, that is the changing landscape of the CP practice. The pragmatic approach will also provide a functional instrument that will be useful for interventions and innovations. Having considered the underpinning paradigm of the research, the discussion now turns to the method, which is informed by pragmatism. The next part goes into depth about each phase of the data collection process, which began with a scoping review, moved onto a mixed approach, and finished with skill mapping.

2.4 Phase one: Scoping review

Conducting a scoping review provides an excellent opportunity for breadth and in-depth coverage of the existing literature which is determined by the review's goal (Arksey and O'Malley, 2005; Koon et al., 2016; Levac et al., 2010). In addition, a scoping review is appropriate for answering a complex or heterogeneous research question that cannot be answered by a systematic review, which needs a more defined question (Khalil et al., 2016). According to Arksey and O'Malley (2005), scoping reviews are a good approach to describe relevent research findings in greater detail, thereby providing a mechanism for successful implementation of the intervention. Additionally, a scoping review provides an overview of the studies and disseminates research findings in a specific field to consumers, practitioners, and policymakers who may not have the time or resources to do so. Thus, the aim for this scoping review was to look at what is known about extending role of CPs, how the role extension has been perceived by stakeholders, perceived benefits/ harms from extending the role of community pharmacists and to identify facilitators and barriers. This allowed for the identification of mechanisms in order to inform health policy.

Scoping reviews are a relatively new form of literature review that can be used to summarise the literature on a specific topic (Brien et al., 2010). Scoping reviews are akin to systematic reviews in that they use a transparent and rigorous approach to identify, organise and describe a literature in a systematic manner (Pham et al., 2014) but they differ from systematic reviews in numerous ways- see **Table 2:2** for more details.

Table 2:2 A comparison between scoping and systematic reviews

	Systematic review	Scoping review
Research question	A specific research question with certain characteristics	Often broad research question(s)
Inclusion and exclusion criteria	Typically determined at the beginning.	They could be developed post hoc.
Quality filters	It is often applied	It is not a primary priority
Data extraction	It is a requirement to provide a detailed data extraction.	It may or may not be required.
Data synthesis	Quantitative synthesis.	Qualitative synthesis
Conclusion	Formally evaluates the quality of included studies and draws conclusion about the research question.	It is used to find parameters and gaps in the literature.

Source : Adapted from (Brien et al., 2010)

2.4.1 Methods

The approach for this scoping review was based on Arksey and O'Malley's (2005) framework and Levac et al. (2010) subsequent suggestions. The review has five main phases: (1) determining the research question(s), (2) identifying relevant studies, (3) selecting studies (4) charting data, and finally (5) collecting, summarising, and reporting the findings. Each stage is discussed in detail below.

2.4.1.1 Determining the research question(s)

The question underpinning this study was, "what is known about the community pharmacist's growing role? The inquiry ‘what is known’ is not limited to extending the community pharmacist’s role, but is wider and includes inquiries concerning stakeholders' perspectives, experiences with community pharmacists’ services, enablers, and barriers, and whether CP services are beneficial or harmful. The scoping review is used to further describe depth the findings and scope of research in the

context of community pharmacy in the UK, thus offering a mechanism(s) which highlighted the successful implementation of extending community pharmacists' services.

2.4.1.2 Identifying relevant studies

This scoping review relied on using databases related to health and pharmacy, assuming that they cover all the research about CP services. Consequently, the following databases were systematically searched: Cochrane Library, Medline, EMBASE, and Scopus. A snowballing method was used to identify further studies through Google Scholar, reference list and the research similar citation function.

2.4.1.3 Selecting studies

Based on the scoping review's goal and goals, a search strategy was created to find sources.

2.4.1.3.1 Eligibility criteria

The scoping review focused on literature in the English language published between 2013 and 2022 and conducted in the UK. The study should explore one or more of the following options: (a) stakeholder perceptions toward extending role of the community (i.e., beyond the community pharmacist's traditional role which identified in **Table 2:3**); and\or (b) studies include information about benefits or harm of providing predefined services; and\or (c) facilitators and barriers for implementing these services, based on the relevance and feasibility of each option. The choice to narrow the focus to a specific list of CP services allowed for a more in-depth examination of these services beyond traditional roles and duties of the community pharmacist. Inclusion and exclusion criteria were used to ensure that the services

chosen were the most relevant and commonly given by community pharmacists in the UK (see **Section 1.3.3** for current CP services in four countries). This method, however, does not rule out the possibility that alternative CP services exist that meet public needs but were not included on the list. By restricting my focus, I was able to manage the scope of the study more effectively, ensuring that it maintained manageable within the limitations of time and resources. This strategy allowed for an in-depth assessment of each service, which boosted our understanding of the role of community pharmacists. As a result of this insight, we will have a greater understanding of the stakeholders' perspectives on community pharmacy services, as well as the recognised benefits, advantages, drawbacks, and problems for effective implementation of CP services. The views of various stakeholders were taken into consideration, including but not limited to patients or the general public, community pharmacists, GPs, HCPs, policymakers, and commissioners.

Table 2:3 Selected CP services

Alcohol Screening and Brief Intervention
Anticoagulant Monitoring Service
Blood-Borne Virus Screening (Hepatitis B, Hepatitis C and HIV)
Chlamydia Screening and Treatment
Emergency Hormonal Contraception
Mental Health services
Minor Ailment Service
Needle and Syringe exchange
Health Check
Pharmacy champion (For providing customers with health and wellbeing advice)
Stop Smoking
Sore throat test and treat**.**
Vaccination Services
Weight Management Service

*** To create this table, exclusion criteria were employed in conjunction with a review of the community pharmacist's current services, which are shown under **section 1.3.3**.

Specifics for the remainder of the criteria for inclusion in the study are outlined as follows:

Field: Healthcare services

Specialty: Community Pharmacy Services and Public Health.

Activity: Evaluation of community pharmacy services.

Measurements: Services evaluation, which includes assessing the benefits\ harm of providing services in the community pharmacy for stakeholders, economic evaluation, and facilitators and barriers for service implementation.

I developed key words based on field and specialty inclusion criteria to conduct the search in the selected database. Although they contained the keywords, large numbers of the results were not considered suitable to answer the research questions. Additional criteria, including activity and measurement criteria were used to retrieve more relevant results. These variables are facilitators, barriers, benefits, harm, disadvantages, and economic evaluation. Although the objective of the research was to target the studies related to extending role of the community pharmacist beyond the tradition role (i.e., dispensing prescriptions), the measurement criteria helped to exclude papers about the service implementation processes and did not answer the research question. By reading the abstracts, I was able to eliminate the irrelevant pieces. 164 relevant articles were identified. For more details see **Table 2:4** which presents the final search strategy used for the review.

Regarding rigour, all the included papers in this review were published in peer reviewed journals. I read all the studies at least twice to ensure that the relevant information was captured. All conference abstracts, notes and editorials were

excluded from the review because the robustness and validity of their findings could not be confirmed.

2.4.1.3.2 Exclusion criteria

This research was limited to reviewing the evidence available in the English language about community pharmacy services conducted in United Kingdom. The work was narrowed down and other restrictions were introduced, such as (a) Studies related to the pharmacist role in the GP practices, (b) Research related to medication support services (adherence and counselling). Only studies conducted between 2013 and 2022 were included in the review to ensure their relevance to current practice. The literature about CP services is scattered and many services are being delivered in this setting; thus, services not listed in **Table 2:3**. were excluded. It should be noted that publication bias cannot be ruled out, with most papers reporting on successful implementations of CP services.

2.4.1.3.3 Quality assessment

Individual study quality was assessed by using the Critical Appraisal Skills Programme (CASP) checklist for quantitative, qualitative, cohort, randomised controlled trials, and economic evaluation (CASP, 2019), while for mixed methods, the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018). The purpose of the quality assessment was to facilitate the synthesis of findings rather than to include or exclude studies.

Table 2:4 Final search strategy used for the scoping review

Database	Search term	Articles	Retrieve
Embase	Community Pharmacy service.mp. / limit to (full text and English language and yrs.="2013 -Current")	25/03/2022 23	3
Medline(R)	Community Pharmacy Services/ and (barrier$ or challenge$ or facilitator$ or disadvantage$ or harm$ (harm$ or harm reduction) or benefit$ (cost-benefit analysis or health Benefit plans, employee)) Limited to (English language and full text and year="2013 - Current")	27/03/2022 17	2
Cochrane library	Community pharmacy services in Keyword OR community pharmacy services barrier in Keyword OR community pharmacy services facilitator in Keyword OR community pharmacy services benefit in Keyword OR community pharmacy services disadvantage in Keyword - (Word variations have been searched) Limited to (year=”2013 -Current”)	31/03/2022 157	4
Scopus	(TITLE-ABS-KEY (community AND pharmacy AND services) OR KEY (community AND pharmacy AND services AND facilitators) OR TITLE-ABS KEY (community AND pharmacy AND services AND barriers) OR TITLE-ABS-KEY (community AND pharmacy AND services AND benefit) OR TITLE-ABS-KEY (community AND pharmacy AND services AND harm) OR TITLE-ABS-KEY (community AND pharmacy AND services AND disadvantages)) AND PUBYEAR > 2012 AND (LIMIT TO (AFFILCOUNTRY , "United Kingdom")) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English"))	1/04/2022 779	165
Other		3	3
Total		979	177
After removing duplication		948	164

2.4.1.4 Charting data

The charting procedure was multi-staged, requiring data extraction from individual publications. I read all the studies at least twice to ensure that relevant information was captured. The papers were entered into an Excel spreadsheet for organisation and were then reviewed independently. To create a detailed spreadsheet database, I

collected descriptive elements such as general citation information, setting, study goal(s), technique, study populations, and key findings from the included articles which are represented in **Appendix 1**.

2.4.1.5 Collecting, summarising, and reporting the findings.

The aim of the final stage of scoping review is to give structure to the identified literature. To present my findings rigorously, analysis was split into two sequential parts. A descriptive numerical summary and a thematic analysis are both included in analysis. Initially, the screening process is visually summarised in the flow chart. The number of articles discovered is first noted, and then the selection process is made explicit by reporting on choices made throughout the scoping review. Additionally, Arksey and O'Malley (2005) discuss the need for a descriptive numerical summary that outlines the features of the studies that were included, such as the total number of studies included, the different study design types, the years of publication, the characteristics of the study populations, and the nations where the studies were carried out. Consequently, to create a narrative summary of chosen research, I made the decision to construct the extracted data thematically. There is no attempt to give a viewpoint on the 'weight' of evidence in connection to specific interventions because the scoping research does not aim to assess evidence quality and so cannot identify whether specific studies generate robust or generalizable findings (Arksey and O'Malley, 2005).

2.4.2 Analysis

Thematic synthesis was carried out in three phases. The first phase of the analysis included free coding of data and researchers' interpretation of the original data. The

coding process involved summarising content from each article's results and discussion sections into one or more descriptive codes that incorporated meaning. The procedure continued with the grouping of codes into descriptive themes. Following this, the articles were coded into pre-existing themes, with new themes being generated as needed. In the last stage, themes and sub-themes were organised into specific categories based on the research focus areas: perceptions of stakeholders towards CP services, benefits from providing CP services, disadvantages from providing CP services, barriers, and facilitators for providing CP services. An Excel spreadsheet was developed to support the organisation of themes and sub-themes based on different perspectives (i.e., public and patients, CP team, commissioners, policymakers, and GPs) for all included papers.

After identifying all the influential factors, a second round of analysis was carried out to determine mechanisms that influenced the CP services implementation. It looks specifically at the collective or individual reasoning and responses of mechanisms based on the resources available that allow or inhibit the transformation in a particular setting (Lacouture et al., 2015). However, the context-mechanism-outcome configurations (CMO), which are discovered through examination of the chosen literature, describe how and under what conditions certain outcomes are achieved by interventions (Long et al., 2022b). Identifying CMO enables us to understand complex systems and can assist in explaining, predicting, and implementing interventions in these systems (Parkkinen et al., 2018). Therefore, this study looked at the impact the CP services have on patient/ pharmacy users/ public and staff to define the mechanisms related to three different contexts within CP that may be associated with successful outcomes. Thus, the literature is mapped as follows:

- **Contexts:** The conditions in which the intervention is effective

- **Mechanisms**: Generative reasons why interventions produce results
- **Outcomes**: What the intervention accomplished

These dimensions were applied pragmatically to primary evidence for the presentation of evidence to policymakers and commissioners. I believe it provides a comprehensive approach to capturing often rich data within the CP services literature that is frequently overlooked by other scoping review methods. The procedures I use to create mechanisms are as follows:

1. **Identifying the context:** Identify the context in which CP services will take place to determine whether the intended mechanism is appropriate for that setting. This may include factors such as geographical location, population characteristics, or the political and social environment.
2. **Identifying the mechanism:** Identify the mechanism through which intervention produces the intended outcome. This may involve identifying the behaviour or process that connects context to the outcome.
3. **Gathering evidence:** It is a crucial component of the process of developing mechanisms for research and it conducted with careful attention to detail and an emphasis on methodological rigor. This step involves reviewing the themes that were identified during the first round of analysis and gathering evidence to support how these themes contribute to the mechanisms that are being identified. The purpose of this step is to demonstrate how the themes identified in the previous round of analysis are used to support the mechanisms in the specific context in which the intervention is taking place. During this step, I focused on building a clear, evidence-based argument that explains how the mechanisms identified are underpinned by the themes found in the previous analysis.

4. **Refining mechanism:** Identifying the evidence that is most pertinent to the mechanism by refining the results of this search.
5. **Data presentation:** This stage involves providing relevant information from selected literature that relate to a certain mechanism.

Overall, developing a mechanism involves a combination of theoretical and empirical work to understand how and why an intervention produces certain outcomes in a particular context. By following these steps, I develop a more nuanced understanding of the complex relationships among contexts, mechanisms, and outcomes in this research. It was clear at an early stage of reviewing the literature that data about mechanisms was not widely reported. Most of the studies were descriptive, and the depth of the data was minimal. To maintain rigour, all themes and mechanisms were discussed during supervision meetings. The following part illustrates the next stage of data collection, which is mixed methods. The section gives a general overview of mixed-method research (MMR), explains why it is being used in this PhD, and then goes into depth about each phase of MMR.

2.5 Mixed Methods

Mixed-methods research (MMR) evolved over the last twenty years, and there have been many definitions. In this thesis, the definition from Creswell and Clark (2018) was adopted, which relies on defining the core characteristics of MMR and includes:

- Collecting and analysing both qualitative and quantitative data rigorously to answer questions of the research.
- Integrating both qualitative and quantitative data and their results.
- Arranging these procedures in a logical way through specific design.
- Framing MMR procedures within philosophy and theory.

Combining both qualitative and quantitative methods provide several advantages compared to research that uses a single method, through broadening the scope of study and providing an opportunity for a richer understanding of the investigated topic. The methodological strength of MMR comes from the diversity of sources of data through the integration of different methods (i.e., qualitative, and quantitative). This maximises the strengths of both approaches at the same time, whilst offsetting the weaknesses (Bryman, 2016). Furthermore, MMR allows the researcher to add insights that might be omitted when only a single approach is used. Finally, since MMR is concerned solely with the integration, conclusions will be drawn from combining both qualitative and quantitative results of the research, which provides a more comprehensive view to inform policy and practice (Curry and Nunez-Smith, 2015).

Focusing on health care settings where the complexity of interventions is higher, qualitative methods will help to address how interventions work, whilst quantitative methods will be more useful in assessing the effectiveness of said interventions (Pope and Mays, 2006). In social pharmacy research, MMR is considered a valuable

platform because the research questions in this field are usually multi-layered and not exclusively qualitative or quantitative (Aronson, 2013). Thus, MMR provides a robust tool for researchers to assess the full picture within the social context.

2.5.1 Explanatory sequential mixed method

This research will use explanatory sequential MMR, which is when the researcher uses a qualitative approach following a quantitative approach for clarifying findings from the quantitative data analysis (Edmonds and Kennedy, 2019). Generally, this approach consists of two phases which emphasise both quantitative and qualitative equally. The second phase (i.e., a qualitative method) will be used to explain the findings from the initial phase of the study. In this project, the quantitative phase will be dominant (i.e., questionnaire). For the overview of this research, see **Figure 2:2**.

Connected integration is the approach used for combining both qualitative and quantitative data and occurs when qualitative data emerges from the quantitative data (Creswell and Clark, 2018; Curry and Nunez-Smith, 2015). This means the dataset from the quantitative part of the study is used to inform the qualitative interviews and to explain the findings of the questionnaire. In terms of sampling, a subset of participants in the survey was selected for qualitative interviews. Again, integration happens when the dataset of the questionnaire is used to develop a guide for qualitative interviews. According to Fetters et al. (2013), this mode of integration is called “building”. Lastly, at the stage of reporting results and interpretation of data, another type of integration occurs, which is called “joint displays”. This happens through bringing new perspectives beyond the gained information from the results (i.e., skill mapping) (Fetters et al., 2013).

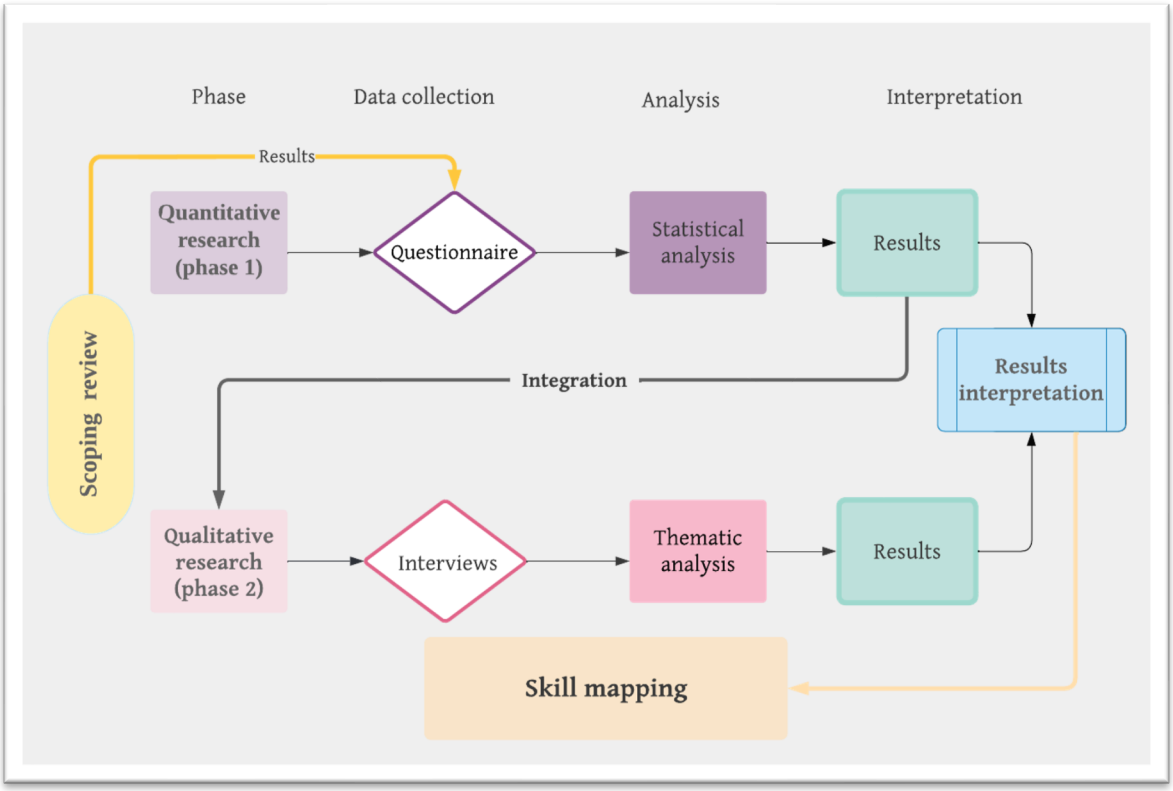


Figure 2:2 Study flow chart

2.5.2 Rationale for choosing a mixed method design

I have chosen an MMR design due to the purpose of the research. Based on different resources including Greene et al. (1989) and Bryman (2016), I identified the reasons for choosing a mixed methodology as "completeness", "developmental", "expansion" and "explanation". "Completeness" means to gain a complete picture of the investigated topic. "Developmental" aimed to ensure that questions in the second phase emerge from the inferences of the first phase, which also leads to the development of hypotheses that the researcher will test in the second phase. Somewhat similar to this is "Explanation", which refers to one method being used to help explain the results of another method. Meanwhile, "Expansion" refers to extending the range and width of inquiry by using different approaches for different inquiries.

In my research, completeness, developmental, expansion, and explanation will play an essential role in research development and result interpretation. Firstly, the MMR design will be useful to identify the set of skills that community pharmacists will need in the future, based on the public need. The results from the questionnaire will help to develop the interview question and to understand the general attitude towards the community pharmacy services. Conducting a qualitative interview after the questionnaire will be an excellent opportunity for broadening the scope of the investigated topic given that the focus of the research is public need.

Using quantitative data is useful for providing a big picture and measuring the extent of social phenomena (Curry and Nunez-Smith, 2015). Regarding this research, questions pertaining to public acceptability of using CP service will help to show any trends, which will be useful for identifying a generalisable attitude. The participants' personal experiences, which is explored in the qualitative interviews, accompanied by thoughts and feelings, can help to bring depth and context to the analysis (Pope and Mays, 2006; Robson and McCartan, 2016). Thus, the qualitative results of the study will be included to expand upon the information gathered from the questionnaire analysis by highlighting topics that could not be picked up from the quantitative analysis results. This combination will strengthen both methods and overcome the weaknesses of each.

Following the evaluation and analysis of the quantitative and qualitative data, triangulation was carried out in this study. The term “triangulation” refers to the combination of two or more sources and the study of phenomena (Denzin, 1989). The goal is to compare and contrast data, looking for inconsistencies, convergence, and complementarity in order to gain a better understanding of the phenomena (Jason and

Glenwick, 2016). Triangulation provides meaning by getting a larger and more detailed knowledge than utilising a single technique or data source, and can assist boost validity (Denzin, 1989; Wald, 2014).

2.5.3 Research Rigour

As mentioned earlier, MMR is characterised by increasing the strength of both quantitative method and qualitative method through strengthening the research process. However, combining two different paradigms leads to challenges in assessing the research quality (Wisdom et al., 2012). Each paradigm has its own terminologies that are used. For example, quantitative research used internal validity, reliability, objectivity, and generalisability, which are replaced by credibility and confirmability, transferability and dependability in qualitative research (Abowitz and Toole, 2010; Dellinger and Leech, 2016; Hong and Pluye, 2018; Wisdom et al., 2012). Regarding MMR, the quantitative and qualitative components integrated, which is more than the gathering of each method (Fetters and Freshwater, 2015). Several researchers have proposed techniques to ensure rigour in the methodological components of the MMR (Creswell and Clark, 2018; Harrison et al., 2020; Onwuegbuzie and Corrigan, 2014; O'Cathain, 2010; Tashakkori and Teddlie, 2010). Taking this into account, the current project adapted Good Reporting of A Mixed Methods Study (GRAMMS) framework (O'Cathain et al., 2008); this will be explored in more detail throughout this chapter and a general description of the framework is represented in **Figure 2:3**. On the other hand, the weaknesses of each approach will be stated clearly in the "Study Strengths and Limitations" Section.

GRAMMS	Describing reasons for using MMR to the research question
	Describing the research design in terms of the purpose, priority and sequence of methods
	Describing each componant of the study in terms of sampling, data collection and data analysis
	Describing how and where integration has occurred
	Describing any limitation associated with the mixing the methods
	Describing any insights gained from integrating the method

Figure 2:3 Good Reporting of A Mixed Methods Study (GRAMMS)

Source: Adopted from (O'Cathain et al., 2008)

2.6 Phase two: Quantitative method (Survey research)

This section describes the quantitative part of the study i.e., survey research. It gives details about the questionnaire development, measurements, validation process, sampling strategies, and the analysis plan of the questionnaire.

To begin with, a questionnaire is defined as a systematic method used to collect information from a sample of the population (Groves et al., 2011). To develop a survey, the purpose of the survey, justification of using this method, type of survey, and mode of distribution should be identified (Creswell and Clark, 2018). The aims of using the questionnaire were to provide a quantitative description of public attitudes towards community pharmacy services; observing trends and identifying public opinions regarding the use of technology in delivering CP services; and testing associations among variables of a population. The main strength of the survey study is the generalisability from the study sample to the entire population, which means that conclusions can be drawn about attitude or behaviour regarding that population (Edmonds and Kennedy, 2019; Peter, 2018; Rattray and Jones, 2007).

Since the current study is intended to identify the skills the community pharmacist will need in the future based on the needs of the public, a survey was deemed the best choice as the primary research method. Furthermore, questionnaires are an ideal tool in behaviour research to measure crucial factors such as attitudes, opinions, beliefs, characteristics, and expectations (Bryman, 2016; Peter, 2018). Another reason for choosing this method is that questionnaires are considered to be a relatively economical, quick tool to complete, and usually easy to analyse (Rattray and Jones, 2007). Most importantly, the anonymous nature of questionnaires, which protect participants' privacy and confidentiality, could convince individuals to be involved in

the study (Creswell and Creswell, 2018). However, there are some problems related to the use of questionnaires to collect data. The most reported issue in the literature is low response rate (Bickman and Rog, 2009; Bryman, 2016; Peter, 2018; Rattray and Jones, 2007; Stockemer, 2019). To address this issue, incentives were offered for the participants to encourage them to take part in the study which was the chance to win one of two £20 Amazon vouchers. Other problems are related to formulation of the questionnaire such as question wordings, flow of questionnaire, context, and choice of response (De Leeuw et al., 2008). Therefore, it is important to keep the questionnaire relatively simple, short, and straightforward. The questionnaire used in this study was developed specifically in such a manner; more information will be provided in the validation process under constructing questionnaire (**Section 2.6.1.1)**.

2.6.1 Survey design

A cross-sectional anonymous web-based questionnaire was developed. The survey was developed on Jisc, which is hosted at https://www.onlinesurveys.ac.uk/. The license was provided by the University of Nottingham, and the website adhered to the requirements of General Data Protection Regulation.

The questionnaires were descriptive in nature and aimed to describe respondents' perceptions about CP services and the relationship between their attributes and those perceptions CP services can all be considered perceptions. The design was based on the objectives of this PhD, the brainstorming and intensive review of the literature and British policy documents, and analysis of the scoping review. From these, an appropriate valid and reliable measure was formulated the steps of questionnaire development are represented below.

Using an electronic platform to operate a survey has many advantages over other survey types. It was helpful to control the order of the questions, so that participants were only able to see what they were supposed to, thereby avoiding any unnecessary questions or information. In the presence of a filter question, it would skip automatically to the next appropriate question. A web survey gave the researcher control over the appearance, which included colour, formatting, and response styles. Respondents' answers were automatically saved in the database, which meant they could be retrieved at any time for data analysis. This eliminated need for coding of responses or manual entry of data into a spreadsheet. This was considered beneficial for the research because it reduced the possibility of errors when processing the data and also saved time (Bryman, 2016). However, there are disadvantages of using a web based survey that are related to the random sample validity, response rates, and restrictions on behavioural data collection (Milner et al., 2017). More information about how I addressed these issues will be presented in **Section 2.6.2**.

2.6.1.1 Constructing questionnaire

There were three versions of the questionnaire: the pilot study, public questionnaire which was slightly changed from the pilot study (see **Appendix II**) and the other for pharmacy users (see **Appendix III**). The questionnaires used in this study were developed in in several steps- see **Figure 2:4**. The first stage involved conducting a literature review and brainstorming to identify current public views towards community pharmacy and plans for developing current services or introducing a new service. Since policy makers in the UK planned to increase access to health services, there was scope for CPs to play a very important role in achieving this (more information was represented in **Chapter one**). The information gathered was used to

inform the design of a questionnaire. Secondly, I discussed this version of the questionnaire with my supervisors who have extensive expertise with CP services and research and with my colleagues from University of Nottingham.

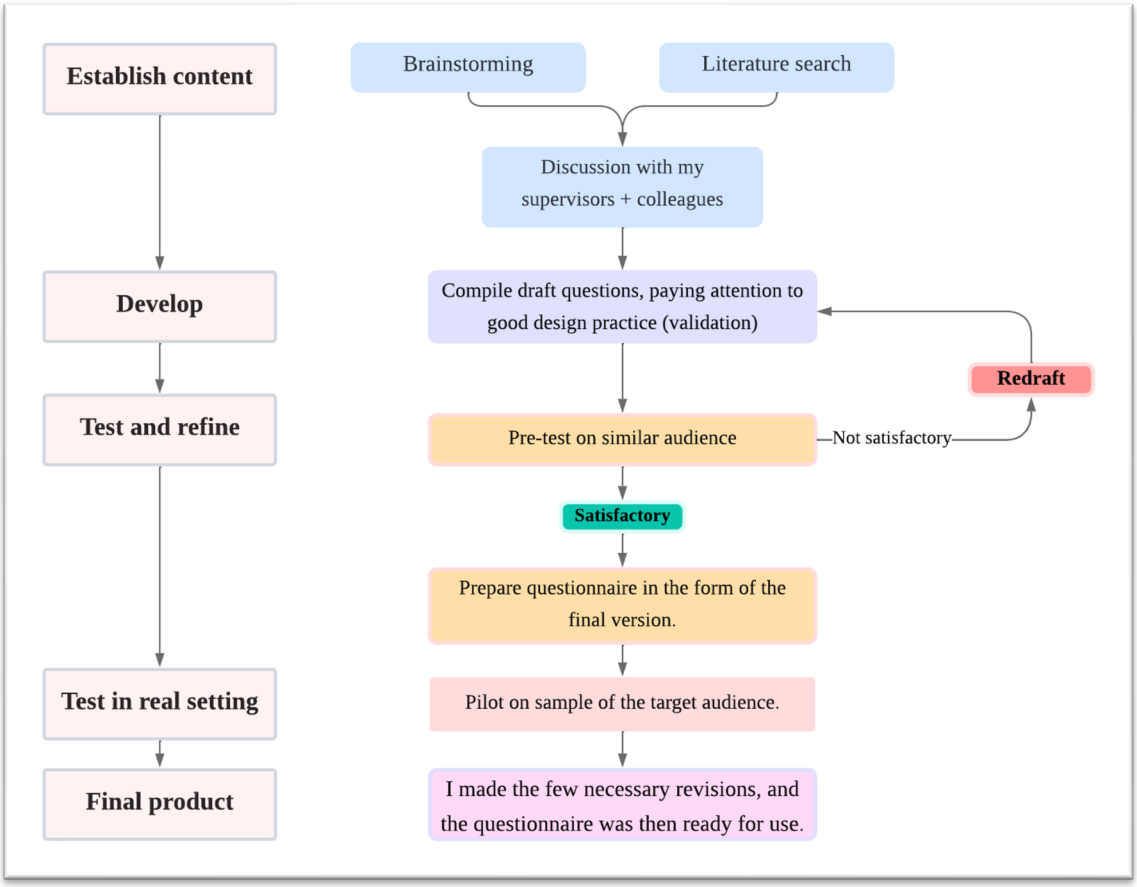


Figure 2:4 The process of developing the questionnaire

The questionnaire consisted of five sections: (1) current use of healthcare services, (2) attitudes about current services within community pharmacy, (3) perceptions about management of minor conditions, (4) attitudes towards health promotion and ill-health prevention services that are provided in CP and (5) demographic information. The items in the questionnaire addressed awareness towards CP services, the perceptions of participants regarding the use of technology in delivering CP services, and attitudes towards delivering public health services in CP.

In order to measure people's opinions, attitudes, health beliefs, and behaviours regarding CP services, different types of questions were used. In this section, each of them will be discussed briefly:

- **Multiple-choice questions:** This type of question consists of different categories that the participants can select from, which must be mutually exclusive. For this type of question, the respondent can give either a single answer (can pick one option only) or multiple answers (can pick several answers).
- **Likert Scale:** This consists of fixed options designed to measure opinions or attitudes. Ordinal variables were used to measure the strength of the participant's experience.
- **Dichotomous Survey Questions:** This type of question consists of two answering choices such as Yes or No questions.
- **Categorical Survey Questions:** In these questions, researchers split continuous numerical questions into categories, such as age group. Using categories might be particularly useful to protect participant information, such as in cases where respondents may not want to reveal the exact information or recall the behaviour.
- **Rank-Order Questions:** This type of question allows participants to rank options based on certain criteria, such as preference (i.e., participants can rank options from most favourite option to least favourite option consecutively).

In this study, the majority of questionnaire questions were multiple-choice questions with pre-formulated answer as options. In addition to this, they also included "other" as option, which allowed people to enter short text freely when their preferred options

were not listed. The Likert scale questionnaire used the 5-point scale (agree, strongly agree, neither agree nor disagree, strongly disagree, disagree), whilst demographical details were recorded using categorical scales.

Once completed, the initial questionnaire design was then validated. Demonstrating validity when developing a questionnaire is vital. According to Rattray and Jones (2007), validation of questionnaires refers to the process of checking whether a questionnaire is measuring what it is planned to measure. There are several methods that could be used to measure questionnaire validity: face, content, construct, and criterion validity (see **Table 2:5**).

Table 2:5 Measurement related to questionnaire validity

Type of validation	Explanation
Face validity	This assesses the questionnaire presentation and relevance of the questions through checking the questions to sure that they are relevant, reasonable, unambiguous, and clear
Content validity	This is conducted through judgements of experts on how well the content of the questionnaire represents what it is intended to measure
Criterion validity	This measures the agreement between the questionnaire and another questionnaire that is accepted as valid
Construct validity	This measures to what extent the questionnaire test the hypothesis or theory that it is supposed to measure

Source: Adapted from (Bruce et al., 2018)

Face and content validity were selected to validate the questionnaires (i.e., pilot and Study II). This decision was made due to the absence of a gold standard measurement to compare questionnaires. The content validity was established after the generated items had been organised and the questionnaire had been assembled (see **Figure 2:5**), at which point, five experts in community pharmacy services were selected to review and critique the content in order to assess whether the questions would effectively capture the required data. The recommended number of experts to inform

questionnaire development was five to ten (Almanasreh et al., 2019). I therefore chose five individuals so as to ensure a better agreement between the experts. After receiving responses from the experts, quantitative and qualitative analyses were conducted.

For quantitative analyses, the Average Congruency Percentage (ACP) was used. The ACP is calculated by gathering experts' ratings of relevance for each item in the questionnaire, then taking the average rating across each of the experts (Almanasreh et al., 2019), with the lower limit of acceptability of ACP to be 0.90 (Waltz et al., 2017). ACP was selected to quantify content validity because it is a simple way to compute and interpret the result. It also gives content validity for the entire questionnaire and each individual question. It can be utilised to assess the performance of the experts, and most importantly, it allows the questionnaire developer to decide whether to keep or exclude items from the questionnaire.

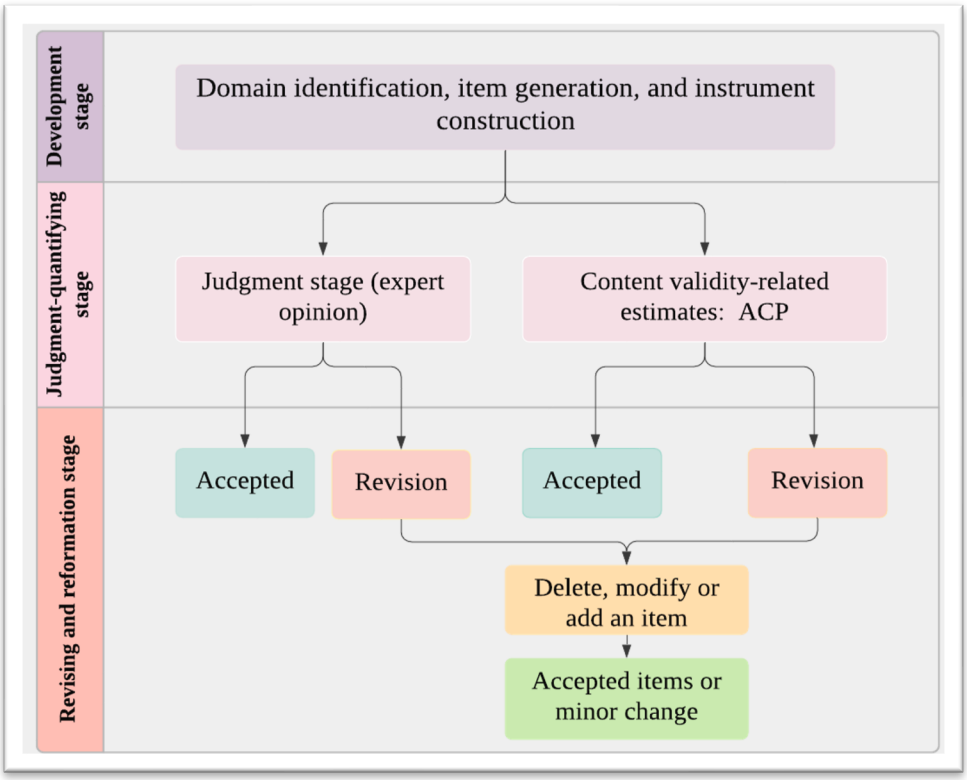


Figure 2:5 Flow diagram describing the process of content validity evaluation of the questionnaire

For qualitative analyses, the comments from the experts were collected, then the decision about the question of whether to keep, change, remove, or add a new item to the questionnaire was taken. Finally, changes were placed where appropriate, to enhance the clarity of both questions and options, based on the expert's comments. The result of the ACP for each question in the survey will be represented bellow through giving their final decision on the question and the percentage of agreement. During each step of the questionnaire development, face validity was conducted to make sure the questions were straightforward and relevant, and the order of the questions was logical and easy to follow. An additional panel discussion was undertaken to ensure the language used in the questionnaire was public-friendly and free from jargon.

Sequentially, the public questionnaire was pre-tested with 20 members of the public (participants were recruited to complete the questionnaire and then to give comments regarding the questionnaire design). This step was conducted to confirm the face validity of questionnaire and to estimate the period that the participants would need for questionnaire completion. It was also used to evaluate the ease of navigation of the online survey.

Many factors were taken into account while choosing responders for the pre-test. Pre-test participants should resemble or be comparable to my real participants. As a result, I thought about the demographics of the respondents to the actual survey (i.e., wide age group). Frequently, this is not a "random selection" procedure. It was my intention to gather a variety of experiences regarding CP services from various potential respondent groups, including those who may comprehend or respond to the questions differently, who may have access to varying amounts of information, who may have

varying degrees of ability to respond to the questionnaire, and who may have varying levels of education or prior experience. My restricted resources, including time, and finance, however, had an impact on my choice. Although I sacrificed some geographical dispersion by conducting pre-tests locally (i.e., at University Park Campus / University of Nottingham), the campus had a large number of visitors who requested to participate in the pre-test along with students, employees, and academics. I requested the participant to check the completed questionnaire after the pre-test was finished. I also inquired about any potential issues they may have seen when filling out the questionnaire (e.g., mistakes, blanks, questions that seemed to take a long time to finish or were very tough, etc). No problems were reported; thus, no adjustments were made.

A pilot study was conducted to determine if any aspects of the study methodologies or procedures needed to be changed, as well as how those modifications would be implemented. Based on the result, slight changes were made on the questionnaire to improve some aspects and decrease the time needed by the participants to fill in the questionnaire. The final version can be found in **Appendix II.** With regards to the pharmacy user questionnaire, it was a part of a larger project that takes place every year to evaluate services in the CP. The project was conducted in some Boots branches in Nottinghamshire, UK. The questions were derived from a public questionnaire, with some changes in the wording and type of question made to enable the questions to fit in with the project. The face validity of the questionnaire was established by reviewing the questions and assessing whether they appeared to be measuring the desired construct.

2.6.1.1.1 Results of the Content analysis

A. Current use of healthcare services:

1. Do you suffer from any long-term conditions? that are controlled by taking medicines or by using other treatments??

- ☐ Yes. Please describe ……..
- ☐ No

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

2. Over the last 6 months, how often have you visited your GP?

- ☐ Once
- ☐ Twice
- ☐ Three times
- ☐ Every month
- ☐ Every week
- ☐ Never

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

3. Over the last 6 months, how often have you visited a community pharmacy?

- ☐ Once
- ☐ Twice
- ☐ Three times
- ☐ Every month
- ☐ Every week
- ☐ Never

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

4. What are the reasons you visit community pharmacy? **(Tick all that apply)** *

- ☐ To pick up a prescription
- ☐ To get advice about your medicines
- ☐ To get advice about your health
- ☐ To buy non-prescription medicines
- ☐ To get advice about your medical condition
- ☐ To buy non-medical items, such as toiletries, baby food, etc.
- ☐ To access a health service
- ☐ None of the above
- ☐ Other. Please describe…….

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted + add a question (90%)
Expert 5 = Accepted (100%)
Degree of agreement = 98%

Add a question.

Who do you usually visit the community pharmacy for? (**Tick all that apply**)

- ☐ Yourself
- ☐ On behalf someone else
- ☐ Not applicable

Degree of agreement = 100 %

N.B: There were no modifications to this question after piloting.

B. Services within community pharmacy:

5. Which of the following do you think community pharmacists and their teams can help you with? **(Tick all that apply)**

- ☐ Managing long term diagnosed conditions, such as diabetes, hypertension (high blood pressure), etc.
- ☐ Managing minor conditions such as flu, colds, etc.
- ☐ Advice and support about medicines
- ☐ Vitamins and herbal medicines
- ☐ Repeat prescriptions.
- ☐ Healthy living advice
- ☐ None of the above
- ☐ Other. Please describe…….

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

6. Which of the following community pharmacy services are you familiar with?

(Tick all that apply)

- ☐ Vaccinations such as flu jab
- ☐ Stop smoking.
- ☐ Weight management services
- ☐ Health check
- ☐ Travel medicine
- ☐ None of the above
- ☐ Other. Please describe……...

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted + recommendation to add more options (90%)
Expert 5 = Accepted (100%)
Degree of agreement = 98%

Recommendation to add more options.

- ☐ Medicines reviews
- ☐ Emergency Hormonal Contraception (EHC) supply
- ☐ Chlamydia screening and treatment services
- ☐ None of the above

Degree of agreement = 100 %

N.B: There were no modifications to this question after piloting.

7. Please rank each of these possible methods of communicating with your pharmacist to indicate your preferences: (**1** will be the most favourable mode and **4** the least favourable)

- Face to face ☐
- Telephone counselling (voice calling) ☐
- Online video counselling ☐

(for example; Facetime and Skype)

- Home visit ☐

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

8. How likely would you be to use online pharmacy services (i.e., ordering your prescribed medicines, over the counter medicines OTC from the internet to be delivered straight to your home or office)?

- ☐ Extremely likely
- ☐ Very likely
- ☐ Quite likely

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

- ☐ Neither likely nor unlikely
- ☐ Quite unlikely
- ☐ Very unlikely
- ☐ Extremely unlikely

N.B: There were no modifications to this question after piloting.

9. Would you like community pharmacies to provide screening services (such as blood tests, cholesterol level, hepatitis C tests, etc)?
   - ☐ Yes
   - ☐ No
   - ☐ Do not know

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

C. Management of minor conditions:

10. Where would you currently seek advice from if you had a minor condition such as cold or flu? Please rank each source that you would use to indicate your preferences: (**1** will be the most favourable and **5** the least favourable)
    - Family or friends ☐
    - GP ☐
    - Community pharmacy ☐
    - The internet ☐
    - Nobody. ☐

    I will rely on myself or my previous experience

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted+ recommended to add an option (90%)
Expert 5 = Accepted (100%)
Degree of agreement = 98%

Add an option.

- ☐ NHS 111

Degree of agreement = 100 %

N.B: There were no modifications to this question after piloting.

11. Would you consider using a mobile phone app to help you in the management of minor conditions that you have diagnosed yourself?

- ☐ Yes
- ☐ No
- ☐ Do not know

Expert 1 = Accepted (100%)
Expert 2 = Change wording (50%)
Expert 3 = Accepted (100%)
Expert 4 = Change wording (50%)
Expert 5 = Change wording (50%)
Degree of agreement = 70%

Change

Would you consider using a mobile phone app to help you identify and treat minor conditions?

Degree of agreement = 100 %

N.B: There were no modifications to this question after piloting.

D. Health promotion:

12. **To what extent do you agree or disagree with the following statements?**

12.1. Pharmacy teams are a good source of advice about healthy living.

- ☐ Strongly agree
- ☐ Slightly agree
- ☐ Neither agree nor disagree
- ☐ Slightly disagree
- ☐ Strongly disagree
- ☐ Don't know

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: This question has been deleted from pharmacy user questionnaire to reduce time need to fill questionnaire.

12.2. Community pharmacy could be a good place to provide services related to promoting a healthy lifestyle

- ☐ Strongly agree
- ☐ Slightly agree
- ☐ Neither agree nor disagree
- ☐ Slightly disagree
- ☐ Strongly disagree
- ☐ Don't know

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: This question has been deleted from pharmacy user questionnaire to reduce time need to fill questionnaire.

12.3. Health campaigns on social media (such as Facebook, Twitter, Instagram, etc.) would help me to increase my awareness of relevant health issues

- ☐ Strongly agree
- ☐ Slightly agree
- ☐ Neither agree nor disagree
- ☐ Slightly disagree
- ☐ Strongly disagree
- ☐ Don't know

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

13. How do you think the pharmacist could help you to take responsibility for your health? **(Tick all that apply)**

- ☐ Provide advice
- ☐ Signpost you to online materials
- ☐ Provide educational leaflets
- ☐ Refer me to other healthcare providers
- ☐ I do not know
- ☐ Other. Please specify……

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: This question was slightly modified by adding addition option: Prescribe medications.

E. Pharmacist prescribers

14. Do you think it would be useful if your pharmacist could prescribe medicines like the GP does?

- ☐ Yes
- ☐ No
- ☐ Do not know

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

15. How do you think a prescribing pharmacist (as described above) could help you manage your medical conditions? (Tick all that apply)

☐ Give advice about your condition or how to use your medicines
☐ Prescribe your medicines
☐ Adjust your existing medicines
☐ Refer you to the GP
☐ All of the above
☐ Do not know
☐ Other. Please specify ……

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: This question has been deleted from pharmacy user questionnaire to reduce time need to fill questionnaire.

F. Demographic information:

16. Gender:
☐ Female
☐ Male
☐ Prefer not to say
☐ Other

If you selected Other, please specify…….

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

17. Age:

☐ 18-24 years old
☐ 25-34 years old
☐ 35-44 years old
☐ 45-54 years old
☐ 55-64 years old
☐ 65-74 years old
☐ 75 years or older

Expert 1 = Accepted (100%)
Expert 2 = Accepted (100%)
Expert 3 = Accepted (100%)
Expert 4 = Accepted (100%)
Expert 5 = Accepted (100%)
Degree of agreement = 100%

N.B: There were no modifications to this question after piloting.

18. Choose one option that best describes your ethnic group or background:

- ☐ White; English/ Welsh / Scottish / Northern Irish / British
- ☐ White: Irish
- ☐ White: Traveller
- ☐ Mixed: White and Black Caribbean
- ☐ Mixed: White and Black African
- ☐ Mixed: White and Asian
- ☐ Asian / Asian British: Indian
- ☐ Asian / Asian British: Pakistani
- ☐ Asian / Asian British: Bangladeshi
- ☐ Asian / Asian British: Chinese
- ☐ Black / Black British: African
- ☐ Black / Black British: Caribbean
- ☐ Arab
- ☐ Other

If you selected Other, please specify ……

Expert 1 = Accepted (100%) Expert 2 = Accepted (100%) Expert 3 = Accepted (100%) Expert 4 = Accepted (100%) Expert 5 = Accepted (100%) **Degree of agreement = 100%**

N.B: There were no modifications to this question after piloting.

Finally, because the public questionnaire was designed for individuals in the UK, an optional question concerning location (i.e., nation) was added (more information was provided at **Appendix II**.

2.6.2 Participants

Two methods of sampling were selected to recruit participants: convenience sampling and snowball sampling. Convenience sampling refers to a non-systematic method for recruiting participants, which allows potential participants to self-select into the sample (Bryman, 2016). Meanwhile, the snowball sampling method begins by identifying one participant who meets research inclusion criteria, then asking them to refer the questionnaire to someone else, and so on (Bryman, 2016). Convenience sampling was selected to recruit participants in feasibility, public and pharmacy user questionnaires. Another recruitment technique used for the pilot and public questionnaire was snowball sampling. Friends and colleagues were asked to disseminate the questionnaire to their friends and families. This approach was useful

to expand the sample of participants (Stockemer, 2019). The criteria for selecting the subjects for all the questionnaires are represented in **Table 2:6.** All participants in the study were informed about the anonymity, purpose, study design and the possible impact of the findings before consenting to participate.

Regarding the questionnaire administration mode each study adapted different modes – see **Table 2:6**. For the pilot study, the methods were interviewer-assisted (conducted through reading each question out loud to the participant and then recording their responses) and self-completion (in which an online version of the questionnaire was distributed to members of a patient support group in Cardiff). Self-completion questionnaires are the most cost-effective way to collect data from large groups of individuals (Lavrakas, 2008). Furthermore, anonymity benefits both researchers and responders.

Respondents are more likely to answer truthfully when not required to give out identifying information (Lavrakas, 2008). Self-completion surveys also have the benefit of eliminating interviewer bias because the researcher cannot influence the participants' responses (Lavrakas, 2008). On the other side, there is no control over the response rate (Lavrakas, 2008). Face-to-face interviews provide advantages in that the questions can be specified and discussed in greater detail, and non-response is reduced (Lavrakas, 2008; Snowball and Willis, 2011). However, doing face-to-face interviews is costly (Lavrakas, 2008; Snowball and Willis, 2011). They also offer responders less time to consider their response (Snowball and Willis, 2011). The goal of using both interview assistance and self-completion techniques is to maximise the sample's representation of the general population.

Regarding **Study II**, a self-completion method was used, meaning that the questionnaire can be completed by the respondent without the help of an interviewer. I used the Internet distribution technique because of the increased usage of the internet in the country (in 2020, 92% of adults in the UK have recently used the Internet (Office for National Statistics, 2020a)). Generally, the Internet-based questionnaire has emerged as a viable alternative to the paper questionnaire (Ebert et al., 2018; Zuidgeest et al., 2011). It has been demonstrated that web-based research reduces data gathering costs (Ebert et al., 2018; Lavrakas, 2008). As more individuals in the UK acquire access to the Internet, possible differences in population coverage between paper- and Internet-based questionnaires decrease, as does the potential for selection bias from utilising the Internet for questionnaire. Furthermore, Internet self-completion questionnaire provides inherent advantages such as the elimination of any potential bias in answers due to an interviewer effect, and participants are more likely to honestly express their thoughts (Feldman et al., 2017).

However, some research has found that Internet-based surveys had a lower response rate when compared to conventional modes of delivery (Basnov et al., 2009; Feldman et al., 2017; Kongsved et al., 2007). Generally, the response rate varies depending on the duration of the survey, and researchers must be aware of and take steps to avoid fake data (Milner et al., 2017). To improve the response rate, I adopted different strategies. For the first website which uses email list (FindParticipants®), I used three rounds of participant recruitment. After a period of two weeks, a reminder email was sent to non-responders. The third and final email sent included a motivational incentive (two chances to win a £20 Amazon gift voucher). Another website (SurveyCircle®) used online promotion to promote the questionnaire, with two chances to win a £20 Amazon gift voucher. Also, I created page numbers and

progress completion reports to inform participants of how much of the questionnaire is yet unanswered. Finally, I tried to keep the questionnaire as short as possible (around five minutes). According to Milner et al (2017), a short questionnaire ranging from one to five minutes may be able to keep 95% of the participants who start the questionnaire. Moreover, interest in the study would affect retention rate positively (Milner et al., 2017). Thus, it was important to incorporate in the invitation letter the important of study on the CP services and the future implications of the study -see **Appendix IV**.

Also, access is limited to individuals who have subscribed to the service, are active, and are available at the time the survey is posted; thus, these websites cannot collect a genuinely random sample of participants. Aware of this issue and I used two different websites (FindParticipants® and SurveyCircle®) to recruit the participants. These websites used different ways to recruit the participants which were online advertisements of the questionnaire and direct emails sent to samples chosen from various sources' lists (based on my inclusion and exclusion criteria). I also used convenience sampling (non-probability sampling) in order to be accessible to the public and anybody can take part.

Finally, the sort of participants that may be recruited and the types of questions that can be asked are also a limitation of online research (Milner et al., 2017). As mentioned earlier, the individuals taking part in the questionnaire is limited to the website subscribers and it is difficult to verify that participants specific criteria because it is self-reported information. As a result, studies involving these individuals are limited in that they mostly collect data on attitudes and perceptions, while it is only occasionally feasible to collect behavioural data (Milner et al., 2017). When

considering this research, I was concerned with public attitudes towards CP services, thus this issue was not considered to be problematic to my research.

While for **Study III**, Pharmacy users' views, were interviewer-assistance mode where used and due to the nature of the study (i.e., multiple administrators of the questionnaire) an extra measure was used to ensure consistency and quality of questionnaire administration and that all the students were administering the questionnaire in the same way. Therefore, before data collection, the team of principal investigators (i.e., investigators responsible for the annual CPs service evaluation project) trained twenty-nine undergraduates in a two-hour session about administrating survey and collecting data. During the training session, all the students observed the research team conducting the questionnaire. Then, each student was given a chance to practice the questionnaire administration, and the principal investigators observed their performance.

After deciding on a sample procedure, it was time to consider who will be researched. There are two types of participants who, although being chosen for the sample, did not participate in the study as responders. However, a variety of outcome rates, including response rate, cooperation rate, rejection rate, and contact rate are frequently mentioned in survey reports and the literature (American Association of Public Opinion Research, 2016). The response rate will be illustrated in the context of this study (i.e., Study II). The response rate is the percentage of the chosen sample that participates in the research (Bruce et al., 2018; Phillips et al., 2017). One of the six definitions established by the American Association for Public Opinion Research is generally accepted in academic surveys. The formula used to compute the response rate counts only surveys returned with every question answered, and all

nonrespondents are included in the computation based on known information that all survey recipients are eligible (American Association of Public Opinion Research, 2016). The equation is as follows:

Response rate =

$$complete\ survey \Big/ (complete\ survey + partial\ complete\ survey) + (refused + non\ contact + other)$$

Take into account that the FindParticipants® website issued 576 emails for eligible participants, whereas SurveyCircle® identified 459 active eligible participants at the time the survey was posted.

Response rate = 208/ (208+ 85)+(742+0+0)= 0.2

2.6.3 Setting and data collection

The pilot study targeted the public in Cardiff, Wales. The most crucial considerations when choosing Cardiff/ Wales are the public's attitude toward CP services is tied to their interest, either directly (i.e., because the study objectives reflect the vision of health and social care in Wales (Welsh Government, 2018)) or indirectly through growing public interest healthcare services or through cultural and political implications of the findings on services delivery. For the public questionnaire, I recruited participants from all over the UK using an electronic distribution method. I decided to widen my sample to include the entire UK in order to better understand public attitudes regarding CP at the national level, especially as each country runs differently. Furthermore, this study considers national health priorities in four countries, which is expected to be valuable in informing future strategy and plans of action on major health needs to meet current challenges.

For the pharmacy user questionnaire, the participants were invited to take part in the study when they visited 15 branches of Boots community pharmacies, located in Nottinghamshire. According to the Index of Multiple Deprivation (IMD) (Ministry of Housing and Communities and Local Government, 2019), half of the pharmacies were located in the most deprived area (Ministry of Housing, 2019). IMD is considered an official measure of relative deprivation in England, which is calculated based on multiple inputs. These inputs consist of 39 separate indicators, organised under seven key domains; for more information see **Figure 2:6**. In England, Lower-layer Super Output Area (LSOA) is arranging 32,844 neighbourhoods based on to their level of deprivation relative to each other. The Indices of Deprivation is a relative measure rather than an absolute scale. This is useful in comparing small areas and recognising the most deprived areas rather than identifying deprived people or quantifying how deprived the area is. **Table 2:6** demonstrates the LOSA code and IDM of the pharmacies selected for data collection, which covers a wide range of areas according to IDM.

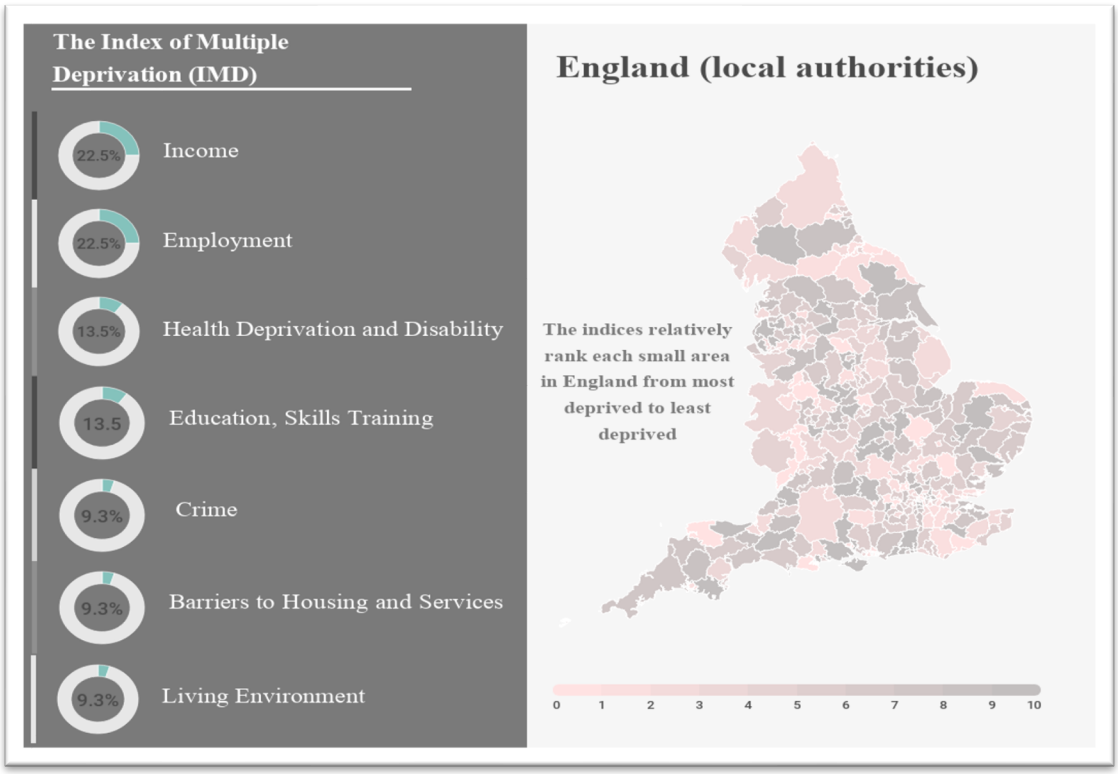


Figure 2:6 The English Indices of Multiple Deprivation (IMD), 2019

The time and duration both varied; however, some of responses were collected during the COVID-19 pandemic and before lockdown in the UK- see **Table 2:7** for more information.

Table 2:6 IDM classification for area of the selected CPs

Postcode	**LSOA code**	**IDM**	
NG9 2JQ (Beeston, High Rd).	E01028085	21871	
NG10 1HZ (Long Eaton)	E01019682	4792	
NG15 7AX (Hucknall, 52-54 High St)	E01027933	10324	
NG5 7EB (Arnold)	E01028209	8471	
NG6 8AQ (Hucknall Lane)	E01013882	2175	
NG1 3QS (Victoria Centre)	E01033409	8090	
NG2 1RU (Riverside)	E01013870	4715	
NG5 2FS (Sherwood)	E01013969	11081	
NG2 5GR (West Bridgford)	E01028416	20969	
NG7 5HY (Mary Potter Centre)	E01013811	1688	
NG6 8QH (Bulwell Main St)	E01013877	130	← Highest
NG6 8HD (Commercial Rd)	E01013885	1188	
NG8 2QP (Wollaton)	E01013984	30163	← Lowest
NG9 1GA (Beeston, Middle St)	E01028085	21871	
NG10 1RY (Long Eaton HC)	E01019679	13332	

Table 2:7 Methods summary for three questionnaires

	Pilot study	Study II: Public views	Study III: Pharmacy users views
Inclusion criteria	• Able to give informed consent • Age 18 or above • In good mental and emotional condition • Able to understand and communicate in English	• Able to give informed consent • Age 18 or above • In good mental and emotional condition • Able to understand and communicate in English	• Able to give informed consent • Any adult (18 years and above) who visited any of the selected Boots® CPs • In good mental and emotional condition • Able to understand and communicate in English
Exclusion criteria	• Age less than 18 • Lack of capacity • If completing the survey may have caused them distress. • Critical medical condition		
Mode of administration	• Interviewer-assisted • Self-completion	• Self-completion	• Interviewer-assisted
Data collection time	April 2019	November 2019 to the end of January 2020	Two-week period in March 2020.
Setting	Cardiff	UK (Online)	Nottinghamshire

2.6.4 Analysis

The data analysis was conducted using IBM SPSS Statistics version 28.0 software for Mac (IBM, New York). This program is an integrated statistics package useful for data analysis, data management, and graphics. Using a web-based questionnaire for the pilot study and public questionnaire allowed for the exportation of responses in a spreadsheet to SPSS. As for the pharmacy user questionnaire, all the data was gathered and organised on an Excel spreadsheet. Then, the data was reviewed and cleaned by the principal investigator of the original research. When I handled the data,

I developed another Excel spreadsheet that included only the questions relating to my project.

Before any analysis was performed, the data was screened and cleaned so as to ensure a clean dataset for analysis. After each of the three datasets had been cleaned, preliminary analysis was carried out, which included dealing with issues such as normality and outliers. Normality may be determined either by using statistical methods such as skewness and kurtosis, or by using graphical approaches such as frequency histograms (Tabachnick and Fidell, 2014). Skewness and kurtosis, on the other hand, are thought to be too sensitive for high sample numbers (Pallant, 2020; Tabachnick and Fidell, 2014). Therefore, Tabachnick and Fidell (2014) propose utilising a graphical tool to analyse the shape of the distribution instead of relying on statistical evidence such as skewness and kurtosis. Based on those graphical approaches were given precedence, particularly for pharmacy user questionnaire due to relatively large sample size. The histogram revealed that the distribution of scores did not appear to be normally distributed.

Following this preliminary analysis, I examine the data collected from three separate questionnaire-based studies using descriptive analysis to meet the study objectives which are:

1. **A pilot study:**
    - Preliminary evaluation of responses.
    - Assessing acceptability of delivering screening services, availability of pharmacist prescribing and using digital tool for delivering CP services or promoting a healthy lifestyle.

- Assessing the capacity to recruit participants and the characteristics of the resulting sample.
- Evaluating and refining data collection procedure (i.e., type of survey (mail, online, or in-person), design of survey questions and layout, and method of distribution).
- Evaluating resources for conducting research on large scale.

2. **Study II: Public attitudes towards CP services:**

- To explore public awareness regarding current services available in the CP.
- To identify public attitudes towards delivering screening services and the availability of pharmacist prescribing in CP.
- To identify public attitudes towards using digital health for delivering health services or for health promotion and illness prevention.

3. **Study III: Pharmacy users' attitudes towards CP services questionnaire:**

- To identify the CP users' attitudes towards the ability of the community pharmacist.
- To identify CP users' awareness regarding current services available in the CP.
- To identify pharmacy users' attitudes towards health promotion and selfcare when delivered by the community pharmacist.
- To identify pharmacy users' attitudes towards using digital tool for delivering CP services.

By conducting a descriptive analysis of the data collected from these three studies, we will gain a better understanding of these topics and be able to draw actionable

conclusions from the results. In terms of the treatment of missing data, Available Case Analysis (AC) was used; more details are shown below.

2.6.4.1 Missing data

All the study variables (e.g., age, gender, ethnicity) were represented with non-response codes, which indicated any missing variables. In self-reporting research, missing data is considered problematic because it compromises research quality (Fox-Wasylyshyn and El-Masri, 2005; Kyureghian et al., 2011). Additionally, I could not perform any standard statistical procedures with incomplete datasets (i.e., most statistical procedures require a value for each item). Therefore, this problem needs to be addressed to ensure validity of the research results (Lang and Little, 2016).

In the literature, there are three defined mechanisms which describe the probability of the missingness: missing at random (MAR), missing completely at random (MCAR), and missing not at random (MNAR) (Fox-Wasylyshyn and El-Masri, 2005; Lang and Little, 2016; Schafer and Graham, 2002). Theoretically, MAR missingness can be predicted by the other variables on the data set, but not on the missing components; whereas with MCAR, the variable is not conditioned by missing and observed data (Kyureghian et al., 2011; Lang and Little, 2016; Schafer and Graham, 2002). In the MNAR mechanism, the probability of missing depends on both the observed and missing values (Kyureghian et al., 2011; Lang and Little, 2016).

Missing data can be handled using either imputation (replacing the missing value by estimating) or deletion methods (excluding the missing data from statistical calculations) (Fox-Wasylyshyn and El-Masri, 2005). Method selection depends on the degree of bias of the results and the degree of dispersion around the true scores

(Fox-Wasylyshyn and El-Masri, 2005). Therefore, the selection of a data treatment method should be carefully considered.

According to Bennett (2001) and Eekhout et al. (2012), when the percentage of missing data is above 10%, the analysis of the research results is likely to be biased. However, the calculated percentage of the missing responses in my dataset did not reach a consensus at which missing data becomes problematic. Moreover, I assumed the missing data was MCAR. Therefore, the decision to use Available Case Analysis (AC) or pairwise deletion was taken to address the missing data. This means that statistics are computed using only observed variables (Fox-Wasylyshyn and El-Masri, 2005; Lang and Little, 2016; Schafer and Graham, 2002).

The advantage of using pairwise deletion over listwise deletion (or complete case analysis) is maintaining higher power, and this can lead to sufficient statistics but with inconsistent degrees of freedom (i.e., each statistic can be derived from a different dataset) (Lang and Little, 2016). However, inconsistency in the results can produce biased standard errors, which can lead to incorrect inferences (Lang and Little, 2016).

2.7 Phase three: Qualitative method (semi- structured interview)

The above section gave detailed information about the second phase of this study, which used questionnaires as the primary research method. In this section, I will discuss the second phase of my research, which used a qualitative approach. It describes the aspect of the research design, rational for using "7Ps marketing mix", research procedures, and the methods that were used in analysing the qualitative data. The main aim for using the qualitative method was to have an in-depth and better understanding of the questionnaire results.

Qualitative research can be defined as "*research begins with assumptions and the use of interpretive/theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem"* (Creswell and Poth, 2018, p.74). Qualitative research is considered to be an interpretive, naturalistic approach that consists of a series of actions to make sense of certain phenomena. This entails researchers trying to interpret certain phenomena through the explanation that people bring to it (Creswell and Creswell, 2018).

For this part of the study, semi-structured telephone interviews were selected due to the specific interest regarding public perceptions and attitudes towards CP services. This format of interview allowed rich and detailed information about the participants' experiences with CP services to be acquired (Braun and Clarke, 2013; Creswell and Poth, 2018; Pope and Mays, 2006). Most importantly, this interview format empowers interviewees to share their opinions and thoughts in a flexible way, by asking additional questions freely when required (Creswell and Poth, 2018). In this project, the interview schedule was designed to produce findings that could explain the findings from phase one (questionnaire) from the participants across the UK.

Additionally, I intended to give interviewees a chance to speak freely about their recent experiences in the CP, their feelings towards CP services, and how they want the CP services to change in the future. In addition, telephone interviews were considered a flexible tool which came with the accessibility to include participants from a wide geographical area (Braun and Clarke, 2013). Cost-wise, telephone interviews are much cheaper than face-to-face interviews. Furthermore, it is useful for participants and interviewer safety. It also provides more anonymity and privacy, lowers social pressure, and improves bonding with participants. Finally, some researchers believe that using telephone interviews to obtain qualitative data might help to mitigate power dynamics in the researcher-subject interaction. In particular, as compared to in-person interviews, telephone interviews may be less intrusive and offer greater authority and control to participants in terms of arranging interview to fit their schedules, as well as postponing, interrupting, or terminating the interview (Drabble et al., 2015; Holt, 2010). For these reasons, telephone interviews were selected over other types of interviews.

However, there are some disadvantages which include some participants lacking a phone service, a lack of visual contact which can lead to missing body language, and the possibility of participants being distracted by activity in their surroundings (Novick, 2008). I was aware of these drawbacks of conducting telephone interviews and precautions were taken. More information will be provided throughout this chapter.

2.7.1 Rationale for Using the 7Ps Marketing Mix

In healthcare research, increasing healthcare costs, growing public demand and the fact that many plenty new healthcare services have been introduced rapidly, all need to be taken into acocunt. Despite widespread interest and a pressing need to comprehend these developments, the situation of the research is scattered. There is a need for research based on a sound theoretical framework and which includes a defined technique for replication in order to expand the body of knowledge. Using a theoretical framework is helpful to provide understanding about the phenomena under study as an explanatory tool. The framework offers an alternative to established ideas by highlighting the contextual aspects of research. The framework emphasises the contextual components of research while providing an alternative to conventional ideas. Behavioral theories are helpful for assessing challenges and affecting implementation strategies in light of the goal of this thesis, which is to identify public need from the community pharmacist, facilitators and barriers . They explicitly describe the structural and psychological factors thought to regulate behaviour and behaviour change.

There are a variety of theoretical frameworks which could be used to construct this research, such as the Theoretical Domains framework (TDF), Knowledge to Action framework (KTA), Consolidated Framework for Implementation Research (CFIR) and Health Belief Model (HBM). These frameworks have been commonly applied in health services research to explain and predict health-related behaviours in connection with healthcare service utilisation.

However, these frameworks for behavior change might differ from one another and serve different aims as represented in **Table 2:8**. Many of these frameworks incorporate a variety of domains, some of which focus on a single level (individual, team or organisational), such as HBM, TDF and KTA, while others are multi-level aspects of behavior that may affect individual, team, and organizational aspects, such as CFIR. However, all these frameworks focus on identifying aspects that impact service implementation rather than exploring how a CP service might add value to CP users and the broader healthcare system. Using a theoretical framework in research aims to avoid repeating previously investigated concepts by adding to, rather than replacing or duplicating, previous studies (Fox et al., 2015). These frameworks were widely used in CP services research exploring other options, which is also useful.

Table 2:8 The purpose of using different frameworks

Framework	Aim
Theoretical Domains framework (**TDF**)	To determine the effects of health-care professionals' behavior on evidence-based recommendations through examining the cognitive, emotional, social, and environmental factors that impact behavior (Atkins et al., 2017).
Knowledge to Action framework (**KTA**)	To describe or direct the whole implementation process (Birken et al., 2017).
Consolidated Framework for Implementation Research (**CFIR**)	To determine the elements that influence implementation (i.e., Factors influencing implementation which are: characteristics of the intervention, characteristics of the individual, the implementation process, the inner and the outer setting)(Birken et al., 2017; Nilsen, 2015)
Health Belief Model (**HBM**)	To use particular belief patterns to predict health-related behavior which include: perceived severity , perceived susceptibility , perceived benefits, perceived obstacles, and self-efficacy (Conner and Norman, 2015).

Another way to address the purpose of this study is to employ marketing theories that focus on recognising CP users' needs and preferences while taking other organisational complexity into account (Kotler et al., 2016; Wilson, 2012). According

to Kotler et al. (2016), marketing is defined as a process where businesses produce value for consumers and establish strong customer relationships to re-coup that value. Generally, there is increasing interest in using marketing theories to improve service provision and reach organisational goals (Wilson, 2012). Unlike behavioural change theories, which focus on specific aspects of stakeholders behaviour, marketing theories seek to comprehend how an organisation as a whole might fill the gap between itself and target population (Wilson, 2012). Since CPs encounter several organisational issues - as mentioned in **Chapters 1** and **4** - that go beyond individual patient needs, I decided to use a marketing strategy to inform the qualitative interview development and analysis.

It has been suggested that applying marketing theories to the public sector might help these organisations better grasp how to satisfy the expectations of their target population (Wilson, 2012). Furthermore, marketing theories highlight the influential factors on service demand and uptake from the public (Evans and McCormack, 2008; Ewing and Caruana, 2000). Thus, marketing theories could be used in primary healthcare research and, in particular, for the CP to highlight stakeholders' needs and preferences, evaluating variables that impact service utilisation, examining organisation facilitators and barriers and how services might satisfy quality standards. However, applying marketing theories to CP research is currently limited (Mirzaei et al., 2018).

To guide study designs, a variety of marketing theories might be applied. Some of the most often utilised marketing theories that would have been relevant for this study research include “4Cs marketing model and “4Ps marketing mix”. Generally, the marketing mix is a conceptual framework that highlights the key decisions taken to

meet the customers demand (Londhe, 2014). The “4Cs marketing mix” consists of "Consumer," "Cost," "Communication," and "Convenience," which is a more consumer-oriented approach (Lauterborn, 1990; Londhe, 2014). This approach, on the other hand, seeks to comprehend what a customer wants from a product, but ignores the difficulties that come with providing a service. The “4Ps marketing mix consists of “product”, “price”, “promotion” and “place” is a more production-oriented approach (McCarthy, 1964; Rafiq and Ahmed, 1995). However, this framework is very simplistic and does not go far enough, missing important aspects such as people and processes of the intervention. It is also unsuitable for services since it is more product-oriented (Rafiq and Ahmed, 1995). However, it is critical to separate "services" from "products" in the health sector (Corbin et al., 2001). The four distinct features of services that set them apart from products are: " Intangibility," "heterogeneity," "inseparability," and "perishability" (Wilson, 2012)- see **Table 2:9** for more information .

Table 2:9 Product versus service

Product	**Service**	**Resulting implications**
Tangible	Intangibility	Services cannot be inventoried. Services are not patentable. Services are difficult to represent or express. It is tough to set a price for service.
Standardised	Heterogeneity	Employee and consumer actions influence service delivery and customer satisfaction. The quality of services is determined by a number of uncontrollable factors. There is no guarantee that the service provided corresponds to what was advertised and planned.
Production separate**s** from consumption	Inseparability: simultaneous production and consumption	Customers are involved in the transaction and have an impact on it. Customers have an impact on each other, and staff have an impact on the service outcome. Decentralization could be necessary. It is difficult to produce in large quantities.
Non-perishable	Perishability	Supply and demand for services are challenging to synchronise. It is not possible to retune or resell services.

Source: Adapted from (Wilson, 2012).

Alternatively, Booms and Bitner's "7Ps marketing mix" is based on knowing what customers need/want from a service while taking into consideration the impact of service design, delivery, and external communications on customer views of services. The 7Ps consists of seven steps that should be considered to achieve the successful implementation of a product or service within a target population which are "product", "price", "place", "promotion", "people", "process" and "physical evidence" (Booms and Bitner, 1981; Rafiq and Ahmed, 1995) (see **Figure 2: 7** for more information).

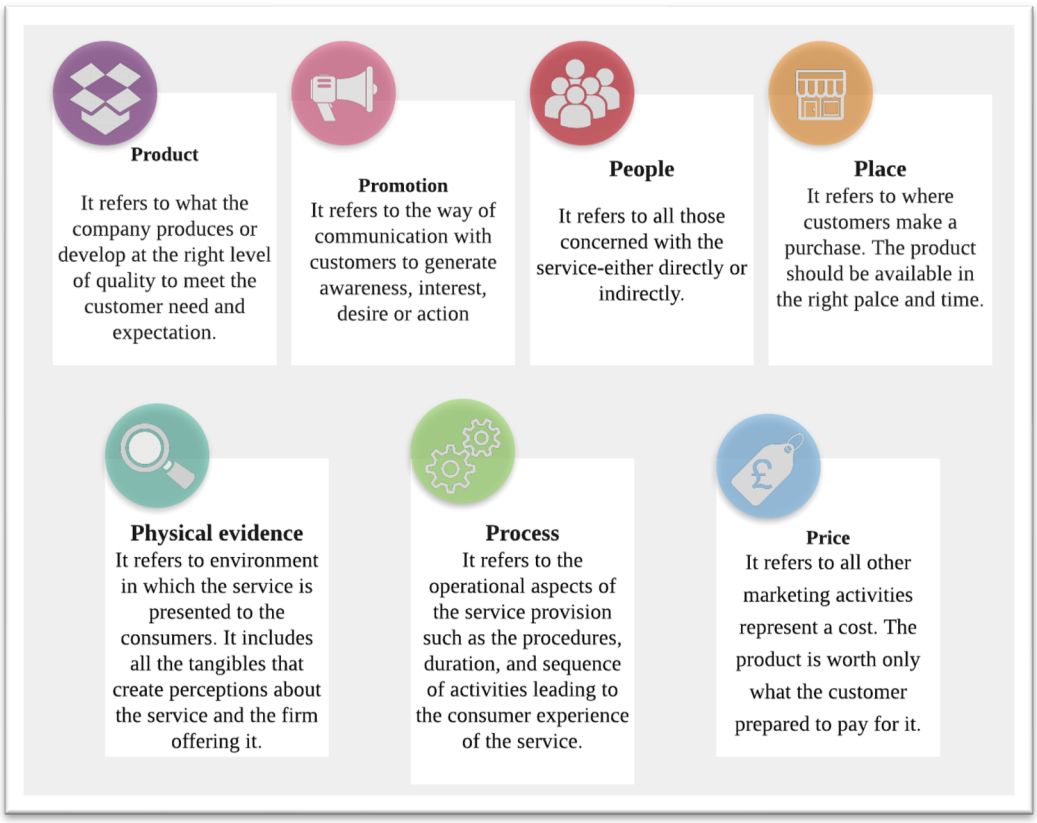


Figure 2:7 Definition of 7Ps marketing mix

According to previous research, marketing frameworks might be used by organisations providing services to develop strategies that aimed to increase service demand and utilisation (Abedi and Abedini, 2017; Abedi et al., 2019; Hindi et al., 2019b). There is additional evidence of the marketing mix aspects' affecting patients'

access to use of healthcare venues (Abedi et al., 2019; Mirzaei et al., 2018; Ravangard et al., 2020).

In light of this research, the “7Ps marketing mix” could provide valuable insights to identify pharmacy users’ needs and preferences and to understand factors that influence service utilisation (Mirzaei et al., 2018). Also, it could be useful to envision new developments for the current or the future CP services. When all the aspects of "7Ps” carefully considered, a set of recommendations/strategy may be developed to guide future CP service implementation and utilisation or to help enhancing CP services in the future. Another significant benefit of employing the “7Ps marketing mix” for this research project was its adaptability to qualitative research methods. As a result, during the second part of this research, the "7Ps marketing mix" was employed to frame data collection (topic guide) and data analysis.

The 7Ps framework was applied in relation to CP services (see **Table 2:10** for more information) which was informed by findings from previous research (Hindi et al., 2019b). However, slight modifications were made to fit with this project aims and objectives as Hindi et al. (2019) focused on “the stakeholders’ experiences and expectations of CP services within the primary care pathway for patients with long term conditions” while this research examined the public experiences and expectations from the community pharmacist. The definition of each aspect was reviewed during supervision meetings to ensure rigour. In terms of "price", I decided that the aspect would be defined in terms of the value offered by pharmacy services, as most NHS UK services are free.

Table 2:10 7Ps marketing mix in relation to the CPs

Item	Definition in relation to CP services
Product	Identifying public perceptions and expectation regarding the CP services.
Price	Identifying public perceptions regarding the added value from CP services.
People	Identifying how interactions with community pharmacists could influence their perceptions regarding community pharmacists and their services.
Place	Identifying public perceptions regarding access to the CP.
Process	Identifying public experiences and expectations in term of delivering of CP services and\ or utilizing CP services.
Promotion	Identifying how community pharmacists' services are communicated and promoted.
Physical evidence	Identifying how the public perceptions could be affected by physical characteristics of CPs.

2.7.2 Interview design

Semi-structured telephone interviews were used. The most crucial feature of a semi-structured interview is a pre-formatted interview guide, but the sequence of items was controlled by the participants. Generally, the responses of the participants were documented by note-taking or by recording the interview. I developed an interview guide from the results of the questionnaire, which covered a wide range of topics related to CP services framed by the "7Ps marketing mix", as presented in **Figure 2:8**.

The interview guide was designed to highlight certain topics, whilst also providing an opportunity for unanticipated themes to develop. Initially, the interview guide was created to understand the participants' conceptualisation of health and community pharmacy-related services. Over time, the guide changed to focus on the participants' health needs that could be delivered through CP and understanding the reason(s) behind the low utilisation of CP services, through exploring participants' exposure to CP services and the impact of their experiences. Also, guide aimed to identify public perception towards using technology in delivering CP services. Furthermore, interviews explored the benefits of extending the role of the community pharmacist,

as well as the facilitators and barriers to providing new services. Although the topic guide focused on broad topics, specific questions were designed for participants suffering from minor condition(s) to identify the community pharmacist's role in managing their condition(s). The final section of the topic guide focused on participants' demographic information, which included gender, age, ethnic group and health status.

Product	What do you need/ want from pharmacists? • **Current services:** Tell me about your experience with the CP service? • **Minor ailments:** Did you ever seek advice from your community pharmacist when you are suffering from any minor conditions? Why or Why not? • **Pharmacist independent prescriber:** Do you think it will be useful if the community pharmacist can prescribe medicine for you ? why? • **Healthy living:** How do you think the pharmacist will help you take responsibility for your health? Do you think it will be useful if the community pharmacist provide advice related to health through social media or the internet? Why? Do you think it will be useful if the community pharmacist provide screening services?
People	Do you think the pharmacists could offer more services than currently available? Which way of communication you preferred to deal with your pharmacist ? why? Do you think the community pharmacist a reliable source of advice regarding your health? Why? Do you think the community pharmacy team are able to advise you about minor conditions? Why? Do you think it will be useful if the community pharmacist provides telephone or online video counselling for managing your minor condition? Why?
Process	What would encourage/prevent you from using the community pharmacy for public health or clinical services? What is/ are the reasons behind using the community pharmacist for public health or clinical services?
Place	Do you consider community pharmacy as a suitable place to provide public health or clinical services?
Promotion	How do you think the community pharmacist can promote their services? Or increase the usage of their services?
Physical evidence	Do you think the community pharmacy as a suitable place for public health services or clinical services? why?
Price	Do you think providing public health\clinical services in the community pharmacy is beneficial for you? Why?

Figure 2:8 Mapping topic guide to "7Ps marketing mix"

In term of disadvantages of the telephone interviews there were a few points to consider when designing the interviews. With regards to the lack of visual communication, I did not use any visual aids. Also, I considered improving my communication skills and interpersonal skills so as to critically evaluate my own

responses during the interviews, and to work through potentially difficult moments in the interviews. Therefore, I attended three training courses concerned with conducting qualitative interviews to gain the required skills to conduct the interviews efficiently.

Also, strategies were adapted to be friendly and personable through interviews and demonstrating responsiveness to interviewee's issues and the content of the interview. These strategies include validation and clarification interactions, as well as active listening and supportive vocalisations. Paying attention whilst actively listening was important to the conducting of telephone interviews, in order to identify incomplete responses. In case of short responses, I believe it preferable to allow respondents to self-generate whatever is on their thoughts. However, I formulated probes (i.e., follow-up questions) to be used when required depending on what interviewees have already said, which could be helpful in getting rich information- see **Appendix V**.

In case of distractions or interruptions, the participants were given a chance to respond to the distraction source or to continue the interview. However, the time of the interview had been selected by the participant according to the best suitable time for them. While I conducted the interview in my office at University of Nottingham, a sign on my office door stated that "please do not disturb, interview in progress".

2.7.3 Conducting the Interviews

To ensure the validity of the interview, a protocol was written to explain the interview procedure. Before conducting the interview, a copy of the consent form and the participant information sheet were sent to the participants. The participant information sheet was developed to inform participants about the aim of the study, the importance of the interview for the research, and to highlight the participants' rights for more

information - see **Appendix VI**. Meanwhile, the consent form provided verbal confirmation that the interviewees were willing to participate in the interviews - see **Appendix VII**. At the beginning of each interview, I clarified how the interview would be conducted for the participants, the topics that would be covered and how the interview would be conducted for the participants, the topics that would be covered and how long the interview would last. The participants were also given the chance to ask questions, and permission was taken from the participants to record the interview. Furthermore, they were informed about how the data generated from the interview would be handled, and how their confidentiality would be guaranteed. All this information was included in the study protocol to improve interview validity and reliability and reduce my effect (i.e., the deformation of a telephone interview response that results from differing replies to the interviewers' social style and personalities or the way they deliver certain questions).(Gray, 2014).

2.7.4 The interview procedure

All interviews were conducted by telephone, at times selected by participants when they were initially contacted (by E-mail). As mentioned earlier, at the beginning of each interview, the participant was informed about the aim of the study, and I stressed the importance of the participant's opinion and that there were no correct answers or wrong answers to the interview questions. In addition, participants were assured that their responses would be treated as confidential information, and that their identity would be kept anonymous. Then, I asked for permission to record the interview with the digital recorder. At the same time, notes were taken for all interviews. Although the interview was in a semi-structured format, the questions were phrased with caution to avoid leading questions, and probes were incorporated in the guide to

reduce any bias (Bryman, 2016). Generally, the questions evolved from the questionnaires and were then categorised based on their similarity (Braun and Clarke, 2013). However, when the participants gave short or inadequate answers, I made an effort to encourage them to give further responses through rephrasing the question and providing examples. In order to minimise my effect, measurements were taken to control my behaviour, which included reading the questions as they were written in the question guide, probing indirectly, and providing clarification without influencing the participants' answers.

It was observed from the interview that interaction between me and the interviewee was informal, perhaps because they were telephone interviews and were conducted in the evening most of the time. At the end of each interview, I thanked the participants for their commitment to the study and their time. I also explained that they would be rewarded for their time and contribution with an Amazon voucher.

2.7.5 Piloting the semi-structured interview

Piloting interviews is considered to provide a great chance for the researcher to reflect on and modify the research design using a systemic approach (Bloor and Wood, 2006). This stage was performed to ensure the validity of the instrument by guaranteeing that the questions were directly focused on the research objectives (Gray, 2014). According to Sampson (2004), piloting a qualitative interview study helps to identify issue(s) in research or questions. For this research, two participants from the public (PhD students unrelated to the pharmacy field) were recruited to test the interview questions. During the piloting phase, the interview questions, consent form and participant information sheet were sent to the participants through the email. I asked the test participants to comment on the clarity of all of the documents sent.

Then, an actual interview was conducted with the test participants to sure that their responses reflected the aim of the interview questions. Neither of the test participants had comments on the consent form and the participants' information sheet. Regarding the questions, the test participants said that the questions were straightforward, and they did not face any difficulty in answering them. Thus, there were no changes made in the interview guide.

2.7.6 Participants

As mentioned earlier, sequential explanatory MMR, which relates quantitative methods to qualitative methods with one phase informing the other, was used to inform the sampling strategy for the interviews. Participants in the interview were required to be individuals who took part in the quantitative phase (Creswell and Clark, 2018). Therefore, a random purposeful sampling technique was used, which consisted of randomly selecting an individual from the participants of the questionnaire and randomly choosing the number of individuals to take part in the study (Collins et al., 2006). In this study, the participants taking part in the questionnaire (i.e., public questionnaire) were asked to volunteer for an interview. The sample size was not a problem because this method was intended to explain the results of the questionnaires rather than develop new themes (Collins et al., 2006).

All the participants were interviewed at a convenient time, which allowed them to feel comfortable and to express their thoughts and ideas. These interviews were held between November 2019 and mid-March 2020. All the participants were interviewed by me, and the duration of the interviews were between 22 minutes and 90 minutes. Although the participants had the right to withdraw from the study at any time, all

completed the interviews. At the end of the interviews, I sent a reward for the participants – a £20 Amazon voucher.

2.7.7 Recording and transcribing interview

Qualitative interviews were digitally recorded after taking agreement from all the participants. This decision was made because I needed to concentrate on what is being said rather than taking notes. However, short notes were taken during the interview to remind and prompt me when interesting points were made.

Digital equipment was tested beforehand to ensure that I was familiar with it and to avoid any technical problem(s). Using a digital recorder generated digital files, which were considered to be very useful when handling the files (such as when using an automatic transcribing program). The transcribing process was conducted whenever possible. Generally, transcription of an interview is an extremely time-consuming process in which an hour of an individual interview could take six or seven hours to transcribe (Pope and Mays, 2006). This is hugely dependent on the quality of the audio-recording. Regarding this research, all audio-recordings of the interviews were converted to a verbatim transcript. This was done by me, except for two interviews which were selected to be transcribed by the automated transcription service that was provided by the University of Nottingham.

2.7.8 Analysis

After the interviews were completed, I prepared data for analysis. The thematic analysis approach was used for analysing interviews. It is defined as "*a method for identifying, analysing, and interpreting patterns of meaning ('themes') within qualitative data"* (Clarke and Braun, 2017, p. 297). It is considered the most suitable

approach for qualitative data analysis because it allows flexibility with respect to the interpretation pf results and has the capability to identify patterns from responses within the dataset. This type of analysis summarises the key features of a data regardless of sample size and can be used to provide detailed descriptions of it (Braun and Clarke, 2019). Using thematic analysis was beneficial for this project because it facilitated understanding of public perceptions regarding the CP services, and any perceived impact on extending the community pharmacist's role. This included how participants' experiences in community pharmacy influenced their opinions and the reasons considered to underpin the success and failure of CP service implementation.

In the frame of MMR, the thematic analysis approach was considered suitable. I employed a hybrid approach that included both inductive and deductive approaches. This method complemented the research aims and objectives by incorporating the chosen theory into the deductive thematic coding process whilst also enabling themes to arise instantly from the data using inductive coding. The value of using a hybrid approach is to demonstrate rigour in themes development through providing a flexible and consistent set of procedures for guiding analysis (Fereday and Muir-Cochrane, 2006). Combining inductive and deductive theme analysis was done in an effort to take use of each method's strengths. Also, providing a clear audit trail shows how I arrived to the conclusions and provides a path back to the original data set for additional explanations, elaborations, and confirming or disproving evidence (Fereday and Muir-Cochrane, 2006). This would be useful in making sense of the data and to understand the public need from the community pharmacist.

The inductive approach includes working strictly on the grounds of the participant's experiences, which drives the whole analysis (i.e., data driven) (Braun and Clarke,

2006). Inductive analysis refers to the approach that largely employs extensive readings of raw data to extract ideas and themes (Thomas, 2006). It requires systematic reading over data line by line and giving codes to paragraphs or segments of texts as concepts related to the research aim and objectives. It is a repetitive process that requires moving back and forth between data analysis and literature to make sense of emergent themes. This approach was used to initiate the analysis and to allow unexpected themes to emerge and develop.

On the other hand, deductive analysis is driven by theory (i.e., employs a theme-based organising structure) (Braun and Clarke, 2006). This is used as a start list in the analysis to ensure that certain ideas are included in the data (Braun and Clarke, 2006). In light of this research, the deductive analysis used the "7Ps marketing mix" to understand what the public want/need from their community pharmacist, whilst considering the influence of the CP service design and way of delivery. The "7PS" framework is used while themes/subthemes emerged from the data using the interpretative technique. To evaluate interpretation and remove bias, the emergent themes/subthemes were discussed with my supervisors at supervision meetings. Applying the 7Ps marketing mix frameworks as a theory-generative rather than a confirmatory one which could allow for the application of critical realist notions of abduction and retroduction (i.e., the creation of new or enhanced theory when an interview produced a theme that was not covered by the framework (Proudfoot, 2022)).

According to Braun and Clarke (2006), the thematic analysis process of the interview goes through six stages: Familiarising with your data, generating initial codes,

searching for themes, reviewing themes, defining, and naming themes, and finally, producing the report (see **Figure 2:9**). More details were provided in the next section.

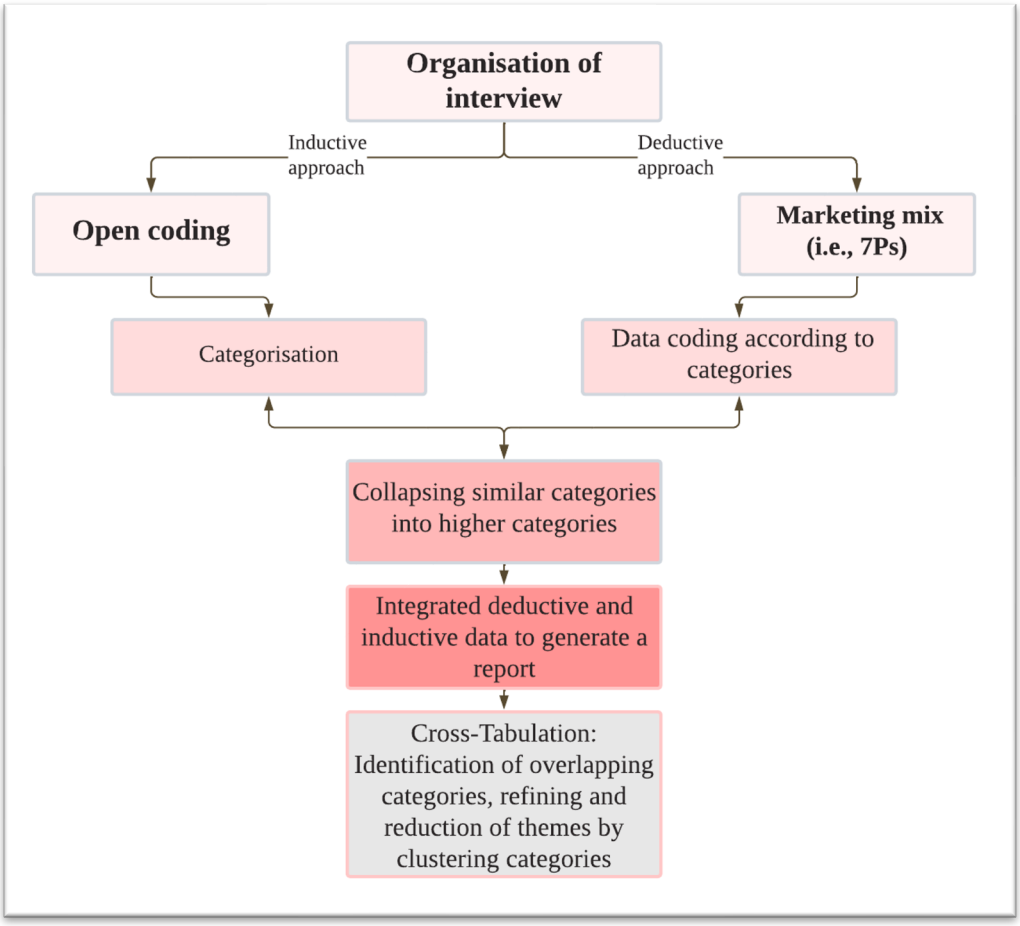


Figure 2:9 Preparation, organisation, and data analysis process

2.7.8.1 Inductive/Deductive Hybrid Thematic Analysis

Stage 1: Familiarising with your data

After transcribing the interview, I went through transcripts to become familiar with the data and to get general ideas about the participants' input. At the same time, I reflected on the overall research. To ensure that I was familiar with the content, the transcripts were read individually at least twice.

Stage 2: Generating initial codes

I began the coding, which allowed me to focus on a specific feature of the data by using the principles of thematic analysis (Braun and Clarke, 2006; Nowell et al.,

2017). As was previously established, codes were both theory and data driven in the study. I first created theory-driven codes before creating data-driven codes to interpret public perception about CP services. I used 7Ps marketing mix elements as the theory-driven codes that make up a **codebook 1**. As part of the code-generating stage, which was infused with cyclic and repetitive cycles of grouping significant data. At supervision meeting, my supervisors reviewed the deductive codes in the context of the data. To obtain a consensus and prove the study's rigour, comparisons and discussion of the codes were consistently conducted (Roberts et al., 2019).

After the development of theory-driven codes/codebooks, I created data-driven codes— **Codebook 2**—for analysing public perception about the CP services. Inductive coding was used to code interview transcripts in order to search for different themes within the same data source (interviews). I attempted to find patterns within subthemes by breaking down the raw material into smaller units as I read each line. Determining the codes' reliability was the final stage in building data-driven codes. I followed the exact steps used to create theory-driven codes, including talking about definitions and examples of the codes and applying them to the raw data. Ultimately, two codebooks were created as a preliminary set of codes for future examination and revision. To manage and organise the codes, the NVivo software program was used. This software helped me to work efficiently with coding schemes and facilitated both depth and sophistication of analysis (Nowell et al., 2017).

Stage 3: Searching for Themes

The stage of finding themes requires thinking about how relevant codes might be grouped together to generate a wider theme (Nowell et al., 2017). My thoughts began to construct a possible theme map form both indicative and deductive coding. In respect to various codes, a group of potential themes was formed at this point, along

with a "miscellaneous" theme. Codes that did not seem to fit into the 7Ps marketing mix were stored under the "miscellaneous" theme (Braun & Clarke, 2006). Themes and codes have been listed and grouped on thematic maps to support me as I analyse the link between codes, themes, and different levels of themes" (Braun & Clarke, 2006).

Stage 4: Reviewing Themes

I went back to the raw data and utilised the "compare-and-contrast" process to confirm that the produced themes were supported by the data. According to Braun and Clarke (2006), this reviewing stage comprises two levels:

- **Level 1:** It concerned with reading the data extracts and determining if they appear to create a coherent theme.
- **Level 2:** It concerned with determining whether the candidate thematic map properly represents the meanings in the data set as a whole.

As I carried out the Level 1 analysis, I saw that several of the codes that were previously classified as "miscellaneous" theme have connections to the major themes of the 7Ps marketing mix and they did capture some significant information on the study topic (Braun & Clarke, 2006). In this manner, the revised theme seems to more accurately reflect the views of the participants and represent the general shapes of the coded data. Level 2 was focused on a similar procedure but also took into account the validity of themes over the full data set. Themes and codes may still need to be worked on again at this stage of examining the themes to account for missing data from earlier coding phases and determine whether the themes make sense within the context of the data set.

Stage 5: Defining and Naming Themes

In this stage, each theme must be reduced to its essentials before being organised into a unified narrative (Braun & Clarke, 2006). Also, it is essential to integrate each theme into a larger narrative about the data as a whole, with overlap to be avoided. At the conclusion of this process, I could clearly distinguish between themes and non-themes. At this point, the titles of each theme were also given another look with the goal of being concise and clear.

Stage 6: Producing the Report

The data analysis went to the write-up stage once a group of fully developed themes had been identified. Issues that emerged from the data and previous research were examined, debated, and contrasted with relevant literature. The focus of the report was on our analytic narratives and chosen examples that captured the core of the data by using participant quotations (Fereday & Muir-Cochrane, 2006). Some were included because they were often mentioned in the transcripts and were especially representative of a variety of viewpoints, while others were chosen for their uniqueness in articulating a novel point of view that shaped the various experiences with CP services. While reporting the data, literature was employed to compare and validate the provided evidence. As a consequence, the report conceptually combined and interwoven our narratives, quotes from many data sources, and literature to convey the rich narrative of data and make a convincing case in regard to the research question (Braun and Clarke, 2014) ; more detail is provided in **Chapter Five**. The last stage of data collection is represented in the next section and offers comprehensive details on the skill mapping approach.

2.8 Phase four: Skill mapping

In order to fulfil the aim of the research, skill mapping was conducted. This is a process used to identify the skills and capabilities required in order to perform a particular job or role (Mittal et al., 2019). The skill mapping provides a clear understanding about the current and future skill that the workers need. Identifying the required skills will help to provide evidence-based training, which would be beneficial for both the workers and their organizations (Mittal et al., 2019). This is because it helps to improve the worker's engagement with their job and therefore improves the overall performance of the organisation (Busaibe et al., 2017).

Skill mapping is also useful in focusing training on particular areas that need improvement (Paul, 2005). The skill mapping method has many implications, such as identifying skills for each role, developing new skills, developing standards of practice, improving capability to do interventions, conducting performance appraisal and improving performance (Paul, 2005). The role of community pharmacists is evolving, which means that all the stakeholders need regularly examine the community pharmacists' skill levels, and to provide training and development programs. This will be helpful to ensure the quality and safety of the services provided by the community pharmacist. I completed the skill mapping based on public needs, which will be useful for community pharmacists when developing their skills or adapting new skills improving their capability to do interventions and improving their performance.

2.8.1 Method

In order to conduct skill mapping, further analysis of questionnaires and qualitative interviews were conducted through a framework approach. To support skill mapping, document analysis was utilised to corroborate, interpret, and expand findings from various data sources (Frey, 2018). Document analysis was employed as a supplementary source of information to address research questions, uncovering insights, developing set of skills which the community pharmacist will need to fulfill the current and future need, and gaining a greater understanding of this research. Document analysis is a type of qualitative research that uses a systematic approach to examine documentary evidence and to respond to particular research questions (Bowen, 2009; Frey, 2018). Document analysis, as with other qualitative research methodologies, necessitates frequent inspection, evaluation, and interpretation of data to obtain meaning and empirical knowledge of the construct under investigation (Bowen, 2009; Frey, 2018).

2.8.1.1 Source of data

All the data collected in the previous two phases were included in the skill mapping. In addition, document analysis was incorporated to answer the research question. To limit the list of possible document sources, a preliminary search was conducted. This step was useful because the prospective sources include databases and a large number of papers to go through (Frey, 2018). A preliminary search of prospective sources helps to discover more keywords to add to the search list, to clarify and define inclusion and exclusion criteria, and to establish which document sources produce the greatest amount and highest quality of documents relevant to the research issue. When I undertook a preliminary search, I quickly evaluated the retrieved results, looked at

the trend and determined the quality and number of relevant results. This method assisted me to determine the most relevant sources for sampling.

2.8.1.2 Sampling

All the data from the previous research (i.e., both qualitative interview and quantitative questionnaires) were included. Regarding the documents, a systematic approach was used for document sampling. This is useful to keep track of decisions made about sources searched, methods used, keywords utilised, and results returned (Frey, 2018). Furthermore, taking into account the potentially vast number of documents related to the research question and developing a set of clearly defined inclusion and exclusion criteria helps to focus document selection and ensure the authenticity and representativeness of those chosen for the sample (Frey, 2018).

2.8.1.2.1 Inclusion and exclusion criteria for document analysis

Identifying inclusion criteria is useful in enabling the final selection process by assuring representativeness, subject and content relevancy, and appropriateness (Frey, 2018). A more in-depth assessment of the papers obtained is necessary at this level in the data gathering. Therefore, a systematic literature review was applied to comprehensively investigate and concisely summarise the available literature on the skills that the community pharmacist needs to fulfil future need. The review focused on literature in the English language published between 2013 and 2022. I verified that the documents acquired in the initial sample utilising the inclusionary criteria were relevant to the study and useful in answering the research question (i.e., related to skills for pharmacists). Any study that did not meet these criteria was excluded.

Result of the research strategy for document analysis

Based on the preliminary results which included two frameworks from the Royal Pharmaceutical Society focused on pharmacist competencies (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019), I found a need to expand research beyond these documents in order to address some skills which were not included such as digital skills and marketing skills. Regarding the selection of digital skills, The RPS Foundation Pharmacist Framework (2019) has been cited as being important in producing pharmacists suited for future practise. Nevertheless, the papers did not acknowledge these skills. As a result, the decision was made to search for these skills. Whereas for marketing skills, the choice was made to include them in order to mimic the rest of this thesis, which employed marketing concept to analyse qualitative data, and the value of marketing skills in the context of healthcare was demonstrated in the literature (Lega, 2006; Loureiro et al., 2021; Sharma et al., 2014).

Systematic research was conducted, including four databases to address gaps related to digital skills and marketing skills. As a result, the total number of the identified citations was 396. Following the screening of the abstracts and titles, the number of excluded articles was 380, which means that 16 full texts were reviewed and only two articles were selected- see **Table 2:11**.

2.8.1.3 Data collection and management

To handle data, I developed a system for managing and organizing the result of documents sample. This was important to ensure that the data is representative and on point for the research question. The aim of this study was to identify the set of skills that the community pharmacist needs. The results of the qualitative interview and

quantitative questionnaires were used to identify the services both public and pharmacy users need/want. A table was developed to identify these services based on the trend and participants' preferences. In terms of document analysis, thematic analysis was employed to extract data from the documents. Then, I developed a table which contains essential information which would be useful in identifying skills and placing them in relationship to each other or to an identified service. I used the NVivo program to facilitate data management and analysis. More details are provided in next section.

Table 2:11 Final search strategy used for the document analysis

Database	Search term	Articles	Retrieve
Embase	digital skill.mp. limit to (full text and English language and yrs.="2013 -Current")	0	0
	marketing/ and skill/ limit to (full text and English language and yrs.="2013 -Current")	11	0
Medline (R)	Digital skill. mp Limited to (English language and full text and year="2013 -Current")	10	0
	"Delivery of Health Care"/ or "Marketing of Health Services"/ or Marketing/ or marketing skill.mp\ limit to (English language and full text and "review articles" and yrs.="2013 -Current")	47	0
Cochrane library	digital skill in Title Abstract Keyword AND "healthcare professional" in Title Abstract Keyword - in Trials (Word variations have been searched)	12	0
	marketing skill in Title Abstract Keyword AND "healthcare professional" in Title Abstract Keyword - in Trials (Word variations have been searched)	2	0
Scopus	digital AND skill AND (LIMIT-TO (AFFILCOUNTRY , "United States") OR LIMIT-TO (AFFILCOUNTRY, "United Kingdom") OR LIMIT-TO (AFFILCOUNTRY , "Australia") OR LIMIT-TO (AFFILCOUNTRY , "Canada")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "MULT"))	250	0
	marketing AND skill AND (LIMIT-TO (AFFILCOUNTRY , "United States") OR LIMIT-TO (AFFILCOUNTRY , "United Kingdom") OR LIMIT TO (AFFILCOUNTRY , "Australia") OR LIMIT-TO (AFFILCOUNTRY , "Canada")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (SUBJAREA , "MEDI")) AND (LIMIT-TO (EXACTKEYWORD , "Adult")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (SUBJAREA , "HEAL"))	62	0
Other		2	2
Total		396	2

2.8.2 Analysis

Framework analysis was used, which refers to *"an analytical process which involves a number of distinct though highly interconnected stages"* (Ritchie and Spencer, 2011, p.311). This approach involves a systematic process of charting and sorting data based on key themes. Using framework analysis helps in reducing and structuring data in a way that will support answering the research questions (Gale et al., 2013). A "framework" is useful in providing tailored answers regarding specific groups while being simple to apply to policy and practice (Goldsmith, 2021). Framework analysis is a form of comparative thematic analysis that uses an organised structure of inductively and deductively derived themes (i.e., a framework) to conduct cross-sectional analysis using a combination of data description and abstraction to conduct cross-sectional analysis (Goldsmith, 2021; Ritchie and Spencer, 2011). Through being both anchored in and interpreting from the data, the ultimate goal of framework analysis is to uncover, describe, and interpret significant patterns within and across data of and themes within the phenomena of interest (Goldsmith, 2021; Ritchie and Spencer, 2011). This method was selected because it is an excellent tool for supporting thematic analysis, and it could provide a systematic model for managing and mapping the skills. The drawbacks of framework analysis stem from the requirement to use a more structured analytical framework, which requires more time and resources (Barnett-Page and Thomas, 2009; Gale et al., 2013; Goldsmith, 2021).

The development of a framework and its application are the two main components of framework analysis. These two key components are formed in five stages: familiarisation, identifying a thematic framework, indexing, charting, mapping, and interpretation (Catherine et al., 2000; Gale et al., 2013; Ritchie and Spencer, 2011).

Each of these analytical stages is briefly described in **Figure 2:10**, while the well-defined procedure is described subsequently.

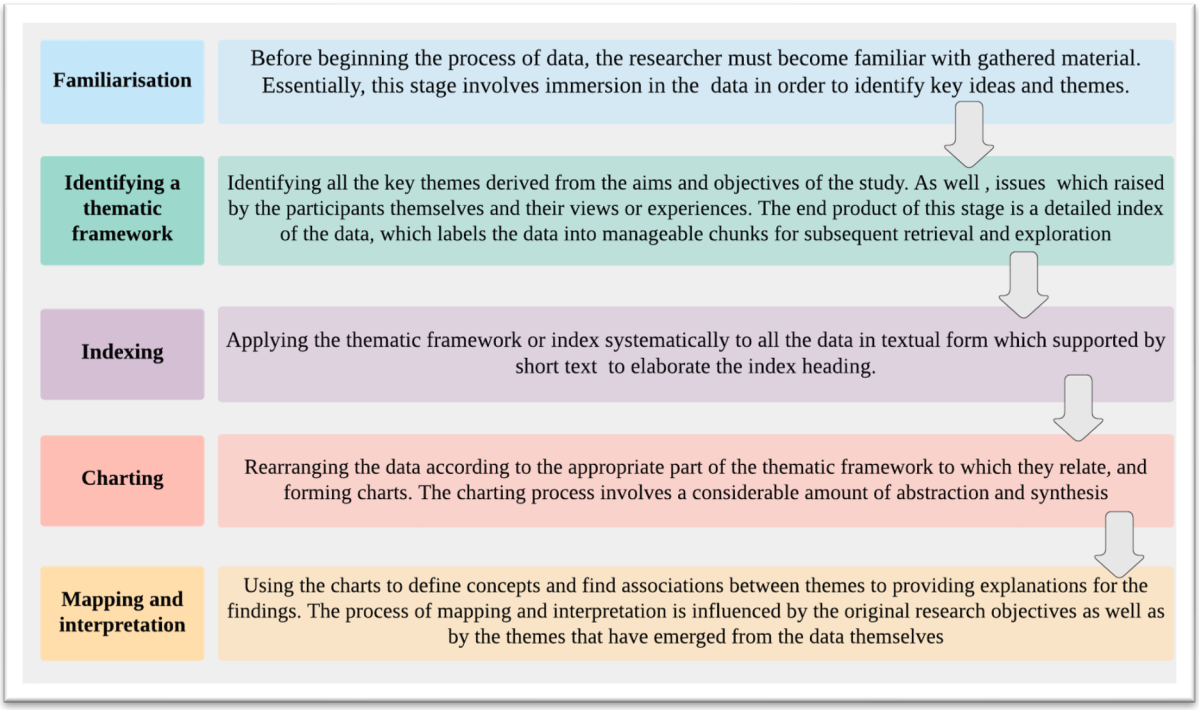


Figure 2:10 Stages of data analysis in the framework approach

2.8.2.1 Familiarisation

Data familiarisation was the first phase in the analysis, and gave me a basic, meaningful understanding of the datasets. I began to comprehend major themes in the data by immersing myself in it and make notes on crucial thoughts which were about the research aim and objectives. I continued to familiarise myself with the data until I had a reasonable understanding of it, including the range of variance within the dataset (I included mixed method data at this stage).

To conduct the data familiarisation with the datasets, I first reviewed all three questionnaire results and the twelve interview transcripts. In my first review of the datasets, I identified key themes on this topic which are related to the public needs from the community pharmacist. Then, I reset my expectations for the data and

conducted a second data review, simply looking for key ideas around the needs from the community pharmacist. I did this through involving my supervisor (CA) and my colleagues in data analysis, to enhance understanding of the collected data (Mey and van Hoven, 2019). I took notes (by hand) about my thoughts and my understanding of the data without explicitly linking these thoughts to the data. Key themes from the data familiarization stage are represented in **Table 2.12**.

Table 2:12 Key themes from all the data sets at the familiarization stage

Need	Facilitators	Barriers
Counselling	Advertisement	Lack of awareness
Prescribing	Good relationship	Insufficient time or staff
Manging minor ailment	Service endorsement	CP image
Advice regarding healthy Lifestyle	Enough staff	Insufficient funding
Testing	Funding	
Screening		

2.8.2.2 Identifying a thematic framework

This stage extends the analysis from specific descriptions of data themes to the identification of more abstract ideas, with the goal of creating a framework, or structure for the analysis and the interpretation that follows. This framework or analytic structure is made up of a mix of predetermined and emergent themes and concepts. Then, these concepts and themes were categorised to help address the study's aim (i.e., Identifying and developing a set of skills for community pharmacists to meet current and future public needs). The framework was formed from primary themes and ideas which are supported by secondary themes and concepts that elaborate on or subdivide the major themes and concepts. This stage of determining the framework was an iterative process. To move from basic descriptions to

conceptual abstractions, an initial framework was evaluated against a reasonable amount of the data and refined as needed.

To identify the set of the skills that the community pharmacist will need, I initially reflected on the second data familiarisation process. Given the data and the patterns I had found, I imagined how the framework would appear. I decided that I would be able to build a framework which could link the need of the public and CP services to the set of skills that I extracted from document analysis which included the Foundation Pharmacist Framework, the Advanced Pharmacy Framework (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019) and academic literature. Because I was already working with pen and paper in the previous data familiarisation process, I chose to develop the basic framework components in the same way.

Then, I used a computer-assisted qualitative data analysis software (NVivo) programme. I went through the datasets, connecting text from transcripts /quantitative results to the proposed framework. When I came across material that did not match the proposed framework but was useful for understanding the public need from the community pharmacist, I built additional framework components. For this stage, I also developed sub-components where I thought it would be beneficial to get a more nuanced knowledge of the datasets. CP services and examples of these services were added as sub-components. These components were recognized from the questionnaire or given by interview participants. The goal of this stage is to determine the skills required by the community pharmacist to deliver a specific service.

Although explicit coding effort is a regular aspect of the framework identification step, at this point, the focus was on identifying the key themes and concepts as well as

their conceptual relationships (see **Table 2:13** for more information). I used explicit coding to identify the framework in datasets because I wanted a better grasp of the data and trends. I also chose to begin coding with NVivo rather than with pen and paper because I anticipated that as my grasp of the data grew, I would want the ability to efficiently reorganise, collapse, and divide codes.

Table 2:13 Framework Identification in the qualitative and quantitative dataset for understanding the public need and CP services to fulfil it. In addition to barriers and facilitators to delivering the CP services

		CP services	Example of the CP services	Skill
Need	Counselling / advice	Face to face consultation	New medicine service	
			Medication use service	
		Healthy living advice	Healthy living services	
	Managing minor ailments	Managing minor ailments	Consultation service	
			Prescribing service	
	Screening / testing	Repeat prescription	Prescribing for well controlled chronic condition	
	Health promotion	Health check	Includes: cholesterol, blood pressure, diabetes	
		Testing	Uncompleted UTI and STD	
		Screening	Hep. C, HIV and MH	
	Digital health	Online pharmacy	To order prescription or/ and OTC	
		Teleconsultation	To support selfcare	
			Online medication review	
		Mobile health app	To support minor ailments	
		Health awareness	Online education material	
Facilitators	Good relationship			
	Advertisement of the services			
	Enough number of Staff			
	Service endorsement			
Barriers	Lack of awareness			
	Insufficient time or staff			
	CP image			
	Funding			

2.8.2.2.1 Document analysis process

The Advanced Pharmacy Framework by the RPS has recognized Clusters and Competencies that are essential for exhibiting advanced stages of practice, regardless of the sector. Competency, as defined by Crawford (2005), is characteristic of an individual that is causally linked to effective and/or superior performance in a job or situation. This comprises of knowledge, skills, attitudes, and personal ability termed as 'competence' (Carraccio et al., 2002). The RPS's Advanced Pharmacy Framework is centred around performance-based competencies that prioritize skilful practice, illustrating one's ability to demonstrate job knowledge ‘know-how’ (Napier et al, 2009). The framework emphasizes successful pharmacists' behaviours and actions (Crawford, 2005; Napier et al, 2009). The RPS Advanced Pharmacy Framework was subject to document analysis to break down the competencies into their underlying skills. This step aimed to pinpoint the specific abilities required by community pharmacists. A step-by-step approach for recognizing skills from competency frameworks was employed which include :

1. **Identify the specific competencies listed in the competency framework:**

   Six key competencies were identified which are:

   - Expert professional practice.
   - Collaborative working relationships.
   - Leadership.
   - Management.
   - Education, training, and development.
   - Research and evaluation.

2. **Analyse the competencies to determine the associated skills:** This involves breaking down each competency into its individual underlying skills using thematic analysis which represented in **Figure 2:11.**

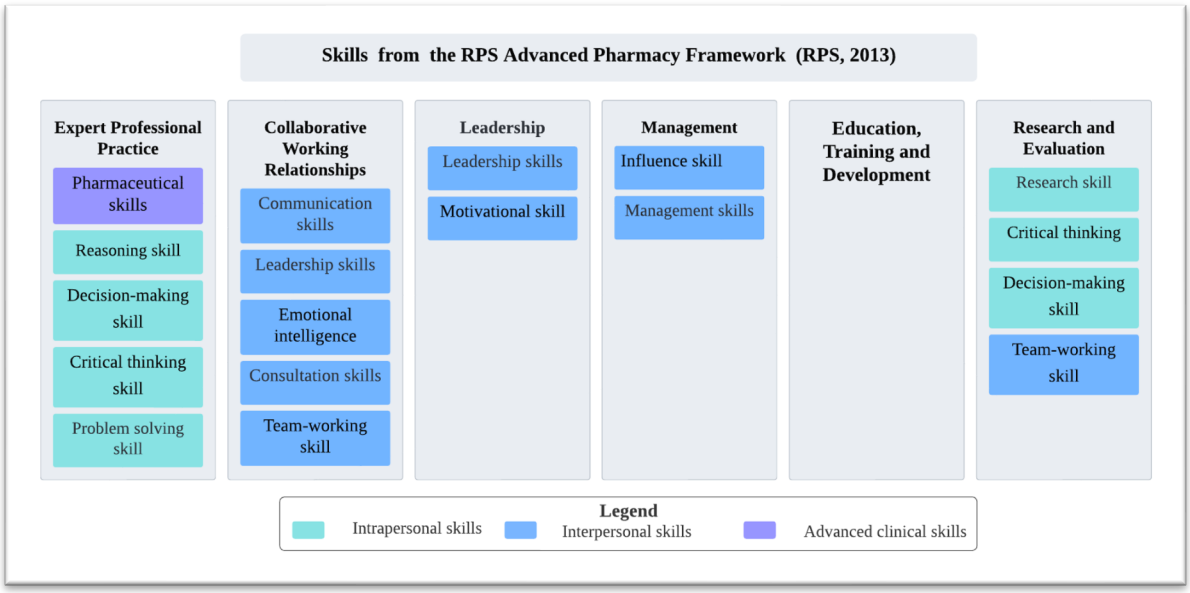


Figure 2:11 Extracted skills from RPS Advance Pharmacy Framework

3. **Group skills by similarity:** After identifying the skills under each competency, it is important to group them based on similarities. This helps to identify broader skill categories and can be useful for further analysis of competencies.

4. **Validation:** It is critical to confirm that the skills listed are correct. I validated the skills by comparing them with the document about 21st century skills (Joynes et al., 2019)

The RPS Foundation Pharmacist Framework, on the other hand, is attribute-based. Attributes are classified into three domains: knowledge, possessing and displaying,

and being (Singh et al, 2020). The knowledge domain refers to the discipline's propositional content, which subject specialists often promote and evaluate as the primary type of knowledge that graduate professionals need to develop (Singh et al., 2020). Possessing and displaying attributes refers to the actions and skills of doing as well as the active practise of a certain discipline's knowledge (Singh et al., 2020). Finally, being refers to a conception that gets to the heart and identity of being a professional and entails more than knowing and doing (Singh et al., 2020). As a member of the profession, this involves interacting with the self in relation to contextual specificity. This domain incorporates the tacit features of attributes involving persons making moral and ethical decisions. An attribute framework defines the main characteristics necessary for optimal performance in a certain job or function (Crawford, 2005; Napier et al., 2009). I use the following procedures to determine skills from an attribute framework:

1. **Identify the attributes listed in the framework:** Nine attributes were identified which are;
    - Applying clinical knowledge and skills.
    - Professional accountability.
    - Evidenced-informed decision making.
    - Person-Centred Care.
    - Communication and consultation skills.
    - Collaborative working.
    - Leadership and management.

- Education, research, and evaluation.
- Resilience and adaptability.

2. **Analyse the attributes to determine the associated skills:** Once I have identified the attributes, I break them down into specific skills or knowledge areas that are required to demonstrate each attribute using thematic analysis. For example, the attribute of communication and occultations skills involve skills such as communication skills in all medium (i.e., face to face, digital communication, written communication), documentation skills, and consultation skill. For more information see **Figure 2:12.**

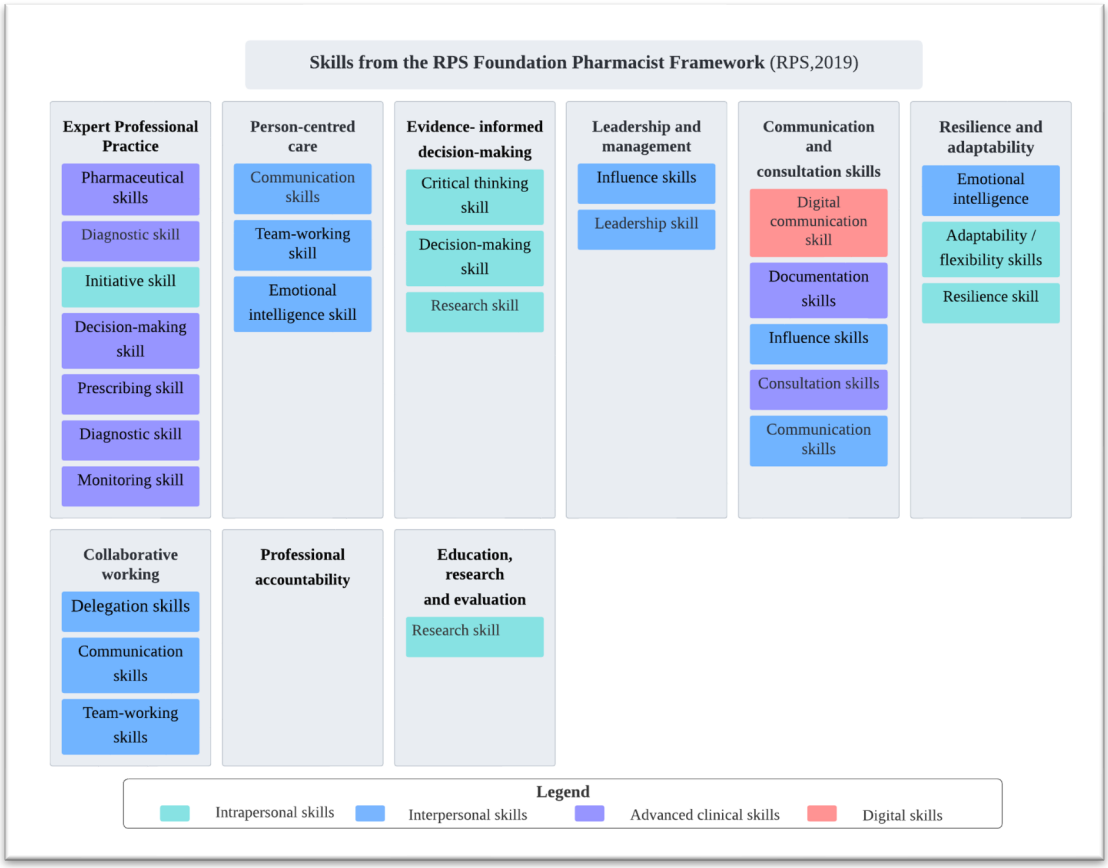


Figure 2:12 Extracted skills from RPS advanced pharmacy framework

3. **Group skills by similarity:** Once I identified the skills associated with each attribute, I grouped them based on commonalities. This can help to identify

broader skill categories and make it easier to identify the most important skills for a role.

4. **Validation:** It is critical to confirm that the skills listed are relevant and correct. I validated the skills by comparing them with the document about 21st century skills (Joynes et al., 2019)

The RPS framework utilised a different approach from other documents by using a competency-based framework, while the other documents identified skills in certain aspects. To identify skills, I employed the role analysis method, which focuses on identifying inputs and outcomes rather than simply listing tasks (McKillip, 2001). The main objective of role analysis is to systematically collect information about the community pharmacist's role. The process involves identifying activities and simplifying them into tasks or duties, eliminating overlaps, and organising statements. The resulting list is then evaluated to determine its significance in the successful performance of community pharmacy services. Finally, the knowledge and skills necessary for delivering such services effectively are identified- for more information see **Table 2:14**. Finally, the validation process for these documents differed from that of previous frameworks, as discussed in **Section 2.8.3**.

Table 2:14 Extracted digital and marketing skills from literature

Digital skill	Technical skill
	Information management skill
	Communication Skills
	Creativity skills
	Ethical awareness
	Cultural awareness
Marketing skill	Communication skills
	Creative skill
	Contents creation
	Analytical skill
	Customer insights
	Digital Marketing

2.8.2.3 Indexing

The next stage in the framework analysis was to apply the framework systematically to all the research data once a reasonable framework was determined. This procedure is known as indexing because it mimics the process of creating a book's index. The data from the research and the framework components may be linked using a simple coding method. To make the data analysis and future processes in the framework easier, I utilised NVivo.

I had to figure out how to link the study data before I could start indexing. There is no conventional linking structure, such as page numbers in a book index, on which to rely. Rather, using the proper units of analysis to connect framework components (i.e., items which are the focus of the study framework). Because applying the framework to all research data at the same time involves evaluating how effectively the framework works with and for the study data, the indexing stage also provides a critical opportunity for framework revision. The indexing steps include confirming and revising each framework component and sub-definition components and boundaries, as well as adding to framework sub-components to accommodate new variation. As regards the study datasets, the indexing had already been started in the previous two phases. At this point, I did not make any revisions due to the framework being derived from both the qualitative, quantitative and document analysis.

2.8.2.4 Charting

The next stage in framework analysis is to organise and abstract the research data so that it can be analysed systematically and comprehensively. This was done by developing one or more charts that summarises the study's findings. The chart(s) are

laid up in a matrix format, with ordered rows and columns filled in by the analysis units and framework components. Although charting is primarily concerned with summarising research data, it is also reliant on the work completed in the framework analysis' previous stages. The process of charting allowed me to examine and improve prior choices regarding the suitable units of analysis, the sequence of units of analysis and components of the framework, the proper level of data abstraction, and the framework's suitability for the dataset.

When it comes to revisiting and improving decisions about the suitable units of analysis, charting the indexed research data may reveal that one or more of the units of analysis cannot be carried forward from the indexing stage. Regarding this project, although I was able to concurrently index the information by four units of analysis (i.e., skills, CP services, facilitators, and barriers), for the charting stage, I switched to multiple units of analysis— divided skills into five subunits to mapped to CP services, facilitators, and barriers. A separate framework was used to address facilitators and barriers. Grouping the skills to five subsets as a unit of analysis are useful for observation illustrates. It is also crucial to make the connection between the data and the analytic process, while also reminding the reader that every dataset/analysis pairing cover aspect of fitting of whether the skill fits or does not fit to the CP service. This method was more challenging to implement, especially when it came to creating six charts utilising four different units of analysis. However, I was able to compare charting trends within the community pharmacist set of skills, across CP services, facilitators, and barriers.

Charting necessitates an explicit order to arrange rows and columns when revisiting and improving the order of units of analysis and framework components. The

previous framework identification and indexing phases are more likely to have recommended order for framework components. Regardless of the order of the units of analysis and framework components prior to this stage, I used the research questions and the evolving analysis to guarantee that the units of analysis and framework components on the charts were in an explicit and adequate order. It might be as simple as grouping units of analysis by essential attributes to impose order (for example intrapersonal skills, interpersonal skills, clinical skills, digital skills, and marketing skills).

I populated the internal cells of the charts after establishing the charting structure of the rows and columns. This necessitated examining the data in indexed form and selecting or reconsidering the data's suitable for abstraction. However, indexed study data was utilised to fill the inside cells of the charts through using the NVivo software (i.e., Matrix option). The aim of using NVivo software was to make charting easier and to keep live linkages between the cells in the chart and the research data. I reviewed the study data by using the framework component within the NVivo software and then manually entered my summary of the data in the relevant cell into a table that I had created in lucid chart website (https://www.lucidchart.com). The framework continued to work well for the data, and no new framework components or sub-components were added to the chart.

2.8.2.5 Mapping and interpretation

The final phase of framework analysis aims to bring together the major findings from the previous processes, such as intelligent guesses about patterns to look for in the data, as well as comparisons between and within units of analysis and framework

components. In order to make decisions, the mapping process was based on my personal experiences as a pharmacist. General terms, decisions based on experience refer to those that are influenced by prior experiences, either directly or indirectly (Yechiam and Aharon, 2012). In most experience-based decision tasks, an individual repeatedly makes choices and obtains outcomes from the available alternatives, thus decisions are based on previous experiences, with no clear explanation of the payoff distributions that determine which outcomes are chosen (Yechiam and Aharon, 2012). The mapping results should show relationships between different analytical units for the main goal of the study, which is to link a set of skills to public needs. In the end, I attempted to make a compelling story about the data structure and pattern.

2.8.3 Validity

The validity of skill mapping reflects the critical features of the quality of research and assure that the findings of the research are reliable and trustworthy. It is concerned with the suitability of research value, tools and techniques, and procedures, such as data collection and validation (Mohamad et al., 2015). The validity of this research was established using skilled moderators (i.e., my supervisors, who have extensive expertise in pharmacy research and practise) through meeting and discussing the data on a regular basis (Creswell and Creswell, 2018). Their role was to examine the findings for accuracy by using the final framework and detailed description to assess whether skills aligned with CP services. Using a moderator will aid in overcoming personal bias and guarantee that the data is valid and not influenced by what I want to see or hear.

2.9 NVivo and qualitative data analysis

As mentioned earlier, I decided to use a qualitative data analysis software to analyse the qualitative data. This was deemed appropriate because it enabled me to manage and analyse a huge amount of qualitative data (Bazeley, 2013). Another benefit of using qualitative data analysis software is to bring order to the traditionally messy nature of the data. However, there are concerns about the potential for undesirable influence of the tool on the qualitative research analysis or compromising the researchers' ability to meet their tailored research needs (Bazeley, 2013; Woods et al., 2016). Regardless of this, using NVivo Version 12 allowed for coding of the data, connecting ideas, recording notes, and analysing the data. Additionally, entering the data onto a software package gave a deeper understanding of the emerging themes, and enabled the application of the theoretical framework. Understanding the practical applications of using NVivo software package to analyse the qualitative data was valuable. Reflecting upon this experience, it must be acknowledged that my expertise gained in using this technology will be useful in the future.

2.10 Reflexivity

Subjectivity in qualitative research is considered to be a fundamental part of this type of research. It does not only occur on the part of the researchers, but also from the participants. Therefore, it can be very hard to know whether the researcher's interpretations of the results reflect the participants' opinions or not. Thus, reflexivity is very important in qualitative research analysis and data interpretation because it enables the qualitative researcher to gain awareness of their influence on the research. Reflexivity is defined as continuous self-reflection about the researcher's engagement to show the researcher's awareness of their beliefs, actions, and feelings (Darawsheh, 2014; Gray, 2014). It involves the researcher realising their impact on knowledge construction (Gray, 2014). Generally, in qualitative research, it is used to enhance credibility and trustworthiness (Gray, 2014; Smith, 2006). According to Smith (2006), research transparency could be improved through reflecting on the research process and the researcher's actions. Reflexivity provides an opportunitiy for the researcher to make any required changes to make ensure that the findings of the research are credible. According to Darawsheh (2014), reflexivity could be used as a guidance tool by the researcher to reduce bias in research.

Taking this into account, reflexivity was considered in this project to increase qualitative research rigour and trustworthiness. Therefore, I used a reflective log during all stages of the research for personal development. The notes from the reflective log were used in discussions during supervisory meetings. Reflective frameworks were used to structure the log based on the stage of the study. A retrospective review of the log was helpful in developing subsequent studies and analyses. Additionally, I would like to highlight the importance of continuous

reflection during all the stages of my PhD, and this was particularly useful in controlling biases. Other forms of reflexivity were also used and will be discussed in the following sections.

2.10.1 Epistemological reflexivity

Epistemological reflexivity influences the researcher's thinking and conceptualization of the world (Willig, 2008). This type of reflexivity encourages the researcher to reflect on their assumptions about the world and the nature of knowledge (Gray, 2014; Willig, 2008). It is helpful to think of how the researcher's epistemological and ontological assumptions affect the research design, data collection and findings interpretation. In this context, I come from a strongly positivistic background which is reinforced by my own role as a pharmacist. This viewpoint was changed remarkably by conducting qualitative research as a graduation requirement for my Master of Science degree. Feeling comfortable with both paradigms influenced my decision to conduct an MMR for my doctoral research.

2.10.2 Personal reflexivity

Qualitative research shows that personal and professional background influences people's thinking (Willig, 2008). There are several dimensions that affect the state of my 'pre-understandings' and thus, interpretive abilities of the research results. Education-wise, I have obtained my pharmacy degree from a King Abdul Aziz University in Saudi Arabia, my MSc from University College London in the UK but I have never practiced as a pharmacist in the UK. While I have not used any of the CP services, I usually visit the CP for over-the-counter medication or for toiletries. Therefore, I had few presuppositions or opinions about pharmacy practice in the UK.

With respect to my personal life, I was born and raised in Saudi Arabia, which is an Islamic, wealthy Middle Eastern country and Arabic is my native language.

I consider that my background as a pharmacist makes me believe that community pharmacists can provide more services. At the same time, I consider the CP environment to be a convenient place to minimise pressure on GPs and emergency departments. However, I have never worked in community pharmacy in Saudi Arabia nor in the UK; this was useful for being non-judgmental on the participants' experiences towards CP services. In order to keep my power and influence under control, through adapting different strategies such as self-representation before the interview (Mullings, 1999). Therefore, I chose to present myself as a PhD student from the University of Nottingham. I also intended to place the participant in a position of power equivalent to mine; this, in my opinion encourages the participants to speak freely and reduces the risk of reluctance to offer an honest and detailed response. In addition, I attempted to eliminate any expectations among the participants of being a member of any regulatory organisation in the UK or being in a position of judgement. Furthermore, I consider it crucial that the participants understand that the purpose of the study is to gain a better knowledge of their needs and experiences in the CP, rather than to evaluate or report their attitudes towards CP services. This was further enhanced as I focused on the participants' experiences whilst trying to understand how to improve them in the future. During the interviews, I was completely neutral towards the participants' answers. My educational background and practical experience as a hospital pharmacist enabled me to conduct these interviews, where I could rephrase any unclear questions and used analogies to make the questions clearer for the participants.

In regards to conflict of interest, which refers to situations when the researcher's professional judgement in performing or reporting research is affected by financial or other personal concerns (Curzer and Santillanes, 2012), I declared that there would be no conflict of interest. My credibility was enhanced due to being an international student investigating public needs from community pharmacists in the UK (i.e., being agenda-free). It is critical to emphasise that my scholarship was sponsored by the Saudi government for educational purposes only which covers my university fee and living cost, while my project has no monetary or financial component from any organisations in the UK or Saudi Arabia. This is to rule out the possibility of any potentially dubious agenda-driven or politically influenced goals. As a result, I am not following any pre-determined agenda.

Overall, bias in qualitative research cannot be totally excluded due to the subjective nature of the qualitative methods. However, self-awareness and reflexivity will positively reflect on my work and enhance the trustworthiness and validity of research.

2.11 Ethical considerations

Before conducting this project, a detailed research proposal was submitted to the School of Pharmacy Research Ethics Committee (see **Appendix VIII**) in order to safeguard all research participants from any harms that may arise (directly or indirectly) from the study, and ensure strategies are put in place to deal with any issues such as:

- **Autonomy:** All the research participants were aware of their voluntary participation without penalty for not taking part through the Consent Form (**Appendix VII**) and Participant Information Sheet (**Appendix VI).** Additionally, they have freedom to withdraw at any stage of the study, without giving a reason and without any consequences for them.
- **Anonymity and Confidentiality:** All the personal information gathered through qualitative interviews were treated as confidential information. In order to achieve this, we followed certain procedures:
    - Only the research team (i.e., me and supervisory team) had access to audio recordings and field notes. A pseudonym was developed for each participant in the study to protect their identity, which did not resemble the participants' actual names.
    - All research files and materials were named based on unique identifier numbers (e.g., P_1).
    - Data collected during the study (i.e., audio recordings) were stored on a secure, and encrypted hard disk. Additionally, the researcher's personal computer was password protected.

- **Incentives:** No payment was given to participate in this research. However, the participants in the interview were rewarded for their time with an inconvenience allowance (an Amazon gift voucher).

This PhD project received a favourable ethical opinion from the School of Pharmacy Research Ethics Committee, University of Nottingham (ref: 015-2019 dated 25th of October 2018 and updated on 20th of October 2019). An NHS ethics review was not required for the study because it was a service evaluation that did not include NHS staff or patients.

2.12 Summary

This chapter gives a step-by-step discussion of the research methodology and methods used in this study. The chapter described the philosophy underpinning this research, the overall research design, the research approach, including tools for collecting and analysing data and, at the end of the chapter, ethical considerations were also discussed.

A scoping review was used to inform the MMR adopted for conducting this research, and two different types of data (i.e., quantitative, and qualitative) were collected. Quantitative research (questionnaire) was the primary research method, used to obtain the participants' opinions toward community pharmacist services. This was then analysed using descriptive statistical analysis. The second method was to conduct semi-structured telephone interviews to explain the quantitative data, which was collected and analysed using the 7Ps theoretical framework. Then, the results from the previous two stages were used to preform skill mapping.

The next chapter will describe the findings of the scoping review and the subsequent two chapters will present the findings of the MMR while the final results chapter will present the findings of the skill mapping.

Chapter 3. Scoping review

3.1 Introduction

In this chapter, I present a scoping review of extending the role of the community pharmacist in the UK. This chapter attempts to address four of the thesis' main goals, namely:

- **Objective one:** Identify stakeholders' perceptions regarding the current role of the community pharmacist.
- **Objective two:** Explore the public's awareness of the current community pharmacist's roles and community pharmacy services.
- **Objective three:** Identify perceived outcome(s) from extending the community pharmacist's role.
- **Objective four:** Identify stakeholders' perceptions about facilitators and barriers to using the community pharmacist's services.

I review stakeholders' perceptions regarding extending role of the community pharmacist while addressing the advantages, disadvantages, and challenges of delivering extended services in the CP. Then, I discuss the main mechanisms that underpin the success and failure of extending role of the community pharmacy. The chapter concludes by discussing the results and highlighting the strengths and limitations of this scoping review.

3.1.1 Scope of the research

Worldwide, healthcare systems are facing challenges due to increasing demand (World Health Organization, 2008). Internationally, health policy in many countries has focused on reforming primary care sectors to achieve sustained benefits (Hall,

2015; Ministry of Health, 2016; Simms, 2010; Smith et al., 2013; Tenbensel, 2008; World Health Organization, 2008). These include increasing access to services, providing better utilisation of the workforce, and increasing health promotion and self-care. As part of the reforms, policy-makers have recognised the potential for CP services to support the health needs of the population and minimise workload pressures on primary care (Canadian Pharmacist Association, 2016; Murray, 2016).

Community pharmacists are well-trained professionals and are the most accessible healthcare provider (Noyes, 2017). Pharmacists who are capable of reaching not only patients with chronic diseases but also members of the general population who do not frequently use healthcare services (Noyes, 2017). In recent years, the community pharmacist role has become more involved in providing clinical and public health services (Agomo, 2012). The nature of the community pharmacy (i.e., pharmacies embedded in local communities) and the frequency of contact between the public and pharmacists gives a significant opportunity to further develop their roles and conduct many services addressing the increasing demands for healthcare, and supporting equity in access (Ministry of Health, 2016). In recognition of this, reimbursement structures were introduced for a range of clinical, medicines and public health services, such as lifestyle advice, minor ailments management, sexual health services and substance misuse services.

However, attempts to introduce or develop services in the community have often been challenging (Hindi et al., 2018). The reasons behind this could be related to the healthcare systems, CP or the services themselves. Therefore, there is an urgent need to understand stakeholders' preceptions toward extended services in the CP. This could play important role in the success or failure of implementing of CP services.

Undertaking a scoping review allows for extensive and in-depth evaluation of the existing literature. Furthermore, it is an excellent way to address this complex research topic. The previous chapter provided a detailed method, while the next section will describe the results of the scoping review.

3.2 Results

The total number of the identified citations was 979. Following the screening of the abstracts and titles, the number of excluded articles was 815 which means 164 full texts were reviewed and 36 articles were selected for this scoping review order to answer questions- see **Figure 3:1**.

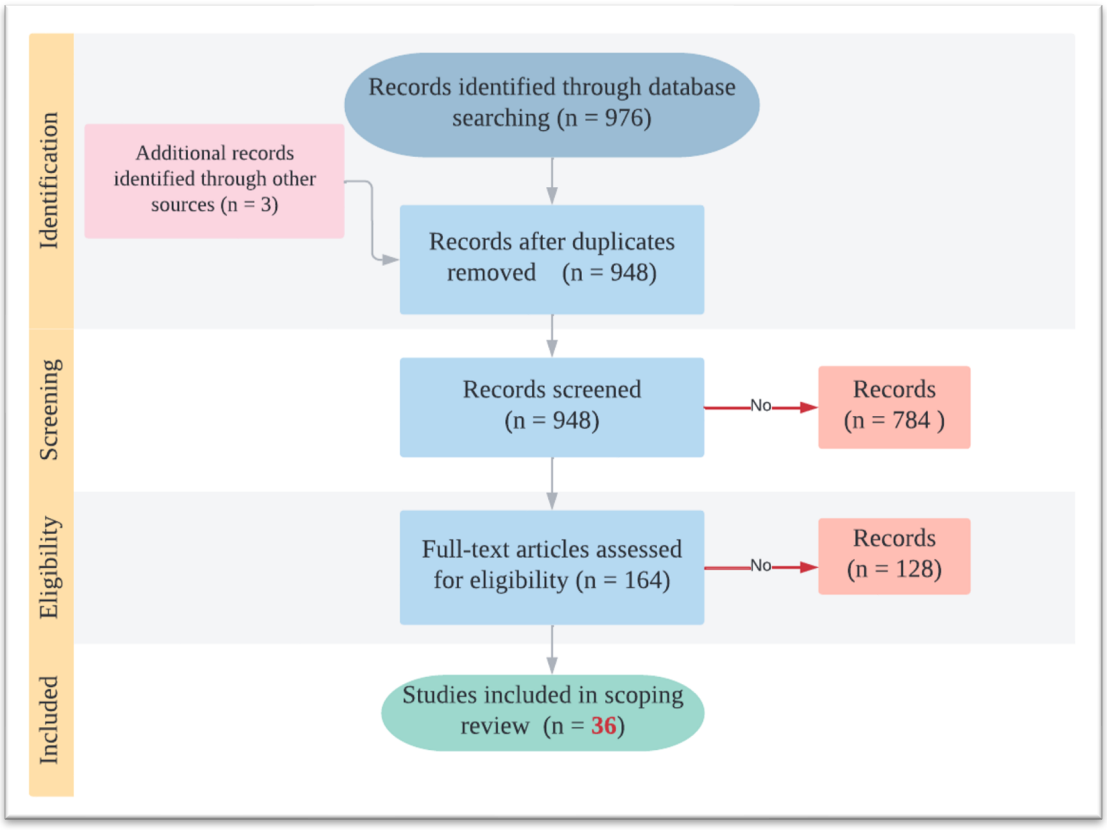


Figure 3:1 Scoping review flow chart

3.2.1 Study characteristics

Papers were predominantly from England (n = 23). Most study designs included qualitative interviews (n = 15, 41.7%), questionnaire surveys (n = 6, 16.7%), mixed methods (n = 6, 16.7%), service evaluation (n = 6, 16.7%), papers that utilised two qualitative techniques (n = 2), and just one study that was an economic evaluation. The papers that were chosen were fairly dispersed across the time frame that was chosen (i.e., between 2013 to 2022). 11 publications looked at diverse stakeholder viewpoints (including GPs, pharmacists, commissioners, and patients), four papers looked at exclusively pharmacist perspectives, and 16 papers looked at public/patient perspectives. Only four publications looked at the impact of CP services, two looked at their efficacy, and just one looked at the cost of CP services. More information is provided in **Appendix I**.

3.2.2 Critical appraisal

The majority of the publications did not address ethical concerns (i.e., confidentiality, sensitivity, and consent), potential researcher biases or influence on the data. Also, most of the studies failed to provide justifications for the sample techniques and methodologies utilised. There was no information available on how the qualitative and quantitative data were combined in the mixed method study. All studies employed suitable procedures; however, some did not offer enough information on data gathering, whereas the majority of papers reported participant demographics. Some studies did not offer sufficient data on statistical analysis and did not explain how the themes were formed. The majority of studies described their findings clearly, and all but 11 papers addressed the implications for policy and/or practise. The results of every included study were utilised to verify and support the conclusion.

3.2.3 Themes

In addition to the mechanisms, four primary themes emerged: "perception," "advantages," "disadvantages," and "challenges." These themes were utilised to define stakeholders' perceptions, expectations, and experiences about CP services. More details will be presented below.

3.2.3.1 Stakeholders' perceptions toward the community pharmacists and their extended role

Generally, the public have a positive experience with many services that are provided by community pharmacists (Boag et al., 2021; Corlett and Krska, 2016; Krska and Mackridge, 2014). Participants in many studies have mentioned that they have been highly satisfied with their experience with CP services (Boag et al., 2021; Ingram et al., 2018; Mackridge et al., 2016; Mantzourani et al., 2021; Rai and Wood, 2018; Warner et al., 2013). Also, participants in two studies valued the pharmacy team's professionalism (Krska and Mackridge, 2014; Mantzourani et al., 2021). Considering the skills, a study conducted in Brighton and Hove shows that the patients highly rated pharmacist interpersonal and communication skills (Ingram et al., 2018).

Many participants thought that pharmacists had a broader consultative role, especially when doctors were unavailable (Gidman and Cowley, 2013). They also believed that community pharmacists dealt with minor self-limiting diseases more efficiently than doctors because of their knowledge of OTC medicines (Gidman and Cowley, 2013). In addition, the vast majority of participants in Boog et al.'s (2019) qualitative research were supportive of pharmacists expanding their role to provide emergency contraceptives. A majority of survey participants said that they have confidence and trust in pharmacists when it came to discussing alcohol-related issues

(Fitzgerald et al., 2015). However, participants in two studies preferred discussing alcohol issues with a doctor over a pharmacist (Fitzgerald et al., 2015; Mackridge et al., 2016). CP staff thought that pharmacy was a good location to get alcohol-related information (Mackridge et al., 2016).

With regards to pharmacist independent prescribing, a study conducted in Scotland shows that the respondents favoured pharmacists prescribing the same medications as physicians, while others indicated that pharmacists should only prescribe for mild diseases, repeat prescriptions, or low-risk medications (MacLure et al., 2013). When it came to health-related questions, there were a few participants in two studies who stated that hey preferred to speak with their doctor or a nurse for a more in-depth discussion about their health (Atkin et al., 2021; Corlett and Krska, 2016). Another qualitative study mentioned that participants have a higher level of interpersonal confidence in their doctors and that they prefer to approach them for more serious health issues (Atkin et al., 2021). A few people said they felt at ease discussing their health with a pharmacist. Pharmacists were perceived to have more time, but less opportunities to reinforce decisions (Atkin et al., 2021).

3.2.3.2 Advantages from extending role of the community pharmacist

Many studies suggested that CP services could be beneficial for patients and the public because they provide an easily accessible and convenient service without the need for an appointment (Agomo et al., 2016; Ahmaro et al., 2021; Aly et al., 2019; Atkins et al., 2016; Boog et al., 2019; Corlett and Krska, 2016; Deslandes et al., 2020; Fitzgerald et al., 2015; Gidman and Cowley, 2013; MacLure et al., 2013; Mantzourani et al., 2020; Rai and Wood, 2018; Turnbull et al., 2020; Warner et al., 2013). There is no waiting list or queue (Warner et al., 2013) in addition to extended opening hours which is advantageous for the public (Ahmaro et al., 2021; Rai and Wood, 2018; Turnbull et al., 2020). At the same time, they help to promote health and wellbeing for the public (Corlett and Krska, 2016; Fitzgerald et al., 2015; Sohanpal et al., 2016), increase access to health care (Brown et al., 2014; Warner et al., 2013), satisfy health needs for the public (Boog et al., 2019), empower patients (Boog et al., 2019; Corlett and Krska, 2016; Mantzourani et al., 2021), and provide more healthcare options for patients (Atkins et al., 2016; Boog et al., 2019). Furthermore, some services may include a financial benefit for the pharmacy (Brown et al., 2014).

3.2.3.3 Disadvantages

The stakeholders recognised many disadvantages of CP services. Some of these disadvantages were associated with nature of the services itself. Participants in a focus group perceived that community pharmacists provided incomplete services that did not work effectively in collaboration with other primary care providers (Gidman and Cowley, 2013). Participants in another qualitative study demonstrated how community pharmacists struggle to provide patients with enough information (Atkin et al., 2021; Ingram et al., 2018; Turnbull et al., 2020). Another issue raised by participants in a qualitative study was that CP services were perceived as being less personal (Turnbull et al., 2020). Participants most often stated reservations about pharmacies as emergency contraceptive tablets suppliers and reported CP teams as being judgmental, unsympathetic, and unsupportive (Turnbull et al., 2020). This could affected the pharmacist professional image and risked becoming little more than an essentialised enactment of consumerist health care (Atkin et al., 2021). From a qualitive observational study, the majority of the CPs undertook health promotion activities in response to requests from the local government (Atkin et al., 2021).

Regarding to safety of services, some participants were concerned about the risks associated with pharmacists' competence (MacLure et al., 2013). Also, participants were concerned about privacy and confidentiality due to the public nature of the pharmacy (Fitzgerald et al., 2015; Turnbull et al., 2020). Furthermore, a qualitative study shows that there was little proactive follow-up provided from the pharmacist after the initial contact to provide healthy living advice (Atkin et al., 2021). This finding was supported by quantitative research that revealed pharmacy users had difficulty contacting the pharmacist over the phone (Ingram et al., 2018). Pharmacist

claimed that the main disadvantages of extending their role was added workload that came with their growing role (Mantzourani et al., 2016) which could influence the quality of services.

3.2.3.4 Challenges

23 papers investigated factors which could prevent community pharmacists from extending their role. The challenges were classified in four categories, which are presented in **Figure 3:2**.

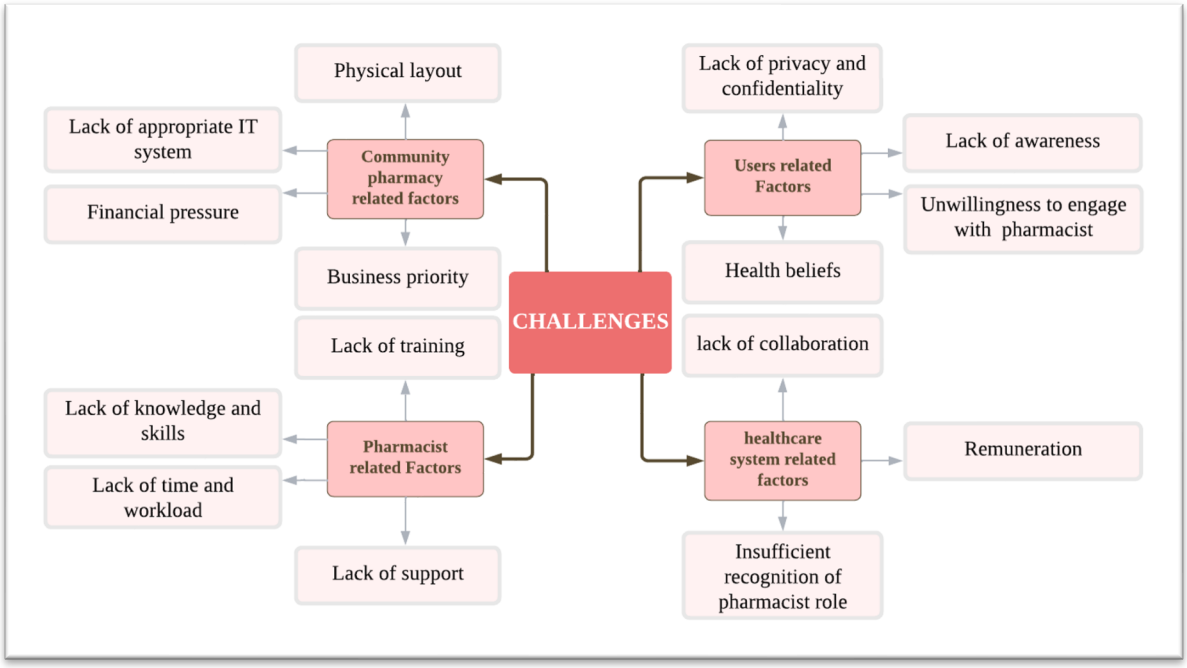


Figure 3:2 A summary of the challenges to provide expanded CP services

3.2.3.4.1 Pharmacist related factors

Lack of pharmacist time was the most reported barrier to delivering extra services in CP (Agomo et al., 2017; Ahmaro et al., 2021; Atkin et al., 2021; Boog et al., 2019; Brown et al., 2014; Gidman and Cowley, 2013; Jacobs et al., 2018; Krska and Mackridge, 2014; Sohanpal et al., 2016). Some studies mentioned increased workload as a hinderance from providing new services (Atkin et al., 2021; Brown et al., 2014; Cooper and Tsoneva, 2017; Evans et al., 2016; Firth et al., 2015; Gidman and Cowley, 2013; Krska and Mackridge, 2014; Mantzourani et al., 2021; Newlands et al., 2011; Saramunee et al., 2014). Meanwhile, a study mentioned that time pressure due

to the volume of dispensing was the main issue that prevented pharmacists from delivering additional services (Saramunee et al., 2014). One study mentioned that pharmacists lack of time management and prioritisation skills as hinder for extending CP services (Atkin et al., 2021). These elements could result in an inconsistent service delivery, which was identified in another study as a barrier (Saramunee et al., 2014). Additionally, an inadequate number of staff could cause time constraints for the existing CP team and make delivering extra services a real challenge (Atkin et al., 2021; Cooper and Tsoneva, 2017; Jacobs et al., 2018).

Another common barrier that was reported by pharmacists was the lack of training (Agomo et al., 2017; Aly et al., 2019; Kember et al., 2018; MacLure et al., 2013), which could influence pharmacists' confidence in their ability to deliver extended services (Agomo et al., 2017; Saramunee et al., 2014). Furthermore, GPs, pharmacists and the public have concerns regarding pharmacists' lack of knowledge and skills (Agomo et al., 2017; Boog et al., 2019; Brown et al., 2014; MacLure et al., 2013; Saramunee et al., 2014; Sohanpal et al., 2016) to conduct services beyond dispensing. Participants in a mixed methods study questioned pharmacists' competence and expressed concerns around the pharmacist's ability to deliver public health services (Saramunee et al., 2015a).

In two studies, pharmacists themselves were recognised as a barrier and were not interested in providing extra services (Agomo et al., 2017; Brown et al., 2014). Pharmacists' unwillingness could be for many reasons, such as fear of change (Brown et al., 2014), financial loss (Atkins et al., 2016), or concerns about jeopardising relationships with GPs (Evans et al., 2016; Rai and Wood, 2018). Also, employee

pharmacists reported that they received insufficient support to extend their role (Boog et al., 2019).

3.2.3.4.2 Pharmacy user and public related factors

The most cited barrier for community pharmacy service utilisation is poor public awareness (Agomo et al., 2017; Cooper and Tsoneva, 2017; Evans et al., 2016; Firth et al., 2015; Gidman and Cowley, 2013; Kember et al., 2018; Krska and Mackridge, 2014; Lindsey et al., 2017; Mantzourani et al., 2021; Mantzourani et al., 2016; Saramunee et al., 2014; Saramunee et al., 2015a). Many studies showed that lack of publicity was the main reason for low utilisation of the CP services. In one study, participants perceived that insufficient marketing of their services lead to low public awareness (Rai and Wood, 2018). Several studies repeatedly raised concerns regarding the perceived lack of privacy within CP among public and pharmacy users (Ahmaro et al., 2021; MacLure et al., 2013; McNaughton et al., 2011; Saramunee et al., 2014; Taylor et al., 2012). Participants of two studies exhibited a low awareness of the private counselling room (Ahmaro et al., 2021; Saramunee et al., 2014). Regarding concerns about the confidentiality of patient information, participants believed that the CP venue was unsuitable place for discussing a private issue (Agomo et al., 2017; Ahmaro et al., 2021; MacLure et al., 2013; Saramunee et al., 2014; Taylor et al., 2012).

Patients' participation with CP services was viewed by pharmacists as a major barrier to expanding their service (Rutter and Vryaparj, 2015). Also, it seems that people's perceptions about the community pharmacists affected their preferences to use their services and they were sometimes not receptive of new pharmacist roles. In one qualitative study participants were afraid of being judged by the community pharmacist (Ahmaro et al., 2021). While other qualitative research showed that the

participants have low trust in pharmacists in comparison to GPs which impacted their use-to-use CP services (Gidman and Cowley, 2013; Saramunee et al., 2015a). In many studies, participants perceived that the role of pharmacists was limited to providing certain services related to medicine dispensing (Newlands et al., 2011; Saramunee et al., 2015a). Therefore, the lack of the understanding of pharmacist training was identified as a barrier (MacLure et al., 2013). However, there are many factors affecting patients' willingness to use pharmacy services, such as inconvenient waiting times (Ahmaro et al., 2021; Krska and Mackridge, 2014). Furthermore, the pharmacist's motivation to provide additional services was questioned, and in some studies, both patients and the public recognised the conflict of interest between the professional role of the community pharmacist and the commercial side of the CP (Cooper and Tsoneva, 2017; Kember et al., 2018). Finally, a lack of relationships due to frequent staffing changes (i.e., locums staff) was recognised as a barrier in a mixed methods study in which the participants saw the community pharmacist as stranger and they preferred not to discuss their issue with him/her (Saramunee et al., 2015a).

3.2.3.4.3 Community pharmacy related factors

There were areas of concern related to the environment and design of the CP among both the public and pharmacists. In many studies, community pharmacy layout was considered an inappropriate place for private discussions (Cooper and Tsoneva, 2017; Gidman and Cowley, 2013; Krska and Mackridge, 2014). There were perceived concerns about the absence of a suitable location, such as a private consultation room or pressure to using a private room to deliver services (Atkin et al., 2021). Pharmacists, patients and GPs have argued that the ability of pharmacists to expand their services is restricted sometimes due to limited physical space (Sohanpal et al.,

2016). Participants in a qualitative study stated that the fear of being overheard from other customers was a barrier to using CP services (Ahmaro et al., 2021; Krska and Mackridge, 2014). Participants in two studies said that the unavailability of the appropriate application of health, safety, and security procedures prevented the delivery of extra services (Atkins et al., 2016; McNaughton et al., 2011).

Another factor mentioned by pharmacists was financial pressure, which is related to the business nature of community pharmacy (Agomo et al., 2017; Atkin et al., 2021; Evans et al., 2016; Gidman and Cowley, 2013). In several studies, participants perceived that the Information Technology (IT) system in the community pharmacy had a negative impact on extending the pharmacist role due to limited access to secure internet (Agomo et al., 2017; Cooper and Tsoneva, 2017; McNaughton et al., 2011), or lack of access to medical records (Atkins et al., 2016; MacLure et al., 2013). Many influencing factors related to the particular service being provided might deter pharmacists from delivering that service. The high setup cost of some clinical services could affect the availability of the service in CP (Saramunee et al., 2014). Also, two studies highlighted that some topics' sensitivity, and stigmatised diseases were an issue for the community pharmacists when delivering some services, such as STD and alcohol intake (Ahmaro et al., 2021; Mackridge et al., 2016).

3.2.3.4.4 Healthcare system related factors

In some cases, the structure of the healthcare system could make it challenging for community pharmacists to deliver additional services. Most of the time, community pharmacists feel isolated from other HCPs. In many studies, pharmacists reported limited collaboration with other HCPs (Aly et al., 2019; Jacobs et al., 2018;

Saramunee et al., 2014). A lack of clear referral channels from the community pharmacist to other HCPs was reported as barrier and vice versa (Mackridge et al., 2016; Mantzourani et al., 2021). In one study, GPs raised concerns about the quality of healthcare that was provided for their patients through CP (Atkins et al., 2016).

Funding of community pharmacy services was considered to be the main barrier to delivering new services (Mackridge et al., 2016). Two qualitative studies highlighted the inconsistent commissioning model as a problem (Mantzourani et al., 2021). In two studies, pharmacists thought that the government failed to include CP in their policy planning for the future (Agomo et al., 2017). All these factors created challenges to providing additional services in CP.

3.2.4 Mechanisms

The initial analysis of the data yielded four themes that were relevant to the implementation of CP services. However, to gain a more comprehensive and nuanced understanding of the underlying processes and linkages between context and outcomes, these themes were further scrutinized into six probable mechanisms that could be driving the outcomes of interest. This process involved a closer examination of the data to identify more specific connections between the context and the outcomes.

The six mechanisms that were identified represent a more comprehensive understanding of the complex and multifaceted nature of the implementation of CP services that may be underlying the observed relationships. Each mechanism was supported by empirical evidence and was deemed relevant to the context in which the research was conducted. By distinguishing these mechanisms from the themes, this research aimed to develop a more robust and comprehensive understanding of the factors contributing to the successful implementation of CP services. **Figure 4:3** shows a mind map illustrating the relationship between context, mechanisms, and outcomes.

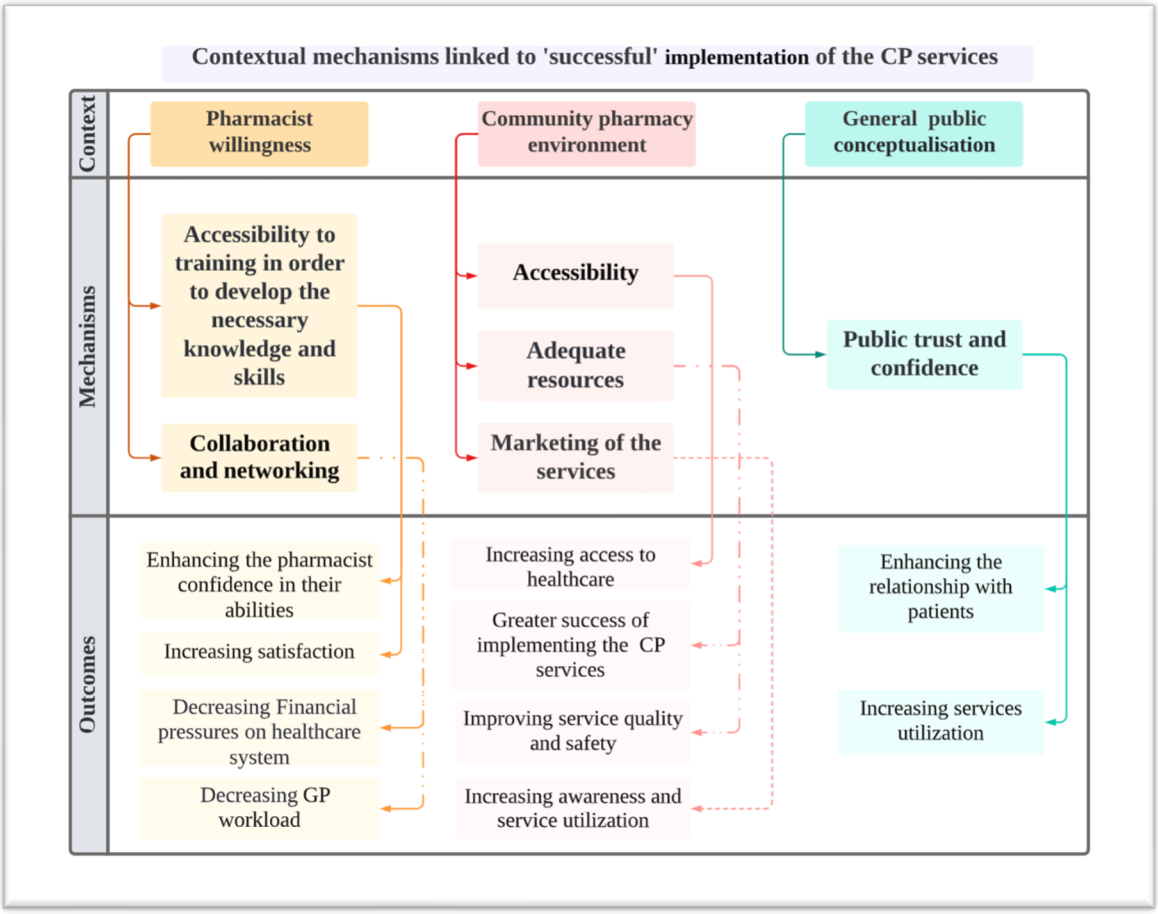


Figure 3:3 Key mechanisms identified from synthesis evidence

3.2.4.1 Accessibility to training to develop the necessary knowledge and skills

Looking at the studies included in this review, pharmacists themselves could play a significant role to delivering CP services. Increasing pharmacists' willingness, motivation, and professional interest to deliver additional services has a huge impact to support successful service delivery (Brown et al., 2014; Mantzourani et al., 2021). This could be facilitated through education and training pharmacists to conduct advanced clinical or public health services (Agomo et al., 2016; Boog et al., 2019; Brown et al., 2014; Firth et al., 2015; Jacobs et al., 2018; Krska and Mackridge, 2014; Mantzourani et al., 2016; Newlands et al., 2011; Rutter and Vryaparj, 2015; Sohanpal et al., 2016). Additionally, in many studies, community pharmacists reported the need

to develop their clinical and non-clinical skills, such as communication and consultation skills (Agomo et al., 2016; Jacobs et al., 2018; Mackridge et al., 2016; Newlands et al., 2011). Enhancing pharmacists' confidence in their abilities is required to expand their role (Brown et al., 2014; Mackridge et al., 2016). In another study, the pharmacists mentioned an urgent need to develop a competency standard for delivering CP services to ensure that only competent staff would be involved in service delivery (McNaughton et al., 2011).

This could help to boost their skills, knowledge and confidence (Brown et al., 2014) which would lead to increased personal or professional satisfaction(Brown et al., 2014; Cooper and Tsoneva, 2017; Krska and Mackridge, 2014; Rutter and Vryaparj, 2015; Sohanpal et al., 2016; Steed et al., 2017) through better utilisation of pharmacist knowledge and skills. Also, it would motivate pharmacists to take part in further professional development (Brown et al., 2014; Firth et al., 2015; Rutter and Vryaparj, 2015) and increase CP viability (Agomo et al., 2016; Brown et al., 2014). Qualitative studies have shown that engaging pharmacists in delivering healthy living services made them more proactive in approaching people to promote health and increased their confidence in delivering more services (Cooper and Tsoneva, 2017; Lucas and Blenkinsopp, 2015; Rutter and Vryaparj, 2015). These services also helped to improve pharmacists' and pharmacy image (Aly et al., 2019; Brown et al., 2014; Mantzourani et al., 2016).

3.2.4.2 Accessibility to the CP

Many studies included in this scoping review show that the accessibility of CPs acts as a vital mechanism in providing any service, regardless of the existence of a private

counselling room. Stakeholders perceived the accessibility of CP services in terms of opining hour, location, and availability of the services without an appointment (Anderson and Thornley, 2014; Boag et al., 2021; Evans et al., 2016; Kember et al., 2018; Lindsey et al., 2017; Mantzourani et al., 2021; Saramunee et al., 2014; Taylor et al., 2012; Tucker and Stewart, 2015). In many studies, participants mentioned that difficulty in getting an appointment with a GP made the pharmacy an excellent option for seeking medical health services (Anderson and Thornley, 2014; Kember et al., 2018; Tucker and Stewart, 2015), and convenience was a commonly mentioned as advantage for CP services (Anderson and Thornley, 2014; Boag et al., 2021; Mantzourani et al., 2021; Taylor et al., 2012; Tucker and Stewart, 2015).

The key outcomes from the CP accessibility were to help in the promotion health and well-being for the public (Corlett and Krska, 2016; Fitzgerald et al., 2015; Sohanpal et al., 2016), to increase access to healthcare (Brown et al., 2014; Warner et al., 2013), meet public health needs (Boog et al., 2019), to empower patients (Boog et al., 2019; Corlett and Krska, 2016; Mantzourani et al., 2021), and to provide more healthcare options for patients (Atkins et al., 2016; Boog et al., 2019). Also, two studies show that CP services were beneficial for the public because their knowledge and understanding of their condition and treatment increased which resulted in improved self-care (Mackridge et al., 2016; Mantzourani et al., 2016).

Many studies show that clinical services delivered by pharmacists were safe and clinically effective which helped to improve patients' clinical outcomes (Boardman and Avery, 2014; Brown et al., 2014; Corlett and Krska, 2016; Ingram et al., 2018) and patients' quality of life (Buchanan et al., 2020; Corlett and Krska, 2016). A study that evaluated an emergency contraceptives service showed that providing emergency

contraceptives helped to reduce the rate of teenage pregnancy and abortion (Mantzourani et al., 2019). Another study stated that providing contraceptives in the CP would be useful in improving effective use of contraceptive and reducing unwanted pregnancies (Boog et al., 2019).

3.2.4.3 Adequate resources

In the context of the CPs, the availability of adequate resources essential for successful support of services delivery includes human recourse, equipment, space, and financial aspects. Having an adequate number of CP employees on hand to deliver CP services served as a driver for expanding the role of the CP pharmacist (Evans et al., 2016; Krska and Mackridge, 2014). This would be useful to ensure that the community pharmacist can accommodate the workload that results from extending their role (Mantzourani et al., 2021). With regards to equipment, the presence of an IT system is important in supporting delivery of CP services (Agomo et al., 2016; MacLure et al., 2013; McNaughton et al., 2011). Another study suggested that providing an easy-to-use tool to deliver services would be an important factor (Mackridge et al., 2016). Additionally, studies show that environment and physical layout of the community pharmacy (such as the existence of a private consultation room) (Anderson and Thornley, 2014; Mackridge et al., 2016) were crucial in service acceptability among pharmacy users to ensure their privacy and confidentiality (Krska and Mackridge, 2014; Turnbull et al., 2020). There were external facilitators which were recognised by the CP that include availability of adequate remuneration (Sohanpal et al., 2016). A qualitative study found that empowering the community pharmacist through direct compensation would be useful in encouraging them to engage with service provision (Agomo et al., 2016). The main outcomes from this is

effective use of NHS resources providing services that could reduce the healthcare cost (Mantzourani et al., 2016).

3.2.4.4 Marketing of the services

In the context of the CP, there was another essential mechanism to support CP services and increase services utilisation: good publicity. Many studies highlighted the importance of patient awareness regarding the pharmacist role, which motivates customers to use them (Agomo et al., 2016; Evans et al., 2016; Lucas and Blenkinsopp, 2015; Mantzourani et al., 2021; Saramunee et al., 2014), supporting the need for better promotion of community pharmacy services (Firth et al., 2015; Kember et al., 2018; Mackridge et al., 2016; Rai and Wood, 2018). Furthermore, improving public awareness and understanding regarding the pharmacist training and capabilities was considered as an enabler (MacLure et al., 2013). Another study found that promoting the availability of private consultation room would be important to increase service uptake for services concerned with sensitive issues such as chlamydia testing (Ahmaro et al., 2021). Increasing the recognition of the CP services would lead to increase public engagement and loyalty (Brown et al., 2014).

3.2.4.5 Collaboration and networking to develop supportive relationships

Collaboration and networking were recognised as important mechanises to develop intraprofessional / interprofessional relationship. Many studies show providing support for pharmacists from peers or management is crucial for service sustainability (Boog et al., 2019; Brown et al., 2014; Jacobs et al., 2018; Mantzourani et al., 2016). In the context of the pharmacists and other HCPs, it is important to acknowledge the impact of good relationship (i.e., inter-professional collaboration) to facilitate the

provision of extended role of the CP (Agomo et al., 2016; Boog et al., 2019; Brown et al., 2014; Firth et al., 2015; MacLure et al., 2013; Mantzourani et al., 2021; Rai and Wood, 2018; Saramunee et al., 2014). This could happen through increasing awareness regarding their role among GPs (Mantzourani et al., 2016) and improve their collaboration with GPs and other HCPs (Agomo et al., 2016; Brown et al., 2014; Mantzourani et al., 2016).

The impact of extending the role of the community pharmacists is also beyond the pharmacy profession. Some studies suggested that managing minor conditions and providing public health services could be useful in reducing GP workload (Agomo, 2012; Aly et al., 2019; Boag et al., 2021; MacLure et al., 2013; Mantzourani et al., 2020; Mantzourani et al., 2016). This would be useful in allowing them to focus more on complex patients (MacLure et al., 2013). Conversely, the results of a qualitative study revealed doubts among GP teams regarding the decline in overall GP workload for services such as minor ailments where there was no impact on utilisation of hospital and primary care facilities (Aly et al., 2019).

Also, integration of the CP into primary care is essential for extending the role of the CP pharmacist (Boog et al., 2019; Krska and Mackridge, 2014; Mantzourani et al., 2021) which could happen through availability of clear referral pathways within the primary healthcare sector (Boog et al., 2019; Mantzourani et al., 2021; Turnbull et al., 2020). At the same time, having access to patient records would enhance the quality of CP services to make safe decision for patients (MacLure et al., 2013). CP services could be beneficial in dealing with the increasing financial pressures in the healthcare system through providing cost saving (Agomo, 2012) or cost-effective services (Atkins et al., 2016; Buchanan et al., 2020). A qualitative study conducted in Wales

claimed that CP minor ailments services might be useful in reducing healthcare cost and in using NHS resources effectively (Mantzourani et al., 2016). Two studies were conducted that considered the impact of CP services on the public health with a view to evaluating the vaccination programmes, which showed that pharmacy services helped to increase vaccination rate (Deslandes et al., 2020; Warner et al., 2013).

3.2.4.6 Public trust and confidence

In context of the public, building trust and confidence in CP services and pharmacist's ability were considered as important mechanisms to support successful services provision. Much research has demonstrated that pharmacists' behaviour and creditability were seen as the cornerstones of building a good patient-pharmacist relationship, which positively affected patients' use of CP services (Anderson and Thornley, 2014; Atkin et al., 2021; Boag et al., 2021; Lindsey et al., 2017; Mackridge et al., 2016; Saramunee et al., 2014). Much qualitative research shows that providing friendly (Mackridge et al., 2017; Turnbull et al., 2020) and non-judgmental services were considered important for the participants to use CP services (Ahmaro et al., 2021; Atkin et al., 2021; Krska and Mackridge, 2014). Previous exposure to CP services was considered as a facilitator to use it again (Boag et al., 2021). In two qualitative studies, participants thought that pharmacists had more time than GPs to discuss health problems with them (Atkin et al., 2021; Lindsey et al., 2017). Another two qualitative studies showed that participants preferred to discuss minor conditions with the pharmacist rather than with GP (Boag et al., 2021; Tucker and Stewart, 2015). However, extending the roles of pharmacists would be helpful in enhancing the pharmacists relationships with patients to become more trusted and respected by

the public (Agomo et al., 2016; Brown et al., 2014) and increase awareness regarding their role among public (Mantzourani et al., 2016).

3.3 Discussion

3.3.1 Key findings

The scoping review summarised evidence about stakeholders' perceptions, advantages, disadvantages, and challenges of extending role of the community pharmacist. The perspectives of the public, pharmacy staff, commissioners and GPs were gathered from across the United Kingdom regarding a wide range of clinical and public health services in CP. This review adds to the existing literature by gaining a deeper understanding of primary research results via identifying several support mechanisms, contexts, and outcomes. The findings will also help improve services in the future to meet public healthcare needs and inform policy.

The key findings from this analysis reinforce the claim that extending the role of the community pharmacist is beneficial for the public because these services will be more accessible and convenient for people. Therefore, such measures could help increase community accessibility to healthcare services. From a pharmacist's perspective, providing these services would increase their job satisfaction through a better utilisation of their skills and knowledge. In addition, some CP services could help to reduce pressure on GPs and reduce the financial burden on the healthcare system. The review also highlighted key challenges for community pharmacists extending their role, including insufficient time or space, inadequate training, inadequate remuneration, low demand or insufficient interest from patients, professional isolation, low awareness, and commercial pressure. These results corroborate the

findings of a great deal of two previous systematic review conducted in UK about the CP services (Hindi et al., 2019a; Hindi et al., 2018).

These outcomes were underpinned by six support mechanisms: accessibility to training; accessibility to the CP; enough resources; promotion of the services; collaboration and networking; and public trust and confidence, considering pharmacist willingness, CP environment, and public conceptualisation as contexts.

These findings are supported by a meta-synthesis of barriers and facilitators that impact the implementation of CP services (Hossain et al., 2017b). The organization's support has an impact on pharmacist engagement with services provision, and obstacles may be turned into advantages (Hossain et al., 2017b; Moran et al., 2014; Roots and Li, 2013). These findings are also in line with Moran et al.'s (2014) work, which looked at the effective implementation of support measures for healthcare practitioners in rural and remote areas. Furthermore, efforts to modify clinical practice by persuading individuals have been shown to be inefficient without organisational commitment (Hossain et al., 2017b).

However, the synthesis mechanisms revealed concerns regarding the degree of details included in primary research. Most of the studies contained limited information about the organisational context and influential elements at the community and healthcare system level. Currently, the COVID-19 pandemic is encouraging the drive towards changes to community pharmacists' roles as part of the frontline healthcare workforce. The results of this review could be useful for policymakers in building a successful model of care through highlighting challenges and facilitators.

3.3.2 Strengths

Generally, the key strength of this review goes beyond the findings of empirical research to explain mechanisms supporting the successful delivery of the CP services. The review has focussed on identifying relations between contexts, mechanisms and outcomes employing thematic analysis which extracted, combined, and organised the data systematically. Therefore, the review could help policymakers optimise healthcare services for maximum effect. In this review, it was found that a great variety of study designs have been used to explore stakeholders attitudes towards services delivered in community pharmacies to identify key mechanisms that support successful provision for any services. In addition, the reviewed research did not focus on one service but looked at different types of services delivered in CPs. The results of this review could be extrapolated to any similar context to inform policy.

3.3.3 Limitations

This study has some recognised limitations. First, most of the primary research gave very few details about the context of CPs, such as the number of staff, types of pharmacies, role of pharmacists and other services that were delivered in the pharmacies. Such information could provide a better understanding of the mechanisms and their impacts on outcomes. If included in each paper, such information would have helped inform the mechanisms.

Another limitation is that most of the qualitative studies used descriptive analysis rather than theoretical frameworks, and did not develop theory, which makes the findings preliminary; as a result, further investigations should be considered. Most of the research focused on perceptions and attitudes towards community pharmacy

services rather than assessing the acceptability of the services and outcomes from delivering new services in the community pharmacy. Further research to evaluate workflow, patient clinical outcomes, and economic impact should be conducted. Furthermore, the research methodology and accompanying measuring tools used by research to evaluate CP services were impacted the mechanisms in this study. There was an overrepresentation of articles that used self-reported outcomes which influenced the result of this review.

3.4 Summary

This review indicates that CP services are beneficial for the public and pharmacists. Some services show financial benefits for healthcare system. In addition, the key advantages for extending CP services have been identified, which include accessibility of the CP services and convenience. Additionally, extending the community pharmacist's role can be combined with some disadvantages such as increasing workload and pressure on the pharmacist. Also, concerns were raised by some stakeholders regarding the safety and the quality of the CP services.

The scoping review highlights key challenges for community pharmacists when extending their services. These include lack of knowledge and skills, insufficient time, inadequate training, inadequate remuneration, professional isolation, low awareness, and commercial pressures. The review also lists the mechanisms underpinning the successful implementation of CP services which include accessibility to skills and knowledge, accessibility to CP, adequate resources, marketing, collaboration and public trust and confidence.

This scoping review played a crucial role in guiding the development of the questionnaire in the subsequent stage. The review helped to identify key themes and mechanisms on the topic of interest. Specifically, the scoping review helped to identify a specific context for the questionnaire development, namely the public conceptualisation of the CP role. This information was valuable in developing a focused and relevant questionnaire that would address the research objectives most efficiently. Once this context was identified, I was able to focus on developing questions that would explore this area in-depth. The questionnaire was designed to capture the nuances of public perceptions of the CP roles and findings will be represented in the next chapter.

Chapter 4. Results of the quantitative research

4.1 Introduction

This chapter presents the first phase of a sequential explanatory mixed methods study that aims to explore public attitudes towards community pharmacy (CP). The chapter is built upon a scoping review conducted in the previous study, where key themes and mechanisms underpinning the successful implementation of CP services were identified. Only one context was selected from the scoping review for the development of questionnaires for the present study, namely the public conceptualization of the community pharmacist role. By using the scoping review to identify a specific context, I was able to create a questionnaire that was focused, relevant, and comprehensive rather than attempting to cover many different contexts, the research focused on one area where there was a clear gap in the literature. As such, the questionnaire was able to provide valuable insights into the public conceptualization of the CP services and pharmacist roles, generating knowledge that can inform policy and practice in the field.

As presented in Chapter One (**Section 1.6.2**), three out of eight of my research objectives were quantitative in nature and were addressed by the questionnaires, which were:

- **Objective two:** Explore the public's awareness of the current community pharmacist's roles and community pharmacy services.
- **Objective five:** Explore the public's attitudes towards the ability of the community pharmacist to extend their role.
- **Objective six:** Identify the public's attitudes toward using digital tools to deliver community pharmacy services.

This chapter consists of three main sections: the results of the pilot study, the questionnaire form the public, and the questionnaire that focused on pharmacy users' perspectives. The questionnaire data were analysed using descriptive statistical methods which was appropriate to address the research objectives, as described in **Chapter 2** (see **Section 2.6.4**). Each study begins with a brief introduction, followed by the results of the statistical tests done for each of the research objectives. After that, separate discussion sections highlight the strengths and limitations of each questionnaire. Finally, the chapter finishes with a summary of the findings.

4.2 Study I: A pilot study

Generally speaking, pilot studies are a small study used to assist plan a larger confirmatory investigation (Arain et al, 2010). Conducting pilot studies can be used for a variety of reasons, including testing research protocols, determining the validity of tools, estimating the recruitment rate, and estimating parameters such as the variance of the outcome variable to determine sample size (Arain et al., 2010). Considering this research, a pilot study conducted to determine if any aspects of the study methodologies or procedures need to be changed, as well as how those modifications will be implemented. Assessing the capacity to recruit participants and the characteristics of the resulting sample.

4.2.1 Results

In this pilot study, a total of 69 responses from the general public in Cardiff, Wales were available for analysis, consisting of 37 interviewer-assisted responses and 32 online responses.

4.2.1.1 Participants' characteristics

Almost two thirds of the participants were female (65%), spanning a variety of age groups and ethnicities, with approximately 66% (n = 46) below 35 years old. Other demographic characteristics are shown in **Table 4:1**. Slightly more than one third (35%) of the participants did not visit the GP within the last six months, while only 15 participants did not visit community pharmacy in same period. Reasons for visiting the CP were varied see **Figure 4:1**.

Table 4:1 Participants' characteristics

Characteristics	n (%)	Total population: 364,200 (%)
Gender		
Female	45 (65.2)	183,800 (50.4)*
Male	23 (33.3)	180,500 (49.6)*
Prefer not to say	1 (1.4)	NA
Age		
18-24 years old	21 (30.4)	54593 (15)*
25-34 years old	25 (36.2)	60200 (16.5)*
35-44 years old	6 (8.7)	44600 (12.2)*
45-54 years old	7 (10.1	41900 (11.5)*
55-64 years old	5 (7.2)	37000 (10.2)*
65-74 years old	3 (4.3)	27800 (7.6)*
75 and above	2 (2.9)	23500 (6.5)*
Ethnicities		
White	40 (58)	309100 (84.5)[&]
Black	1 (1.4)	57400 (15.6)[&]
Mixed	3 (4.3)	
Other	25 (36.2)	
Health status		
Not suffering from LTC	53 (76.8)	NA
Suffering from LTC(s)	16 (23.2)	NA

* Source is Cardiff Local Authority for 2018 Mid-Year Estimation (Cardiff Council, 2019).

[&] Source is Welsh statistic (Ethnicity by area and ethnic group for the mid of 2019) (Stats Wales, 2021).

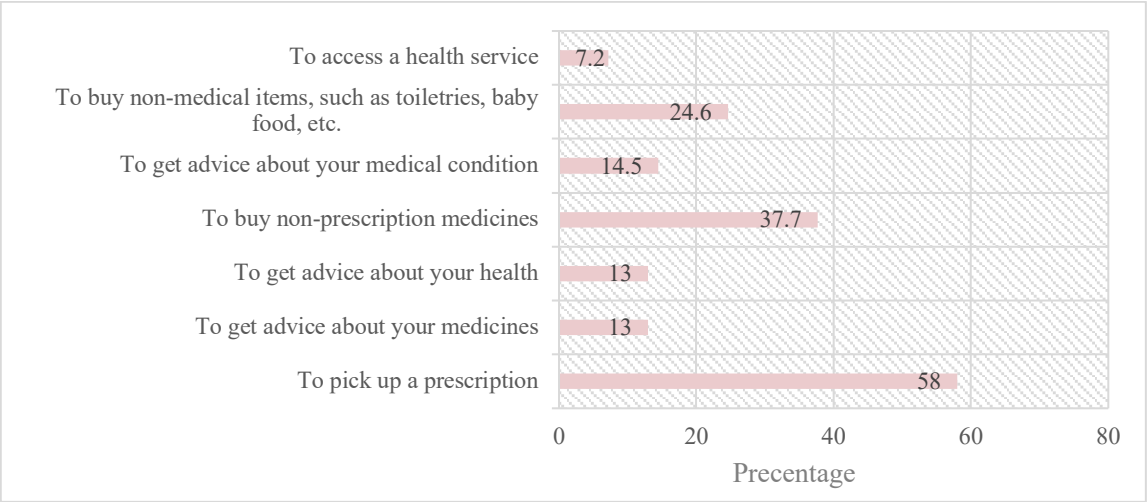


Figure 4:1 Reasons to visit a CP

4.2.1.2 Awareness among general public in Cardiff towards current community pharmacy services

Participants awareness about the services delivered in the CP varied (see **Figure 4:2**). Additionally, the participants believed that CP team could be helpful in providing advice related to medicine (71%, n = 49) and repeat prescriptions (56%, n = 39). The face-to-face mode of communication was considered most favourable by 88% (n = 61) of participants, followed by telephone counselling (55%, n = 38) and online video counselling (45 %, n= 31). Whilst 67% (n = 46) said that community pharmacists could be helpful in managing minor conditions, only 16% (n = 11) would consider the community pharmacist as a first option for seeking advice regarding these conditions. Meanwhile, 57% (n = 39) of the participants would prefer to ask for advice from friends or family, or to rely on themselves. None of the participants would call NHS 111 for advice as first option. Using the Internet was an option for many people and 71% (n=49) of participants would consider using a mobile application to identify and treat minor conditions.

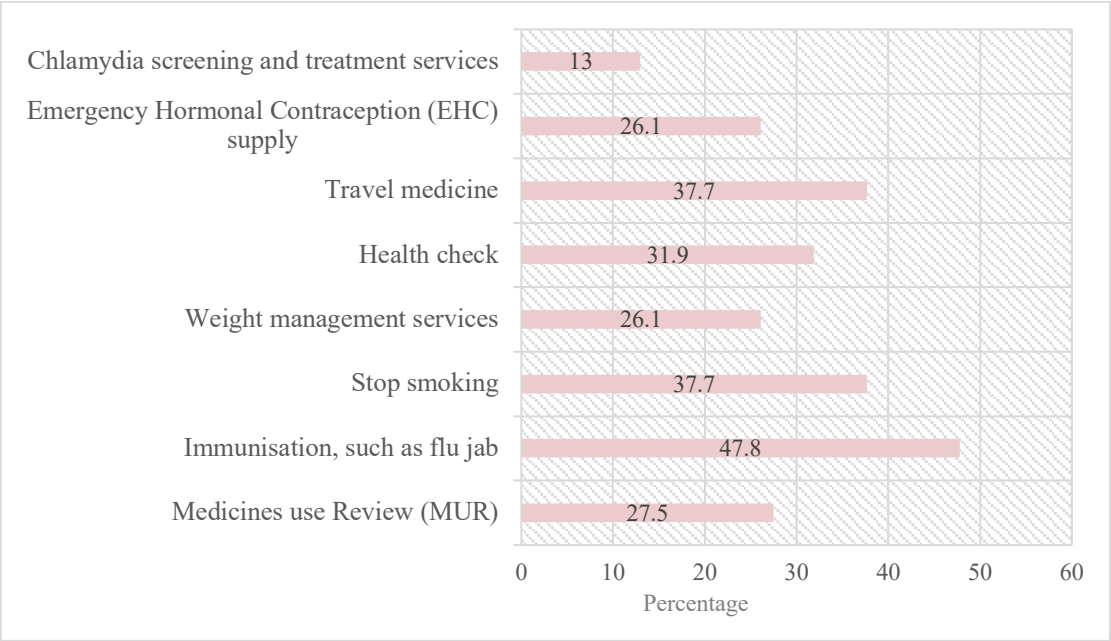


Figure 4:2 Awareness about the current CP services

4.2.1.3 Public opinion about introducing new services in the community pharmacy

Over 70% (n = 49) agreed or strongly agreed that community pharmacy teams are a good source of advice about healthy living and the pharmacy environment is suitable for promoting healthy lifestyles. However, the majority believed that social media campaigns could be useful to increase awareness about health issue. Almost half of the participants were extremely likely to use the services of an online pharmacy (i.e., ordering prescribed medicines or over-the-counter medicines (OTC) from the Internet to be delivered straight to a selected address).

Overall, the participants felt that the role of the community pharmacist in providing self-care would involve providing advice (64%, n = 44), referring to other healthcare providers (41%, n = 28), providing educational leaflets (35%, n = 24) and signposting to online materials (23%, n = 16).

The idea of introducing screening services in the community pharmacy was largely accepted by participants (81%, n = 56). In addition, 71% (n = 49) of participants felt that having pharmacist independent prescribers in community pharmacy could be useful to: give advice (73%, n = 50), prescribe medicine (64%, n = 44), adjust prescriptions (58%, n = 40) and refer to the GP (62%, n = 43).

4.2.2 Discussion

Most of the participants had visited the CP at least once within the last six months. However, awareness about the current services being delivered in the CP varied. Over the half of the participants were visiting the CP to collect prescriptions and most participants felt that the pharmacist and their team could help with medication-related tasks such as giving advice or repeat prescriptions. There was, however, an overall willingness to use pharmacy services such as screening services and those focusing on lifestyle.

When planning large-scale research project, it is critical to identify the potential for recruiting challenges and, ideally, to apply solutions ahead of time. As a result, recruiting will be more efficient and effective. I utilised a variety of methods to recruit participants, including email, in-person interviews, and friends and family snowballing techniques. In terms of in-person recruiting in public spaces in Cardiff, a number of issues were discovered, including weather, personal safety, high cost for traveling, time, and regularity issue (e.g., availability of Welsh version of the questionnaire) and the capacity to recruit people were low. Attempts to recut participants using GP and community pharmacy staff failed because of time constraints or a lack of personnel. When creating the protocol and planning for large

scale, this study helped to clarify challenges to recruitment and how they might be addressed.

However, using several distribution methods were challenging and added to my workload which contributed to a poor recruitment process. As a result, data collection procedure was refined to include only one method of questionnaire distribution which help in providing targeted, consistent, and effective recruitment process through a focused channel. Also, the length of the questionnaire could be a reason for high rate of drop out (only 69 of 210 who visited the website were competed the questionnaire). Therefore, modifying the design and layout should be considered to make it easier for participants to complete, and not overly onerous regarding the number of questions.

4.2.2.1 Limitation

The number of the participants were fairly low; hence, there is a possibility of non-responder bias, which is a common problem for health surveys (McCluskey and Topping, 2011). Furthermore, interviewer-assisted approaches could have led to social desirability bias. The survey participants were small, and a range of views and perspectives were uncovered. The generalisability of study findings may be limited by the small sample, an insufficient participation from elder population and some ethnic groups.

4.2.2.2 Recommendations

- Using only one method for questionnaire administration to reduce complexity and improve consistency.
- Adjusting questionnaire layout and design.
- Rewording some questions to make it easy to compete.

- Offering incentives to questionnaire respondents who finish the questionnaire to increase response rates.
- Measurements were taken to address some of the limitations found in this pilot study, including:
    - Two questionnaires were developed using different administration method (one used online delivery, while the other used face-to-face assistant interview).
    - Locations were selected based on the available resources (i.e., online questionnaire where target the UK population whereas face-to-face were collected only from Nottinghamshire).
    - Regarding face-to-face mode of delivery, indoor locations were selected (in particular CPs) to overcome issues identified from outdoor locations. However, locations from various socioeconomic levels should be used to ensure representative sampling.
    - A team should be engaged to assist with data collection during face-to-face interviews, and training should be given to preserve consistency and data quality.
    - While younger populations are more likely to respond to online surveys, alternative data gathering techniques should be used to obtain data that is more representative of the population.

On the basis of these recommendations, the online form of delivery was employed for large-scale projects that cover the UK. The advantages and disadvantages of using an online distributing method were taken into consideration as discussed in methodology and method chapter **Section 2.6.2**. The main advantages of using the online

distributing method were the ability to recruit participants from a wider geographical area (i.e., across the UK) and cost benefits. Since this research was not targeted at specific expert populations, having access to an internet pool of participants offers a way to address the participant issue (i.e., low number of the participants). In terms of research resources, practical consideration such as cost, and logistics necessitate the use of this form of questionnaire distribution. However, both ethical and financial criteria were taken into account while choosing the online distributing company; more information about the websites were provided in methodology and method chapter, **Section 2.6.2**.

The pilot study also demonstrates that in-person data collecting causes a delay in the research process because it is a time-consuming method, whereas Internet-based research enables a researcher to get information from a large number of individuals quickly (Milner et al., 2017). Importantly, the duration is not always based on the number of participants (Milner et al., 2017). This advantage was crucial for selecting this method due to time frame of my PhD. Furthermore, using the internet for research not only allows for the recruitment of large number of participants, but it is frequently more economical (Milner et al., 2017); reducing expenditures due to there being no need to spend time or resources on collecting data or entering the data into a database. Also, the findings are always available, and responses are handled automatically.

In terms of the participants' characteristics, I have been aware using online distribution method would affect the characteristics of participants to be more skewed for younger people. Therefore, a third study was conducted which used the face-to-face interview assistant method. This could be useful in generating more generalisable results to the population and overcome the limitation of the pilot study and online

questionnaire. Furthermore, using one method for administration for each questionnaire will be helpful in reducing the complexity and improving consistency. Considering the limitations that identified in this pilot study, the location was selected to be indoor (Boots ®). This could be useful to overcome many challenges such as safety, unpredictable weather, and cost. Also, a group of 29 undergraduate students were employed to collect data in response to the time-consuming problem associated with face-to-face interview assistant method. However, the training session was provided to maintain consistency (see **Chapter 2**, **Section 2.6.2)**. Finally, this pilot study was useful to evaluate research resources and made informed decision for the following steps.

The following section will report the results of the first questionnaire, which was named as public questionnaire that targeted the UK audience and was distributed online. The other questionnaire, named the pharmacy user questionnaire, was targeted at those who went to CPs in Nottinghamshire and employed a face-to-face interviewing assistant method (reported in **Section 4.4**).

4.3 Study II: Public attitudes towards CP services

From the previous pilot study, I developed a plan to expand the study on a larger scale (i.e., larger population and location). The pilot study was useful to refine procedure which includes:

- **Study design:** Many changes were made to the research design and format in order to minimise the amount of time required to fill out the questionnaire and make the questions easier to complete.
- **Recruitment process:** This study used two websites for recruitment process and a motivational incentive was offered to increase response rate.
- **Setting:** Internet-based questionnaire to cover the entire UK.
- **Mode of administration:** Using only one method for questionnaire administration (online self-reported questionnaire) to reduce complexity and improve consistency.

Taking these considerations into account, a questionnaire was developed to identify public attitudes regarding CP services. To achieve research aim and objectives, a cross-sectional anonymous web-based questionnaire were used for data collection. More information about the method was presented in **Chapter 2** – **Sections 2.6.2** and **2.6.3**. The next section will represent the results of the questionnaire.

4.3.1 Results

In this study, a total of 208 responses were available for analysis with a response rate of 20%.

4.3.1.1 Participants' characteristics

More than half of the participants were female (59.1%), and the majority of them were below 35 years old. Additionally, almost two-thirds of the participants identified themselves as being of white ethnicity; detailed information is presented in **Table 4:2.** Regarding the participants' geographical distribution, three-quarters of the participants were living in England, see **Figure 4:3** for more information.

The majority of participants (81.7%) visited the CP at least once in the last six months for various reasons, represented in **Figure 4:4**. In contrast, 30% of participants had not visited the GP in the last six months; **Figure 4:5** shows the frequency of visiting the GP and the CPs during this time period. The majority of the participants reported going to the pharmacy for themselves (81.7%), and only 29.8% go to CP on behalf of someone else.

Table 4:2 Participants' characteristics

Characteristics	N (%)
Gender	
Male	83 (39.9)
Female	123 (59.1)
Age	
18-24 years old	110 (52.9)
25-34 years old	67 (32.2)
35-44 years old	16 (7.7)
45-54 years old	8 (3.8)
55-64 years old	5 (2.4)
65-74 years old	0
Above 75 years old	2 (1)
Ethnicities	
White	127 (61.1)
Black	8 (3.9)
Asian	17 (8.2)
Mixed	10 (4.8)
Other	46 (22.1)
Health status	
Not suffering from LTC	146 (70.2)
Suffering from LTC(s)	62 (29.8)

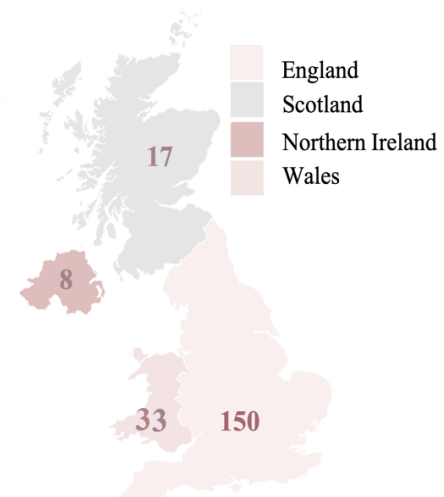


Figure 4:3 Geographical distribution of the participants

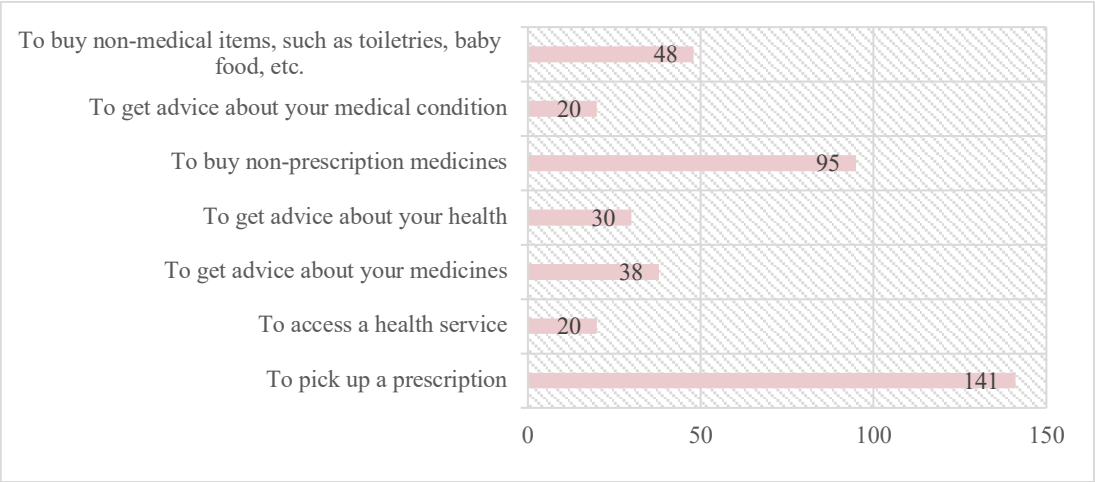


Figure 4:4 Reasons to visit community pharmacy

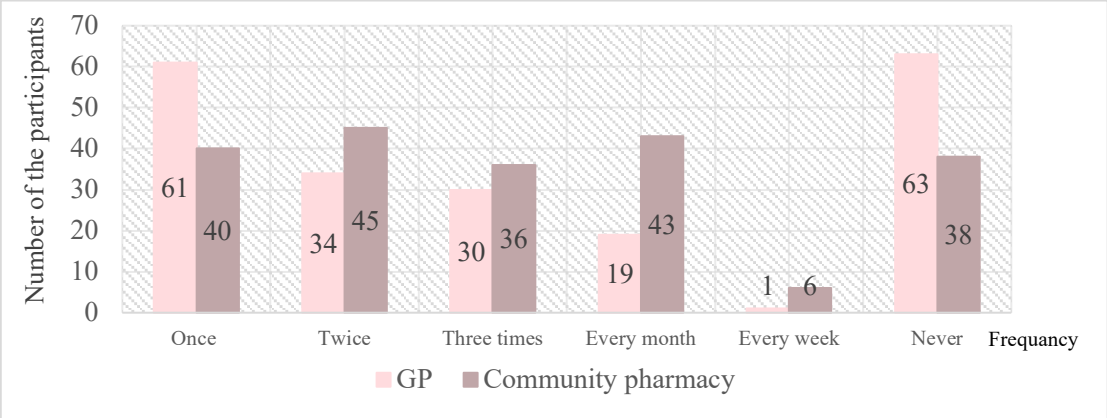


Figure 4:5 Number of visits to GP and CP over last six months

4.3.1.2 Attitudes towards current community pharmacy services

Most of the participants reported that community pharmacists and their teams could help with providing advice and support regarding medicines (n= 159 (76.4%)) and repeat prescriptions (n= 138 (66.8%)). When the participants were asked about their preferred method of communication with the pharmacist for delivering counselling, most of them preferred to communicate with the pharmacist directly (i.e., face-to-face), then telephone counselling (i.e., voice calling) after that online video call, while the home visit was the least preferred method of communication.

Regarding minor ailments, 72.4 % (n=150) of participants thought that the pharmacists in CPs and their teams could help manage minor conditions, such as cold and flu. The community pharmacist was not the first choice for the participants in getting advice to deal with these conditions. Participants preferred to rely on their personal experience or to ask their family and friends. **Figure 4:6** demonstrates the top three sources of advice for managing minor conditions from the participants' perspective.

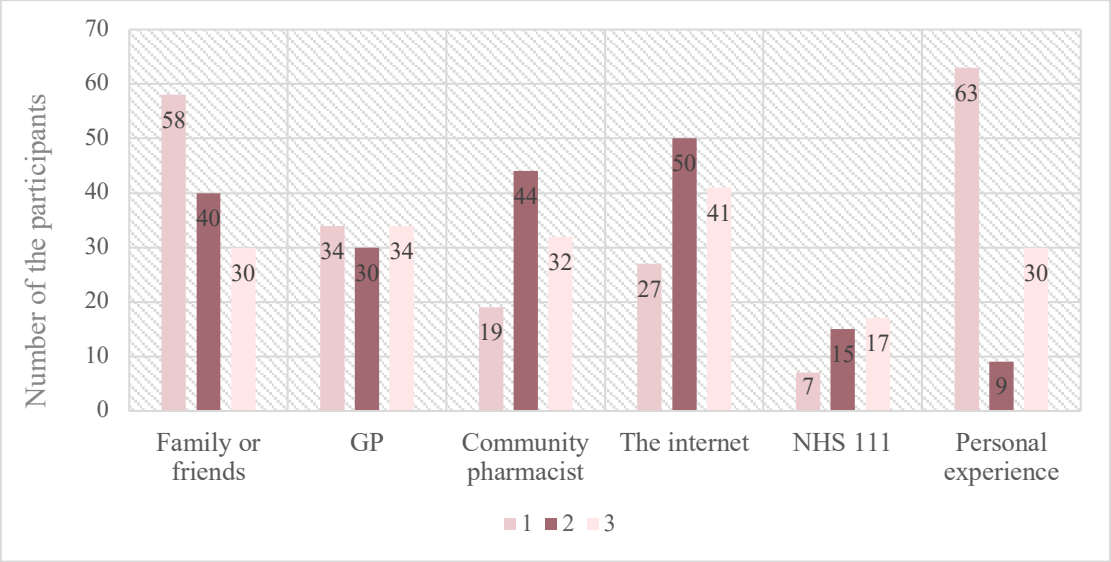


Figure 4:6 The top three sources of advice about minor ailments

However, only 38.5% (n=80) thought that pharmacists could help in managing chronic conditions, such as hypertension and diabetes. Additionally, 88 participants believed that CP teams could provide advice regarding healthy living. Meanwhile, almost two-thirds of the participants perceived that CP teams could help them with vitamins and herbal medicines.

In terms of the advanced services delivered in the CP, the participants' awareness of the services was varied. The most popular service was vaccination (n=101).

Meanwhile only 26 participants were unaware of any services in their local CP. In **Figure 4:7** more information will be represented.

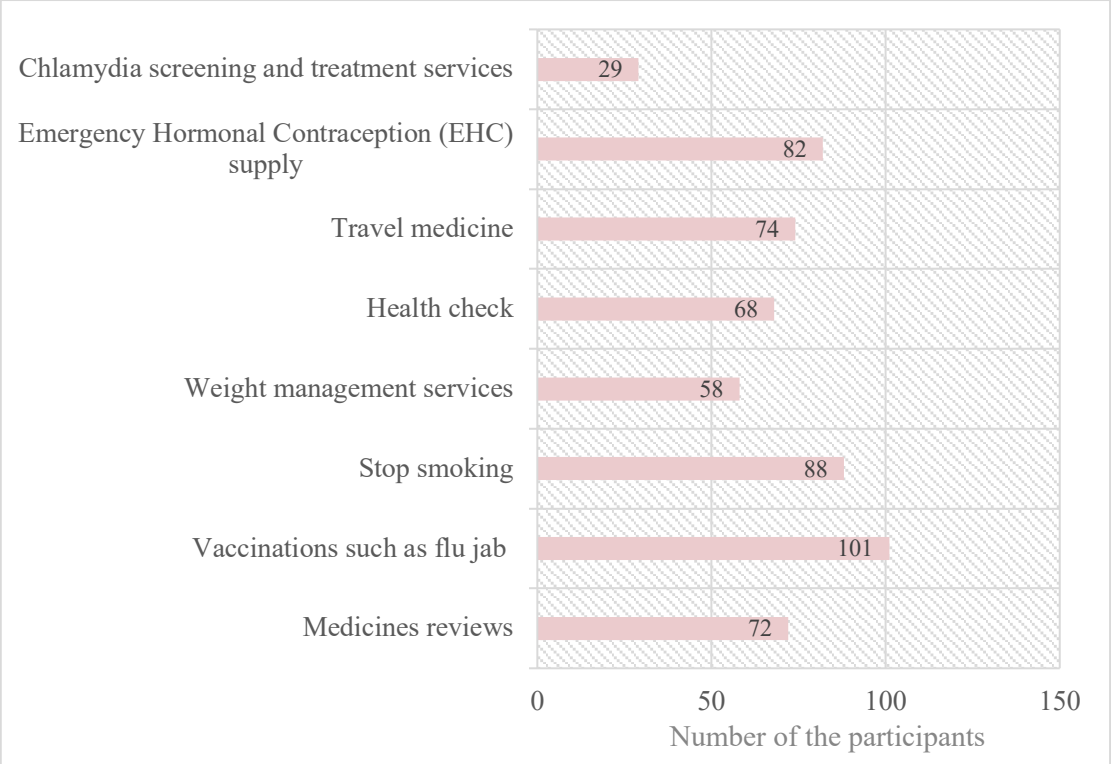


Figure 4:7 Familiarity with CP services

4.3.1.3 Public opinion about introducing new services in the CP

Turning now to the use of digital health in the CPs, most participants were open to the idea. When they asked about online CP services, 79.3% (n = 165) of the participants would be likely to use online pharmacy (where available) to order prescribed medication or OTC. Also, 72.6% of the participants would consider using mobile health applications that use artificial intelligence to identify or treat minor ailments. As regards age, there was a high tendency for participants less than 35 years old to use digital health applications, as shown in **Table 4:3.**

Table 4:3 Breakdown of participants who consent to use CP services according to their age

Age group / Agreement to use CP services		18 – 24 years old	25-34 years old	35-44 years old	45- 54 years old	55-64 years old	75 and above
Digital health	Online pharmacy	85	57	12	5	5	1
	Mobile health app	81	52	12	4	2	0
	Social media for health promotion	74	54	10	5	5	0
Clinical services	Pharmacist prescribers	77	47	9	4	5	1
	Screening services	87	55	14	7	5	1

Regarding extending the role of the community pharmacist into health promotion, participants had different views. 77.9% (n= 162) of the participants perceived that the community pharmacist's role in promoting self-care is providing advice. Meanwhile a third thought that the pharmacist could help by directing individuals to appropriate online material. Furthermore, the option of referral to other HCPs through the CP and providing educational material were considered an option for the participants to improve self-care by 40.4% and 38.5%, respectively. Additionally, 71.2% agreed that using a new platform (i.e., social media such as Facebook, Twitter, Instagram, etc.) could help in promoting a healthy lifestyle and increasing awareness on relevant health issues. Using social media was also higher in younger age as shown in **Table 4:3**.

The next question in the survey was concerned with illness prevention. The majority of participants agreed that providing more clinical services, such as screening services, in CP would be useful. 81.3% (n= 169) of the participants would like to have screening services in the CPs. However, the acceptability of conducting the test in the community setting was higher in the participants aged less than 35 years old, as

demonstrated **in Table 4:3**. In terms of the availability of independent pharmacist prescribers in CP, more than two-thirds of participants thought it would be useful. Also, over half of the participants thought that community pharmacists' capability to prescribe medicine would help them take responsibility for their health. However, using pharmacist independent prescriber services in CP was similar to other services in that the younger population would have more tendency to use the service - see **Table 4:3**.

4.3.2 Discussion

4.3.2.1 Key findings

In this study, the demographic characteristics of the participants were skewed to a younger age bracket (more than half of the participants were aged between 18 and 24) in comparison with previous study. However, this did not affect the trend of the responses since the results of this questionnaire were similar to those from the pilot study. In both studies, most participants had visited the CP at least once within the last six months and more often than the GP for many reasons. The main reason to visit CP was collecting a doctor's prescription either for themselves or someone else.

Regarding the awareness about CP, it varied but in both studies, and the most popular service was vaccination. Most of the participants felt that the pharmacist could help with medication-related activities such as giving advice or repeat prescriptions. There was, however, an overall willingness to use pharmacy services such as screening services and those focusing on healthy lifestyle. Furthermore, using digital health tool to deliver CP services were acceptable by the participants. However, the percentage was high by 20% in this study which could be explained by the skewed demographic.

As presented in **Chapter one**, the healthcare systems in UK are run differently. Therefore, the geographic distribution of the participants is important to understand public attitudes toward CP services. In this questionnaire, most of the participants were from England (72.1 %, n=150 out 208). However, the trend of the response was similar to the previous questionnaire from Cardiff/ Wales (i.e., pilot study).

4.3.2.2 Comparison with current literature

Several other studies have investigated the public's views about the role of community pharmacists (Firth et al., 2015; Lindsey et al., 2017; Taylor et al., 2012; Um et al., 2014). A qualitative study conducted in Wales found that the public was aware of the community pharmacist's role in giving advice on prescribed or purchased medicines and acknowledged them as experts in drugs; this concurs with our findings (Kember et al., 2018). However, qualitative findings are not generalisable, and the study used a small sample of participants, which means they may not be representative of the views of the public.

Several studies found that users of CPs are unaware of extended community pharmacist services (Agomo et al., 2017; Cooper and Tsoneva, 2017; Dare et al., 2017; Firth et al., 2015; Hossain et al., 2017a; Lindsey et al., 2017; Lowres et al., 2015; Lucas and Blenkinsopp, 2015; O'Reilly et al., 2015). However, the results from the quantitative phase showed that awareness about current public health services was varied, which could mean that some of the community pharmacist services may have started to become more popular.

There was an overall willingness to use pharmacy services for minor ailments, pharmacist independent prescribers, screening services and lifestyle-related health issues. In terms of minor ailments, there was high awareness regarding the pharmacist's role in managing minor conditions. In line with this, a systemic review showed that the public recognised the community pharmacist's role in managing minor ailments (Paudyal et al., 2013). However, the participants did not identify the community pharmacist as the first port of call when they needed advice for minor conditions. Meanwhile, there is a high potential for using technology (i.e., mobile health applications) for dealing with minor conditions. Therefore, digital tools could offer community pharmacists an opportunity to influence self-care in the future much more than at present.

A review published in 2017 about the public view of pharmacist independent prescriber concluded that public support for pharmacist prescribing roles was restricted to managing chronic conditions, minor ailments or repeat medications (Famiyeh and McCarthy, 2017; MacLure et al., 2013). In this study, the participants believed that the pharmacist prescriber would help them to take responsibility for their health. Generally, participants agreed that community pharmacists could be a good source of advice about healthy living. These results are in agreement with Corlett and Krska's (2015) findings, which showed that the information provided by the pharmacist to the participants were helpful in making lifestyle modifications. However, a minority of participants in the previous study felt that the information, although useful, was too superficial and that they should visit their doctor or a nurse for a more in-depth discussion about their health. Regarding the provision of screening services in community pharmacy, previous studies have suggested that the

public view about pharmacy's role in providing a range of screening services was positive, which is consistent with the findings of this study (Mackridge et al., 2016; Saramunee et al., 2015b; Weidmann et al., 2015).

Finally, this study suggested that using social media by the community pharmacist could be useful for increasing awareness regarding relevant health issues. A recent quantitative study shows the willingness of the public to use social media for health advice, which is maintained by a healthcare provider (Crilly et al., 2019b). However, these findings, together with the findings from this study, should be interpreted with caution because both studies include a high proportion of participants under 35, which is not fully representative of the public and the way of the data collection (i.e., online distribution of the questionnaire). This result may be explained in that the under 35 age group is more likely to be positive in their perceptions of social media compared to those who are over 35.

4.3.2.3 Strengths and limitations

The strength of this study is that the public have expressed their thoughts about CP services and extending the community pharmacist's role. This study found that there is high acceptability among the participants to use extended CP services and unlock the community pharmacist's potential. Furthermore, it provides insight about the public perceptions about using digital health tools for delivering CP services or for improving awareness about healthy lifestyle pre-COVID-19.

However, there are various limitations to this study that may have impacted the outcomes. First, the response rates were low, which could raise a possibility of non-

responder bias. However, this is a common problem for health surveys (McCluskey and Topping, 2011). Furthermore, the sample sizes could mean a range of perspectives were not displayed. In addition, the generalisability of findings is limited because of insufficient participation from older people and some ethnic groups and geographical areas, which may affect the representativeness of the data. Therefore, the findings should be interpreted with caution. Finally, the questionnaire depended on self-reporting behaviour which means social-desirability bias cannot be ruled out.

Some of these limitations were associated with data collection and distribution methods (i.e., web survey and online distribution method) as discussed in the Methodology and Method chapter (**Section 2.6.2**). Therefore, the following study was conducted to overcome these challenges and improve the sample size characteristics while focusing on the CP users. Nonetheless, the experience from the pilot study was taken into consideration in planning the next study.

4.4 Study III: Pharmacy users' attitudes towards CP services questionnaire

From the previous pilot study, I was made aware of the challenges that associated with the data collection method (i.e., both online and face to face questionnaire). At the same time, it will be useful to captures CP users' perspectives regarding services and collecting data on estimated usage or documenting actual use of specified CP services. Therefore, a third questionnaire was developed to address some challenges of data collection and administration methods, which are:

- **Setting:** Selection of the location based on available resources (collected solely in Nottinghamshire) and the use of indoor locations (CPs) to address concerns observed in outdoor locations.
- **Participants:** Using the face-to-face assistant interview mode of delivery to obtain more representative data and overcome demographic limitation that associated with online questionnaire (i.e., skewed data to younger population).
- **Mode of administration:** Using only one method for questionnaire administration (face to face assistant interview) to reduce complexity and improve consistency.
- **Data collection:** This questionnaire was part of a larger project in which a team (consisting of undergraduate students) collected data and received training to ensure consistency and data quality. This was an opportunity to overcome the changes that associated with resources and time constrain.

Taking these considerations into account, a third questionnaire was developed to express CP users' attitudes regarding CP services. The distinction between prior studies and this study is that past studies included the general public, but this study concentrated on CP users, which might help policymakers understand people's (who

have prior experience with CP services or who had never utilised CP services) perceptions and attitudes regarding CP services to build future policy and strategy. To achieve objectives of this study, I used cross-sectional anonymous questionnaire for data collection. More information about the method was presented in **Chapter 2**, **Sections 2.6.2** and **2.6.3**. The next section represents the results of the questionnaire.

4.4.1 Results

In total, 1474 costumers took part in this questionnaire, but we only received 1339 complete responses.

4.4.1.1 Participants' characteristic

The main characteristics of the questionnaire participants were illustrated in **Table 4:4**. However, 68% of them were women, and nearly two-thirds of participants suffered from a long-term condition. The bottom half of the table shows the diverse representation of age categories. As regards the participants' backgrounds over three quarters were white British, see **Table 4:4** which provides a breakdown of the information.

The reasons to visit CPs were varied among the participants but collecting prescriptions was the most reported reason (54.5 % n= 769 out of 1410). In addition, 31.5% (n= 445 out of 1410) of the participants visited the CPs to buy non-medical products. Regarding the frequency of visiting the CPs, this questionnaire shows that almost two-thirds of the participants visited the CPs once a month or less - see **Figure 4:8** for more information.

Table 4:4 Participants' characteristics

	N (%)	Total number of participants	Total population in Nottinghamshire 828,200 (%)*
Gender			
Male	450 (31.5)	1426	408,010 (49.3)
Female	975 (68.4)	1426	420,214 (50.7)
Other	1 (0.1)	1426	NA
Health status			
Not suffering from LTC	475 (34.5)	1378	NA
Suffering from LTC(s)	903 (65.5)	1378	NA
Age			
18-34 years old	281 (19.7)	1,428	143,191(17.3)
35-49 years old	268 (18.8)	1,428	155,194 (18.7)
50-64 years old	366 (25.6)	1,428	172,200 (20.8)
65-79 years old	411 (28.8)	1,428	127,879 (15.4)
80+ years old	102 (7.1)	1,428	45,432 (5.5)
Ethnicities			
White – British	1130 (79.6)	1419	NA
White – Irish	14 (1)	1419	NA
White – Traveller	1 (0.01)	1419	NA
Asian – Indian	33 (2.3)	1419	NA
Asian – Pakistani	65 (4.6)	1419	NA
Asian – Bangladeshi	5 (0.4)	1419	NA
Asian – Chinese	29 (2)	1419	NA
Black- Caribbean	20 (1.4)	1419	NA
Black- African	22 (1.6)	1419	NA
Mixed: White and Black Caribbean	15 (1.1)	1419	NA
Mixed: White and Black African	4 (0.3)	1419	NA
Mixed: White and Asian	7 (0.5)	1419	NA
Arab	7 (0.5)	1419	NA
Other	67 (4.7)	1419	NA

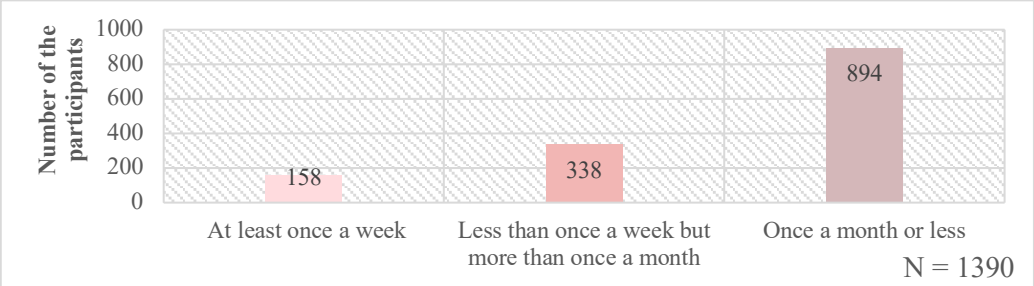


Figure 4:8 Frequency of visiting CP among the pharmacy users

However, 77% (n = 1072) of the participants prefer to use the same CP, which means staying using a specific community pharmacy and not switching to another one when in need of any services. Moreover, 63% (n = 882) stated that the pharmacy where they had been recruited for data collection is their normal pharmacy (i.e., their regular pharmacy, which they usually attend for any pharmacy-related services)- see **Figure 4:9** for more information.

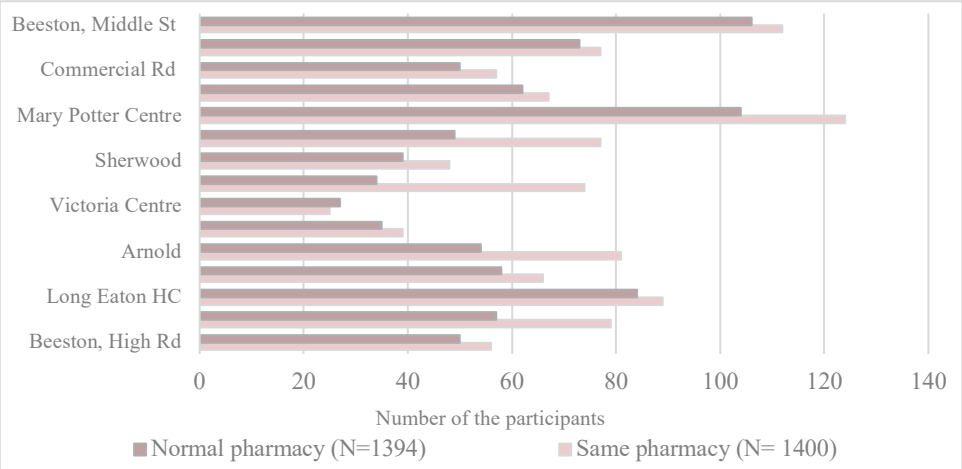


Figure 4:9 Participants distribution based on their normal CP and preference

4.4.1.2 Attitudes towards current community pharmacy services

The majority of the participants stated that community pharmacists and their teams could help them in situations related to their medication, such as providing advice and support regarding medicine (92.1%) and repeat prescriptions (85.2%). On the other hand, in situations related to managing chronic conditions, only 49.1% of participants thought that the pharmacist could help them with this. Meanwhile, almost three-quarters of the participants agreed on the CP team's capability to deal with minor ailments. More information is presented in **Figure 4:10.**

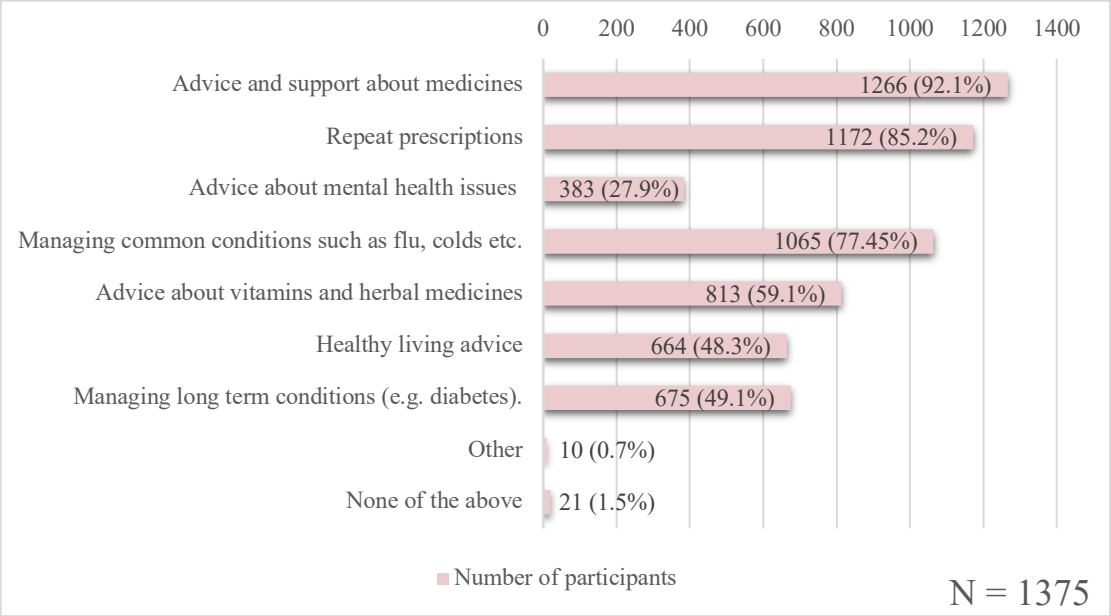


Figure 4:10 Perception about ability of CP team to help participants

The results presented above could be linked to the previous experiences of the participants with CP services. 92.6% (n= 1287 out of 1390) of the participants have visited the CP to collect a prescription, whereas only 10.9% of the participants used advanced CP services, such as smoking cessation. **Figure 4:11** shows all the services that were used by the participants in the past.

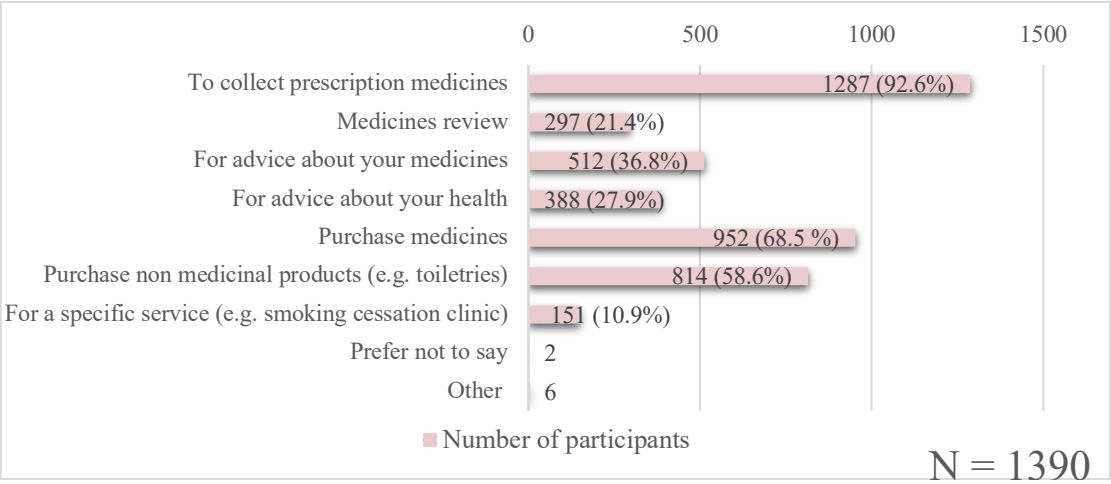


Figure 4:11 Previous reasons for using CP services

However, 58.6% of the participants agreed that they could manage their own health without any help from the pharmacist or any HCPs. These participants were visiting community pharmacies less frequently. 83.4% of participants who thought that they could manage their own their health agreed or strongly agreed that they would go to the doctor when they had to. Two-thirds of the same group agreed or strongly agreed that pharmacists could help them to manage minor conditions. In contrast, only 41.7% agreed or strongly agreed that pharmacists could help provide healthy living advice. However, 58.4% of the participants (n= 1369) felt that they know where to go when they felt ill or from whom to seek help.

Regarding the services delivered by the pharmacist, such as diagnosis, advice, and support, 59.5% of the participants thought that pharmacists could give an accurate diagnosis. Meanwhile, most of the participants (95.2%) agree or strongly agreed with the pharmacist's ability to provide advice about medication. In the case of providing advice about general health, 62.9% agreed on the pharmacist's ability to provide good advice. See **Table 4:5** for more detailed information regarding the participants' health needs and their relationships with community pharmacist.

Table 4:5 Participants' opinions regarding their health needs and relationships with their pharmacists

Statement	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)	Total number of participants
I like to manage my own health needs	394 (28.5)	811 (58.6)	114 (8.2)	58 (4.2)	6 (0.4)	1383
I prefer to only go to my doctor when I really have to	607 (43.9)	706 (51.1)	5 (2.5)	31 (2.2)	3 (0.2)	1382
I trust my pharmacist to give me an accurate diagnosis when I ask about symptoms	293 (21.2)	822 (59.5)	208 (15.1)	52 (3.8)	7 (0.5)	1382
I trust my pharmacist to give me good advice about medicines	435 (31.6)	876 (63.6)	52 (3.7)	12 (0.9)	2 (0.1)	1377
I trust my pharmacist to give me good advice about general health	312 (22.2)	865 (62.9)	155 (11.3)	38 (2.8)	5 (0.4)	1375
My pharmacist cares about me	203 (14.8)	734 (53.5)	349 (25.4)	74 (5.4)	12 (0.9)	1372
When I'm ill, I find it difficult to decide who I should consult/where I should seek help	33 (2.4)	240 (17.5)	74 (5.4)	799 (58.4)	223 (16.3)	1369
I worry that I would get in trouble if I turned up to the wrong place when I wanted to seek help	18 (1.3)	149 (10.9)	103 (7.5)	794 (58.1)	302 (22.1)	1366

4.4.1.3 Public opinion about introducing new CP services

Exploring public attitudes towards developing new CP services was one of the objectives of this research. Therefore, two main points have been the questionnaire's focus: developing new service delivery models and adapting new clinical services. The virtual pharmacy (i.e., online pharmacy) was selected for service delivery. Just over 38% of all those surveyed (N = 1362) agreed or strongly agreed that they would be interested to use an online pharmacy. However, 25.9% of the participants who used CP previously to collect prescriptions agreed that they would order medicines from an online pharmacy. In comparison, only 19% of the participants who used CP previously to buy medicines agreed that they would order medicines from online pharmacies. Additionally, the participants who visit CP more frequently have less of a tendency to use online pharmacy services.

As regards the use of other platforms such as TV, radio, billboards, and buses to advertise a healthy lifestyle, 61.9% (N = 1367) of the participants agreed or strongly agreed that this could help them increase their awareness. However, participants between 50 and 79 years of age reported a greater tendency to be affected by these platforms- see **Table 4:6**.

Table 4:6 Crosstabulation age group versus public health advertising

		Age group				
		18- 34	**35-49**	**50-64**	**65-79**	**80+**
Public health campaigns advertising	Strongly agree	32	29	42	38	5
	Agree	132	133	177	192	52
	Neither agree nor disagree	63	41	40	55	11
	Disagree	43	41	64	84	22
	Strongly disagree	9	5	11	13	7

Opinions on introducing clinical services (such as screening services) into CP differed depending on the type of service. For example, 40% of the participants agreed that

CPs are a suitable place for screening Sexually Transmitted Infection (STI), which is already available in some places (i.e., Chlamydia screening). In comparison, only 27% agreed on the suitability of the CP to conduct mental health (MH) screening. Regardless of the low motivation to use CP screening services related to MH, 43.9% of the participants who thought community pharmacists could help with MH-related issues agreed or strongly agreed to undergo MH screening services. In terms of conducting screening services for Hepatitis C and Human Immunodeficiency Virus (HIV), slightly more than a third of the participants agreed or strongly agreed on the suitability of CPs as a place to do relevant screening test. However, previous exposure to other CP services had a different effect on the participants' opinion on the suitability of the CP to provide screening services. Almost half of the participants who had used CP services before agreed or strongly agreed with the suitability of providing STI and Hepatitis C screening services in CP, whereas only 27.2% agreed or strongly agreed with the suitability of providing secerning for the MH issues. It seems that the participants' attitudes were affected by their perception of community pharmacists' abilities to diagnose their condition correctly. However, screening for STIs recorded the highest percentage of agreement (40.1%, n= 536 out 1336) while screening for MH issues recorded the lowest (27.4 %, n= 368 out of 1344).

4.4.2 Discussion

4.4.2.1 Key results

The results of this questionnaire show that most of the participants visited the CP at least once a month or less. The main reason for visiting the CP was to collect doctor's prescription or to buy OTC medication. Like the previous two questionnaires, the vast majority of the participants were thinking that the community pharmacist can help with medication-related activities such as giving advice or repeat prescriptions. Furthermore, many participants think that the community pharmacist helps with minor ailments. However, most of the participants agreed of strangely agreed that they can manage their own health, but they trust the community pharmacist in providing advice about general health. Awareness about CP varied. Unlike the previous two questionnaires, the willingness to use online pharmacy services was lower among the participants in this questionnaire. However, sample sizes were very different from the previous questionnaire, and the characteristics of participants in the online questionnaire were skewed to the younger population. With regards to the suitability of the CP to conduct screening services, the participants' perceptions varied depending on the type of the test.

4.4.2.2 Comparison with current literature

The current study found that CPs are predominantly visited for prescription dispensing and OTC medication purchases. These results are in line with those of previous studies (Hindi et al., 2018; Krska and Morecroft, 2010; Mackridge et al., 2017). Although there was some acknowledgement of secondary responsibilities in dealing with minor diseases, participants recognised pharmacists' main role as

suppliers of medication and providing advice about medicine. This finding broadly supports the work of other studies conducted in the UK that look at the public preception towards the community pharmacist's role (Gidman and Cowley, 2013; Hindi et al., 2018; Kember et al., 2018; Saramunee et al., 2014). However, a lack of public or patient awareness of extended CP services was a frequent outcome in the literature (Agomo et al., 2017; Cooper and Tsoneva, 2017; Firth et al., 2015; Hossain et al., 2017a; Kember et al., 2018; Lindsey et al., 2017; Lowres et al., 2015; Newlands et al., 2011; O'Reilly et al., 2015; Saramunee et al., 2014; Taylor et al., 2012). In two qualitative investigations, the participants acknowledged their unfamiliarity with the variety of CP services provided (Krska and Mackridge, 2014; Saramunee et al., 2014). However, this survey revealed that many participants were using extended services, which might indicate that people are becoming more aware of CP services.

In the current study, participants' belief in community pharmacists' ability to provide good general health advice. Several publications looked into people's perceptions of community pharmacists' involvement in delivering healthy lifestyle advice (Agomo and Ogunleye, 2014; Brown et al., 2012; Mills et al., 2017). These studies' participants appeared to accept and value this community pharmacy role. In regards to the pharmacist's ability to provide an accurte diagnosis, the participants were largely positive. This outcome is contrary to that of Tucker and Stewart (2015) who found that their study's participants had concerns about pharmacists misdiagnosing. Also, this study set out with the aim of assessing the participants' willingness to use online pharmacy services. Contrary to expectations, this study found that the majority of the participants were unwilling to use online pharmacy. In accordance with the present results, previous studies have demonstrated that people still favour the conventional

pharmacy (Bansal et al., 2022; Fittler et al., 2010; Fittler et al., 2013). However, this should be interpreted with caution because many of these studies were conducted before pandemic. This preference could be explained as customers are more inclined to buy from vendors they trust and feel personally linked to than from persons or organisations they are unfamiliar with (van de Ven and Koenraadt, 2017). There is often no physical interaction with the buyer with Internet vendors (van de Ven and Koenraadt, 2017). As a result, online pharmacies must employ additional techniques to establish a trust relationship with their customer (Long et al., 2022a; van de Ven and Koenraadt, 2017).

However, acceptance of the screening services was different, which depended on the type of screened disease. Among the range of services suggested to the participants, the STI recorded the highest percentage of agreement among the participants. A possible explanation for these results may be that there are already services available in CP, such as chlamydia screening. These results concur with those obtained by Arnet et al. (2018), who showed that most participants in a quantitative questionnaire support pharmacy-based chlamydia screening test. However, the acceptability of screening for mental health was lower. These results differ from those of Kingston et al (2014), who showed high acceptability of perinatal mental health screening among the public but reported that there is a lack of studies that represent the public's views about the screening of other mental health problems. This inconsistency may be due to the lack of recognition of the community pharmacist's role in mental health.

4.4.2.3 Strengths and limitations

The strength of this study is that pharmacy users recorded their actual use of CP services. Also, they have expressed their thoughts and opinions about CP services and extending the community pharmacist's role. Furthermore, this study includes a large sample size and the sample of pharmacy users was considered representative of the total population and was confirmed by analysis of total population data obtained from the Nottinghamshire County Council, see **Table 4:4**. This allowed the researcher to draw valid conclusions on current attitudes towards CP services.

There are various limitations to this study that must be acknowledged before extrapolating the results to the country. First, the coverage and survey results were limited to Nottinghamshire, and may not be reflective of the rest of the country. Second, data collection used convenience sampling and happened in a short period of time (only two weeks) before the UK went into the COIVD-19 lockdown. Since more people utilised CP services during the pandemic, perceptions may have shifted since this research was performed. Third, responses were collected from only one type of pharmacy (Boots), implying that the replies do not represent a wide range of pharmacy sizes, locations, or settings. Furthermore, because the replies to the questionnaire were self-reported, they might be subjected to social desirability and recall biases. The generalisability of this this study should be investigated further.

4.5 Summary

To conclude, this phase of the project has provided a cross-sectional view of public and pharmacy users' perceptions, attitudes, awareness, and uptake of CP services. Overall, the participants have positive attitudes towards the changing roles of the CP and using technology to deliver some CP services. Awareness of CP roles and services varied among the participants, but the community pharmacists' potential was recognised. Also, there was high interest in using the proposed CP services. The results of these questionnaires could be used to inform the future development of the community pharmacist's services.

These results will also be used to inform the next chapter of this thesis, which will provide deep insight into the participants' perceptions and more information about people's needs in terms of CP services, along with the facilitators and barriers to using CP services.

Chapter 5. Results of qualitative research

5.1 Introduction

This chapter presents the second phase of a sequential explanatory mixed methods study. In the first phase of the study, quantitative data was collected to determine the public attitude towards CP services in the UK. The second phase of the study focused on qualitative research that aimed to gain an in-depth understanding of the underlying reasons behind the quantitative findings. This phase involves interviews with members of the public. The results from the previous chapter were used to develop the semi-structure interview guide. This chapter presents the themes generated from the interviews to address six of overall thesis objectives that include:

- **Objective two:** Explore the public's awareness of the current community pharmacist's roles and community pharmacy services.
- **Objective three:** Identify perceived outcome(s) from extending the community pharmacist's role.
- **Objective four:** Identify stakeholders' perceptions about facilitators and barriers to using the community pharmacist's services.
- **Objective five:** Explore the public's attitudes towards the ability of the community pharmacist to extend their role.
- **Objective six:** Identify the public's attitudes toward using digital tools to deliver community pharmacy services.
- **Objective seven:** Explore the public's perceptions about their needs from community pharmacists.

This chapter highlights the findings of the study were mapped to the 7Ps marketing fireworks, which is a framework used to analyse the different marketing elements that

contribute to the success of a service and provide insights into areas where CPs can focus to improve their services and increase patient satisfaction. Then separate sections present the discussion and the study's strengths and limitations. Overall, this chapter highlights the importance of conducting mixed-methods research and how mapping the findings to a marketing framework can provide insights into improving CP services. The chapter concludes by stressing the importance of continuing research to understand public attitudes towards CP services further. This understanding is vital in improving the quality of care provided to patients and improving health outcomes.

5.2 Results

5.2.1 Participants' characteristics

A total of 64 participants originally agreed to take part in this phase of the study, but only 12 participants were interviewed. The study was terminated due to Covid-19 pandemic situation (i.e., the UK nationwide lockdown). This decision was taken due to the huge impact of the pandemic on service delivery for both GPs and CP services, which could have dramatically influenced the participants' perceptions. The participants had different exposures to and experiences with CP. Most of the participants were female, and their age varied between 18 and 60 years; for more information about the participants' characteristics, see **Table 5:1**.

5.2.2 Themes

During the process of iterative thematic analysis, emerging codes were mapped to the 7Ps marketing mix framework (product, price, place, promotion, people, process, and physical evidence) and several themes and subthemes emerged. The 7Ps allow a better understanding of what the public want/need from the community pharmacist, whilst accounting for the influence of public perceptions regarding the design of CP services,

method of service delivery and communications with community pharmacist. The nature of the iterative analysis facilitated a more in-depth explanation of the underlying topic. The main themes are summarised in **Figure 5:1**. Aside from the 7Ps framework, no additional underlying themes were discovered.

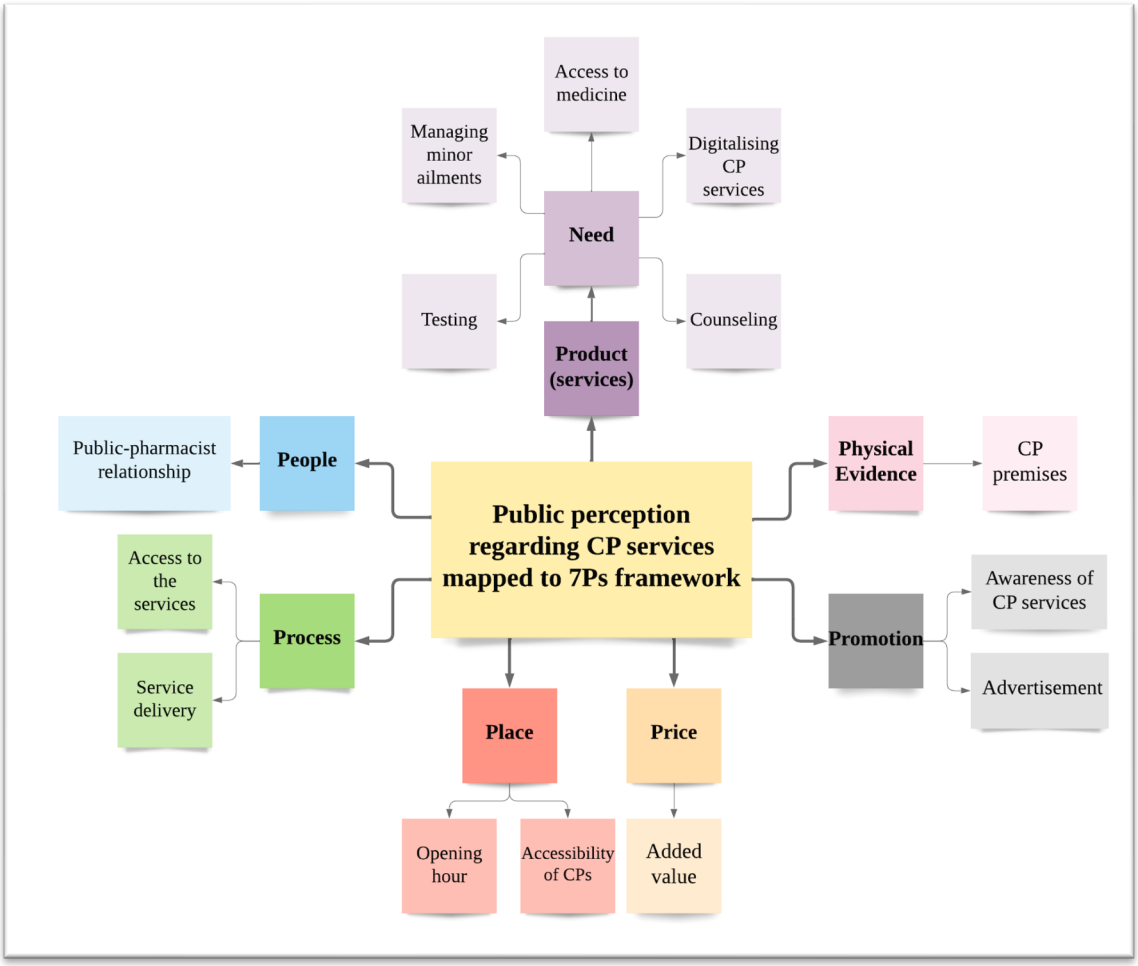


Figure 5:1 Conceptual framework developed from mapping themes/subthemes onto 7Ps marketing mix components

Table 5:1 Demographic characteristics of the interview participants

Participant identification	Gender	Age	Ethnicity	Health status	Frequency of using CP
P1	Female	54	White/ British	Primary biliary cholangitis	Regular user
P2	Female	18	White/ British	Multiple sclerosis	Regular user
P3	Female	21	White/ British	Irritable bowel syndrome	Occasionally
P4	Female	54	White/ British	Hypothyroidism	Regular user
P5	Female	57	White/ British	Anxiety	Occasionally
P6	Female	23	White/ Greek	Not suffering from any known long-term condition	Occasionally
P7	Female	28	White/ American	depression, anxiety, and allergy	Regular user
P8	Female	33	Latin American	Not suffering from any known long-term condition	Not regular user
P9	Female	28	White/ British	Chronic sinusitis	Regular user
P10	Male	60	White/ British	Hypertension, diabetes, high blood cholesterol	Regular user
P11	Male	25	Indian /British	Not suffering from any known long-term condition	Not regular user
P12	Female	43	Chinese/ British	Not suffering from any known long-term condition	Not regular user

5.2.2.1 Product "NEED"

Participants discussed their expectations regarding the developing role of community pharmacists. They generally agreed on the value of developing the community pharmacist's role in the future. The participants perceived that their needs involve many areas, which include: (1) counselling, (2) access to medicine, (3) managing minor ailments, (4) testing, and (5) digitalising CP services. More information will be provided below.

5.2.2.1.1 Counselling

Most of the participants indicated their need to be provided with information and advice through patient education. Participants recognized that community pharmacists are an important source of information for patients regarding medicines and general health issues, and they also could benefit from providing follow-ups. However, when the participants were probed about this, all participants mentioned that pharmacists rarely offered them information related to general health.

"Information about the drug in an easy, understandable way. And follow up".

P7, Regular user of CP

"Advice regarding health and access to knowledge which will guide my medication use when [I] have problems".

P11, Not regular user of CP

When the participants were probed further about how the community pharmacist could provide and deliver information and advice, it appeared that they would prefer it delivered through leaflets. The participants also suggested that the community pharmacist could provide patients with information and advice on supporting healthy lifestyles. However, it appeared that healthy lifestyle support from the community pharmacist would be improved through providing more detailed explanations.

"When the people go in to pick up a prescription, they could pick up a leaflet take it home they probably will get information. You can get the information".

P4, Regular user of CP

"Maybe the pharmacist can explain things that we should do to stay healthy and provide more information about healthy lifestyle. These things are important for self-confidence and self-esteem. And also, how the healthy lifestyle could reflect on your body and make you more energised and much better"

P11, Not regular user of CP

"During the health check they do not tell you anything. So, actually the improvement should be through telling you what they are checking. [I] think most of the people they do not know the things that have been checked".

P3, Occasional user of CP

5.2.2.1.2 Access to medicine

Another subtheme that emerged from that data was related to the need for access to medicine. Many participants perceived that CPs could play an important role to provide better access to medications in particular when people face difficulties

accessing GPs. They thought that extending the role of community pharmacist to prescribing was natural due to their drug-focused activities.

"[I] think it will be good if the pharmacist can help through writing prescription when you cannot go to the doctor. Sometimes it takes so long to get an appointment, so [I] think if the pharmacist can prescribe this will be great….. pharmacists are very knowledgeable about medicine so [I] think they can prescribe medicine".

P11, Not regular user of CP

When the participants were probed further about the conditions or treatments that the community pharmacist should be capable of prescribing, they cited many conditions and treatments. Most of the participants mentioned minor ailments. Some participants also mentioned repeat prescriptions. Meanwhile, most of the participants agreed about restricting antibiotic prescribing to the GP unless it was related to a minor infection, such as a urinary tract infection.

"[I] think prescribing medications for minor stuff which is easily diagnosed will be great".

P5, Occasional user of CP

"For example [I] have a repeat prescription so [I] go to the pharmacist, they could prescribe it to me and [I] do not need to go to the GP. If the community pharmacy can do something like this, it will be great."

P9, Regular user of CP

"[I] think it will be useful for people who need contraceptives or may have a well-known condition so when the condition appear the can get the medication like the people who used to get UTI they always knew that they should get that antibiotic … [I] think it will be really useful for condition like this".

P6, Occasional user of CP

5.2.2.1.3 Managing minor ailments

All the participants recognised the role of the community pharmacist in helping them to manage minor conditions. The participants perceived that CPs are ideally placed to allow them to access quick and convenient care without the need for an appointment.

"[I] think the pharmacist is equivalent to the doctor especially when it comes to minor things and speaking to someone you know so you can trust the person".

P6, Occasional user of CP

5.2.2.1.4 Testing

Offering screening tests emerged as a subtheme as well. Many participants identified the community pharmacist's role in illness prevention through offering screening services. Participants thought that having an opportunity to do tests in the CP would be useful for the early detection of diseases.

"[I] think it will be useful because [I] can run tests, and if it shows any problem, [I] can seek help early. You know, cancer, for example, happens all the time".

P11, Not regular user of CP

Some participants had to be prompted to discuss the types of screening that could be useful to be delivered in the CP. Participants suggested screening services such as

blood pressure and cholesterol testing, blood glucose, cancer, mental health, and sexually transmitted infections.

"[I] think definitely diabetes, cholesterol checks, screening for high blood pressure problems…nothing specific unless there is facility for things like allergy".

P4, Regular user of CP

"Things like breast screening. For instant breast screening if it is just on the corner, it will be easy to travel and get that's done. [I] do not know what else can do in the pharmacy, but there is bowel screening now. It is always a good thing."

P1, Regular user of CP

"[I] think it will be good if there are screening services for depression and blood tests".

P11, Not regular user of CP

"So, STD screening ... Or anything related to sexual health. Especially for people in my age group. It will be quite useful."

P2, Regular user of CP

5.2.2.1.5 Digitalising CP services

Although the participants were aware of technologies such as telehealth and mobile health applications, they were not currently using any technology in relation to CP services. However, most participants recognised that there was a potential place for such technologies in CP, in particular with online pharmacy services to order prescriptions or OTC medication.

"[I] think if the doctor writes prescriptions and then [I] have an option to get the prescription delivered to me through the pharmacy website, this will be really useful".

P11, Not regular user of CP

Participants also mentioned that internet technologies could be used by the community pharmacist to support their patients. A few participants described that digital consultations could be used in supporting self-care to meet particular needs.

"For minor conditions, digital consultations are actually good in a way, but again they only help when you do not need to be seen and you do not need a physical examination and [I] do not see any reason why the pharmacist could not do that you know? So yes, it should be telephone consultation available, or videos call being made to pharmacist at any time of the day or night, and it does not have to be pharmacist work in particular pharmacy it could be representative of the pharmacy that covers your area and then we can see them"

P10, Regular user of CP

5.2.2.2 Process

5.2.2.2.1 Access to the services

The participants indicated that they could access community pharmacist services through either active recruitment by pharmacy staff or GP referral. However, participants felt that service endorsement by healthcare providers was crucial for service uptake regardless of the type of the service. One participant perceived that lack of referral to CP services by GPs was largely influenced by the financial benefit.

"My pharmacist mentioned [I] can do the flu jab. They said that you are eligible, so why do not you come and get it from us? And they knew [I] was smoking and they told me we can do smoking cessation for you."

P10, Regular user of CP

"*If [I] am recommended using them by my doctor or health professional and [I] have a health issue [I] need to deal with through the chemist, like diabetic management, even medication checks or something like that, [I] will not hesitate to use it."*

P4, Regular user of CP

"[I] get the feeling that maybe GP either they do want the pharmacist to help them ease the burden, or maybe they do not. Certainly, the GP gets paid extra money for and of course [I] do not want to give those away, so every time [I] get my flu jab at the pharmacy, my pharmacy gets the fee for it instead of my doctor".

P10, Regular user of CP

5.2.2.2.2 Service delivery

Pharmacist education and training were recognised by the participants as key factors which influence CP services delivery. However, the majority of participants think that the community pharmacist has adequate knowledge and training to extend their role.

"Pharmacists sometimes have better knowledge than some of the GPs…. [I] think pharmacists are more trained (..) much more well trained on medication and in which suitable for what, what is the function and indication for certain medication…. [I] think [I] have trust in the pharmacist to know medically.."

P1, Regular user of CP

Meanwhile, some participants perceived that inadequate time and insufficient staff negatively influenced CP service delivery. In relation to the business of the CP, workload and number of staff were the main barriers. Participants thought that the community pharmacists appeared to have no time to discuss their concern when they visited the CPs. In particular, many participants suggested that inadequate numbers of staff were increasing the pharmacists' workloads, making it more difficult for them to find the time to provide advice to CP users.

"*When [I] go to pick prescription from the pharmacy, they are very busy. So, it is just going in and going out. [I] do not usually see people go and ask them".*

P2, Regular user of CP.

"Staffing and staffing levels. They need to have more staff because if [I] want more, I am not going to get it. They do not have enough stuff."

P10, Regular user of CP

One participant also identified funding as a barrier for providing and developing CP services. The participant acknowledged that insufficient funding hinders CP practice development. Additionally, the participants stated that pharmacists were more interested in CP services that generated profit rather than in free services.

"They are evolving into something, but they are very slowly ..... because they do not invest enough money in this system to make them better".

P10, Regular user of CP

"None of the pharmacies were actively involved in this because nobody pays for it, so no one wants to do it……. They are private business owners, and they try to make money".

P10, Regular user of CP

In light of CP services digitalisation, the participants raised concerns about the services' reliability. Some participants felt that they could not trust the digital service and they prefer face to face services.

"[I] think it will be easier for verification if [I] go to speak to them regarding any problems, but on the phone, it is harder to go through things and [I] cannot see their face. It will be easier for me to understand if it is face to face."

P2, Regular user of CP

5.2.2.3 People

5.2.2.3.1 Public-pharmacist relationship

Many participants stated that building relationships with community pharmacists would be critical to using the CP services. However, participants acknowledged the importance of the pharmacists' professionalism. For example, being friendly, approachable through casual conversations and possessing excellent communication skills.

"You need to find the kind of pharmacy which you can build relationship with them…. [I] think sort of knowing your name and your condition this should be part of their job description. You know if the people come often to the community pharmacy it will be nice if the pharmacist looks excited when seeing the patient, offers coffee, and being

talkative or chatty with a friendly face. [I] think [I] will enjoy the pharmacy which will establish trust so [I] can discuss private issues or confidential information. [I] think this will be sensible for establishing a professional relationship".

P6, Occasional user of CP

Previous experience could influence how people use CP services. Participants who had positive experiences with their pharmacist were more open to the idea of using new services.

"If you have a person you are already buying your medication from or you visit regularly, you know the person, and if this person is giving the information, you will believe them, because you know the source".

P8, Not regular user of CP

5.2.2.4 Place

Many participants were positive about using CP services, perceiving community pharmacy as the ideal place for providing healthcare services such as minor ailments, general health advice and screening services. This was due to the accessibility of CP locations and opening hours, as described below.

5.2.2.4.1 Accessibility of CPs and opening hours

The majority of participants indicated that they felt providing health services in the CP would be useful and effective due to the accessibility of the CP and the difficulty in accessing GP appointments. Some of the participants identify the CP flexible

opening hours were great advantage over GP. Therefore, the participant preferred the CP over GP practices.

"The thing about pharmacy, you can go for advice or anything and you do not have to have an appointment, whereas when you go to the GP you need to book an appointment to see them… So, it's going to be a lot easier, a lot quicker as soon as your problem arises, you went to your local pharmacy, and see them".

P10, Regular user of CP

"They are open longer than the doctor…the location of the pharmacy is literally a two min walk, and doctor is further and again my pharmacist works seven days a week while my doctor is only working five".

P1, Regular user of CP

5.2.2.5 Promotion

5.2.2.5.1 Awareness of community pharmacy services

The participants' awareness of the community pharmacist's services was influenced by their frequency of visiting the CP. Generally, participants who rarely visited the CP were unaware of most of the services offered by pharmacists. However, there was concern among participants about how low awareness could prevent them from taking full advantage of the community pharmacist's services.

"[I] did not know the pharmacist could help with many things, if [I] had been aware of that, [I] probably would have gone".

P6, Occasional user of CP

Many participants felt that increasing public awareness would facilitate an increased use of CP services. Several participants emphasised the need to demonstrate the pharmacists' ability to offer more than the traditional role, which is medication supply. In relation to the services, the participants acknowledged their need to know what exactly was offered in the CP.

"Market the services a bit more…. [I] think many people know about it, but I feel they can make it more known what exactly they do, if you go to the particular chemist you know what is actually available".

P4, Regular user of CP

5.2.2.5.2 Advertisements

Participants suggested many ways to promote the CP services, including offering services during CP visits, leaflets, posters in the window, social media, and advertising through GP practices.

"If they want to get enough people, they have to market accordingly. And they have to make sure that either people do not miss the information that they put it up on the windows, or they tell the people when they go into the pharmacy about the things."

P10, Regular user of CP

"[I] imagine poster or leaflet. They could use electronic messaging in GP surgery and there are a lot of different ways. [I] suggest the local press may be."

P4, Regular user of CP

"*Essentially there is a way to do it now the people they do not give attention to things like poster the traditional thing. They need to come up with more new stuff. At the*

same time, it will feel strange for the pharmacist to have a social media account and do things like that. …. when you pay for marketing team on the social media you can target specific people"

P5, Occasional user of CP

5.2.2.6 Physical evidence

In this research, the physical evidence aspect of the 7Ps relates to the CP premises. There was agreement between most participants that current CP premises give the impression of a commercial business rather than a place that provides healthcare services.

"[I] think now the pharmacy is more like a drug store. You go there and you forget you are in the pharmacy. You can buy shampoo, soap, makeup and then oh you realized you are in the pharmacy. Maybe because of that you do not remember this store provides medical services. In your mind it is a drug store rather than a pharmacy"

P8, Not regular user of CP

Also, many participants felt that the pharmacy environment was not an appropriate venue for private discussions due to limited space and size of the CPs. A particular concern was about how busy CPs often get and the risk of personal conversations being overheard.

"It seems like anyone can hear your complaint, so if [I] had personal issue [I] feel [I] cannot discuss it with the pharmacist".

P12, Not regular user of CP.

Additionally, there was a lack of awareness of the availability of a private consultation room in the CP among most of the participants. One participant suggested that a private area for consultation in the CP could be useful to overcome privacy and confidentiality issues. They also noted that it may encourage pharmacy users to discuss more sensitive issues with their pharmacists.

"Having a private area for certain treatment, [I] think it will be a quite useful".

P2, Regular user of CP

5.2.2.7 Price

As mentioned in **Chapter 2**, CP services are free of charge and are commissioned by the government across the UK. Therefore, the prices were referring to the value that participants get from using CP services.

5.2.2.7.1 Added value of the community pharmacist's services

Most of the participants valued the convenient and the easy access to health services provided by the community pharmacy, and these factors influenced their choice to use the community pharmacist's services. They explained that they were able to obtain a professional service much faster without the need for an appointment.

"It's easier - [I] do not have to book an appointment like at the GP. [I] think it is just better go to the pharmacy. For having an appointment with the GP, it will take a week or something, but in the pharmacy it's just walk-in service… it's more convenient."

P3, Occasional user of CP

In regard to digitalising some of CP services, the participants identified many benefits of doing this, including convenience, privacy, and timesaving. The primary advantage which emerged from the data was convenience. Many participants perceived that digitalising CP services (i.e., delivery or teleconsultation) would be much easier and more convenient for them. One participant also thought it would be useful because it provides more options for pharmacy users.

"It is more convenient so [I] do not actually need to ring or go personally to ask for the prescription. It will be easier just to order it online to my work. Sometimes it is really hard to get someone on the phone. At some times of the day, they get really busy, but if [I] get it online it would be much easier. And probably [I] would not forget to order my repeat prescriptions if [I] get it online .. it is always helpful to have more option".

P3, Occasional user of CP

Another perceived value of having a teleconsultation with a community pharmacist is patient privacy. Participants acknowledged privacy as a benefit of using online services, especially when it is related to a sensitive topic.

"Privacy – [I] can go online to discuss things sensitive to me, maybe a female issue. Personal things will discourage me to go and ask somebody about it face to face".

P4, Regular user of CP

One final value recognized by the participants was the impact of the service digitisation on time. Participants perceived that using the technology to deliver CP services would influence waiting time positively.

"[I] think this could be an effective service because [I] will be likely less waiting time, and also will be another way to build relationship with community".

P9, Regular user of CP

"Save time for queuing people. [I] think a dedicated line number for certain services through the NHS it will be handy for the people it they feeling they really do not want to go to the doctor then they can just be in their comfort zone in the home and not spared any bugs and not come to a public place, just call the pharmacist, and ask for help".

P1, Regular user of CP

5.3 Discussion

5.3.1 Key qualitative findings

The qualitative aspects of this research used marketing theory to address the following study objectives: eliciting public need and perspectives towards community pharmacist services using a theoretical framework (i.e., 7Ps marketing mix), which clarified several areas for development. Using marketing framework could influence public awareness regarding the community pharmacist's role and increase utilisation of CP services.

The findings from this study highlighted community pharmacists' potential to fulfil public needs and reduce the workload on other HCPs by providing services such as promoting health, conducting screening, offering access to prescriptions, and managing minor ailments. However, this study also highlighted the public intention to use these services; therefore, improving public awareness through service promotion

is essential. Appropriate campaigns to promote the community pharmacist's services both locally and nationally could be important to improve public and other HCPs perceptions. Furthermore, using this marking framework was useful to facilitate development of the CP services through identifying empirical factors for successful service provision. The findings also revealed challenges in relation to the delivery of services.

5.3.2 Comparison with literature

The participants identified five needs: counselling, access to medicine, managing minor ailments, testing and availability of digital health tool.
The participants highlighted the need to get more information from the community pharmacist. However, several reports have shown that how community pharmacists struggle to provide adequate information to their patients (Atkin et al., 2021; Ingram et al., 2018; Turnbull et al., 2020). Also, this research found that participants who reported the need of providing prescription access through the community pharmacist which were consistent with the literature (MacLure et al., 2013). While the majority of respondents were in favour of making a limited number of medications available from pharmacist prescribers, the themes raised concerns that needed to be addressed.

With regards to the need to manage minor ailments in the CP, participants acknowledged the importance of community pharmacists in treating minor diseases and preferred to see a pharmacist when their symptoms were deemed minor or unworthy of a GPs time. Participants also mentioned frequently using pharmacies for convenience because they could not secure an appointment with their GP. These results are consistent with data obtained from a systematic review which illustrates the

importance of the pharmacist's role in managing minor ailments (Paudyal et al., 2013). Furthermore, participants in this study recognised testing or screening services as need. However, prior research indicates that the role of CPs in screening and intervention is relatively unknown (Saramunee et al., 2014). In UK, many of these services have been added into CP such as cardiovascular screening, diabetes screening, weight management, chlamydia screening, and alcohol-related services. However, previous research has demonstrated that screening and intervention studies are both feasible and desired among pharmacy users (Baraitser et al., 2007; Buchanan et al., 2020; Dhital et al., 2010; Mackridge et al., 2016).

All the participants showed an understanding of community pharmacists' traditional roles, but a more limited understanding of newer services, notably those related to public health. The findings from this phase consolidates data from previous research and adds to existing evidence that there is a perceived need to enhance public knowledge and awareness of CP services and extended role of the community pharmacist (Agomo et al., 2016; Evans et al., 2016; Lucas and Blenkinsopp, 2015; Mantzourani et al., 2021; Saramunee et al., 2014). For example, the "Ask Your Pharmacist" campaign in England plays an important part in promoting community pharmacists' role in managing minor ailments for both the public and HCPs (Anderson, 2007). Therefore, different approaches were suggested by frequent community pharmacy users to promote CP services, such as posters and leaflets in pharmacies, in combination with being proactive in telling pharmacy visitors about the services provided by the pharmacist. Using different ways to promote CP services could be effective in reaching the population. These findings broadly support the work of other studies in this area, which have shown the need to use different methods to

increase the level of awareness and service utilisation (Hindi et al., 2018; Hindi et al., 2019b; Kember et al., 2018; Saramunee et al., 2014).

In terms of accessing CP services, the results from this study indicate that GP endorsements of community pharmacist services or previous personal experience are the factors most likely to affect people's uptake of CP services. There are similarities between the attitudes expressed by participants in this study and those represented by Hindi et al. (2018) about good personal relationships with pharmacists and inter-professional networking support (i.e., GPs and other HCPs) to increase service utilisation. Furthermore, public perceptions about pharmacists seem to affect the public's use of CP services. The participants acknowledged that pharmacists are well trained and educated healthcare professionals who can provide public health services or drug-related activities. This finding is contrary to those of some previous studies, which have concluded that the public perceives pharmacists' roles as limited to dispensing and managing minor ailments (Hindi et al., 2018; Saramunee et al., 2014). Consistent with the literature, this research found that participants also supported the pharmacist prescribing role and were confident in their ability (Famiyeh and McCarthy, 2017).

From the participants' perspective, accessibility of the CP and convenience were the most important advantages that enhanced the use of pharmacist-led services. These results are in line with those of previous studies (Gray et al., 2016; Hattingh et al., 2016b; Horsfield et al., 2011; Kember et al., 2018; Lindsey et al., 2017; McMillan et al., 2013; Ogunbayo et al., 2017; Um et al., 2013; Um et al., 2010). In addition, consistent with the literature, this research found that the non-appointment nature of community pharmacists makes people prefer community pharmacists over GPs

(Kember et al., 2018; Tucker and Stewart, 2015). At the same time, the commercial image of the CPs reinforced negative perceptions among the participants towards their suitability to conduct extended healthcare services. Other environmental features, such as the size and space of the CPs, were mentioned by the participants; such factors could have an impact on their privacy and prevent them from using the community pharmacist services. The participants were worried about the consultation being overheard, particularly with sensitive issues. The perceived lack of privacy was repeatedly discussed in the literature as a barrier to using advanced CP services (Hattingh et al., 2016a; Hattingh et al., 2017; Knox et al., 2016; Liekens et al., 2012; McMillan et al., 2013; McNaughton et al., 2011). Moreover, the results of this study showed low awareness regarding the availability of consultation rooms. This finding was also reported by Hindi et al. (2018) and Saramunee et al (2014). However, it is important to ensure that CP premises are suitable for delivering new services.

Another issue is pharmacists' time and workload. The findings from this study show that the participants perceived that there was a high workload on the pharmacist, which prevented them from asking for help or advice. These results agree with those obtained by a systematic review which concluded that an insufficient number of staff and high workload prevent the community pharmacist from delivering extended services (Hindi et al., 2019a). Thus, it is necessary to delegate technical tasks such as medicine supply to community pharmacy support staff and improve the level of staffing in the CPs.

In digitalising CP services, there is great potential for pharmacists to contribute to public healthcare by incorporating digital health tools into their practice. Currently, CPs are engaging with their users by providing online pharmacy services, which

include ordering prescriptions or OTC medication, refills and booking services. However, further development to use mobile health applications and social media could be incorporated to provide medication-related information or general health advice. This study has identified the participants' perceptions regarding digital health and their willingness to use online CP services in addition to social media and mobile health applications for health advice. The participants already engaged with health digital tools to access information, particularly for minor ailments. However, most participants welcomed further expansion of their use to the digital health resource provided by the community pharmacist. These results agree with Crilly et al. (2019) findings which showed the public's willingness to use digital tools run by healthcare providers. Concerns were expressed about replacing face-to-face communication with digital communication tools. These results may have changed because more people have used digital health resources during the pandemic.

The participants recognised many advantages of incorporating digital health tools into CP services, including convenience, privacy and saving time. In accordance with the present results, previous studies have highlighted convenience as an advantage of using digital health services (Cain et al., 2010; Crilly et al., 2019b). In contrast, the trust issue appeared to be a disadvantage of using social media and mobile health applications. This finding was also reported by Crilly et al. (2019). Therefore, clear guidance should be established for community pharmacists on how to design trustworthy digital resources and for the public on how to identify these resources.

5.3.3 Strengths and limitations

The qualitative technique was employed to enable for in-depth examination of quantitative results to influence future work and provide data to inform policy. The

use of telephone interviews introduced many advantages (see **Chapter 2**). One of the major benefits was enabling the participants from across the UK to take part in the study, which helped to incorporate a wide range of experiences and maximise the transferability of the findings. In practice, the ability to take part from any location was appealing to participants, boosting recruitment, and enabling them to participate while doing other tasks. At the same time, telephone interviews represent a highly efficient method in terms of using time and resources. The telephone interview timeslots were flexible (out-of-working-hour options were available), providing a real benefit for those in employment. Finally, the findings of this study have a deep theoretical underpinning, allowing policymakers to develop a conceptual framework to support future recommendations and the development of the community pharmacist service during healthcare transformation.

While I think the findings of this study are rigorous and have important implications for how CP services are designed, developed, and commissioned, I do acknowledge that the research was using semi-structured interviews in this research may have influenced the direction of the interview. In some cases, especially with participants with no experience of CPs, there were moments when participants had some points when they did not feel they had anything to say. In addition, the interviews were individual; thus, the responses could not be verified by other interviewees. Furthermore, the use of telephone interviews hindered my ability to fully observe the participant behaviour, which could have influenced the findings. Although the participants had a wide range of experiences, it is important to consider that the findings may not be an accurate reflection of the public experiences with community pharmacists across the UK, possibly affecting the transferability of the findings. I also recognize that the disparities in experience between those living in low, medium, and

high deprivation regions in terms of CP accessibility were not extensively investigated from an experiential standpoint. Furthermore, ethnicity was not considered in the sampling process, and the majority of the research participants appeared to be of White British ethnicity. People of different ethnicities may have different experiences with CPs, especially when it comes to public health services.

In addition, while using incentives is usual, it may have resulted in a bias in recruitment, with atypical people being selected. The magnitude of the inducements, however, was tiny enough that it was not deemed a relevant component in the data collected. Because participants are aware that the study originated in a pharmacy school, there is a possibility of social desirability bias. Regardless of the short duration of data collection for the qualitative interviews, which took only four months, the COVID-19 pandemic had a huge impact that can be perceived as a limitation. During this time, the healthcare market has changed dramatically. The COVID-19 pandemic has had major effects on delivering both GP and CP services via increasing use of digital tools.

In terms of the data collection, I initially had little experience conducting interviews, which could be recognised as a limitation of the research. However, as I gained more experience, I became better at doing so. To develop my skills, I completed a training course in conducting focus groups and individual interviews. As a researcher, I tried to remain as objective as possible and be reflexive to limit the bias introduced by my background; that I had never worked in the CP or in the UK was useful in keeping an objective mindset.

5.4 Summary

This phase of the qualitative study used the 7Ps marketing theory to identify public need and factors that influence CP services utilisation from a public perspective. The participants believed that the CPs are more accessible than GPs. However, promoting CPs services is essential to increase awareness among the public. Using this theory was useful for identifying the facilitators and barriers that should be considered to improve service utilisation.

The results of this mixed methods project will be used to inform the next chapter, which is about identifying the set of skills that community pharmacists need to satisfy the public needs that have been identified.

Chapter 6. Results of skills mapping

6.1 Introduction

Skill mapping is a valuable tool for organizations to identify skills of their workforce and to develop targeted training programs. One of the mechanisms identified in the scoping review that can influence the successful implementation of CP services is the availability of knowledge and skills among pharmacists. This chapter focuses on this mechanism and explores the relationship between public need, CP services and skills. The development of set of skills for community pharmacists is essential for meeting the public needs, and the process of skill mapping can provide valuable insights to identify skills that are needed most.

The previous two chapters aims to identify the public opinion about CP services and to develop a comprehensive understanding of their needs through conducting a mixed-method study, collecting data from questionnaires and semi-structured interviews. The findings from the studies allowed for the identification of several CP services. This chapter aims to develop a comprehensive understanding of the essential skills that community pharmacists should possess. While previous chapters focused on the first seven of the eight research objectives, this chapter focuses on the last aim, which fits into the study's qualitative approach which is:

- **Objective eight**: Identifying and developing a set of skills for community pharmacists to meet current and future public needs.

To identify the set of skills for the pharmacist, sequences of steps and analysis were conducted which addressed by the first seven research objectives to identify the community pharmacist potential role based on the public need. In contrast, objective

eight offers a wider perspective regarding how to fulfil the public need. This objective addresses the paucity of comprehensive research regarding Community pharmacist skills in the academic literature.

Appropriately skilled pharmacists are essential to providing safe, effective, and patient-centred services. While community pharmacists are developing their roles and services, it is imperative for pharmacists to build up appropriate skills. The chapter explores each of these skills in detail. The findings of this study are of immense importance to policymakers, HCPs, and future researchers in the field. The chapter emphasizes the significance of developing the identified skills to meet the public needs, enhance the quality of service, and provide better health outcomes for patients. Overall, the chapter contributes to the development of community pharmacy and provides guidance for community pharmacists to build the necessary skills to meet the emerging public needs. Therefore, in this chapter, I present skill mapping based on public needs and matched CP services. Unfortunately, due to the impact of the COVID-19 pandemic, I did not have the chance to conduct interviews with community pharmacist to support skill mapping. However, a document analysis was used instead to fulfil this aim. More information is provided in **Chapter 2**.

The suggested skill frameworks differ from the present RPS frameworks in terms of focus, application, and level of detail. The RPS framework focuses on larger features that individuals should have in order to accomplish their roles, such as personal characteristics and specialized knowledge domains. It is used to determine suitability for a position and to highlight areas for improvement. In contrast, skill frameworks emphasize specific technical skills that an individual must have in order to perform

specific activities efficiently. They can be used to create training programs for community pharmacist and assess their ability to perform specific CP services.

Furthermore, RPS frameworks can be used to support professional development throughout the profession by developing training programmes (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019). Also, it can be used to identify and acknowledge the stage of practise of the pharmacist (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019). Meanwhile, the skill frameworks proposed in the thesis are appropriate for designing training and evaluating pharmacist skills in specific services. The level of detail of the two frameworks varies as well, with RPS frameworks being larger in scope and incorporating a variety of qualities or competencies. These can differ depending on the context or scope of pharmacy profession, and they can be classified into different domains. The proposed skill frameworks, on the other hand, are more precise and task-specific, directing community pharmacists on practical abilities for executing certain services.

The present chapter begins by presenting the results of the framework analysis, with a separate section for skills to address CP services and facilitators and barriers. Following that, there is a discussion of the results. Finally, the chapter concludes with a summary.

6.2 Results

The results from previous chapters were used to inform the framework analysis to identify the set of skills that the community pharmacist will need to fulfil the public need in the future. The frameworks will be useful for advanced roles of the community pharmacist across the UK. Findings were divided into two main clusters based on the CP services or facilitators and barriers. The core element of each framework is discussed in detail below.

6.2.1 Skills related to the CP services

In this section I represent the set of skills that the community pharmacist needs to develop and/or in relation to public need. However, **Figure 6:1** provide brief description about the community pharmacist services which were identified from the previous studies (more information about the data extraction were provided at **Chapter 2)**. Thereafter, five sets of skills were identified that were considered essential for the community pharmacist to cope with changes to their role in the future. These set of skills were intrapersonal skills (i.e., personal skills), interpersonal skills (i.e., communicating well with others), clinical skills, marketing skills and digital skills. The core element of each skill is discussed in detail below.

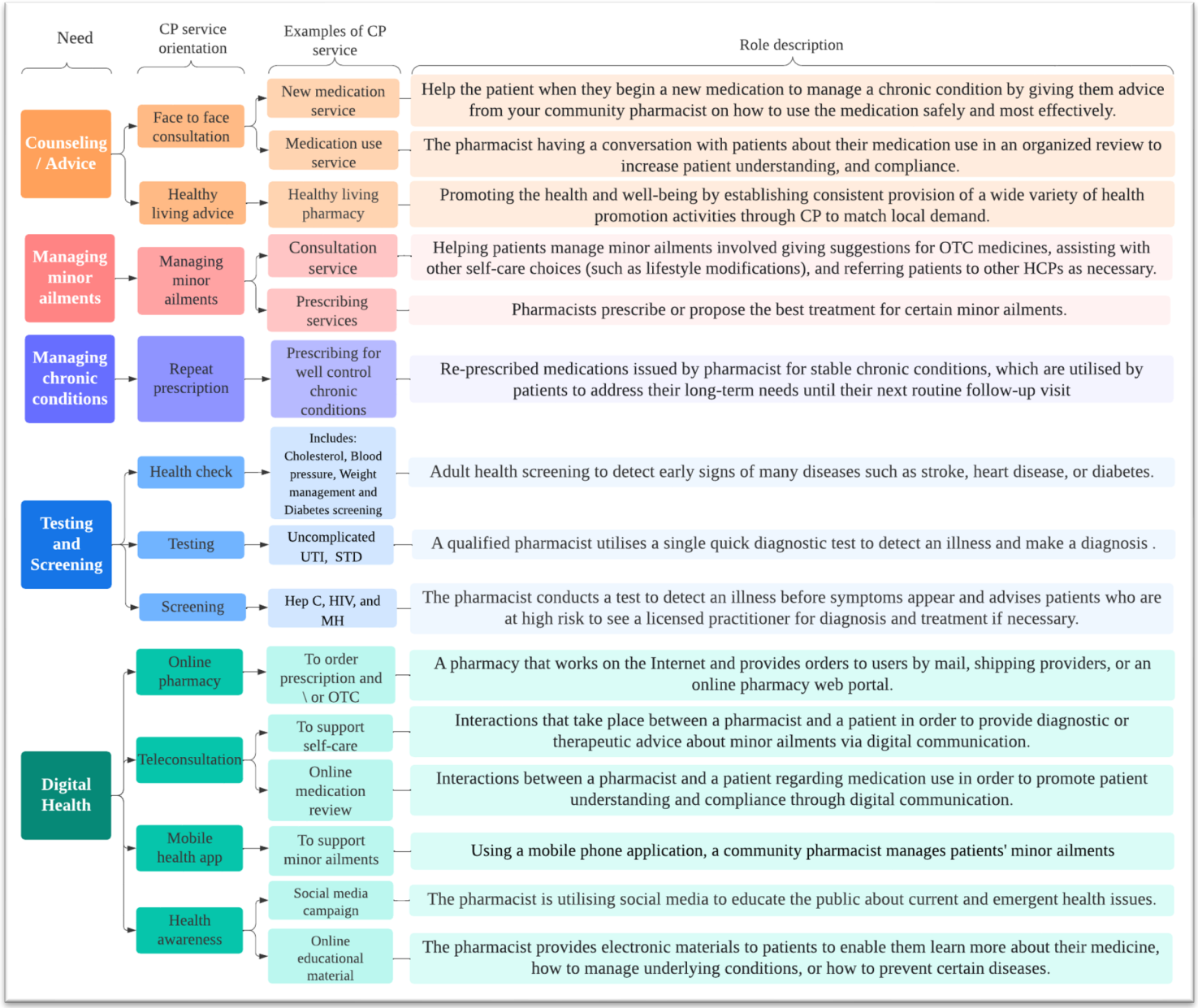


Figure 6:1 Describing role of the community pharmacist

6.2.1.1 Intrapersonal skills empirical frameworks

Intrapersonal skills refer to the internal abilities that help in managing emotions and behaviour (Shek and Leung, 2016). Generally, intrapersonal skills involve a wide range of abilities that are related to self-understanding and self-management (Hogan and Warrenfeltz, 2003; Shek and Leung, 2016). Intrapersonal skills are fundamental for developing the role of community pharmacist, which could influence patient outcomes, patient safety, and quality of care. I focus on eight types of intrapersonal skills that could be relevant to developing services in the CP. These skills include, resilience, decision-making skill, initiative skill, critical thinking skill, reasoning skill, adaptability/flexibility skill, problem solving skill, and research skill . More information about intrapersonal skills is presented in **Table 6:1**. All of these skills were recognised by the Royal Pharmaceutical Society frameworks (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019).

However, as shown in **Figure 6:2**, selected CP services were mapped to relevant intrapersonal skills. There were some skills which were essential to all of the identified CP services such as initiative skill. To overcome the lack of knowledge and improve public involvement with CP services, initiative skill will be required when bringing new CP services to the general public. This may be achieved by being more proactive in marketing CP services and the pharmacy profession. In addition, adopting new roles in promoting health and providing screening services would be associated with initiative skills.

There are other skills which were more services oriented. For example, , resilience skill, decision-making skill, critical thinking skill, and reasoning skill will be useful

for CP services that includes providing counselling and advice, managing minor ailments, managing well-controlled chronic conditions, conducting screening and testing.

In terms of coping with healthcare system transformation, the pharmacist needs to be easily adaptable to new roles or situations, and flexibility and adaptability skills are essential for extending role of the CP which includes services related to health promotion, illness prevention and digital health. To play new roles, a community pharmacist will need more than just adaptability; they will also need problem-solving skills that will help them deal with challenges that arise during normal daily tasks. Moreover, research skills are considered a central capability for pharmacists because of the rapid development in the field. This cognitive skill is not restricted to conducting research; it includes gathering information and critically analysing and reviewing resources which are necessary to provide effective and safe services for CP users.

Table 6:1 Definitions of intrapersonal skills

	kills dimensions	Definition
Intrapersonal skills	Resilience skill	Ability to face challenges with confidence and responsibility (Neenan, 2017).
	Decision-making skill	Ability to give patients safe and accurate guidance regarding their symptoms (Sinopoulou et al., 2017)
	Initiative skill	Ability to be independent when it is necessary to respond to changes (i.e., take action) (Kivunja, 2015).
	Critical thinking skill	Ability to think rationally and logically understand the connection between ideas (Cottrell, 2017).
	Adaptability/ flexibility skill	Ability to learn new skills rapidly in response to changing condition (Kivunja, 2015).
	Reasoning skill	Ability to apply the principle of logical thinking (Hughes, 2015)
	Problem solving skill	Ability to recognise, frame, and solve complicated situations (Wüstenberg et al., 2016)
	Research skill	It is the pharmacist's ability in relation to (Murdoch-Eaton et al., 2010): • Research methods: Ability to develop research questions, identify and use appropriate methods. In addition, capability to recognise the research's limits, and construct an academic argument. • Information gathering: Ability to identify and use a variety of information sources and recognize all information sources. • Critical analysis and review: Ability to conduct critical reviews to the research paper. • Data processing: Ability to use appropriate analysis tools to conduct data analysis and represent statistical Information



N/A: Not Applicable

Figure 6:2 Intrapersonal skills empirical framework

6.2.1.2 Interpersonal skills empirical framework

Generally, interpersonal skills refer to the effective interaction between people (Valaitis et al., 2018). These skills build on communication skills, which by themselves are insufficient to create and sustain a relationship with patients (Duffy et al., 2004). Community pharmacists need to adapt other skills to be able to extend their role. Important elements of interpersonal skills include communication skill, influence skill, team-working skill, emotional intelligence skill, delegation skill and leadership skill, management skill and motivational skill (see **Table 6:2**). All of these skills have been recognised by both Royal Pharmaceutical Society frameworks (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019).

However, some of the interpersonal skills are essential for the workplace environment (i.e., the CP), whereas others are needed for interaction with the CP users. **Figure 6:3** shows the relationship between the identified skills and proposed CP services from this research.

What stands out in the framework is that communication skill, leadership skills, delegation skill, and management skill are required to deliver all the CP services that identified in this project. The ability to communicate effectively is essential skills for community pharmacists to develop positive rapport with patients and other HCPs. Additionally, effective communication skills may affect how CP services are used in the future. Providing services related to healthy living requires certain skill, such as influencing skills and motivational skills which can be useful in changing people's behaviour to become healthier. With regard to applying emotional intelligence, this will be useful to help create better relationships with CP users, which has been identified as an enabler for using CP services.

There are also some skills not related to the services itself but that are important for the workflow such as delegation skills, management skill, team-working skill, and leadership skills, which are all essential for expanding the CP's role. If the number of the CP services were increased, it could be useful to transfer some of the CP responsibilities to pharmacy support team (i.e., pharmacy technician, accredited checking technician, dispensing assistant, and medicines counter assistant) to ensure that there is enough time to deliver new services. Furthermore, management skill and team-working skill are important skills for extending the role of the community pharmacist and increasing the number of their services to provide smooth and efficient delivery of the services. Finally, leadership skills are a cornerstone to develop the role of a pharmacist and adapt to these new roles.

Table 6:2 Definitions of interpersonal skills

	Skills dimensions	Definition
Interpersonal skills	Communication skills	Ability to effectively interact with other people (Rider and Keefer, 2006).
	Team-working skill	Ability to work with others in groups (Rider and Keefer, 2006).
	Emotional intelligence skill	Ability to understand and manage both personal and others' emotions and use it as a source of information (Nafukho et al., 2016)
	Influence skill	Ability to motivate and persuade people to reach certain goals (Riggio and Tan, 2014) .
	Leadership skills	Abilities to encourage people to achieve pre-set goals or vision (Riggio and Tan, 2014).
	Delegation skill	Ability to assign tasks and give responsibility and authority to others (Barnes et al., 2018)
	Management skill	Ability to keep his or her workers' day-to-day job activities completed with great efficiency (LaGanga, 2019).
	Motivational skill	Ability to tailor interactions to people's preferences and styles through leading others, articulating expectations, persuading, and delivering useful feedback (Riggio and Tan, 2013)



N/A: Not Applicable

Figure 6:3 Interpersonal skills empirical framework

6.2.1.3 Advanced clinical skills empirical framework

Clinical skills are defined as pharmacists' ability to collect information from the patient, apply their knowledge about disease to make evidence-based decisions and effectively communicate with patients and other HCPs (Sims and Campbell, 2017). Community pharmacists deliver a range of interventions for chronic disease management, minor ailment management, and the prescribing of medicines. In addition, participants in this study thought that extending the role of community pharmacists would be an acceptable model of healthcare delivery. Currently, community pharmacists are capable of delivering services related to medicines. Changing the pharmacist's traditional role (i.e., as a dispenser) to new advanced clinical services is associated with adapting a wide range of intrapersonal, interpersonal, and clinical skills.

It is important to ensure that community pharmacists are equipped with the necessary clinical skills, especially with increasing interest in the following: using CP for minor ailment management such as in CPCS in England, increasing the number of pharmacist independent prescribers particularly in Wales and Scotland; or providing medication without prescription, such as high doses of statins and oral hormonal contraceptives. Therefore, in England, there is a programme for developing pharmacist consultation skills that target post-registration professional development (Jee et al., 2016). More information can be found at http://www.consultationskillsforpharmacy.com/. For pharmacist independent prescribers, there are other specific training programmes to help pharmacists develop the required clinical skills. However, there is still a need to maintain and develop clinical skills to deliver clinical services, such as managing minor ailments, chronic

conditions or dispensing some medications. Based on this point, relevant clinical skills should be considered; these involve many aspects, such as pharmaceutical skill, consultation skill, diagnostic skill, prescribing skill, monitoring skill, and documentation skill (see **Table 6:3**). These skills would be useful to prepare the community pharmacist to engage in direct patient care. However, data from **Figure 6:4** shows specific information about each CP services and the required skills.

Table 6:3 Definitions of clinical skills

	Skill dimensions	**Definition**
Advanced clinical skills	Pharmaceutical skills	Pharmacists' abilities and knowledge to share responsibility for drug therapy outcomes (Penna, 1990).
	Consultation skills	Ability to hold meetings with patients to discuss their conditions or treatments (Jee et al., 2016).
	Diagnostic skills	Ability to find a way to effectively solve patients' clinical problems (Sinopoulou et al., 2017).
	Prescribing skills	Ability to select medicines rationally for patients based on their clinical needs for a sufficient time and at minimal cost (Kamarudin et al., 2013).
	Monitoring skills	Ability to collect, analyse and use information to track patients' progress toward reaching treatment plan objectives and to guide future decisions (Tietze, 2012).
	Documentation skills	Ability to grasp information and clearly document it with an adequate level of detail for the target audience (Tietze, 2012).



N/A: Not Applicable

Figure 6:4 Advanced clinical skills empirical framework

6.2.1.4 Digital skills empirical framework

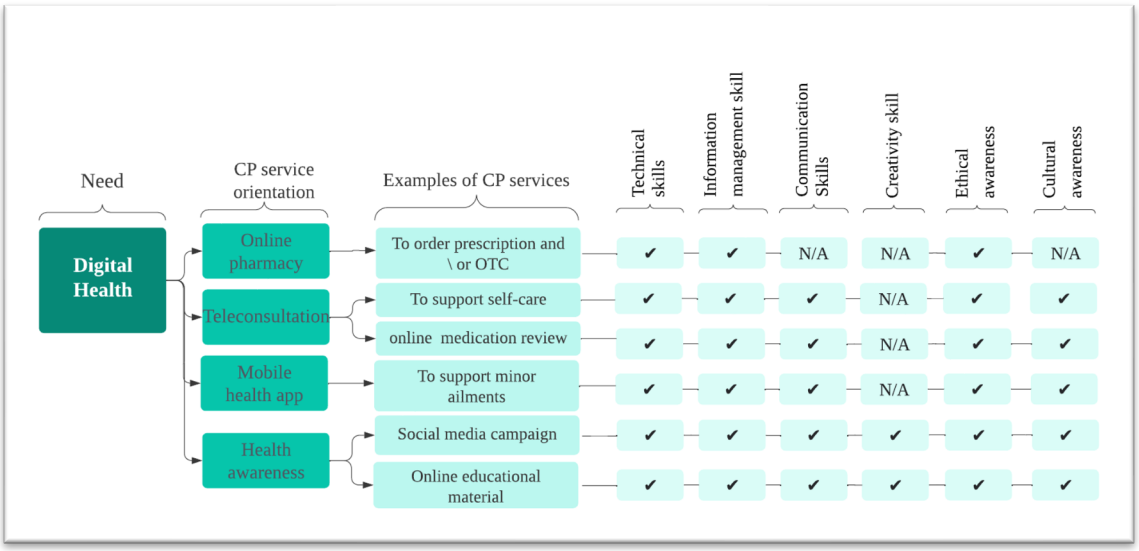
The rapid development of technological innovation and integration of technology in the healthcare field makes it imperative for community pharmacists to acquire digital skills. The current study has highlighted the need to incorporate digital tools to deliver CPs, such as providing teleconsultation, online pharmacy services, mobile health application for managing minor ailments and social media for health awareness campaign. However, the community pharmacist needs to have the appropriate set of skills to ensure the effective use of digital tools in the CP.

The Royal Pharmaceutical Society foundation framework highlights the importance of preparing the pharmacist to fit future requirements by enhancing digital literacy skills (Royal Pharmaceutical Society, 2019). However, this document did not illustrate any particular skills. Therefore, I used the literature to identify potential skills which could be useful for the community pharmacist (Van Laar et al., 2017). Therefore, I selected six digital skills which include technical skill, information management skill, digital communication skills, digital creativity, ethical and cultural awareness; these skills are perceived as important for community pharmacists (see **Table 6:4**). Such skills are important for pharmacists and CP users for keeping up with developments and innovating. Based on this, the core digital skills were mapped against the identified needs and CP services (see **Figure 6:5** for more information).

The framework was focused only on the services which use digital tools in services delivery. However, these skills could be extended to other services which could use electronic devices in services process, for example, consultation, documentation or information exchange with other healthcare providers.

Table 6:4 Definitions of digital skills

	Skills dimensions	Definition
Digital skills	Technical skill	Ability to use electronic devices to complete tasks (Van Laar et al., 2017).
	Information management skill	Ability to use electronic devices for searching and organising information to make informed decisions (Van Laar et al., 2017).
	Communication Skills	Ability to use electronic devices to effectively transfer information to other people (Van Laar et al., 2017).
	Creativity skills	Ability to use electronic devices to create new ideas or treat well known ideas in a different manner and convert ideas into a service (Van Laar et al., 2017).
	Ethical awareness	Ability to be responsible and demonstrate knowledge of ethical and legal considerations when using electronic devices (Van Laar et al., 2017).
	Cultural awareness	Ability to show respect for and understanding of other cultures when using electronic devices (Van Laar et al., 2017).



N/A: Not Applicable

Figure 6:5 Digital skills empirical framework

6.2.1.5 Marketing skills empirical framework

Marketing skills are aimed at selling, advertising, promoting, or fundraising. In the case of the CP, they could be used as a tool to improve CP services utilisation and to meet the CP services objectives. Generally, marketing skills have not been recognised as essential skills for pharmacists, either in foundation or advanced framework (Royal Pharmaceutical Society, 2013; Royal Pharmaceutical Society, 2019). However, these skills could be useful to address some challenges that face community pharmacists or in delivering some CP services such as health promotion and ill prevention. Therefore, I consider it a potential set of skills that would help pharmacists to extend their roles.

Adopting marketing skills for CP service provision will increase opportunities for providing care for the public, offering better coverage, and improving financial sustainability. According to Lega (2006), the marking focus is divided into operational marketing (focus on service features), strategic marketing (focus on competitive position of services cross the whole organisation), and institutional marketing (focus on system to prioritized health needs of particular population). However, I will only highlight operational marketing, which is concerned with what people need and want or expect of a specific service (Lega, 2006). This concept aims to apply the knowledge and skills of marketing to control all CP services processes, which include logistics, waiting times, procedure and information delivery and patient–pharmacist relationships (Lega, 2006). In **Table 6:5**, a brief summary of relevant skills is presented.

Table 6:5 Definitions of marketing skills

	Skill dimensions	Definition
Marketing skills	Communication skills	The ability to successfully communicate with key stakeholders through adapting tailored communication styles to different audiences and situations (Chartered Institute of Marketing, 2019).
	Creative skill	The ability to think about CP services or issues that are related to CP in a new way to generate new ideas and solution (Chartered Institute of Marketing, 2019).
	Contents creation skill	Ability to produce educational material that satisfy the needs of CP customers (Marketing Institute of Ireland, 2019).
	Analytical skill	Ability to perform data collection, data analysis, critical interpretation and effective presentation of data to make informed decisions (Marketing Institute of Ireland, 2019).
	Customer insights	Ability to develop a deep understanding of CP customer behaviours, preferences and needs (Marketing Institute of Ireland, 2019).
	Digital Marketing	Ability to develop and implement effective digital marketing strategy (Marketing Institute of Ireland, 2019).

Considering marketing skills, a framework was developed to show the relationship between relevant marketing skills and CP services (see in **Figure 6:6**). From a marketing perspective, commination skills were also highlighted in relation to promoting CP services or CP roles. In addition, it could be used to address specific services objectives such as promoting self-care or a healthy lifestyle. Regarding creative skill, analytical skill, and customer insight skill, they could be useful skills for the CP to fulfil needs and cope with challenges and changes that face the healthcare system, as well as adopting new approaches for delivering existing services or future services. Content creation skill is more services-oriented and associated with services concerned with developing educational material or health awareness campaigns. Finally, digital marketing skills would be useful for all CP services in order to increase public awareness about it.



N/A: Not Applicable

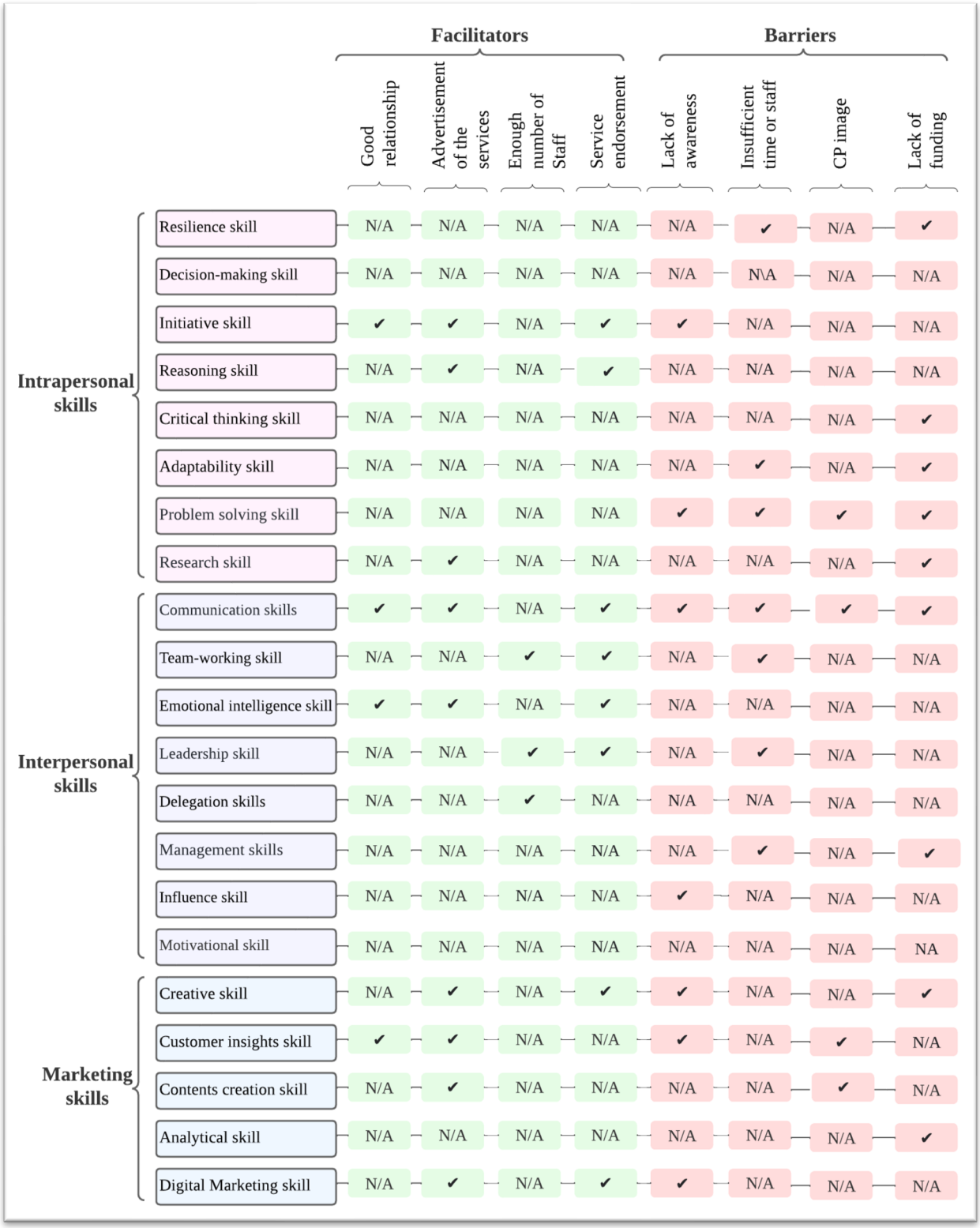
Figure 6:6 Marketing skills empirical framework

6.2.2 Skills to address facilitators and barriers

In this section, the skills were mapped to address the facilitators and barriers identified by the public in this project. This step was considered in order to highlight the importance of these factors in service implementation, delivery, and utilization, in addition to the high influence of intrapersonal and interpersonal skills in the service process. However, only three sets of skills, including intrapersonal skills, interpersonal skills, and marketing skills, were linked to facilitators and barriers, because they are more relevant than clinical skills and digital skills (due to the nature of barriers and facilitators). The framework is represented in **Figure 6:7**.

Considering the facilitators, a good relationship with CP users could be established with the ability to represent a good interpersonal skills. While advertising CP services need a wide range of interpersonal and intrapersonal and marketing skills as shown in **Figure 6:7**. In the case of services endorsement, the pharmacist needs to adapt initiative skill, reasoning skill, communication skills, leadership skill, and management skill.

It is apparent from the framework below that some skills could be useful to overcoming barriers. For example, marketing skills could be used to address the lack of awareness toward CP services. Insufficient resources (both human resources and financial recourses) could be handled successfully by the community pharmacist if they were equipped with an appropriate set of skills (see **Figure 6:7**). Finally, the negative CP image would be changed if the community pharmacist were seen by the public as a healthcare provider rather than a shopkeeper through demonstrating professionalism and adapting some marketing skills to promote the profession.



N/A: Not Applicable

Figure 6:7 Empirical framework to address skills in relation to facilitators and barriers

6.3 Discussion

6.3.1 Key findings

Based on the evidence represented in this PhD, I would like to point out several possible sets of skills related to CP services. One of the most important requirements for a successful implementation of CP services is identifying an appropriate set of skills. Since many changes to the role of community pharmacists were proposed, a defined set of skills should take place. Hence, in this project, I have identified the skillset that the community pharmacist needs to develop to fulfil the public need, which includes interpersonal, intrapersonal, marketing, digital and clinical skills. Recognising these skills could be useful in directing the training for current and future pharmacists.

6.3.2 Comparison with literature

As mentioned in the literature review, utilising the pharmacist's knowledge and skills to extend the role of community pharmacists leads to increased professional satisfaction (Cooper and Tsoneva, 2017; Hanes et al, 2014; Horsfield et al, 2011; O'Reilly et al, 2015; Shaw et al, 2014; Wells et al, 2014). One of the most important skills is clinical skills. Currently, pharmacists provide a wide range of clinical services in CPs. At the same time, several reports have shown that pharmacists are still not confident enough about their clinical skills to deliver some clinical services (Aly et al, 2019; Butt and Ream, 2016; Murray, 2016). To improve the community pharmacists' clinical skills in the UK, clear definitions of the pharmacists' role are required to identify clinical skills for each role. Then, a training programme could be developed that could be built on the existing skills through filling the gap to maintain high-quality services and ensure patient

safety. Opportunity should be given to community pharmacists to develop their clinical skills. In reviewing the literature, the data shows the need for clinical skills and training for the existing workforce (Girvin and Wilson, 2018). The Pharmacy Integration Programme in England has recently contributed 15.9 million to the advancement of pharmacy professionals, including training for pharmacists independent prescribing working in GP and CP, as well as expanding community pharmacists' clinical examination skills (Health Education England, 2021).

With respect to the research's main aim, I suggested six relevant clinical skills which are linked to public need and CP services: pharmaceutical skill, consultation skill, diagnostic skill, prescribing skill, monitoring skill, and documentation skill. This study supports evidence from previous research which show that the pharmacist consultation skills need to improve in order to effectively engage with patients (Jalal et al., 2019; Latif et al., 2011). Also, another two studies conducted on pre-registration graduates in the UK show that the pharmacist needs training in order to develop clinical examination and patient monitoring skills (McIntosh and Stewart, 2016; Power et al., 2021). In terms of advanced qualifications, such as independent prescribing, pharmacists have limited exposure to some clinical skills, including physical examination, and their first opportunity to learn more about these skills would be within the programme (Girvin and Wilson, 2018). Although an independent prescribing training programme would be useful to develop the required clinical skills for pharmacists, little is known about the usefulness and relevant clinical skills in training programmes for pharmacists' practice (Girvin and Wilson, 2018). In relation to community pharmacists, participants defined needs associated with repeat

prescriptions and minor ailments. However, more research should be conducted to examine and evaluate community pharmacists' confidence in their clinical skills in CPs.

In terms of interpersonal skills, developing effective communication skills (to give one example) would be useful to help facilitate inter-professional collaboration (Luetsch and Rowett, 2016) or engagement with pharmacy users (Sohanpal et al., 2016). The results from this study show that CPs should maintain good communication skills to deliver proposed services. This finding broadly supports the work of other studies in this area linking communication skills with successful implementation of the CP services (Dare et al., 2017; Hossain et al., 2017; Ogunbayo et al., 2017). Furthermore, interpersonal skills were recognised as facilitators for delivering CP services (Dare et al., 2017; O'Reilly et al., 2015; Ogunbayo et al., 2017). Findings of the meta-analysis also highlighted the importance of communication skill training in improving the pharmacy student's skill (Jin et al., 2018). Meanwhile, the quantitative research shows that practicing UK pharmacists felt that they were underprepared for conducting consultations that involve motivation behaviours and that they needed training (Jalal et al., 2018).

Regarding other interpersonal skills, the data shows that leadership skills are an important capability to deliver CP services. In accordance with the present results, previous studies have demonstrated that CP reported leadership as an important skills in ensuring patient safety (Irwin and Weidmann, 2015). Furthermore, pharmacists participated in quantitative research valued further training for developing leadership skills (Barnes et al., 2018). Meanwhile, the teamwork and delegation skills were identified in this research as helpful for the CP to address some facilitators and barriers. However, a previous study shows that

pharmacists demonstrate negative attitudes towards teamwork activities due to the leadership role (Irwin and Weidmann, 2015). Other research shows that CPs are confident about their delegation skills (Barnes et al., 2018). The results from this study should be applied with caution due to low the sample size and the chance of social desirability.

With regards to intrapersonal skills, limited studies were found that explore the influence of intrapersonal skills on health service delivery in the context of the CP. In this research, one of the intrapersonal skills was decision-making skills, which were highlighted as an important skill within the CP context in relation to pharmacist clinical activities (Irwin and Weidmann, 2015). This skill would come in use when ensuring the patient safety. However, a qualitative study has shown that intrapersonal skills have an essential influence on successful collaboration between public health and primary care organisations (Valaitis et al., 2018). Therefore, both intrapersonal and interpersonal skills are cornerstones for building relational practice skills. This research suggested a wide range of intra and interpersonal skills that could be useful for improving community pharmacist services, which could help in developing training programmes.

New skills may also be needed in the current and future community pharmacy workforce because of the rapid development in innovation and technology. Using digital tools could help enhance both the clinical and public health roles of community pharmacists (Martin et al., 2018) or enable new roles (Baines et al., 2018). Therefore, improving the digital literacy among the community pharmacists may involve need to learn whole new skillsets (Crilly and Kayyali, 2020). The benefits of the technologies have been shown during the COVID-19 pandemic, as digital technology allows pharmacists to communicate and give advice to

patients at a distance. In addition, social media have provided access to knowledge for the public.

In accordance with the present results, previous research has highlighted the importance of developing online professionalism to ensure positive representation of the HCPs (Benetoli et al., 2017; Crilly et al., 2019). In addition, in 2020 the International Pharmaceutical Federation's development goals highlighted the importance of incorporating digital health services into pharmacy practice and giving the pharmacist workforce a chance for continuous development and education to make sure pharmacists stay up to date with innovations and technology (International Pharmaceutical Federation, 2020). A further document published in 2021 stated that the pharmacist should have the relevant digital knowledge and skills (International Pharmaceutical Federation, 2021). However, further research will be needed to show the influence of these skills on pharmacist performance and patient outcomes.

Considering marketing skills, a lack of awareness was the main barrier to extending the community pharmacist role. Findings from many studies have indicated that effective promotion of the community pharmacist's abilities, skills, and services to the relevant stakeholders are required (Agomo et al., 2016; Hanes et al., 2014; Hattingh et al., 2016b; Hindi et al., 2018; Hossain et al., 2017; Stewart et al., 2018). In addition, adapting. marketing skills can help in ensuring the sustainability of healthcare services (Lega, 2006). In the context of CP services, the aim of adopting marketing skills is to engage in promotional and advertising activity. Generally, in healthcare organisations, the marketing approach focuses on identifying, prioritising, evaluating, and serving the

health needs of the target population (Lega, 2006). According to Elrod and Fortenberry (2020), developing a marketing communications mix is essential for healthcare providers. However, more research will be needed to investigate the impact of marketing skills on community pharmacist services utilisation.

6.3.3 Strengths and limitations

To the best of my knowledge, this study is the first to map out the skills of community pharmacists in response to a recognised public need. In addition, identifying the necessary skills should be useful to improve the quality of the services, patient safety and the use of CP services. Furthermore, introducing marketing skills could influence CP services to result in better service utilisation and integration of CP into primary care. In addition, the information presented in this research could be used to develop training programmes to enhance the current/future community pharmacist workforce. Finally, while this study focused on CP services in the UK, the results could be tested in other similar countries that provide advanced CP services. However, care should be taken to consider differences regarding context.

A key limitation was that the skill mapping was the result of preliminary research, and further investigations should be considered to evaluate the impact of these skills on the services provision and effectiveness of these skills. Another limitation was that the identified skills were based only on public needs, the community pharmacist and other stakeholders did not have the opportunity to comment on the results. Therefore, future research should consider their views on community pharmacists' skillset to compare them with the results of this study.

Finally, I was the only person who coded and mapped the data, which could constitute a limitation. However, during supervision meetings, I discussed the emerging set of skills with my supervisor (my supervisors are expert pharmacists and highly experienced researchers in the context of CP services), which added rigour to the process of data analysis.

6.4 Summary

The community pharmacist needs to gain skills to deliver specific services. Adopting the appropriate skills will affect the community pharmacist's capability to provide effective, safe services and improve patient outcomes. Therefore, the community pharmacist needs to improve intrapersonal, interpersonal, and clinical skills for patient-facing roles in CP. In addition, developing new skills like marketing and advanced digital skills will be useful for improving service utilisation and meeting current and future needs. The last chapter summarises the main findings of the thesis; moreover, it highlights the strengths and limitations, research implications, and areas for future research.

Chapter 7. Summary, implications, and conclusion

7.1 Introduction

This chapter brings together the key findings from the scoping review and analysis of three phases of research: (1) quantitative findings of public and community pharmacy users' attitudes towards extending community pharmacist services; (2) qualitative findings of public perspectives towards extending the role of community pharmacist; and (3) skill mapping. In this way, it examines the extent to which the findings answer the research question—What skill set does a community pharmacist need to adopt to satisfy public need? The main findings of the research are summarised in relation to the aim and objectives, and then a brief description of the key results and what they contribute to the field is provided. **Table 7:1** summarises each chapter and its research objectives.

The overall strengths and limitations of the research are also presented in this chapter. Then, I explain and discuss the implications of this research for community pharmacy practice, the healthcare system in the UK and policy. In addition, I identify possible areas for future research in the context of the results of this research. Finally, the conclusion summarises this chapter and the whole thesis.

Table7:1 Meeting of objectives by Chapter

	Objective Description		Chapter
1	Identify stakeholders' perceptions regarding the current role of the community pharmacist	3	Scoping review
2	Explore the public's awareness of the current community pharmacist's roles and community pharmacy services.	3, 4 and 5	Scoping review, Quantitative results, and Qualitative results
3	Identify perceived outcome(s) from extending the community pharmacist's role	3 and 5	Scoping review, and Qualitative results
4	Identify stakeholders' perceptions about facilitators and barriers to using the community pharmacist's services	3 and 5	Scoping review, and Qualitative results
5	Explore the public's attitudes towards the ability of the community pharmacist to extend their role	4 & 5	Quantitative results, and Qualitative results
6	Identify the public's attitudes toward using digital tools to deliver community pharmacy services	4 & 5	Quantitative results and Qualitative results
7	Explore the public's perceptions about their needs from community pharmacists	5	Qualitative results
8	Identifying and developing a set of skills for community pharmacists to meet current and future public needs	6	Skills mapping

7.2 Summary of the key findings

The overall aim of this research was to identify the set of skills community pharmacists are likely to need to meet public needs. The research began with a scoping review (reported in **Chapter 3**), which examined perceptions towards CP services, as well as advantage, disadvantages and barriers to providing new services in the CP. To effectively address the research objective of determining the public's perception regarding the expansion of community pharmacist services, a comprehensive series of data collection and analysis techniques were employed utilising mixed methods. Additionally, the data was subjected to further analysis to determine the specific skills that pharmacists would need to possess for the successful expansion of their services.

The quantitative studies (reported in **Chapter 4**) highlighted public attitudes towards extending the role of the community pharmacist. It identified current awareness about community pharmacist services and perceptions about the role of the community pharmacist in managing minor ailments and self-care. Furthermore, it identified public perceptions towards using digital tools to deliver CP services.

The qualitative phase of the research (reported in **Chapter 5**) identified needs from the participants' perspectives. In addition, it explained and provided in-depth understanding of the quantitative results through using 7Ps marketing framework, revealing barriers to extending the role of the community pharmacist, such as lack of awareness, lack of privacy, high workload and a lack of time and community pharmacy image. Suggested strategies to improve community pharmacist services utilisation included advertising services to increase

awareness, holistic and proactive care, service endorsement from GPs and establishing a good relationship between the pharmacist and CP users.

The final phase of the research (reported in **Chapter 6**) went on to identify a set of skills that community pharmacists will need to expand their roles. Five types of skills were identified: intrapersonal, interpersonal, advanced clinical, marketing, and digital skills. These skills would be useful for community pharmacists to provide relevant services at safe and effective manner. Identifying these skills could also be used to design an appropriate training programme for the community pharmacist to ensure patient safety and service quality.

When drawing together the findings from each of the research phases, they highlight several opportunities for community pharmacists to expand their roles. Improving communication with patients and collaboration with other HCPs are crucial measures to support local communities. In addition, changes in the current practice should be considered, such as delegation of some tasks to other members of the CP team, increasing use of technology, improving signposting practices and ensuring person-centred care for the whole population.

Training for community pharmacists is also key, ideally covering a range of topics that include minor ailments, general health, illness prevention and improving patient outcomes. In addition, further training for developing or adapting new skills will be essential for supporting community pharmacists to expand their role. The main prerequisite for providing future services for the public in the CP context is increasing awareness of the role

of the community pharmacist. In addition, integration of the CP into primary care would be useful. In term of integration many plans were put in place to ensure that CP services will effectively integrate to primary care system such as ICS (more information is provided at **Chapter 1**). The contribution of this research to knowledge will be discussed in the next part, followed by a discussion of the study's strengths and limitations.

7.3 What this PhD adds to knowledge

In this PhD, I undertook a scoping review that attempts to provide an updated overview of a potentially extensive and diverse body of literature relevant to stakeholders' perceptions towards expanded CP services in the UK, benefits from extending the role of the community pharmacist, advantage and disadvantages that related to CP services. It has also discovered ways that promote the successful delivery of CP services by evaluating relationships between context, mechanisms, and outcomes.

This PhD has also provided an update on the publics' and pharmacy users' knowledge and attitudes concerning the usage of CP services. Moreover, it addresses people's willingness toward using the extended role of the community pharmacist which might be beneficial in unlocking the potential of community pharmacists. It also brings new information on the public's and pharmacy user's perceptions of the use of digital tools to deliver CP services in the UK before and at the very early stages of the pandemic (before national lockdown). These results could be beneficial for community pharmacists to begin using digital health tools into their service delivery and to refer the public to trustworthy sources of

information. This must be driven by policies aimed at improving the public's digital health literacy.

This PhD emphasises the importance of public perception of CP services and identifies several elements that may influence their utilisation, which provides an update regarding this topic and also addresses the barriers and facilitators to using CP services. These findings are important for current and future CP services, which should be considered for successful implementation of the CP services and improve service utilisation.

Furthermore, policymakers and other stakeholders should do more to market CP services to the general population, according to the important results of the study. This study has proposed many techniques for advertising and promoting CP services to potential users, which may be effective in changing public perceptions of community pharmacies and holistically promoting their expanded roles. The general public must be aware of the healthcare and public health services provided in CP for them to be truly accessible. Finally, this project also provides new knowledge by not only identified public needs but also matched them to skills. Recognising these skills could also be important in directing training for present and future pharmacists.

7.4 Strengths and limitations

This research has provided insight into the needs, facilitators, and barriers of extending the role of the community pharmacist, as well as the set of skills required to deliver this expanded role. This was undertaken through a scoping review, mixed methods approach and skill mapping utilising a pragmatic research design. As

discussed in the methodology chapter, there are strengths and limitations that are important to assess and summarise before considering the implications of the findings from this study.

To the best of my knowledge, this is the first scoping study that focuses on stakeholders' perceptions regarding extending role of the community pharmacist while addressing the advantages, disadvantages, and challenges of delivering extended services in the CP. In addition to identifying the main mechanisms that underpin the success and failure of extending role of the community pharmacy. As a result, identifying mechanisms might help policymakers in improving CP services delivery for maximum impact. Also, this is the first research to carry out skill mapping for community pharmacists based on a public need. Identifying the required skill set should also help to enhance service quality, patient safety, and the usage of CP services. Identifying required skills will help stakeholders to develop a training programme for workforce development.

The key strength of using mixed methods is combining the strengths of both quantitative and qualitative methods, which gives the opportunity to explore both the breadth and depth of broad and complex questions. Mixed methods provide a better understanding of extending the role of the community pharmacist from a public perspective in a more reliable and robust study design by elaboration or clarification of quantitative approach outcomes with qualitative method findings. Furthermore, the quantitative results facilitated the development of the interview guide and expansion of the results, which attempted to broaden and deepen the public's perception of CP services. When paired with qualitative interviews in which participants were given the option to use their own words, the questionnaires presented a contextual picture. This study detect how context of the CP affects the public's needs and expectations, and hence how to enhance

engagement with CP services. In addition, this study provided an understanding of variations of services across the UK.

Another strength of using mixed methods is employing a sequential design, in which the findings of quantitative research inform and enable a further refining of the design of qualitative research. Many of the considerations surrounding the strengths of the use of mixed methods was discussed in **Chapter 2**, aiming to ensure the rigour of the research. Moreover, this study design provides great opportunities by giving the participant chance to explain the results of questionnaire by acknowledging the reasons for their preference(s) in the interview.

Triangulation is also a strength of mixed methods studies, in this research, triangulation revealed some convergence of findings and validated the findings. For example, the survey showed the variation of awareness in terms of the CP services, and then data from the interviews explained this variation and provided further context from the public perspective. Another example of triangulation was seen when the public reported in the survey that they visited the CP more frequently than the GP; in the interviews, the participants explained the trend by acknowledging the reasons for their preference. Using triangulation techniques in this study therefore helped to boost the research rigour and validity, lowering potential bias, and generating new data.

The findings of this study have a deep theoretical underpinning, allowing policymakers to develop a conceptual framework to support future recommendations and the development of the community pharmacist service during healthcare transformation. Finally, to my

knowledge, this is also the first study to conduct skill mapping for community pharmacists based on an identified public need. In addition, identifying the needed skills will help stakeholders to develop a training programme for workforce development.

Regardless of the effort that was made to minimise any issues with used methods (see **Chapter 2**), there are still certain limitations in this research. Each method of collecting research data in this study has specific limitations and more details were included under each method.

7.5 Implications

7.5.1 Implications for community pharmacy

Across the UK, community pharmacists have a clear role within the healthcare system in that they provide access to health services and information. However, community pharmacists need to improve some of their skills for a better utilisation of their potential, which will be useful for their local communities and other HCPs. Since this research focused on identifying public needs from the CP that included extended services (i.e., the services beyond the medication supply), many of the implications relate to community pharmacists themselves helping to shape the future of the CP sector. These implications range from smaller changes that could be conducted by pharmacists to larger modifications that should be considered at the national level (i.e., commissioners, policy makers, pharmacy organisations and professional bodies).

This study revealed inadequate public knowledge about pharmacists' roles and capabilities, although this might have changed as community pharmacists have played a prominent

healthcare role during the pandemic. Raising awareness among the UK population about pharmacist services in the community setting is an important first step. Community pharmacists also need to be more proactive in promoting their services to increase service utilisation through conversations with pharmacy users to ensure they have enough information about the support that is available in the CP. This research identified public needs from the CP. Raising awareness among community pharmacists regarding public needs can help them change their practice and adapt new attitudes so that they can provide better support to the CP users. The participants identified counselling and providing information regarding medication, disease, or general health as needs in the current research. Therefore, community pharmacists should be mindful of the level of information required by patients.

At the organisational level, CP owners could help to drive change in extending the role of community pharmacists. They could encourage pharmacists to provide more services by providing infrastructure for service development, such as an IT system. In addition, they could support community pharmacists in completing training, allowing them to gain skills that would be essential for developing their role. This would help community pharmacists to support their local communities, tackle inequality and meet national healthcare priorities.

At the national level, shaping roles of community pharmacists should be aligned with the future vision of each country (see **Chapter 1**) and support the country's future plans. In addition, strong leadership is required to facilitate building intra-professional (i.e., with pharmacists working in other sectors or community pharmacy support team) and inter-professional relationships (i.e., with other HCPs). Community pharmacists should aim to collaborate with their local surgeries or other pharmacists for signposting and raising awareness of their potential for better healthcare provision.

7.5.2 Implications for healthcare practice

In the UK, there is a strong need for the transformation of healthcare systems to meet the rapid increase in public needs. At the same time, it is necessary to maintain a high quality of healthcare provision. Managing minor ailments was also identified as a need. Services related to minor ailments are well established in England, Wales, and Scotland. However, the findings from this project show that patient referral to community pharmacist services is crucial for increasing awareness and service utilisation. This could be helpful in decreasing pressure on GPs and emergency departments. Leaders in healthcare need to utilise the community pharmacists' potential, particularly as independent prescribers, to cover more minor ailments. This could be established by providing appropriate training for pharmacists to identify, manage or refer patients to be adequately managed in other healthcare settings.

Health promotion and illness prevention represented one of the biggest priorities for healthcare leaders in the UK, as also recognised by the public in this study. It is critical for the future of the healthcare system that community pharmacists develop their role in health promotion and illness detection. Commissioners should invest more money in community pharmacists to fulfil this role. This could be established through providing appropriate training for developing pharmacists' skills.

Regarding the digitalisation of CP services, investing in technology to provide good quality patient care should be prioritised. The COVID-19 pandemic and the associated restrictions (i.e., government lockdown measures) show the importance of using digital technology for care provision. Many people are isolated and unable to access health services, and technology plays an important role in providing support for people to access health care. From the pharmacist's perspective, the technology infrastructure was reported as a barrier,

as was the accessibility of patient information (see **Chapter 3**). These barriers affected the ability of community pharmacists to provide high quality and safe patient care, particularly with the movement of the leaders to increase the number of independent prescribers in the CP (see **Chapter 1**). Therefore, healthcare leaders should promote adequate data sharing among all providers to allow for a fluid movement of information to support high-quality healthcare provision.

Finally, a lack of skills was a barrier identified by community pharmacists to deliver new services, as shown in **Chapter 3**. Therefore, in line with the proposed services in this research, skills mapping was conducted to facilitate care provision. Providing adequate training for community pharmacists was an important finding from this study for successful implementation of CP services. In addition, availability of professional development for the workforce, in line with each UK country's priorities, led to facilitating sustainable service provision. A significant investment is necessary to support the community pharmacist workforce's training needs to handle essential health priorities. To do this, healthcare executives should collaborate with academic and CP practise leaders to create training programmes that meet all future needs.

7.5.3 Implications for healthcare policy

In terms of policy, the findings of this research are well positioned within the current agenda across four health and social care systems, further demonstrating the public need form CP, investigating public attitudes on extending role of community pharmacist, and assessing the skills that the community pharmacist need to meet this need (see **Chapter 2**). This research provides insight into public perceptions, which should be considered by policymakers to improve service utilisation. There are further ways to support the role of

community pharmacists in medicine optimisation, particularly with minor ailments and pharmacist independent prescribers in the CP. Also on the national healthcare agenda is the need to improve the role of pharmacists in wellbeing to maintain good general health. Since CPs are omnipresent and the pharmacist is the most accessible healthcare provider in the primary care setting, this could help to achieve countries' visions. Therefore, it is strongly recommended to publicly promote CP services. This step is important because the main barrier to utilising CP services is currently a lack of awareness. In addition, it is important for developing the role of the pharmacist considering the public perspectives based on their needs, which could help to inform future healthcare policies and support the expansion of community pharmacist roles.

In consideration of the workforce strategies, this research is useful for policymakers because it highlights the set of skills community pharmacists will need. The potential roles of community pharmacists in health promotion and illness prevention and management of minor ailments have been overlooked in healthcare policy documents. However, the results of the scoping review demonstrated that the enabling mechanisms for successful implementation of CP services have the potential to drive change and shape the future of the profession.

In light of digital health, the positive public's views towards the use of technology in delivering some CP services which could be useful in offering different ways of support for the wider community, while at the same time providing more options for the CP user and bringing the four countries a step closer to achieving their visions regarding digital health. Therefore, policymakers could utilise the findings of this research to integrate digital tools

to deliver CP services provision. They could also create and provide training to assist community pharmacists in increasing their roles.

7.5.4 Implications for future research

This research presented the skill set that pharmacists need to deliver the potential services in the CP, which are built on a public point of view. The pharmacists have not been invited to provide their insights about the specific set of skills they deem necessary to fulfil the needs of the public. Therefore, reflection by pharmacist on this issue is required. Furthermore, investigating the impact of these skills on the services provided and pharmacy users should be considered. Since this research only focused on skills, further research is needed to develop competency-based training materials. Potential areas of training could include management of minor ailments, health promotion and ill prevention. This could be conducted via collaboration between academics, policymakers, the Royal Pharmaceutical Society and CP leaders.

However, there is a need for further research that explores solutions to overcome barriers to expanding community pharmacists' roles. For example, funding is considered one of the main barriers to the successful implementation of the pharmacist services. Therefore, conducting economic evaluation studies would be crucial evidence to convince leaders to invest more money in CP services. In addition, mechanisms discussed in the scoping review represented six factors which could impact the CP services provision and lead to favourable outcomes. Further in-depth studies focused on these factors will facilitate better understanding of the phenomena.

In terms of CP service digitalisation, research was conducted before lockdown in the UK. People's views may have changed since the initial research was conducted because more people used digital health services during the pandemic. Further research should be conducted to explore people's and community pharmacists' perceptions of using digital health. In addition, research should be conducted to explore the roles of community pharmacists during and post the COVID-19 pandemic, which is important to shaping future CP services provision.

7.6 Conclusion

This PhD has provided an in-depth understanding of the benefits of CP services, as well as highlighting essential attributes that facilitate health service provision within CP and barriers that should be considered in the future. I explored the public need regarding CP's services and identified a set of skills that pharmacists will require to meet that need. This study showed that community pharmacists can play an essential role in community care, especially given the difficulty of gaining access to GPs. Specifically, they can contribute to health care by providing advice, managing minor ailments, providing screening services, and prescribing medicine (i.e., repeat prescriptions or for minor ailments).

In the context of the wider healthcare system, the location of CPs can increase access to health services and provide more support to members of the community, which could serve the Department of Health's agenda (in the four countries) of health promotion and illness prevention. However, community pharmacists' roles and responsibilities must be clearly defined to delineate their place in the whole system. Increasing awareness about the community pharmacist role and services was found to be a vital factor that is important for increasing CP services utilisation. Delivering high-quality and safe services relies on a strong workforce infrastructure; therefore, training is required to develop the current professional workforce to support the system in meeting healthcare needs and requirements.

In terms of digitalising CP services, most participants had positive attitudes towards the use of digital health tools. Meanwhile, the COVID-19 pandemic has compelled the use of digital tools in delivering healthcare services, which means more people will have used it; thus, public opinions may well have changed since this work was completed. Therefore,

community pharmacists need to embed digital health tools into their service delivery and signpost the public to reliable sources of advice. This could be useful in overcoming the credibility issue of digital health services among the public and ensuring wider adoption of digital services. At the same time, community pharmacists need to improve their digital skills to cope with continuous changes in technology and overcome some barriers.

The main conclusion from this thesis is that the public clearly perceived pharmacists to be well-trained healthcare providers. However, identifying skill gaps together with the public need will be useful for informing training programmes for community pharmacists. The proposed skill set will be beneficial for both the existing and future CP workforce.

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Appendices

Appendix I: A summary table of included studies

Title of study	Author / Year	Setting	Aim(s) of the study	Method	Study populations	Important results
A qualitative study of stakeholder views and experiences of minor ailment services in the United Kingdom	Aly et al, 2019	England and Scotland, UK	The purpose of this study was to look at the perspectives and experiences of a variety of stakeholders in relation to the deployment of minor ailment services in the UK.	Qualitative method: Semi structured interviews	33 participants	**1- 1 Benefits for the patient:** The minor ailment services which provide affordable, convenient, private consultation with community pharmacist and easily accessible service without the need for an appointment. The two GP organisation representatives, on the other hand, had a quite different perspective. The minor ailment services could not be used properly if the patient could not recognise their minor ailment condition. **1-2 Benefits to community pharmacists:** The professional image of community pharmacists has improved, and their skill set, and role have been recognised. **1-3 Benefits to health care system:** The majority of stakeholders agreed that transferring mild illnesses to community pharmacy reduced GP burden. The two GP organisation members interviewed claimed that minor illness services had no influence on hospital and primary care facility utilisation. **2. Barriers:** • Training (to improve their skills of operational elements and governance issues). • Reimbursement (poor reimbursement in relation to the amount of work). • Limited healthcare collaboration.
Benefits and barriers to the public health pharmacy: a qualitative exploration of providers' and commissioners' perceptions of the Healthy Living Pharmacy framework	Firth et al, 2015	north of England	To investigate the challenges to the adoption and advancement of the Healthy Living Pharmacy framework from the viewpoints of both providers and commissioners, and to see if pharmacists' perceptions of the framework's success and challenges are shared with commissioners.	Qualitative: Semi-structured interviews	22 participants	**Benefits for the pharmacist:** Workforce development, and motivation for pharmacy teams (Since joining the Healthy Living Pharmacy framework, several pharmacists have reported becoming more involved in engaging patients about health promotion). **Barriers:** • Lack of the awareness. • Time (increased workload). • Financial considerations.
Benefits and tensions in delivering public health in community pharmacies – a qualitative study of healthy living pharmacy staff champions	Cooper and Tsoneva, 2017	Sheffield / UK	To learn more about pharmacy staff champions' perspectives on the positive and negative aspects of their jobs.	Qualitative: Focus group & semi-structured interview	1 focus group (n = 7 participants) interviews (n = 6)	**Benefit for the pharmacist:** Higher work satisfaction and allowing the pharmacist to talk with patients about health and well-being concerns with more information and confidence. Furthermore, pharmacist felt inspired to pursue more formal continuing professional development. **Facilitator:** Advertising services in local GP surgeries or newspapers and gave support for pharmacist to be trained. **Barriers:** • Staffing issues, lack pf time and high workload . • Infrastructure of the CP: Participants claimed that employers still valued store space for selling stock, but that they recognised the need of maintaining income from these, which may help them in their healthy living champions duties in the future. • The community pharmacy's business nature made it difficult to provide an appropriate environment for health promotion initiative. • Lack of awareness. • Lack of IT system particularly Internet.

Helpful advice and hidden expertise: pharmacy users' experiences of community pharmacy accessibility	Lindsey et al, 2017	Northeast region of England	To define how community pharmacy care is viewed and experienced, with a focus on community pharmacy access.	Qualitative: Semi-structured interviews	30 participants	**Facilitators :** • The participant's relationship with the pharmacist. Participants did not consider themselves as 'patients,' but rather as individuals seeking healthcare advice from a community pharmacy. • Time in connection to healthcare access: participants believed that community pharmacists had more time to discuss topics related to unhealthy behaviours. • A sense of empowerment when seeking healthcare advice from a pharmacist who was available without an appointment at a community pharmacy. **Barriers :** Lack of awareness regarding community pharmacy services.
A qualitative exploration of opinions on the community pharmacists' role amongst the general public in Scotland	Gidman and Cowley, 2013	West of Scotland, UK	To understand the public's perceptions and experiences with pharmacy services.	Qualitative: Focus groups	5 focus groups (26 participants)	**Participants views:** Many participants thought pharmacists had a broader consultative role, especially when doctors were unavailable. Also, they believed that community pharmacists dealt with minor self-limiting diseases more efficiently than doctors because of their knowledge of OTC. Patients frequently mentioned that they have a higher level of interpersonal confidence in their doctors and that they prefer to approach them for more serious health issues. **Advantages of the CP:** The participants used pharmacies for convenience since they couldn't get to a GP and pharmacists were more approachable and accessible. **Disadvantages:** Community pharmacies were perceived to provide incomplete services that did not work effectively in collaboration with other primary care providers. **Barriers**: • The pharmacy and retail environments were deemed unsuitable for private healthcare consultations. • In comparison to GPs, pharmacists have a low level of trust. In several cases, participants believed that GPs were sceptical about community pharmacy services. • Participants were unaware of the range of services available at CPs or uncertain about how to access services. • Some thought they were time restricted due to high demands and heavy workloads.
Young people's perceptions of accessing a community pharmacy for a chlamydia testing kit: a qualitative study based in Northeast England	Ahmaro et al, 2021	Northeast England., UK	To understand young men and women attitudes toward pharmacy testing and probable chlamydia treatment were obtained and analysed in order to maximise service provision.	Qualitative: Semi-structured interviews	26 participants (young people)	**Advantages:** The service's geographical accessibility and extended opening hours in Northeast England were seen as advantages. **Facilitators :** • It is important to promote the convenience of pharmacist consultation rooms and the provision of a friendly, non-judgmental service. • The participants found it handy and reassuring to be able to get chlamydia treatment from the same pharmacist. As a result, compared to testing alone, a possible pharmacy test-and-treat service may stimulate greater uptake. **Barriers :** • Concerns about stigma preventing use of chlamydia testing among young people. • When seeking the test, young individuals were afraid of being judged by pharmacy employees or being overheard by customers. • Privacy concerns regarding the pharmacy environment in comparison with other similar testing locations, such as GP and non-medical venues. Only a few young individuals claimed pharmacies were busy. Some people also mentioned how inconvenient it was to wait for a prescription.

Seasonal influenza vaccination delivery through community pharmacists in England: evaluation of the London pilot	Atkins et al, 2016	London, UK	To assess the efficacy and cost of the London pharmacy initiative, a programme that allows eligible patients to get seasonal influenza vaccine at pharmacies.	Quantitative: (records and survey)	Records: pharmacist 58 GPs: 344	**1.1. Benefits for healthcare system** The pharmacy initiative, according to the great majority of pharmacists, reduced the pressure on the healthcare system. GPs, on the other hand, were evenly split on whether the initiative increased or lessened their administrative load (29–30 percent, respectively). Furthermore, a flu vaccination dosage delivered by a pharmacist costs the NHS £2.35 less on average than a dose administered by a GP. **1.2. Benefits for the patient: Pharmacist:** providing more option for patients (98%) and more convenient (97%). **GPs:** providing more option for patients (60%) and more convenient for patients (40%). **Barriers:** • Inefficient access to patient medial record. • GPs were worried about a decrease in the quality of treatment provided to their patients (40–50%). • GPs were concerned about their patient's safety (40%). • GPs were concerned about financial loss (52%). • GPs were concerned about patient data being lost as a result of poor reporting and the need for manual data input.
How do organisational configuration and context influence the quantity and quality of NHS services provided by English community pharmacies? A qualitative investigation	Jacobs et al, 2018	England, UK	To investigate stakeholder views of the organisational and extra-organizational elements that influence service quality and quantity in a community pharmacy, which is a well-known example of a private-sector provider of publicly funded healthcare.	Qualitative: Semi-structured interviews	40 Participants	**Facilitators:** • Number staff, skill-mix and providing training. • Good working connections with GPs may contribute to increasing patient uptake by referring or signposting patients to community pharmacy services. **Barriers:** • Time restrictions faced by pharmacists as a result of rising dispensing volumes, fewer personnel, an expanding range of pharmacist-led services, rising regulatory and administrative burdens, and stock shortages. • The public's attitudes and expectations of community pharmacies, including the services provided and pharmacists' roles. • Insufficient compensation for labour and infrastructure investments. • working relationships with local GPs and • Lack of integration of the new services with the existing services.
Barriers in the public health role of community pharmacists: a qualitative study	Agomo et al, 2017	UK	The study's main goal was to find out what UK healthcare professionals thought about the challenges that community pharmacists face in their public health roles.	Qualitative: Semi-structured interview	15 healthcare professionals	**Barriers:** • Issues with the use of technology and social media in community pharmacy. • Concern about privacy when using modern technology and social media. • pharmacists themselves are concerned about their role in public health. • lack of awareness about the public health role of the community pharmacist. • Employer pressure has limited the amount and quality of public health/clinical activities that community pharmacies may provide. • The inability to perform public health services due to a lack of time. • Inadequate funding. • Government's policy.

						• Insufficient communication skills, a lack of integration in UK undergraduate healthcare programmes, and some of the issues involved with training UK pharmacists as scientists were recognised as educational barriers.
How to enhance public health service utilization in community pharmacy?: General public and health providers' perspectives	Saramunee et al, 2014	Sefton PCT, Northwest England., UK	To investigate the experiences and perspectives of four categories of participants on pharmacy-based public health services, including the general population, pharmacists, general practitioners, and other stakeholders, and to identify potential variables influencing service utilisation.	Qualitative: FGs and Interviews	3 FGs were conducted with the general public (n= 16). 14 semi-structured interviews were undertaken with Pharmacist (n= 9), GPs (n =2) and stakeholders (n= 3).	**Facilitators:** • Accessibility and convenience. • Except for GPs, all participant groups acknowledged pharmacists' approachability and availability without an appointment, which was rated higher than that of GPs. • Good customer-pharmacist relationship. • Pharmacists were self-assured in their ability to deliver public health care. • Awareness of role of community pharmacist. • Understanding of role of community pharmacist. • Providing training would result in stronger support for new service delivery. • Interprofessional collaboration. **Barriers:** • Patients' worries regarding confidentiality and a lack of privacy. Unfortunately, several participants were unaware of the counselling room. • Due to a heavy dispensary workload, several pharmacists have increased their time pressure. • One focus group mentioned a lack of consistency in service delivery. • The public's awareness of pharmacists' roles may be limited due to a lack of publicity. • Although GPs identified the potential benefits of pharmacists, many were sceptical about their ability to provide services for patients with long term condition. • Insufficient financial support. • Inadequate pharmacy team skill mix. • Lack of collaboration with other HCPs involving policy and health service systems.
The public's perception of the role of community pharmacists in Wales	Kember et al, 2018	Northeast of Wales, UK	To learn more about how the general public views the community pharmacist's role in public health.	Qualitative: Focus group	32 participants (5 FGs)	**Facilitators:** • Accessibility of the community pharmacy • It is more convenient for members to talk with their pharmacist or obtain products for addressing minor ailments than to schedule an appointment with a doctor. • The difficulty in getting an appointment with a doctor, as well as the length of time spent waiting for an appointment, was cited by participants in all focus groups. • Pharmacists and general practitioners should do more to advertise services and inform the public about what is available, with leaflets and posters being the most prevalent methods proposed. • The government had a responsibility to promote the community pharmacy services, especially in the areas of public health and health promotion. **Barriers:** • Pharmacists working in large multi-store pharmacies or supermarkets were thought to be less well-trained, less trustworthy, and less professional than those working in smaller pharmacies or those connected to GPs. • A common theme was the possible conflict between business pressures and compassion or professionalism. There was a belief that pharmacies 'connected' to GP surgeries had a lower retail function and were thus less commercially oriented than other types of pharmacies. • Lack of awareness among the public regarding community pharmacy services.

Understanding recruitment rather than as clinical practitioners. and retention in the NHS community pharmacy stop smoking service: perceptions of smoking cessation advisers	Sohanpal et al, 2016	London boroughs, UK	To determine which components of adviser behaviour may be changed to increase the percentage of people who enrol and complete the programme.	Qualitative: Semi-structured interviews	25 stop smoking advisers (13 pharmacists and 12 support staff).	**Benefits for the pharmacist:** Many participants were pleased of their work and felt satisfied that their role as advisers had helped others stop smoking, which had a positive impact on the community's health and well-being. **Facilitators:** • Active involvement with clients and t follow-up. • Gaining reinforcement of motivational and communication skills via providing an appropriate training. • Including employees who aren't professionally trained as cessation counsellors might potentially increase the number of people who join and stay in the quit smoking programme. • Changes to the pharmacy compensation system should be examined to encourage recruitment and enable for personalization of the programme for individual smokers. **Barriers:** • Lack the interpersonal skills which required to effectively engage with smokers and assist them in quitting. • Process of service remuneration • Time and workload. • Two interviewees noted other organisational problems as barriers to smoker recruitment, such as an insufficient supply of nicotine replacement medicines to match client demand and only having one consultation room that was frequently occupied.
Public perceptions and experiences of the minor ailment service in community pharmacy in Scotland	Boag et al, 2021	Scotland, UK	Determine the perspectives and experiences of people who use Minor Ailment Service, as well as the possible influence on other healthcare services.	Quantitative: questionnaire	1,121 respondents Flow up questionnaire: 327	**Perception:** Minor ailments service is a highly recognised service in terms of full satisfaction (87.2%) and consultation experience, as evidenced by the positive impressions and experiences of individuals who have used it. **Advantages:** Participants indicated a strong dependence on GPs, with 59 % stating that if their pharmacy did not provide minor ailments service, they would have gone to their doctor. This research highlights the existing potential impact of access to higher-cost healthcare providers. Most patients reported effective treatment through MAS which was confirmed at follow-up as was further access to healthcare services which demonstrated a minority of patients accessing further services to treat their minor ailments. **Facilitators:** The participants were asked why they used minor ailments to get medical help. The most frequent reasons for utilising minor ailments service were convenience (n=748; 67.1%), no appointment (64.3%), already having a good connection with the pharmacy (62.8 %) used service before (55.7%) or they do not think the Ailment serious enough to see a doctor (59.2%).
The testing of people with any risk factor for hepatitis C in community pharmacies is cost-effective	Buchanan et al, 2019	Isle of Wight, UK	This research aims at the cost-effectiveness of a community pharmacy testing service in a group of persons who are at risk of contracting the hepatitis C virus.	Economic evaluation	186 tests over 24 months	**Benefits:** During the trial period, the intervention discovered 13 new cases of hepatitis C virus in people who disclosed a variety of risk factors, with six of them achieving a successful HCV cure. The intervention resulted in higher healthcare expenses when compared to a control group. However, when compared to the improvement in quality of life associated with the intervention, the ICER was £3689 per QALY gained, which was much lower than the NICE willingness to pay threshold of £20,000 per QALY. The ICER would have been somewhat higher in the hypothetical scenario if the intervention was limited to people with a history of injecting drug exclusively, at £4865 per QALY gained which shows that screening patients with any risk factor for HCV was actually more cost effective than screening only people with a history of injecting drug use.
Involving the public and other stakeholders in development and evaluation of a community pharmacy alcohol screening and brief advice service	Krska and Mackridge, 2014	Sefton, Northwest England, UK	1. To know about community pharmacy staff's, the general public, and other stakeholders' perspectives on pharmacy-based alcohol screening and advisory services; 2. To include all relevant stakeholders in the development of acceptable and	Mixed methods: Interview + questionnaires + observation	**Stage 1:** Survey: 150 members of the public. Interviews: 11 stakeholders **Stage 2:** 9 participants	**Perception:** Participants in the survey were positive about pharmacy alcohol services, with 80 % saying they were comfortable or very comfortable discussing alcohol with a pharmacist. All of the respondents in the interview expressed positive opinions about the service and indicated professional staff attitudes, with no sensation of being rushed. The largest numbers of respondents thought were a good idea through supporting people to stop drinking (92%), written guidance (91%), offering information about other resources (90%), and referral into other programmes (89%). From interview, The pharmacy support staff thought that offering these extra services increased their job satisfaction, therefore alcohol-related services were appreciated.

			feasible pharmacist led alcohol screening and advisory services; and 3. To assess a pilot pharmacy alcohol screening and advising service from multiple perspectives.		**Stage 3;** 10 interviews with service user	**Facilitators:** • Privacy (96%) and confidentiality (94%) • Friendly pharmacist (95%) and enough number of staff (86%) • Training (82%) to ensuring proper knowledge and integration of pharmacy into broader service offering which mentioned by stakeholders, pharmacists, and the general public. **Barriers:** • Pharmacy environment and risk of conversations being overheard. The necessity for suitable private facilities was emphasised by pharmacist interviewees, who also acknowledged that offering alcohol services in an open pharmacy atmosphere was a possible constraint. • Waiting times (80%) and overall pharmacy busyness (68 %) were also key issues for the public, and both pharmacists and their employees' expressed worries about pharmacist workload, indicating the necessity for counter personnel to be involved in providing screening. • Lack of awareness of services
Sexual and reproductive healthcare providers' opinions on expansion of pharmacy-led provision of contraception	Boog et al, 2018	UK	To identify the perspectives of UK contraceptive providers on community pharmacist-led contraception.	Quantitative : Questionnaire	172 respondents	**Perception:** The vast majority of respondents were supportive of pharmacists providing hormonal contraception. The provision of the progestogen-only tablet under patient group directives received the most positive support (78 %supported initiation). Bridging (temporary) contraceptive usage would improve (71.%), effective contraception use would rise (57.4%), and unwanted births would decrease (54.6%), while long-acting reversible contraception use would drop (, 60.1%) **Benefits:** Several respondents viewed providing contraceptives at pharmacies as a method to improve access and expand service delivery. This was thought to be most suited for women with simple/routine contraceptive needs, and it might be "empowering" for those seeking contraception without "perceived barriers/judgments." **Facilitators:** free service, pharmacy services should be completely integrated into sexual and reproductive health services, a collaborative partnership with local sexual and reproductive health services and GPs will be critical. Assistance mechanisms and clear referral paths, in addition to initial training and continuous education, will be critical in providing consistent patient care and professional support for pharmacists. **Barriers:** Not have enough time, knowledge, skills, or support to deliver thorough, holistic sexual health consultations that include all types of contraception and STI screening.
Qualitative exploration of the views of healthy living champions from pharmacies in England	Rutter and Vryaparj, 2015	England, UK	To know more about Healthy Living Champions' perspectives on their roles and to identify any facilitators or barriers to fulfilling them.	Qualitative: semi-structured interview	14 Healthy Living Champions	**Benefits:** Healthy Living Champions were positive about their new role. Also, they were motivated by a feeling of personal development and a desire to serve others, rather than financial gain. The change in status appeared to be well received by Healthy Living Champions, who were able to communicate with patients in ways they would not have been able to before. As a result, HLCs were able to increase their job satisfaction by assisting patients. **Facilitators:** Training, Healthy Living Champions are required to maintain competency and to enhance skills and confidence in order to offer all (and maybe future) services. **Barriers:** Engagement of the general public with service. Healthy Living Champions claimed that the public is unaware of Healthy Living Pharmacy services.
Understanding the impact of a new pharmacy sore throat test and treat service on patient experience: A survey study	Mantzourani et al, 2021	Wales, UK	To explore if patients would accept a pharmacist providing a sore throat consultation that includes clinical grading and point-of-care testing, and how this could affect future health-seeking behaviour.	Quantitative: Questionnaire	510 responses	**Perception:** Patient satisfaction with the new service, its delivery, and the variety of alternatives for sore throat symptom management is quite good. Overall, 98.2% of patients were satisfied with the service, and 98.4% of patients said they would suggest it to friends. Regardless of whether a swab was required, 494 out of 510 patients agreed or strongly agreed that they felt confident in managing their condition at the end of the consultation and 98.8% of the patients said they would return to the pharmacy rather than seek medical care for following sore throat symptoms. Also, patients valued the pharmacy team's professionalism, saying it put them at ease. **Facilitators:** • Convenience and accessibility without the need to book in advance and arrange an appointment, even outside of GP operating hours.

						• Increase collaboration between GPs and pharmacists. • Coordinated efforts to raise pharmacy service awareness. • Effective workload restructuring to accommodate capacity for extended services as part of routine care in the NHS. • Increase pharmacist motivation and willingness to engage, and effective integration and communication of any new pharmacy services within referral pathways across the primary care system. **Barriers:** • The service's commissioning has been inconsistent. • Inappropriate referral from GP • Lack of awareness for the service • Increase pharmacist's workload.
Towards improving service delivery in screening and intervention services in community pharmacies: a case study of an alcohol IBA service	Mackridge et al., 2016	Northwest England, UK	To explore the procedures involved in providing an alcohol screening and intervention service in order to improve service quality.	Qualitative: ethnographic observation + semi-structured interviews	5 CPs: Phase 1; 171 h of observation. Phase 2; audio recordings of 9 consultations Phase 3: 16 interviews with service users at 2 weeks and 14 users at 3 months Stage 4: feedback sessions with staff in all CPs	**Perception:** The majority of participants rated the service highly, saying that the delivery was good and that their previous relationship with pharmacy staff encouraged them to utilise it; nevertheless, a minority thought that alcohol conversations should be held at GP offices. Participants thought the programme may raise knowledge about the dangers of alcohol intake, but many stressed that it would only assist at-risk persons. Participants were generally satisfied with the degree of privacy provided; however, satisfaction was dependant on no other customers accessing the room during the consultation if it took place in a public location. Staff thought that CPs were a good location to get alcohol-related information. **Facilitators:** • Boosting staff confidence and competency such as consultation. • Advertising materials. • Usage of private places. • Staff-customer relationships and use casual sympathetic techniques. • Easy operational data collecting systems. **Barriers:** • Staff attitudes of alcohol intake as a sensitive subject. • Lack of clear referral channels for higher risk people. • All factors that affect financing for commissioned services.
General public's views on pharmacy public health services: current situation and opportunities in the future	Saramunee et al, 2015	Sefton, UK	To explore the general public experience and willingness to utilise seven pharmacy public health services linked to cardiovascular risk in England.	Mixed methods: Questionnaire + focus group	Questionnaire: 908 responses Focus group: 5	**perception :** Overall, only a small percentage of respondents had used any of the CPs public health services.. However, over 40% said they would be willing to utilise any of the health checks, while another 25% said they may use them. Fewer people said they would use a pharmacy for any of the advisory services. Overall, fewer than 20% of respondents said they would go to a pharmacy for particular lifestyle advice such as quitting smoking, drinking responsibly, or reducing weight rather than lifestyle-related health checks. The most likely to utilise any service were frequent pharmacy users, females, and those in better health. **Barriers:** • The public saw community pharmacists as strangers due of **frequent staffing changes** and the use of locums. This led to the conclusion that consumers' trust in pharmacists upholding the confidentiality of their personal information would be eroded, and that excellent relationships with frequent pharmacy users would be discouraged. • The general public was seen to be sceptical about community pharmacists' ability to offer health advice, as there was a belief that this required well-trained professional personnel. • The general public's lack of awareness was attributed to a lack of promotion of service availability. They also claimed that information on the connection between pharmacy public health services and other health-care services was inadequate.

						• Furthermore, participants said that people had been conditioned to think of a community pharmacy as a place where they can get medication and a pharmacist as a medicine expert for the majority of their lives. They believed that changing views, especially among the elderly, would be difficult.
"It's easier in pharmacy": why some patients prefer to pay for flu jabs rather than use the NHS	Anderson and Thornley, 2014	England, UK	Identifying whether people were eligible for free vaccination on the NHS and the reasons why they were paid when they were eligible for free immunisation.	Quantitative: Retrospective study analysis of records + survey	921 surveys	**Facilitators:** There are a number of people who are eligible for the NHS flu vaccination but want to pay for it privately through community pharmacies. The difficulty in getting an appointment (34%) and the inconvenience (44%) are main reasons why people do not use the GP's service. Convenient locations (59%), operating hours (43%), and a liking for the pharmacy environment and or staff (22%) are all reasons for using pharmacies to obtain services.
Views of the Scottish general public on non-medical prescribing	MacLure et al, 2013	Scotland, UK	to explore the public's perceptions about non-medical prescriber in Scotland.	Questionnaire	1,855 responses	**Perception:** Some respondents favoured pharmacists prescribing the same medications as physicians, while others indicated that pharmacists should only prescribe for mild diseases, repeat prescriptions, or low-risk medications. **Benefits:** The main benefit of non-medical prescription, according to respondents, is increased patient convenience as a result of shorter consultation durations. Aside from convenience, respondents mentioned the advantages of a reduction in doctors' workload, allowing them to focus more on more complicated cases. **Disadvantages:** Some participants are concerned about the risks associated with prescriber competence. **Facilitators:** • Reassurances to the general population about healthcare professional training. • Information technology to access patient records. • In addition to information, respondents emphasised the need of collaboration between doctors and non-medical prescribers. **Barriers:** • A lack of understanding of the training of a healthcare professional • Concern about a lack of training and skill in diagnosis. • Many people expressed worries about the requirement to see patients' medical records before making any prescription decisions or taking any actions, especially given questions about the legitimacy and integrity of information provided by patients. Also, need of information recording was emphasised. • Potential lack of privacy and confidentiality in in the community setting
Effectiveness of a community pharmacy weight management programme	Boardman & Avery, 2014	4 Primary Care Trusts in England, UK	The goal of this study was to see how effective a community pharmacy weight management program is in helping obese people lose weight.	Quantitative: Retrospective analysis of data collected by CPs	281 patients	**Benefits for the patients:** At 3 months, those patients who remained in the programme had a statistically significant weight loss (n = 110, p 0.001). At three months, around a quarter of the participants had met their objective of losing 5% of their body weight. There were statistically significant weight and waist circumference reductions at 6 months for those patients who remained in the programme compared to baseline (n = 59; p 0.001). By 6 months, there were statistically significant decreases in blood pressure, with two-thirds of the participants (n = 22) having lower blood pressure than before [mean change in systolic BP = -9.5 mmHg (SD 20.1); mean change in diastolic BP = -4.7 mmHg (SD 9.0)].

Community pharmacy and public health: preserving professionalism by extending the pharmacy gaze?	Atkin et al, 2021	North of England, UK	To examine pharmacists' discussions of healthy living advice in the context of competing demands as they try to fulfil a larger clinical and public health role while maintaining and increasing their professional status.	Qualitative; observation and interviews	Observation: 36 hours Interviews: 7 pharmacists 25 people.	**Perception:** When it came to health-related questions, the majority of the participants said they preferred to speak with their doctor, who they considered was more qualified to provide guidance. A few people said they felt better at ease discussing their health with a pharmacist. Pharmacists were perceived to have more time, but less opportunities to reinforce decisions. **Disadvantages:** This demonstrates how community pharmacists struggle to give patients with useful information (common sense information). 'Add-on' public health roles, rather than improving professional standing, risked becoming little more than an essentialised enactment of consumerist health care. From observation, the majority of the pharmacies undertook health promotion activities in response to requests from the local government. However, there was little proactive follow-up provided. **Facilitators:** • Understanding how patients think about drinking and 'healthy living' in terms of their long-term health. • Having more open talks that include information negotiation rather than provision, might assist community pharmacists combat the present professional vulnerabilities they confront. • Establishing a relationship as the foundation for a more meaningful consultation **Barriers:** • Workload and number of staff • Pressures on the use of time and space • Some pharmacists struggle with time management and prioritisation. • A business-oriented organisational culture constrains.
Impact of a pilot NHS-funded sore throat test and treat service in community pharmacies on provision and quality of patient care	Mantzourani, 2020	Wales, UK	To assess the impact sore throat test and treat on the delivery and quality of patient care, specifically on antibiotic use, patient safety, and GP consultation rates.	Quantitative: Secondary analyses of sore throat test and treat consultation from CP and GP	1725 consultations	**Benefits:** The service may play a role in safely shifting uncomplicated sore throat therapy from GP to community pharmacists while also promoting antibiotic stewardship, according to data from the first five months of implementation**.** According to data, the service has the potential to ease GP pressure. The number of patients seeking treatment for a sore throat has fallen from 0.71 per 1000 in March 2018 (prior to sore throat test and treat) to 0.36 per 1000 in March 2019. (4 months after sore throat test and treat). **Advantages:** The great majority of people who used the services said they said GP or other HCP were not accessible.
Effectiveness of community pharmacies in improving seasonal influenza uptake—an evaluation using the Donabedian framework	Rai &Wood, 2017	West Midlands, UK	To evaluate if the CP service was successful in increasing influenza vaccine uptake by examining the methods used by the commissioners to set it up.	Mixed methods: Surveys and records analysis	8189 participants	**Perception:** The vaccination was given by a pharmacist, and there was a high degree of satisfaction (95.8% stated vaccine administered as well as a GP or nurse). However, Almost every single person who responded (99.6%) said they would use the service again. However, the rate of uptake did not rise. **Advantages:** The most common reason for choosing a pharmacy was convenience (78.3%), owing to the lack of need for an appointment, easy opening hours, and accessibility . **Facilitators:** Enhanced connection with GPs and increased advertising of the service **Barriers:** • Some pharmacists have been hesitant to vaccinate people due to concerns about damaging relationships with GP. • There was very little promotional action.
Support for community pharmacy-based alcohol interventions: a Scottish general public survey	Fitzgerald et al, 2015	Scotland, UK	To understand the general public in Scotland views about community pharmacists' role and engagement in decreasing alcohol use among customers and alcohol-related harm.	Quantitative: Survey	1573	**Perception:** More than two-thirds expressed confidence and trust in pharmacists when it came to discussing alcohol-related issues. Moreover, half of respondents (56.4 %, or 888) believed that pharmacists could provide advice on how to drink alcohol safely. Those who agreed showed strong support (70% agreement) for all efforts, especially referring people to other HCPs or organisations, and discussing suggestion about alcohol consumption limits and how they may influence health. The majority of participants (68.7%) believe that such matters will be addressed in confidence (68.7%, 1080). Respondents preferred discussing alcohol with a doctor over a pharmacist (77.5%, 1219).There was a high degree of agreement (68.7%, 1080) that pharmacists would address matters discreetly, with a comparable proportion (64.3 percent, 1011) agreeing that privacy in a community pharmacy would be a concern. **Advantages:** Pharmacists can influence safer alcohol use due to the wide availability of pharmacies and easy access to expert guidance.

Moving anticoagulation initiation and monitoring services into the community: evaluation of the Brighton and hove community pharmacy service	Ingram et al, 2018	Brighton and hove, UK	The assessment was to compare local outcomes to recommended goals for percentage therapeutic range (RR) and percentage therapeutic target range (TTR), as well as to measure patient satisfaction levels.	Service evaluation (evaluating patients record) and questionnaire for patient satisfaction	2341 patients record & 2126 patients surveyed	**Patients' perceptions of CP services:** Overall satisfaction with the service was high; patient rates of pharmacist interpersonal and communication skills were extremely high, while patient ratings of information delivered to them were less positively. In instance, 13.0% of patients indicated they needed more information about why they were taking warfarin, 31.0 % said they wanted more information on side effects, and 2.8 % claimed they had no information at all regarding adverse effects. The majority of patients thought the pharmacy was clean and tidy (85.4%), and the consultation room was appropriate(95.1%). However, 13.5 %t of customers had trouble getting in touch with the pharmacy over the phone. **Benefit:** This study demonstrates that anticoagulation clinics in community pharmacies can be a safe and clinically effective service. The service exceeded the national average in terms of percentage therapeutic target range (TTR) and percentage therapeutic range (RR).
Increasing seasonal influenza vaccination uptake using community pharmacies: experience from the Isle of Wight, England	Warner et al, 2013	Isle of Wight, UK	To identify effect of community pharmacies influenza vaccination programme on immunisation rates and acceptability of the program among patients.	Service evaluation	2837 patients	**Perception:** Patient satisfaction with the pharmacy-based service was high, with availability being considered as a significant advantage over traditional medical care. Patients who would not otherwise have had access to medical treatments were also immunised through the pharmacy-based service. **Benefits:** The pharmacy service helped to boost patient vaccination rates in both the over-65 and under-65 age categories, as well as the number of people who got their first immunisation. **Advantages of CPs:** Patients cited five primary reasons for using pharmacies: no waiting, no queue, no appointment, convenience, and quick access. Furthermore, patients mentioned a lower risk of infection at the CP and the belief that it would assist lessen the workload of local GPs.
National community pharmacy NHS influenza vaccination service in Wales a primary care mixed methods study	Evans et al, 2016	Wales, UK	To explore and validate the factors that impact pharmacy performance when giving NHS influenza vaccines.	Mixed methods: semi-structured interviews + quantitative analysis of predictors of vaccination numbers in CPs	Interviews: 16 pharmacists	**Advantages:** In Wales, community pharmacists make a tiny contribution to immunisation. Positive findings suggest that community pharmacies reach a higher proportion of younger at-risk individuals, who have low vaccine uptake, than influenza immunisation programmes as a whole. **Facilitators:** • The quantity of vaccines administered was favourably related with a variety of pharmacist-related factors such as longer opening hours, flexibility in offering immunizations, and location. • Public awareness. • Increasing the number of pharmacists who can administer vaccines and delegate some of pharmacist role to support staff. **Barriers:** Workload, logistic, financial pressure, low awareness, or avoid conflict with GPs.
Strategies enhancing the public health role of community pharmacists: a qualitative study	Agomo et all, 2016	UK	In this study, healthcare experts were interviewed in order to develop strategies for improving the public health role of community pharmacists in the UK.	Qualitative: semi-structured interview	15 healthcare professionals (11pharmacists, 3 GPs and a nurse)	**Benefits:** • The greatest advantage of pharmacists playing a role in public health may be in the domain of preventative care. This advantage was stated by all healthcare professionals, not only pharmacists. • Accessibility, which could help pharmacists to be more trusted and respected by the general public. • Enhancing community pharmacists' public health role, according to some, might encourage collaboration between pharmacists and other HCPs, raise pharmacists' visibility, and expand their involvement in healthcare delivery. This might also mean that GPs are under less pressure to deal with issues that could simply be managed by pharmacists. • Others may see advantages in the form of cost savings for the NHS, improved community pharmacy viability, and better time management for other healthcare practitioners. **Facilitators:** • Empowerment via education and awareness, direct compensation of pharmacists. • Other participants highlighted alternative scenarios in which new technology may assist pharmacists improve their public health role, such as recording the public health activities given by community pharmacy, which could be important in emergency circumstances. • All of study participants felt that training communication skills to UK pharmacy students and pharmacists may improve the role of community pharmacists in public health.

						• Integrating UK undergraduate healthcare programmes would assist to break down barriers and improve communication among health-care practitioners, as well as create a greater understanding of practitioners' responsibilities and skill sets. • Adding more public health elements to the undergraduate pharmacy curriculum.
Community pharmacists at the heart of public health: A longitudinal evaluation of the community pharmacy influenza vaccination service	Deslandes et al, 2020	Wales, UK	To assess the community pharmacy flu vaccination programme in Wales.	Quantitative: A longitudinal study	103941 records	**Benefits:** Community pharmacists are delivering a growing number of flu vaccines (Increased CP vaccinations were shown to have a high positive correlation with overall vaccination numbers (R = 0.9316, p 0.01)), benefiting patients in all at-risk categories. **Advantages:** • Accessibility of the CP . • Convenient • No appointment was necessary.
Accessing emergency contraception pills from pharmacies: the experience of young women in London	Turnbull et al, 2020	London, UK	To learn about women's perspectives and experiences with pharmacist-dispensed emergency contraceptive tablets	Qualitative: interviews	25 participants	**Advantages:** The long opining hour, simplicity and quickness of access, as well as the convenience , were important benefits of pharmacy provision of emergency contraceptive tablets. **Disadvantages:** • Participants were concerned about privacy and confidentiality due to Pharmacy' public nature. • Inadequate attention to information requirements and prevention of recurrence of emergency contraceptive tablets need . • Less personal service. • Participants most often stated reservation about pharmacies as emergency contraceptive tablets suppliers. Some people had great experiences, but others reported employees as being judgmental, unsympathetic, and unsupportive. **Facilitators:** • Increased privacy. • Providing more contraceptive counselling. • Regarding pharmacist attitude: being more compassionate approach, and signposting follow-up services.
A 5-year evaluation of the emergency contraception enhanced community pharmacy service provided in Wales	Mantzourani et al, 2019	Wales, UK	to characterise and study variations in the pattern of community pharmacy emergency contraception usage in Wales over five years.	Quantitative: Secondary analysis of data from all NHS emergency contraception consultations.	181 359 records	**Benefits:** The access to emergency contraception through CPs is helping to reduce teenage conception and abortion rates.
From community pharmacy to healthy living pharmacy: Positive early experiences from Portsmouth, England	Brown et al, 2014	Portsmouth, UK	To analyse the impact on service provision and staff involvement at an early stage in the development of the HLP programme, and to interview staff at as many pharmacies as feasible within the sample, in order to acquire a better understanding of the aspects that contribute to the success of HLP.	Mixed methods: data abstraction from pharmacy records, and interviews with staff	38 staff at CPs	**Benefits:** **For the pharmacist:** Individually rewarding, being more motivated at work as a result of increased opportunities to engage customers and enhance their health, improving pharmacist skills (Enhanced communication skills which improved team dynamics and increasing collaboration with other healthcare professionals) and knowledge, increasing self-confidence and there was direct impact on their own healthy habits. **For the patients:** More service resulting in increased public access and the possibility for better outcomes due to effective signposting. **For pharmacy business:** • Service reimbursements have been increased. • The pharmacy's visibility and repute have improved. • Increased client engagement due to Increased recognition of pharmacy services. • Customer loyalty has improved.

						Facilitators: • Staff welling and motivation. The most common motivation for HLP was a sense of obligation to the pharmacy profession and to customers. Professional interest was another motive. • Providing training which is made the participants feel more confident and knowledgeable about approaching customers and initiating talks about health-related concerns, • Good relationship with CP users, and support from Portsmouth NHS Primary Care Trust. **Barriers:** • Lack motivation. • Increase workload and time pressure. • Unfamiliarity with service and resistance to change
New roles in pharmacy – learning from the All-Wales Common Ailments Scheme	Mantzourani et al, 2016	Wales, UK	To explore stakeholder perspectives on a nationwide pilot of the 'Choose Pharmacy' Common Ailments Service in Wales.	Qualitative: Semi-structured interviews	11stakeholders; 7pharmacists, 2 GP practice managers and 2 commissioners	**Perception:** In terms of service, it was thought that there was still a lack of awareness of the modern-day pharmacist's role. Furthermore, Common Ailments Service provided an excellent chance to improve pharmacy's image and raise public and GP knowledge of the services that pharmacy can provide. **Advantages of the service:** • Re-educate patients and increase their confidence in identifying and treating minor illnesses on their own. • Reducing GP workload. • In addition, both commissioners agreed that improved self-care may result in lower health-care costs and more efficient use of NHS resources. • Improving interdisciplinary relationships with other stakeholders. **Disadvantages:** Add workload and time **Facilitators:** Providing support and training.
Evaluation of NHS Health Checks provided by community Pharmacies	Corlett and Krska , 2015	London, UK	Determine the frequency of lifestyle advice and referrals following a pharmacy NHS Health Check, and also attendance at general practises for follow-up, along with attendee feedback and self-reported lifestyle change.	Mixed methods including data abstraction from Health Check and practice records, questionnaire to all attenders and interviews with sample of questionnaire respondents	Data from 190 pharmacy Health Checks, performed in four pharmacies in London, 66 survey respondents and 19 interviews	**Perception:** Almost all survey participants said the pharmacy Health Check was a positive experience, highlighting the pharmacy's accessibility and convenience. They also found the information provided by the pharmacist were helpful in making lifestyle modifications. In general, participants said the Health Checks met or above their expectations. Much of the information offered, according to the participants, was not new, but it was valuable as a nudge to consider making a change. A minority of people felt that the information, although useful, was too superficial and that they should visit their doctor or a nurse for a more in-depth discussion about their health. **Benefits for the customer:** At least one life change was recorded by 68 % of survey respondents, with 47% increasing exercise, 45% changing diet, 5% reducing alcohol consumption, and 6% reducing or quitting smoking. One of them had joined Weight Watchers and claimed to have lost weight already. **Advantages of the services:** Location of the CP is convenient and accessible, services are quick, and just one visit is required.



Determining public opinion on community pharmacy services in UK

Introduction

This survey aims to gather your views about community pharmacy services and will take about ten to fifteen minutes to complete. Your responses will be combined with others to help to inform a Ph.D. project being conducted at the School of Pharmacy, University of Nottingham. The research aims to explore the future of community pharmacy services. Findings are expected to inform health policy and support the improvement of services provided in community pharmacy. Some findings from this research may be published but responses will be anonymised and participants will not be identifiable.

Current use of healthcare services:

Do you suffer from any long-term conditions that are controlled by taking medicines or by using other treatments? *Required

- ☐ Yes
- ☐ No

If you selected Other, please specify:

Over the last 6 months, how often have you visited your GP? * Required

- ☐ Once
- ☐ Twice
- ☐ Three times
- ☐ Every month
- ☐ Every week
- ☐ Never

Over the last 6 months, how often have you visited a community pharmacy? * Required

- ☐ Once
- ☐ Twice
- ☐ Three times
- ☐ Every month
- ☐ Every week
- ☐ Never

Who do you usually visit the community pharmacy for? (**Tick all that apply)** *Required

- ☐ Yourself
- ☐ On behalf someone else
- ☐ Not applicable

What are the reasons you visit community pharmacy? **(Tick all that apply)** * Required

- ☐ To pick up a prescription
- ☐ To get advice about your medicines
- ☐ To get advice about your health
- ☐ To buy non-prescription medicines
- ☐ To get advice about your medical condition
- ☐ To buy non-medical items, such as toiletries, baby food, etc.
- ☐ To access a health service
- ☐ None of the above
- ☐ Other

If you selected Other, please specify:

Services within community pharmacy:

Which of the following do you think community pharmacists and their teams can help you with? **(Tick all that apply)** * Required

- ☐ Managing long term diagnosed conditions, such as diabetes, hypertension (high blood pressure), etc.
- ☐ Managing minor conditions such as flu, colds etc.
- ☐ Advice and support about medicines
- ☐ Vitamins and herbal medicines
- ☐ Repeat prescriptions
- ☐ Healthy living advice
- ☐ None of the above
- ☐ Other

If you selected Other, please specify:

Which of the following community pharmacy services are you familiar with? **(Tick all that apply)** * Required

- ☐ Medicines reviews
- ☐ Vaccinations such as flu jab
- ☐ Stop smoking
- ☐ Weight management services
- ☐ Health check
- ☐ Travel medicine
- ☐ Emergency Hormonal Contraception (EHC) supply
- ☐ Chlamydia screening and treatment services
- ☐ None of the above
- ☐ Other

If you selected Other, please specify:

Please rank each of these possible methods of communicating with your pharmacist to indicate your preferences:

(1 will be the most favourable mode and 4 the least favourable) * Required

	1	2	3	4
Face to face	☐	☐	☐	☐
Telephone counselling (voice calling)	☐	☐	☐	☐
Online video counselling (for example; Facetime and Skype)	☐	☐	☐	☐
Home visit	☐	☐	☐	☐

How likely would you be to use online pharmacy services (i.e. ordering your prescribed

medicines or over the counter medicines (OTC) from the internet to be delivered straight to your home or office)? * Required

- ☐ Extremely likely
- ☐ Very likely
- ☐ Quite likely
- ☐ Neither likely nor unlikely
- ☐ Quite unlikely
- ☐ Very unlikely
- ☐ Extremely unlikely

Do you think it would be useful if your pharmacist could prescribe medicines like the GP does? * Required

- ☐ Yes
- ☐ No
- ☐ Do not know

Management of minor conditions:

Where do you currently seek advice for minor conditions such as cold or flu? Please rank your top three sources of advice * Required

Please don't select more than 1 answer(s) per row.

Please select at least 1 answer(s).

Please don't select more than 1 answer(s) in any single column

	Family or friends	GP	Community pharmacy	The internet	NHS 111	Nobody. I will rely on myself or my previous experience
1	☐	☐	☐	☐	☐	☐
2	☐	☐	☐	☐	☐	☐
3	☐	☐	☐	☐	☐	☐

Would you consider using a mobile phone app to help you identify and treat minor conditions? * Required

- ☐ Yes
- ☐ No
- ☐ Do not know

Health promotion and ill-health prevention:

To what extent do you agree or disagree with the following statement: health campaigns on social media (such as Facebook, Twitter, Instagram, etc.) would help to increase your awareness of relevant health issues? * Required

- ☐ Strongly agree
- ☐ Slightly agree
- ☐ Neither agree or disagree
- ☐ Slightly disagree
- ☐ Strongly disagree
- ☐ I don't know

How do you think the pharmacist could help you to take responsibility for your health? **(Tick all that apply)** *Required

- ☐ Prescribe medicines
- ☐ Provide advice
- ☐ Signpost you to online materials
- ☐ Provide educational leaflets
- ☐ Refer you to other healthcare providers
- ☐ I do not know
- ☐ Other

If you selected Other, please specify:

Would you like community pharmacies to provide screening services (such as blood tests, cholesterol level, hepatitis C tests, bacterial infection, etc.)? *Required

- ☐ Yes
- ☐ No
- ☐ Do not know

Demographic information:

Gender: * Required

- ☐ Female
- ☐ Male
- ☐ Prefer not to say
- ☐ Other

If you selected Other, please specify:

Age: *Required

- ☐ 18-24 years old
- ☐ 25-34 years old
- ☐ 35-44 years old
- ☐ 45-54 years old
- ☐ 55-64 years old
- ☐ 65-74 years old
- ☐ 75 years or older

Choose one option that best describes your ethnic group or background: *Required

- ☐ White; English/ Welsh / Scottish / Northern Irish / British
- ☐ White: Irish
- ☐ White: Traveller
- ☐ Mixed: White and Black Caribbean
- ☐ Mixed: White and Black African
- ☐ Mixed: White and Asian
- ☐ Asian / Asian British: Indian
- ☐ Asian / Asian British: Pakistani
- ☐ Asian / Asian British: Bangladeshi
- ☐ Asian / Asian British: Chinese
- ☐ Black / Black British: African
- ☐ Black / Black British: Caribbean
- ☐ Arab
- ☐ Other

If you selected Other, please specify:

Where are you living? * Required

- ☐ England
- ☐ Scotland
- ☐ Wales
- ☐ Northern Ireland

What is the first half of your postcode? *Required

Participating in further research

If you would be willing to participate further in this research by taking part in a short telephone interview, then please complete the following information. You would be rewarded for your time with a £20 gift voucher.

Name: *Optional

Phone Number or E-mail: *Optional

Best time to contact you: *Optional

Final page

Thank you for taking the time to complete this questionnaire.

Appendix III: Determine pharmacy user attitude toward community pharmacy services (Questionnaire)



Pharmacy ID [ ] Researcher ID [ ] Questionnaire ID [ ]

Date [ ] Time started [ ]

INSTRUCTIONS TO RESEARCHERS

Questionnaire will be administered by Pharmacy students to patients and customers in the pharmacy, no specific groups will be targeted or excluded as we are seeking a wide breadth of views. The only exceptions to this are this survey is not intended to be completed by those under the age of 18. Potential participants should not be approached if they appear to lack capacity or if you feel completing the survey may cause distress.

INTRODUCTION TO PARTICIPANT

Hello my name is [ ]. Would you have around 15 minutes to take part in a survey about the services community pharmacies provide and your opinions about health?

Thank you, your participation is appreciated. This study is being conducted by the University of Nottingham, School of Pharmacy in 15 pharmacies in the Nottingham area. The results from this survey will be used to inform pharmacies locally about what patients want from pharmacy. At the end of the survey, I will give you a small leaflet with these details and also the university contact details should you have any queries or wish to receive a summary of the results.

VISITING PHARMACIES

1. Why did you visit this pharmacy today? (Tick ALL that apply)
   - ☐ To collect prescription medicines
   - ☐ Purchase medicines
   - ☐ Medicines review
   - ☐ Purchase non medicinal products (e.g., toiletries)
   - ☐ For advice
   - ☐ For a specific service (e.g., smoking cessation clinic)
   - ☐ Prefer not to say
   - ☐ Other (specify)

2. Do you normally use the same pharmacy?

   - ☐ Yes
   - ☐ No

3. Is this the pharmacy you normally use?

   - ☐ Yes
   - ☐ No

4. How often do you use a pharmacy?

   - ☐ At least once a week
   - ☐ Less than once a week but more than once a month
   - ☐ Once a month or less

5. What services have you used pharmacies for in the past? (**Tick ALL that apply)**

   - ☐ To collect prescription medicines
   - ☐ Purchase non medicinal products (e.g., toiletries)
   - ☐ Purchase medicines
   - ☐ Medicines review
   - ☐ For a specific service (e.g., smoking cessation clinic)
   - ☐ For advice about your medicines
   - ☐ For advice about your health
   - ☐ Prefer not to say
   - ☐ Other (specify)

MY OPINIONS OF HEALTH CARE AND PHARMACIES

6. Which of the following do you think community pharmacists and their teams can help you with? **(Tick ALL that apply)**
   - ☐ Advice and support about medicines
   - ☐ Managing common conditions such as flu, colds etc.
   - ☐ Repeat prescriptions
   - ☐ Advice about vitamins and herbal medicines
   - ☐ Advice about mental health issues
   - ☐ Managing long term conditions (e.g., diabetes).
   - ☐ Healthy living advice
   - ☐ None of the above
   - ☐ Other (specify)

<u>To what extent do you agree or disagree with the following statements:</u>

7. I like to manage my own health needs

   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neither agree nor disagree
   - ☐ Disagree
   - ☐ Strongly disagree

8. I prefer to only go to my doctor when I really have to
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neither agree nor disagree
   - ☐ Disagree
   - ☐ Strongly disagree

9. I trust my pharmacist to give me an accurate diagnosis when I ask about symptoms

   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neither agree nor disagree
   - ☐ Disagree
   - ☐ Strongly disagree

10. I trust my pharmacist to give me good advice about medicines

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

11. I trust my pharmacist to give me good advice about general health

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

12. My pharmacist cares about me

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

13. When I'm ill, I find it difficult to decide who I should consult/where I should seek help

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

14. I worry that I would get in trouble if I turned up to the wrong place when I wanted to seek help

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

15. I am comfortable buying medicines from an online pharmacy to be delivered directly to my home

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

16. Public health campaigns for example on TV, radio, billboards, and bus adverts have helped increase my awareness of health issues.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

Screening is where a professional provides a test to see if a patient has a particular condition. Anyone can receive the test, it is not dependent on having specific symptoms.

17. Community pharmacies are a suitable place for chlamydia screening (sexually transmitted infection).

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

18. Community pharmacies are a suitable place for HIV screening.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

19. Community pharmacies are a suitable place for Hepatitis C screening (blood infection).

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

20. Community pharmacies are a suitable place for mental health screening (e.g., depression).

- ☐ Strongly agree
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Strongly disagree

All data from this research will be treated anonymously and individuals will not be able to be identified. The information received will be analysed, fed back to the pharmacy where it was collected to inform service design and may be published in academic research papers.

ABOUT YOU

21. Are you:

- ☐ Male
- ☐ Female
- ☐ Prefer not to say
- ☐ Other (specify)

22. What age group are you in?

- ☐ 18-34
- ☐ 35-49
- ☐ 50-64
- ☐ 65-79
- ☐ 80+
- ☐ Prefer not to say

23. Are you eligible for free prescriptions?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

24. Which ethnic group do you see yourself as being a member of? Choose ONE option that best describes your ethnic group or background.

White

- ☐ English / Welsh / Scottish / Northern Irish / British
- ☐ Irish
- ☐ Gypsy or Irish Traveller
- ☐ Any other White background, please describe

Black / African / Caribbean / Black British

- ☐ African
- ☐ Caribbean
- ☐ Any other Black / African / Caribbean background, please describe

Asian / Asian British

- ☐ Indian
- ☐ Pakistani
- ☐ Bangladeshi
- ☐ Chinese
- ☐ Any other Asian background, please describe

Mixed / Multiple ethnic groups

- ☐ White and Black Caribbean
- ☐ White and Black African
- ☐ White and Asian
- ☐ Any other Mixed / Multiple ethnic background, please describe

Other ethnic group

- ☐ Arab
- ☐ Any other ethnic group, please describe
- ☐ Prefer not to say

25. Have you previously been, or are you currently, affected by any of following conditions? **(Tick ALL that apply)**

- ☐ Heart conditions (e.g., Coronary heart disease, Angina, Heart failure, Arrhythmia)
- ☐ Diabetes
- ☐ High cholesterol
- ☐ High blood pressure
- ☐ Respiratory conditions (Asthma/COPD)
- ☐ Depression and/or Anxiety disorder
- ☐ Long term pain
- ☐ Never suffered from any long term condition
- ☐ Other long-term condition
- ☐ Prefer not to say

Thank you very much for participating in this survey

Make pharmacy work better for you



FindParticipants®

Your one-stop online participant resource

Dear Participant,

My name is Suha Alharbi. I am conducting a study as a part of my Ph.D. at the School of Pharmacy, University of Nottingham. I am asking you to assist me by completing a short survey. Currently, I am looking for research participants aged 18 and above from the UK, who can read and understand the English language.

Research Description: I am interested in your attitude towards current services in community pharmacy and how it could be improved to meet your future needs. Participating in this survey could help shape the future of healthcare, ensuring that pharmacy services are developed to provide the best possible care for the people using them. To complete the survey, please follow the link below.

Time Involvement: Your participation will take approximately 5-10 minutes.

Thank you in advance for your valuable contribution.

Suha Alharbi, PharmD, MSc, Ph.D. Candidate

Division for Pharmacy Practice and Policy

School of Pharmacy, University of Nottingham

Compensation: Two chances to win a £20 Amazon gift voucher

Location: https://nottingham.onlinesurveys.ac.uk/determining-public-opinion-on-community-pharmacy-services-3

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Appendix V: Interview topic guide

Introduction

'My name is Suha, and I am a Ph.D. candidate at UON. I am speaking to people to try to find out their views about current and proposed services in the future in community pharmacy. I am interested in your thoughts and opinions, there are no right or wrong answers.'

Is it ok if I record this interview today? so that I can concentrate on what you are saying and don't have to write everything down. Only myself will listen back to it. once the record transfer to transcript it will be deleted it. 'Everything you say will be treated as confidential. When I write up the research I will take out/ change any names you mention and put your feedback together with the other people we are speaking to, so you will not be identifiable.'

'This interview should take about 30 to 60 minutes. Please let me know if you would like to stop the recording or skip onto the next question at any time. Is it ok if we start now?'

Introductory questions:

1. How do you describe yourself as a pharmacy user?
   - If yes?
     - Can you tell me why do you visit the community pharmacy?
   - If No?
2. Can you tell me why do you visit the community pharmacy?

PROPS:

- Can you tell me more about your experience in the community pharmacy?

NEED

- What do you **need/ want** from pharmacists?
- Can you tell me which services you want to be available in the community pharmacy? Why?
- In the questionnaire you were asked about the most preferred way of communication with your pharmacist such as face to face, telephone, or internet (online video)). Can you tell me more about that?

PROPS:

- Can you give me any examples of how community pharmacists can help to support you with your health needs?
- How do you think the pharmacist can help you?

- Have you ever used, or considered using an online pharmacy to order your prescription medicines? can you explain your reasons for this answer?
- Are there any other types of services that you think it would be useful to have available online from pharmacies? ? can you explain your reasons for this answer?
- Do you think it will be useful if the community pharmacist can prescribe medicine for you ? why?

PROPS:

- What types of medicines, and what conditions?

AWARENESS OF CURRENT SERVICES.

- Which of community pharmacy services you are aware of ?
- How were you aware of these services?
- Have you ever used any of these services before?
- **If yes:**
  - Can you tell me about your experience?
  - Do you think this service need to change or improve? How?
  - Do you consider community pharmacy as a suitable place to provide this service? Why?

- What would encourage/prevent you from using the community pharmacy for taking the service?

PROPS:

- What did you think of the service?

- If No:
  - Are you willing to use any of these community pharmacy services? Why?

PROPS:

- During your visit to community pharmacy. Did the pharmacist offer any of these services?

- Do you think the pharmacists could offer more services than currently available? Could you give me some examples?
- How do you think the community pharmacist can promote their services? Or increase the usage of their services?

MINOR AILMENTS

- When are you suffering from minor conditions such as colds, what is your source of advice? Why?
- Did you ever seek advice from your community pharmacist when you are suffering from any minor conditions? Why or Why not?
- If yes?
  - What do you think about the service?
  - How can the community pharmacy team improve the service?
  - Have you ever contacted NHS 111 regarding a minor condition and then been subsequently referred through to the community pharmacist?

PROPS:

- Do you think the community pharmacy team are able to advise you about minor conditions? Why?
- What is/ are the reasons behind using the community pharmacist for managing minor conditions?
- How do you think the pharmacist can help you with minor conditions?

- Do you think it will be useful if the community pharmacist provides telephone or online video counselling for managing your minor condition? Why?
- Had you ever considered to use health mobile phone application to diagnose or treat any minor condition? Why or Why not?

HEALTH PROMOTION AND ILL PREVENTION

- Have you ever had any advice from your community pharmacist related to your health (weight, diet, and exercise)? **If yes:**
    - Can you tell me about your experience?
    - How can the pharmacist improve service in the future?
- Do you think it will be useful if the community pharmacist provide advice related to health through social media or the internet? Why?
- Do you think the community pharmacy as a suitable place for screening services for some disease such as heart diseases, hepatitis, diabetes, etc.? why?
- Do you think to provide screening service in the community pharmacy will be beneficial for you? Why?
- Can you give me some example of screening services that could be provided by the community pharmacy and will help you?

PROPS:

- Do you think the community pharmacist a reliable source of advice regarding your health? Why?
- How do you think the pharmacist will help you take responsibility for your health?
- Do you think the pharmacist can help you to adopt a healthier lifestyle? Why?

Finally, Do you have any questions you would like to ask? Is there anything you would like me to explain?

Thank you for taking part in this interview.

Appendix VI: Participant information sheet

Title of Study: Exploring public attitude towards community pharmacy services.
Name of Researcher(s): Miss Suha Alharbi, Professor Claire Anderson, Professor Tracey Thornley

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

The purpose of this study is to identify the set of skill the community pharmacist will need in the future to improve current services or deliver new services based in your need.

Why have I been invited?

You are being invited to take part because all public views toward community pharmacy services are valuable for the community pharmacist to improve existing services or introducing new community pharmacy services, which could help to support everyone.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. This would not affect your legal rights.

What will happen to me if I take part?

Once you decide to take part, a member of the research team will contact you to set up appointment for telephone interview. The telephone interview will take a part at any time you would like, and the researcher will send you all the details you need. You will have an opportunity to ask any questions you may have, and you will also be emailed a consent form, which you will need to sign and return before the start of the interview. During the interview the researcher will discuss with you your current experience in the community pharmacy, way of improving it, ways of the increase utilization of the community pharmacy, your opinion about introducing new services and barriers from

using the services of the community pharmacy. The interview will be last for approximately one hour.

Expenses and payments

You will not be paid to participate in the study. However, you will be rewarded for your time with an inconvenience allowance of a gift voucher.

What are the possible disadvantages and risks of taking part?

There are no major risks of taking part in this study. The main disadvantage is the time you will be asked to contribute, which will be approximately one hour, plus a small amount of time beforehand to sign and return the consent form.

What are the possible benefits of taking part?

The findings of the study are expected to help community pharmacists to understand what the public need from them in order to improve the services of community pharmacy. On a wider scale, the information we get from this study may help to deliver new services or change the way of delivering exciting services as well improve the care and support available to all member of public in the future.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. The researchers contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do this by contacting the Chief Investigator, Professor Claire Anderson, using the contact details provided below.

Will my taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you will be handled in confidence. If you join the study, some parts of the data collected for the study will be looked at by authorised persons from the University of Nottingham who are organising the research. They may also be looked at by authorised people to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

All information which is collected about you during the course of the research will be kept strictly confidential, stored in a secure and locked office, and on a password protected database. Any information about you will have your name and address

removed (anonymised) and a unique code will be used for the interview transcript so that you cannot be recognised from it.

Your personal data (address, email address, telephone number) will be kept for six months after the end of the study so that we are able to contact you about the findings of the study (unless you advise us that you do not wish to be contacted). All other data (research data) will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to your personal data.

What will happen if I don't want to carry on with the study?

Your participation is entirely voluntary, and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. If you withdraw then the information collected so far cannot be erased and this information may still be used in the project analysis.

What will happen to the results of the research study?

The results of this research will form part of a PhD thesis. They may also be submitted for publication in any relevant scientific journals. If you are interested in receiving a copy of the publish results, please notify the researcher when you are doing the interview. Your identity will be kept confidential in any reports or publications produced from this research.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and is being funded jointly by The Division of Pharmacy Policy and Practice, School of Pharmacy, University of Nottingham.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by The School of Pharmacy Research Ethics Committee.

Further information and contact details

Co-investigator/Facilitator: Miss Suha Alharbi

Email: Suha.Alharbi@nottingham.ac.uk **Phone:** 0115 82 32277

Chief Investigator: Professor Claire Anderson

Email: claire.anderson@nottingham.ac.uk **Phone:** 0115 951 5389

Appendix VII: Participant Consent Form

University of Nottingham
UK | CHINA | MALAYSIA

Division of Pharmacy Practice and Policy
School of Pharmacy
East Drive
Nottingham
NG9 2HY

Title of Study: Exploring public attitude towards community pharmacy services.

Researcher's name: Suha Alharbi

Supervisor's name: Claire Anderson & Tracey Thornley

In signing this consent form I confirm that:

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me.
- I have had the opportunity to ask questions.
- I understand the purpose of the research project and my involvement in it.
- I understand that my participation is voluntary and I may withdraw from the research project at any stage, without having to give any reason and withdrawing will not penalise or disadvantaged me in any way.
- I understand that while information gained during the study may be published, any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published.
- I agree that extracts from the interview may be anonymously quoted in any report or publication arising from the research
- I understand that the interview will be recorded using electronic voice recorder
- I understand that data will be securely stored
- I understand that I may contact the researcher or supervisor if I require further information about the research, and that I may contact the Research Ethics Officer of the School of pharmacy, University of Nottingham, if I wish to make a complaint relating to my involvement in the research.
- I agree to take part in the above research project.

Participant's name (BLOCK CAPITAL)	Participant's signature	Date
SUHA ALHARBI		
Researcher's name (BLOCK CAPITAL)	Researcher's signature	Date

University of Nottingham
UK | CHINA | MALAYSIA

V1.0 Updated 18/07/18

SCHOOL OF PHARMACY
APPLICATION FOR RESEARCH ETHICS REVIEW

Who should use this form:

This form is to be completed by PIs or supervisors (for UGR or PGR student research) who have completed the 'UG project ethics 2017 v1.doc' or 'PG project ethics 2017 v1.doc' forms and have been informed that further ethical review and approval is required before the commencement of a given Research Project.

Researchers in the following categories are to use this form:

1. The project is to be conducted by:
    - staff of the University of Nottingham; or
    - postgraduate research (PGR) students enrolled at the University of Nottingham; or
    - undergraduate research (UGR) (to be completed by the student's supervisor).
2. The project is to be conducted at the University of Nottingham by visiting researchers.

NOTES:

- An electronic version of the completed form should be submitted to the Research Ethics Officer, at the following email address: PA-PHARM-ETHICS@exmail.nottingham.ac.uk. Please **do not** submit paper copies.
- If, in any section, you find that you have insufficient space, or you wish to supply additional material not specifically requested by the form, please it in a separate file, clearly marked and attached to the submission email.
- If you have any queries about the form, please address them to the Research Ethics Team.

☒ **Before submitting, please tick this box to confirm that you have consulted and understood the following information and guidance and that you have taken it into account when completing your application:**

- **The information and guidance provided on the School of Pharmacy's Research Ethics webpages on workspace (**https://workspace.nottingham.ac.uk/display/Pharm/Ethical+Review+Processes **)**
- **The University's Code of Practice for Research (**https://workspace.nottingham.ac.uk/display/ResEth/Code+of+Research+Conduct+and+Research+Ethics**)**

SCHOOL OF PHARMACY APPLICATION FOR ETHICAL REVIEW	OFFICE USE ONLY: Application No: Date Received:

1. TITLE OF PROJECT

Exploring public attitude towards community pharmacy services.

2. SHORT TITLE

3. THIS PROJECT IS:

University of Nottingham Staff Research project	☐
University of Nottingham Postgraduate Research (PGR) Student project	☒
University of Nottingham Undergraduate Research (UGR) Student project	☐
Other (Please specify):	☐

4. INVESTIGATORS

a) PLEASE GIVE DETAILS OF THE PRINCIPAL INVESTIGATORS OR SUPERVISORS (FOR PGR STUDENT PROJECTS)

Name: Title / first name / family name	Professor Claire Anderson
Highest qualification & position held:	Professor of Social Pharmacy Head of Division of Pharmacy Practice and Policy
School/Department	School of Pharmacy
Telephone:	01159515389
Email address:	claire.anderson@nottingham.ac.uk

Name: Title / first name / family name	Professor Tracey Thornley
Highest qualification & position held:	Senior Manager Contract Framework and Outcomes & Honorary Professor in Pharmacy Practice
School/Department	Boots UK / School of Pharmacy
Telephone:	07834 497725
Email address:	tracey.thornley@boots.co.uk

b) PLEASE GIVE DETAILS OF ANY CO-INVESTIGATORS OR CO-SUPERVISORS (FOR PGR STUDENT PROJECTS)

Name: Title / first name / family name	
Highest qualification & position held:	
School/Department	
Telephone:	
Email address:	

c) In the case of PGR student projects, please give details of the student

Name of	Suha Alharbi	Student	4317144
Course of	Ph.D. in pharmacy	Email	paxsa11@exmail.nottingham.ac.uk
Principal	Professor Claire		

5. ESTIMATED START OF PROJECT

Date: 01/10/2018

ESTIMATED END OF PROJECT

Date: 01/10/2021

6. FUNDING

List the funding sources (including internal sources, if any) and give the status of each source.

Funding Body	Approved/Pending /To be submitted
This study is funded by the Division of Pharmacy Practice & Policy, School of Pharmacy, University of Nottingham.	Approved

If you are requesting a quick turnaround on your application, please explain the reasons below (including funding-related deadlines). You should be aware that whilst effort will be made in cases of genuine urgency, it will not always be possible for the Research Ethics Committees to meet such requests. The average turnaround time is 6 weeks but can take longer for more complex projects.

7. SUMMARY OF PROJECT

Describe the purpose, background rationale for the proposed project, as well as the hypotheses/research questions to be examined and expected outcomes. This description should be in everyday language that is free from jargon. Please explain any technical terms or discipline-specific phrases.

In 2003, the Department of Health planned to increase public access to medication through providing flexible time, place and expanding the range of healthcare professionals who can prescribe medication to patients (Department of Health, 2003). Many of these changes were implemented by increasing the community pharmacist (CPs) contribution. Therefore, the role of pharmacists and community pharmacies has changed from a historical role which includes filling prescriptions and counselling, to take a more active role in providing public health services and promoting well-being and prevention. However, there is still a growing interest in developing the role of the CPs to provide more accessible and convenient services to all member of the public (Murray, 2016 and Noyes, 2017). As well, to satisfy the increasing patient demands and improve health outcomes. however, Little is known about public perception about extending community pharmacy services and how it should change in the future. Therefore, this research aims to identify the new extending community pharmacy services that could be necessary to deliver in community pharmacy and set of skills which are required by CPs to fit with the future need.

This Ph.D. project will focus on the following research questions:

- What do patients need from community pharmacists?
    - What the perceived current role of the community pharmacist and how it is should change in the future?
    - What the pharmacist role in prevention and selfcare management?
    - What the pharmacist role in managing minor aliments?
    - How can the community pharmacist use technology in delivering their services?
- How can we utilize community pharmacist' potential to improve healthcare service in the UK?
- What are the skills that community pharmacists need to fit with the future demands of health care?
- What are the barriers and facilitators from the pharmacist perspective to using their skills?

AIMS AND OBJECTIVES

Aim: To identify the set of skill the community pharmacist will need in the future.

Objectives

- To explore the general public's perceptions about their needs from community pharmacy.
- To identify the public attitude toward using technology in delivering their services.
- Exploring the pharmacists' views about new models of care in community pharmacy and identify pharmacies potential which could be used for adapting new model of care.
- Identifying the set of skills that pharmacists working in the community will need in the future (any differences between the pharmacist working in the community, GP, and the hospital).

References:

- DEPARTMENT OF HEALTH. 2003. Building on the Best Choice, Responsiveness and Equity in the NHS.
- *Murray, R. (2016) Community Pharmacy Clinical Services Review, 2016. Available online: https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/12/community-pharm-clncl-serv-rev.pdf [Accessed.*
- *Noyes, J. (2017) Heartbeats on the High Street : How Community Pharmacy can transform Britain's Health, Wealth, and Wellbeing.*

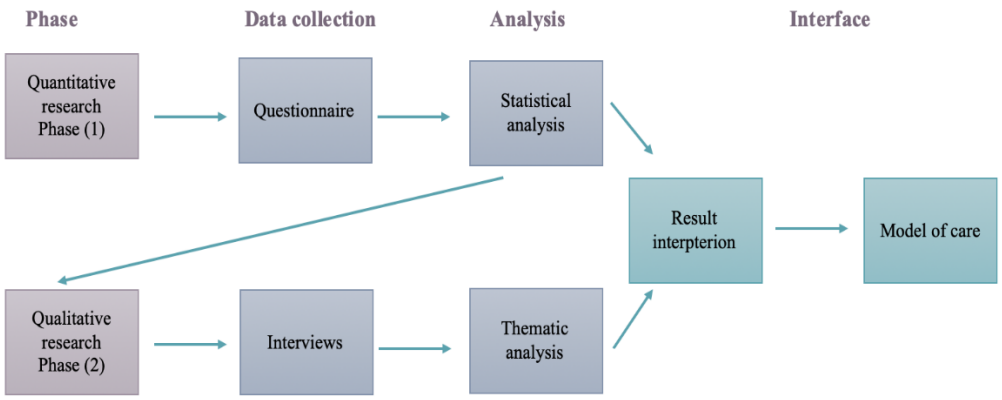
8. CONDUCT OF PROJECT

Please give a description of the research methodology that will be used

The mixed method will be used to conduct the research, which is an approach used to collect, analyse data, and integrate findings of both qualitative and quantitative methods. An explanatory sequential, mixed method design will be used undertaking a quantitative method (questionnaire) to explore the public opinion about community pharmacy services. Then, the finding of the questionnaire will be explained through qualitative research (in-depth interviews). The opinions of members of the public will be explained through a telephone interview to identify:

- Awareness of current services.
- Changes that should be done to improve existing services.
- Pharmacist role in public health and illness prevention.
- Role of the community pharmacist in treating minor ailments.
- Public attitude toward using social media and mobile phone application.
- The barriers and facilitators to increasing access to community pharmacy.

Also, the pharmacists will be allowed to comment on the theme that generates from the general public interview. As well, their opinion about the skills they need to develop to fit with future needs.



9. DOES THE PROJECT INVOLVE PARTICIPATION OF PEOPLE OTHER THAN THE RESEARCHERS AND SUPERVISORS?

Yes ☒ No ☐

Note: 'Participation' includes both active participation (such as when participants take part in an interview) and cases where participants take part in the study without their knowledge and consent at the time (for example, in crowd behaviour research).

If you have answered NO please go to Section 18. If you have answered YES to this question please complete all the following sections.

10. PARTICIPANTS AS THE SUBJECTS OF THE RESEARCH

Describe the number of participants and important characteristics (such as age, gender, location, affiliation, level of fitness, intellectual ability etc.). Specify any inclusion/exclusion criteria to be used.

In this research I am interested to interview pharmacists and members of the public.
Inclusion criteria for the member of public:

- Able to give informed consent.
- Age 18 or above and living in UK.
- Any gender
- In good mental and emotional condition
- able to understand and communicate in English.

Exclusion criteria:

- Age less than 18.
- Mental impairment.
- Critical medical condition.

Regarding the pharmacist any qualified pharmacist working in UK and interested to participate in the focus group may be included in the study

11. RECRUITMENT

Please state clearly how the participants will be identified, approached, and recruited. Include any relationship between the investigator(s) and participant(s) (e.g., instructor-student).

Note: Attach a copy of any poster(s), advertisement(s), or letter(s) to be used for recruitment.

The questionnaire will be distributed electronically through a call for participants website (https://www.callforparticipants.com/researcher), which will give this research opportunity to get responses from all over the UK. Regarding the public interview, the participant will be asked at the end of the questionnaire if they would like to take part in a telephone interview. While for the pharmacists, we will contact the representative pharmacist group to help us to recruit participants. Any interested participant will be contacted by the co-investigator through telephone/email and will then be provided with the information sheet and consent form.

12. CONSENT

a) Describe the process that the investigator(s) will be using to obtain valid consent. If consent is not to be obtained explain why**.** If the participants are minors or for other reasons are not competent to consent, describe the proposed alternate source of consent, including any permission / information letter to be provided to the person(s) providing the consent.

The investigator will provide the Information sheet and explanations of the study details to ensure that the participant has sufficient time to consider participating or not. As well the Investigator will answer any questions that the participant has concerning study participation. Then, all participants will provide written informed consent. The Consent Form will be signed physically or electronically and dated by the participant before they attend their focus group or the individual telephone interview. One copy of the consent form will be kept by the participant, and one will be kept by the Investigator.

Note: Attach a copy of the Participant Information Sheet (if applicable), the Consent Form (if applicable), the content of any telephone script (if applicable) and any other material that will be used in the consent process.

b) Will the participants be deceived in any way about the purpose of the study?

Yes ☐ **No** ☒

If yes, please describe the nature and extent of the deception involved. Include how and when the deception will be revealed, and who will administer this feedback.

13. PARTICIPANT FEEDBACK

Explain what feedback/ information will be provided to the participants after participation in the research. (For example, a more complete description of the purpose of the research, or access to the results of the research).

The research results will be shared with the participants if they would like to. A summary of our findings will be sent to them through email at the end of the study.

14. PARTICIPANT WITHDRAWAL

a) Describe how the participants will be informed of their right to withdraw from the project.

The information sheet will state that "Your participation is entirely voluntary, and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected..". As well the researcher will remind the participant about their right before conducting the FGs or telephone interview.

b) Explain any consequences for the participant of withdrawing from the study and indicate what will be done with the participant's data if they withdraw.

If the participant decides to withdraw from the study the information collected so far cannot be erased because I can't Ignore any thing the participant said in the interview it is clearly stated in the information sheet that:" Your participation is entirely voluntary and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. If you withdraw then the information collected so far cannot be erased and this information may still be used in the project analysis." and the consent form will be taken before conducting the interview. Also, the participant will be replaced if data saturation has not been achieved.

15. COMPENSATION

Will participants receive any compensation for participation?

i) Financial **Yes** ☐ **No** ☒

ii) Non-financial **Yes** ☒ **No** ☐

If **Yes** to **either** i) or ii) above, please provide details.

Light snacks and refreshments will provide to the participants during the focus group. As well inconvenience allowance will be provided to compensate the participant time which is £ 20 voucher.

If participants choose to withdraw, how will you deal with compensation?

Not applicable

16. CONFIDENTIALITY

a) Will all participants be anonymous? **Yes** ☒ **No** ☐

b) Will all data be treated as confidential? **Yes** ☒ **No** ☐

Note: Participants' identity/data will be confidential if an assigned ID code or number is used, but it will not be anonymous. Anonymous data cannot be traced back to an individual participant.

Describe the procedures to be used to ensure anonymity of participants and/or confidentiality of data both during the conduct of the research and in the release of its findings.

Individual participant personal information which could be linked back to the results for example name, email address, phone number are considered confidential and disclosure to third parties is prohibited with the exceptions of me and my supervisors. Participant confidentiality will be further ensured by using unique code for all data was provided in FGs or telephone interview. Therefore, the participant will be anonymous and will not be identifiable.

If participant anonymity or confidentiality is not appropriate to this research project, explain, providing details of how all participants will be advised of the fact that data will not be anonymous or confidential.

17. *STORAGE, ACCESS, AND DISPOSAL OF DATA*

Describe what research data will be stored, where, for what period of time, the measures that will be put in place to ensure security of the data, who will have access to the data, and the method and timing of disposal of the data.

18. OTHER APPROVALS REQUIRED? e.g., Disclosure and Barring Service (DBS) checks or NHS R&D approvals.

☐ YES ☒ NO ☐ NOTAPPLICABLE

If yes, please specify.

19. SIGNIFICANCE/BENEFITS

Outline the potential significance and/or benefits of the research

In order to protect the participants privacy only we will collect the minimum required information to satisfy the purposes of the study. All the documents contain participant information will be held securely, in a locked room and locked cupboard. Access to the information will be limited to the study investigators. Computer held data including the study dataset will be held securely and password protected. All data will be stored on a secure dedicated web server. Access will be restricted by user identifiers and passwords (encrypted using a one-way encryption method). Electronic data will be automatically backed up every 24 hours to both local and remote media in encrypted format.

RETENTION AND ARCHIVING

All records and documents related to the study will be retained at secure archive facilities at the University of Nottingham for at least 7 years or for longer as required. This will be Principal Investigator responsibility. If she is not able to do that, a second person will be nominated to take over this responsibility.

The research will help to improve the community pharmacy in the future. Adapting new roles for pharmacist / new modes of care can help to minimize the pressure on primary care and emergency departments. Also, this could help to face challenges that face NHS due to increasing population and number of people living with long-term conditions.

20. RISKS

a) Outline any potential risks to **INDIVIDUALS**, including research staff, research participants, other individuals not involved in the research and the measures that will be taken to minimise any risks and the procedures to be adopted in the event of mishap

No risk

b) Outline any potential risks to **THE ENVIRONMENT and/or SOCIETY** and the measures that will be taken to minimise any risks and the procedures to be adopted in the event of mishap.

21. ARE THERE ANY OTHER ETHICAL ISSUES RAISED BY THE RESEARCH?

Yes ☐ No ☒

If yes, please specify

22. EXPERT REVIEWER/OPINION

You may be asked to nominate an expert reviewer for certain types of projects, including those of an interventional nature or those involving significant risks. If you anticipate that this may apply to your work and you would like to nominate an expert reviewer at this stage, please provide details below.

Name
Contact details (including email address)
Brief explanation of reasons for nominating and/or nominee's suitability

23. CHECKLIST

Please mark if the study involves any of the following:

- Vulnerable groups, such as children and young people aged under 18 years, those with learning disability, or cognitive impairments ☐
- Research that induces or results in or causes anxiety, stress, pain, or physical discomfort, or poses a risk of harm to participants (which is more than is expected from everyday life) ☐
- Risk to the personal safety of the researcher ☐
- Deception or research that is conducted without full and informed consent of the participants at time study is carried out ☐
- Administration of a chemical agent or vaccines or other substances (including vitamins or food substances) to human participants ☐
- Production and/or use of genetically modified plants or microbes ☐
- Results that may have an adverse impact on the environment or food safety ☐
- Results that may be used to develop chemical or biological weapons ☐

Please check that the following documents are attached to your application.

	ATTACHED	NOT APPLICABLE
Recruitment advertisement	☒	☐
Participant information sheet	☒	☐
Consent form	☒	☐
Questionnaire	☒	☐
Interview Schedule	☒	☐

24. DECLARATION BY APPLICANTS

I submit this application on the basis that the information it contains is confidential and will be used by the University of Nottingham (School of Pharmacy) solely for the purposes of ethical review and monitoring of the research project described herein, and to satisfy reporting requirements to regulatory bodies. The information will not be used for any other purpose without my prior consent.

I declare that:

- The information in this form together with any accompanying information is complete and correct to the best of my knowledge and belief and I take full responsibility for it.
- I undertake to abide by University Code of Practice for Research (https://workspace.nottingham.ac.uk/display/ResEth/Code+of+Research+Conduct+and+Research+Ethics) alongside any other relevant professional bodies' codes of conduct and/or ethical guidelines.
- I will report any changes affecting the ethical aspects of the project to the School of Pharmacy's Research Ethics Officer.
- I will report any adverse or unforeseen events which occur to the relevant Ethics Committee via the University of Nottingham School of Pharmacy's Research Ethics Officer.

Name of principal investigator/project supervisor:	Claire Anderson
Signature:	
Date:	22/08/2019

Please now save your completed form, print a copy for your records, and then email a copy to the Research Ethics Officer, at PA-PHARM-ETHICS@exmail.nottingham.ac.uk. As noted above, please do not submit a paper copy.

Acknowledgment: This form is based on a form used by the University of Birmingham for their Research Ethics Approval (version 25/02/2015), with them