

**Strategies Enhancing the Public Health Role of Community
Pharmacists in the UK**

**A thesis submitted to Middlesex University in partial
fulfilment of the requirements for the degree of Doctor of
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Chijioke O. Agomo

The Institute for Work Based Learning

Middlesex University

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Dedication

I dedicate this project to my wife (Dr. Nonyelum Agomo); my late dad, Mr. John Agomo; and late aunt, Mrs. Dorothy Ndife. Their commitment to knowledge and teaching inspired me to persevere with this endeavour. Most importantly, I thank the Almighty God for His sustenance and protection, as well as making this dream, a reality.

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Disclaimer: The views expressed in this document are mine and are not necessarily the views of my supervisory team, examiners or Middlesex University.

Title: Strategies Enhancing the Public Health Role of Community Pharmacists in the UK

Table of Contents	Page
Dedication	2
Acknowledgement	3
Disclaimer and Title	4
Table of Contents	5
List of Figures	9
List of Tables	10
List of Appendices	10
Glossary of Terms	13
Abstract	15
Chapter 1 - Introduction	16
1.1 – Context	16
1.2 - Background	17
1.2.1 - Overall effectiveness and cost effectiveness	24
1.3 - Defining Public Health	27
1.4 - Definition of Health and Determinants of Health	28
1.5 - The Concept of Advanced Practice	29
Chapter 2 – Terms of Reference/Objectives and Review	
of Relevant Literature	33
2.1 - Terms of Reference	33
2.2 - Ontological Reflection	33
2.3 - My Professional Journey	34
2.4 - Reflecting on my Role as a Change Agent	36
2.5 - Motivation to Study for the DProf	37
2.6 - Enhancing the Study’s Viability	37
2.7 - Theoretical framework	38
2.8 - Review of Literature and Information	42
2.8.1 - Introduction	42
2.8.2 - Search strategy	43
2.8.3 - Results	44
2.8.3.1 - Use of Social Media in Public Health Education	44
2.8.3.2 - Developing Good Adherence Strategies for Patients	45
2.8.3.3 - Enhancing the Public Health Content of Curricula	45

2.8.3.4 - Enhancing the Effectiveness of Communication	50
2.8.3.5 - Promoting Interdisciplinary Initiatives	51
2.8.3.6 - Supporting Efforts on Antimicrobial Resistance	52
2.8.3.7 - Promoting Patients' Self-Management Capacities	53
2.8.3.8 - Strengthening Safe Medication Disposal Methods	53
2.8.3.9 - Enhancing the Management of Polypharmacy	54
2.8.3.10 - Managing Legitimate Medication Needs	55
2.8.3.11 - Remunerating Pharmacists Directly	56
2.8.3.12 - Innovating Smoking Cessation Activities	57
2.8.3.13 - Advancing Pharmacy Practice Experience	58
2.8.3.14 - Other Identified Studies	60
2.8.3.15 - Conclusions	61
2.9 - Aims, Objectives and Outcomes	62
2.9.1 - Assumptions	62
2.9.2 - Aims of my Project	63
2.9.3 - Objectives of my Project	63
2.9.4 - Research Questions	64
2.9.5 - Outcomes of the Project	65
2.10 - Resources	65
Chapter 3 - Methodology	66
3.1 - Introduction	66
3.2 - Project Design: Methodologies	67
3.3 - Plan of Investigation	67
3.4 - Phase 1: Survey	68
3.4.1 - Study Population	68
3.4.2 - Design	69
3.4.3 - Data Analysis	71
3.4.4 - Justification for Effect Size Calculation	71
3.5 - Phase 2 and 3: Content Analysis and Interviews	73
3.5.1 - Methods and Sample	73
3.5.2 - Justification and Limitations of Qualitative Methods	75
3.5.3 - Content Analysis	76
3.5.4 - Data Analysis for Interviews	80

3.5.5 - Improving data reliability	83
3.5.6 - Ethical Considerations	83
Chapter 4 - Project Activities and Findings	86
4.1 - Introduction	86
4.2 - Survey Findings	86
4.2.1 – Pharmacists’ Characteristics	86
4.2.2 - Survey Responses	89
4.2.2.1 - Involvement in Public Health Services	89
4.2.2.2 - Funding for Public Health Services	89
4.2.2.3 - Strategies Enhancing the Public Health Role	90
4.2.3 - Tests for Significance and Correlation of Variables	107
4.2.3.1 - Tests for Significance of Variables	107
4.2.3.2 - Tests for Correlation of Variables	109
4.2.4 - Strengths and limitation of the survey	110
4.2.4.1 – Strengths	110
4.2.4.2 – Limitations	110
4.2.5 – Conclusions	110
4.3 - Content Analysis	112
4.3.1 - Characteristics of UK Schools of Pharmacy	112
4.3.2 - Clinical Studies	113
4.3.3 - Skills Development	113
4.3.4 - Sciences	114
4.3.5 - Research	114
4.3.6 - Law and Ethics	114
4.3.7 - Management	114
4.3.8 - Public Health	115
4.3.9 - Word Frequency Query	115
4.3.10 - Strengths and Limitations of my Content Analysis	123
4.3.10.1 – Strengths	123
4.3.10.2 – Limitations	123
4.3.11 - Conclusions	123
4.4 - Interviews with Healthcare Professionals	127
4.4.1 - Introduction	127

4.4.2 - Characteristics of Healthcare Professionals Interviewed	128
4.4.3 - Enhancing the Public Health Role	131
4.4.3.1 – Enhancing Training in Public Health	131
4.4.3.2 – Creating Awareness Among Pharmacists	132
4.4.3.3 – Empowering Pharmacists in Public Health Activities	133
4.4.4 - The Use of New Technologies and Social Media	133
4.4.4.1 – Benefits with the use of New Technologies	134
4.4.4.2 – Drawbacks with the use of New Technologies	135
4.4.4.3 – Suggestions on the use of New Technologies	135
4.4.4.4 – Benefits in Teaching the use of New Technologies	136
4.4.5 – Benefits of Pharmacists’ Involvement in Public Health	138
4.4.6 – Barriers to Enhancing the Public Health Role	140
4.4.6.1 - Lack of Awareness and Education	141
4.4.6.2 - Lack of Empowerment	141
4.4.6.3 - Commercial Pressure	142
4.4.6.4 - Resistance to Change	143
4.4.6.5 - Inadequate Training and Skills	143
4.4.6.6 – Lack of Time to Provide Public Health Activates	143
4.4.6.7 – Lack of Confidence	144
4.4.6.8 – Government Policy on the Public Health Role	144
4.4.7 - The use of Independent Pharmacist Practitioners	144
4.4.7.1 - Independent Practitioners in GP surgeries	145
4.4.7.2 – Asserting Ownership of Qualifications	145
4.4.7.3 – Concern about the IPP Role	146
4.4.8 - Teaching Communication Methods	146
4.4.8.1 - Developing Professional Skills through Teaching	146
4.4.8.2 - Improvement in the teaching of communication	148
4.4.9 - Integrating UK Undergraduate Healthcare Programmes	149
4.4.9.1 - Benefits Associated with Integrated Learning	149
4.4.9.2 - Concerns with Integrated Learning	152
4.4.10 - Changing the Curriculum to Increase Public Health Content	154
4.4.10.1 – Enhancing Public Health Knowledge and Skills	154
4.4.10.2 – Empowering Pharmacists in Public Health	155
4.4.10.3 – Enhancing the Public Health Content	157
4.4.10.4 - Inadequate Resources for Public Health Activities	158

4.4.10.5 - The Global Nature of Pharmacy Practice	158
4.4.11 - Strengths and limitations of my interview	159
4.4.11.1 – Strengths	159
4.4.11.2 – Limitations	159
4.4.12 – Conclusions	160
Chapter 5 - Discussion, Conclusions and Recommendations	162
5.1 – Introduction	162
5.2 – Discussion	164
5.2.1 - How my Project met its Objectives	188
5.3 - Implications of my Project Findings for Curricular and Public Health Policy	191
5.4 – Conclusion	192
5.4.1 - Recommendations for Further Studies	193
5.4.2 – Limitations	194
Chapter 6 – A Reflexive Account of My Journey	196
References	200
Appendices	223
List of Figures	
Figure 1 International Milestones in the Development of the New Public Health	30
Figure 2 Main Determinants of Health	31
Figure 3 Global Determinants of Health	31
Figure 4 Themes identified from my review of knowledge and information	67
Figure 5 Age of Participants	87
Figure 6 Respondent's Role in Pharmacy	88
Figure 7 Locations of Respondents	88
Figure 8 Characteristics of UK Schools of Pharmacy - Year Established	124
Figure 9 UK Schools of Pharmacy - Location Versus Year Established	125
Figure 10 Group Query Indicating Public Health, Clinical and Science Curricula of UK Schools of Pharmacy	125
Figure 11 Group Query Indicating the Public Health Curricula of UK Schools of Pharmacy	126
Figure 12 Coding for 'safety' by Schools of Pharmacy (England)	126
Figure 13 Node Coding by University vs Country	127
Figure 14 Gender of Interview Participants	129
Figure 15 Age of Interview Participants	130

Figure 16 Role of Interview Participants	130
Figure 17 Nvivo Group Query for Public Health Coding	131
Figure 18 Coding by Item for Collaboration	151

List of Tables

Table 1a Overview of Papers Included in the Review of Knowledge and Information	47
Table 1b Overview of Papers Included in the Review of Knowledge and Information (contd.)	48
Table 2 Evidence Categories used by the Department of Health in the National Service Frameworks	49
Table 3 Relation between aims and objectives and methods	63
Table 4 Different forms of Public Health Services Provided by Respondents	89
Table 5 Possible Ways to Enhance the Public Health role of Community Pharmacists	92
Table 6 Barriers to Enhancing the Public Health Role of Community Pharmacists	94
Table 7 Suggestions on How Community Pharmacy-based Public Health Services Could be Developed in the Future	107
Table 8 Word Frequency Query Results	116

List of Appendices

Appendix 1 Cronbach's Alpha Reliability Test	223
Appendix 2 DProf Project Questionnaire	226
Appendix 3 Covering letter	231
Appendix 4 DProf Project Interview Guide	232
Appendix 5a Means Table by Gender	233
Appendix 5b Means Table by Gender contd.	234
Appendix 5c Means Table by Gender contd.	235
Appendix 5d Means Table by Gender contd.	236
Appendix 5e Means Table by Gender contd.	237
Appendix 5f Means Table by Gender contd.	238
Appendix 6 Anova Table by Gender	239
Appendix 7 Measures of Association by Gender	245
Appendix 8a Means Table by Age of Respondent	248

Appendix 8b Means Table by Age of Respondent contd.	250
Appendix 8c Means Table by Age of Respondent contd.	252
Appendix 8d Means Table by Age of Respondent contd.	253
Appendix 8e Means Table by Age of Respondent contd.	255
Appendix 8f Means Table by Age of Respondent contd.	256
Appendix 9 Anova Table by Age of Respondent	258
Appendix 10 Measures of Association by Age of Respondent	264
Appendix 11a Means Table by Year of Qualification	267
Appendix 11b Means Table by Year of Qualification contd.	268
Appendix 11c Means Table by Year of Qualification contd.	269
Appendix 11d Means Table by Year of Qualification contd.	271
Appendix 11e Means Table by Year of Qualification contd.	272
Appendix 11f Means Table by Year of Qualification contd.	273
Appendix 12 Anova Table by Year of Qualification	275
Appendix 13 Measures of Association by Year of Qualification	281
Appendix 14a Means Table by Respondent's Role in Pharmacy	283
Appendix 14b Means Table by Respondent's Role in Pharmacy contd.	285
Appendix 14c Means Table by Respondent's Role in Pharmacy contd.	287
Appendix 14d Means Table by Respondent's Role in Pharmacy contd.	289
Appendix 14e Means Table by Respondent's Role in Pharmacy contd.	291
Appendix 14f Means Table by Respondent's Role in Pharmacy contd.	293
Appendix 15 Anova Table by Respondent's Role in Pharmacy	294
Appendix 16 Measures of Association by Respondent's Role in Pharmacy	300
Appendix 17a Means Table by Location	304
Appendix 17b Means Table by Location contd.	305
Appendix 17c Means Table by Location contd.	306
Appendix 17d Means Table by Location contd.	307
Appendix 17e Means Table by Location contd.	308
Appendix 17f Means Table by Location contd.	309
Appendix 18 Anova Table by Location	310
Appendix 19 Measures of Association by Location	316
Appendix 20 Test for Correlation	318
Appendix 21 Visualisation of the Curriculum of School of Pharmacy, University of Brighton	327

Appendix 22 Visualisation of the Curriculum of School of Pharmacy, Liverpool John Moores University	328
Appendix 23 Visualisation of the Curriculum of School of Pharmacy, University of Central Lancashire	328
Appendix 24 Visualisation of the Curriculum of School of Pharmacy, Kingston University	329
Appendix 25 Visualisation of the Curriculum of School of Pharmacy, University of Wolverhampton	329
Appendix 26 Visualisation of the Curriculum of School of Pharmacy, University of Reading	330
Appendix 27 Visualisation of the Curriculum of School of Pharmacy, University of Portsmouth	330
Appendix 28 Visualisation of the Curriculum of School of Pharmacy, University of Manchester	331
Appendix 29 Visualisation of the Curriculum of School of Pharmacy, University of Hertfordshire	331
Appendix 30 Visualisation of the Curriculum of School of Pharmacy, Aston University	332
Appendix 31 Visualisation of the Curriculum of School of Pharmacy, University of Bath	332
Appendix 32 Visualisation of the Curriculum of School of Pharmacy, University of Sunderland	333

Glossary of Terms

Anatomy the branch of biology concerned with the study of the structure of organisms and their parts.

Angiogenesis the physiological process through which new blood vessels form from pre-existing vessels.

Aetiology the cause, set of causes, or manner of causation of a disease or condition.

Biochemistry sometimes called biological chemistry, the study of chemical processes within and relating to living organisms.

Biopharmaceutics the study of the chemical and physical properties of drugs and the biological effects they produce.

Biotechnology the exploitation of biological processes for industrial and other purposes, especially the genetic manipulation of microorganisms for the production of antibiotics, hormones, etc.

Drug Tariff outlines what will be paid to pharmacy contractors in reimbursement for the cost of drugs, appliances, etc, used in providing NHS services.

Chloramphenicol an antibiotic useful for the treatment of a number of bacterial infections.

Epidemiology the science that studies the patterns, causes and effects of health and disease conditions in defined populations.

Herceptin the brand name of a medicine called trastuzumab used to treat some types of breast cancer and stomach cancer.

Opioid an opium-like compound that binds to one or more of the three opioid receptors of the body.

Orlistat a drug designed to treat obesity.

Paraneoplastic syndrome a set of signs and symptoms that is the consequence of cancer in the body.

Pharmaceutics is the study of relationships between drugs formulation, delivery, disposition and clinical response.

Pharmacoeconomics the scientific discipline that compares the value of one pharmaceutical drug or drug therapy to another.

Pharmacogenetics the study of inherited genetic differences in drug metabolic pathways, which can affect individual responses to drugs in terms of therapeutic as well as adverse effects.

Pharmacognosy the study of medicinal drugs derived from plants or other natural sources.

Pharmacology the branch of medicine and biology concerned with the study of drug action.

Pharmacovigilance the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem.

Physiology the branch of biology that deals with the normal functions of living organisms and their parts.

Polypharmacy the use of four or more medications by a patient, generally adults aged over 65 years.

Quinolones a family of synthetic broad-spectrum antibacterial drugs.

Statins a group of cholesterol-lowering medicines.

Simvastatin drug used to lower cholesterol and triglycerides (types of fat) in the blood.

Telehealth the delivery of health-related services and information via telecommunications technologies.

Thiazide diuretics a common treatment for high blood pressure also used to clear fluid from the body in conditions where it accumulates too much fluid, such as heart failure.

Warfarin an anticoagulant normally used in the prevention of thrombosis and thromboembolism, the formation of blood clots in the blood vessels and their migration elsewhere in the body, respectively.

Abstract

Introduction

A number of UK studies have investigated the role of pharmacists in public health (Blenkinsopp, et al. 2002; Anderson and Blenkinsopp 2003; Agomo 2012a). However, many of these studies have also identified barriers in this public health role (Agomo 2012a; Agomo and Ogunleye 2014). My project aimed to identify strategies, which could enhance the public health role of community pharmacists in the UK.

Method

My project used a mixed methods approach, involving a content analysis of the UK undergraduate pharmacy curriculum, a descriptive survey of UK community pharmacists and interviews with healthcare practitioners to investigate strategies enhancing the public health role of community pharmacists in the UK.

Results

The majority of my survey respondents indicated that there was a need for pharmacists to work closely with other healthcare practitioners [93.1%, C.I. ± 5.32]; pharmacy students to train with other healthcare students [81.4%, C.I. ± 8.21]; students and pharmacists to be provided with advanced experience in public health [86.2%, C.I. ± 7.24 and 89.8%, C.I. ± 6.32 respectively]; as well as increasing the public health content of the undergraduate pharmacy curriculum [64.8%, C.I. ± 9.97]. Respondents from Cardiff were more likely to participate in local authority-run schemes than other respondents ($p < .001$; $\eta^2 = .296$). Male respondents were more likely to agree that 'insufficient funding from the government' was a barrier to the public health role of community pharmacists [$p = .011$; $\rho = -.269$]. The findings of my interviews confirmed several aspects of my survey findings, particularly as regards accessibility, encouraging collaboration between pharmacists and other healthcare professionals, and tackling a number of barriers, such as the lack of awareness of the public health skills of pharmacists. There were some indications from my content analysis that the teaching of macro-level public health activities (such as epidemiology, assessment, pharmacovigilance, policy development and assurance at the population-based level) in most UK pharmacy schools was either minimal or lacking.

Conclusion

There is a need to enhance the public health role of community pharmacists in the UK. This will help make public health services more accessible to the public, reduce healthcare costs and pressures on other healthcare professionals, as well as helping to elevate the image of community pharmacists.

Chapter 1 – Introduction

1.1 - Context

Supporting my project, which aimed mainly to identify strategies enhancing the public health role community pharmacists in the UK, is my role as a change agent. According to Havelock (1973), a change agent is a person who facilitates planned change or planned innovation. A person can act as a change agent in four primary ways. They include being a catalyst, a solution giver, a process helper and a resource linker (Havelock 1973). I see myself more as a catalyst and a solution giver, rather than as a process helper or a resource linker. This is because, as a catalyst, the change agent helps to overcome inertia and to prod and pressure the system to be less complacent and to start working on its serious problems (Havelock 1973). According to Havelock (1973), change agents do not necessarily have the answers to problems, but they are usually dissatisfied with things the way they are. By making their dissatisfaction known and by upsetting the 'status quo', they energise the problem-solving process, and hence get things started (Havelock 1973).

My role as an insider-researcher-practitioner is also important in my project. Not only have I been engaged in many of the issues concerning pharmacy practice in the UK (as described briefly in my Review of Learning), but my previous work on the role of community pharmacists in public health (Agomo, et al. 2006, Agomo 2012a) puts me in a good position to investigate strategies enhancing the public health role of community pharmacists in the UK. I believe that I am well situated to investigate strategies that can enhance the public health role of community pharmacists in the UK, due to my position as an insider practitioner-researcher and my insight into the role of community pharmacists in public health. Some of the attributes I bring to the project include the fact that I am an independent worker who does not need close supervision. At the same time, I am able to decide logically what should be done and work towards it steadily, regardless of distractions. These attributes, as well as my skills, academic qualifications and professional experiences, have helped me undertake the DProf project.

1.2 - Background

According to the World Health Organisation (WHO 2015a), 2015 represented the target year for the Millennium Development Goals (MDGs). However, as some of the gains made in different regions of the world have been uneven; this also meant that the MDG target could not be achieved in most countries (WHO 2015a). WHO has noted that this uncompleted agenda will need to include new challenges such as the increasing impact of non-communicable diseases, and changing social and environmental determinants (WHO 2015a). However, the WHO has also estimated that of 56 million global deaths in 2012, 38 million, or 68%, were due to non-communicable diseases (NCDs) (WHO 2017). The four main NCDs are cardiovascular diseases, cancers, diabetes and chronic lung diseases (WHO 2017). Most of these conditions are preventable through public health initiatives involving community pharmacists, particularly as the literature confirms the role of pharmacists in alcohol screening (Brown, et al. 2014; Dhital 2004; Dhital, et al. 2015); breastfeeding support (Lenell, et al. 2015); chlamydia screening (Anderson and Thornley 2011; Emmerton, et al. 2011; Gudka, et al. 2013); falls prevention (Mott, et al. 2016); general services (Agomo 2012a); hepatitis C screening (D'Angelo, et al. 2015); HIV screening (Crawford, et al. 2016; Mugo, et al. 2015) and lifestyle support (Chiazor, et al. 2015; Sabater-Hernandez, et al. 2016). In addition, there are some evidence that pharmacists do provide public health services in sexual health (Michie, et al. 2016); syringe exchange services (Janulis 2012; Torre, et al. 2010); TB screening (Bell, et al. 2012; Jakeman, et al. 2015); travel health (Tudball, et al. 2015) as well as weight management services (Um, et al. 2015; Weidmann, et al. 2015).

In terms of contemporary policy context in the world of pharmacy it has been argued that pharmacy education and practice have changed from their initial narrow product-centred focus to the present patient-centred focus in many countries globally, although to different degrees (Addo-Atuah 2014). Therefore, the introduction of the Millennium Development Goals (MDGs), as a framework for promoting global health in relation to development, has made the promotion of population health as relevant as the clinical care of the individual patient (Addo-Atuah 2014). Hence, there is now a demand for a public health-oriented medical education and practice that prepares the present medical practitioner to see farther the individual patient to his community and society (Addo-Atuah 2014). A similar change in pharmacy education and practice have also been made (Bush and Johnson 1979), such that,

will necessitate pharmacy education to comprise the right public health orientation to prepare and empower pharmacists with the necessary knowledge, skills, attitudes, and values crucial for contributing to public health, both at the micro and macro levels, regardless of their practice setting (Addo-Atuah 2014). Moreover, there will an expectation from pharmacists to evaluate public health policies for costs and effectiveness as well as collaborate with government agencies in formulating public health policy (Dolinsky, et al. 2007).

On conditions such as human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDs) prevention, Deas and McCree (2010) have suggested that several training options could be provided one of which is to expand current pharmacy curricula to include information and training on HIV testing and biomedical and behavioural prevention interventions. Another suggestion is to expand clerkship and clinical residency programs to include training in HIV/AIDS prevention (Deas and McCree 2010). In addition, professional pharmacy associations could offer workshops and/or postgraduate courses on HIV/AIDS prevention to practising pharmacists (Deas and McCree 2010). It is possible to extend these trainings to other aspects of public health involving pharmacists.

Still, part of this overhaul in pharmacy education will be to reinforce the involvement of patients and the public in decisions concerning the planning, design, development and delivery of local services in the hope that this will result to an enhancement in public health services for patients (Farrell 2004; Fudge, et al. 2008). According to the Department of Health, “To ensure that excellent education is relevant to the needs of patients and the public, the workforce planning system needs to be based on the way people expect services to be delivered” (DoH 2013). This is also supported by the new General Pharmaceutical Council (GPhC) Standards (especially Standard 5.6) that outline the relevance of patient and public involvement (PPI) in pharmacy education, as well as highlight the need for effecting practical experience of working with patients, carers and other healthcare professionals side-by-side the theoretical and scientific features of pharmacy education (Becket, et al. 2014).

Although, the evolution of pharmacy practice in recent decades has been a global phenomenon, with remarkable changes happening in the developed world (Mossialos, et al. 2013), there are however many barriers that will need to be overcome to ensure best

practice is distributed more widely on an international level (Krass 2016). Some of the factors which affect pharmacy's ability to translate knowledge of evidence-based practice from one environment to another have been noted to include: the wealth of information available; wide differences in healthcare systems; government legislation on ownership of community pharmacy and control of medicines; the structure of the pharmacy sector; the power and influence of the medical profession; the availability of general practitioners (GPs); the education of pharmacists; and systems of pharmacist reimbursement (Krass 2016).

Notably, variations in pharmacy curricula and programmes around the world also have a role to play to the different rate of implementation of best practice models (Krass 2016). Yet, wide variation in the length and comprehensiveness of experiential placements in pharmacy degree programmes lead to variations in level of clinical (possibly, public health) skills of graduates in different countries (FIP 2014). Still, in countries where best practice models are successfully in place by "early adopters", worryingly many practitioners have not always responded. Some of the reasons given for this reluctance include pharmacists often lack of confidence, fear new roles, are stuck when faced with ambiguity, always need approval and are risk averse (Krass 2016).

In addition, some of the influences on pharmacists' role in public health have been noted to include, loss to follow-up and inadequate training (Dhital, et al. 2015); organisational obstacles, e.g. lack of time and unfamiliarity with the tool, as well as, challenges with engaging with clients (Brown, et al. 2014); challenges with incorporating service into normal work flow, staff lack of confidence in public health, and restrictions around commissioned services (Mackridge, et al. 2015). As well as, limited evidence of service effectiveness and cost-effectiveness in the community pharmacy setting (Watson and Sheridan 2011); attitudes towards pharmacists engaging in screening and brief intervention (SBI) for risky drinkers (Sheridan, et al. 2012); as well as pharmacists' attitudes to clients, training, and lack of knowledge and confidence to provide a brief intervention (McCaig, et al. 2011).

Other influences include, commitment issues relating to workload and, in some cases, no staff member taking responsibility for 'driving' the distribution of the specimen collection kits and the restriction of advertising to in-store posters and leaflets (Emmerton, et al. 2011); not simplifying paper work, not using web-based system for recording, lack of

compensations/incentives, and not making testing universally available at all pharmacies, at all times (Gudka, et al. 2013); as well as, recruitment of patients, the process through which the intervention was delivered, the extent to which patients implemented the recommendations for intervention and the acceptance of pharmacists' recommendations by prescribing physicians (Casteel, et al. 2011).

Additional influences hindering the public health role of pharmacists have also been identified to include, lack of an adequate counselling space, lack of demand and expectation of a negative reaction from customers (Eades, et al. 2011); poor implementation of public health initiatives (Hermansyah, et al. 2016); major differences between community pharmacy practice in Europe (Martins, et al. 2015); challenges with pharmacists developing innovative practices, and schools and colleges of pharmacy including public health topics/courses in the curriculum to provide a fundamental knowledge and practice opportunities for students (Nemire, et al. 2010); the lack of qualified staff and adequate infrastructure which may be compromising the quality of the services offered (Gyawali, et al. 2014); as well as lack of appropriate policy on public health role of community pharmacists, inadequate training of students and pharmacists in public health, lack of time and lack of the concept of team work with other health care professionals (Mohamed, et al. 2013).

According to Brown, et al. (2016) there is also the issue of insufficient evidence to assess the effectiveness of community pharmacy-based interventions on health equity; as well as insufficient information to examine the relationship between intervention effectiveness and behaviour change strategies and/or models used, implementation factors, or the organisation and delivery of interventions. Finally, labour costs, competition and inadequate reimbursement levels, which threaten the sustainability of these services (Doucette, et al. 2012); continued shortage in the pharmacist workforce and associated lack of time (Wibowo, et al. 2010); lack of awareness, lack of consensus, preventing young people from accessing pharmacy services, and not adapting services to meet the specific needs of this group (Horsfield, et al. 2014), as well as, the corporation of participating organisations (Lecher, et al. 2015) have also been identified as other influences affecting the public health role of pharmacists.

To manage some of these challenges and as part of its global workforce development goals for pharmacy, the International Pharmaceutical Federation (FIP) have highlighted the need for distinctly identifiable elements of collaborative working and inter-professional education and training, which is expected to be a feature of all workforce development programmes and policies (FIP 2016).

In the UK, the government has identified the importance of a multi-disciplinary public health workforce for handling the main causes of ill health (DoH 1999, 2010a). At the same time, the NHS Future Forum has recently suggested that healthcare professionals such as pharmacists ought to be incentivised in their national contract, as General Practitioners (GPs) are, to deliver health improvements and promote healthy lifestyles (News Team 2012a). Although there are no signs that this has now happened, the closer relationship being developed between GPs and pharmacists by the Royal Pharmaceutical Society (RPS) and the Royal College of General Practitioners (RCGP) (Robinson 2015a), does give some hope that this aspiration will one day become a reality. The white paper 'Choosing health through pharmacy: A programme for pharmaceutical public health' outlines some of the public health priorities for pharmacy (DoH 2005). A recent white paper (DoH 2010a) proposes a higher priority and dedicated resources for public health, with community pharmacists expected to play greater roles than before. While some of the public health activities provided from the community pharmacy have been successful, several have been unsuccessful due to various factors (Agomo 2012a; Agomo and Ogunleye 2014).

According to the Secretary of State for Health, Britain is now the most obese nation in Europe (DoH 2010a). In addition, Britain has one of the worst rates of sexually transmitted infections (STIs), with a relatively large population of problem drug users and increasing levels of harm from alcohol consumption (DoH 2010a). As it pertains to STIs, some of these infections (e.g. chlamydia and hepatitis B), can be further managed through the wider involvement of pharmacists in pharmacy-based vaccination services (Rosado and Bates 2016). Still, other health difficulties faced by Britain include smoking, which alone claims over 80,000 lives every year; poor mental health, tackling which could reduce the overall disease burden by nearly a quarter; and health inequalities between the rich and poor, which have been getting progressively worse (DoH 2010a). The government white paper 'Healthy lives, healthy people' (DoH 2010a), which responds to Professor Sir Michael

Marmot's 'Fair society, healthy lives: Strategic review of health inequalities in England post 2010' report (Marmot 2010) by adopting its life course framework for tackling the wider social determinants of health, uses a new approach, which aims to build people's self-esteem, confidence and resilience right from infancy, with stronger support for early years (DoH 2010a). The white paper complements 'A vision for adult social care: Capable communities and active citizens' (DoH 2010b) in paying more attention to personalised, preventative services that are focused on delivering the best outcomes for citizens and assist in establishing the Big Society. The white paper builds on 'Equity and excellence: Liberating the NHS' (DoH 2010c) to set out the overall principles and framework for public health service that achieves excellent results, unleashing innovation and liberating professional leadership (DoH 2010a).

In a recent white paper, 'Five year forward view', the government presented its plan to make greater use of pharmacists through its plan for 'Multispecialty Community Providers' (MCPs), which would become the focal point for a far wider range of care needed by their registered patients (NHS 2014). With this arrangement, larger group practices could in future begin employing consultants or engage them as partners, bringing in senior nurses, consultant physicians, geriatricians, paediatricians and psychiatrists to work alongside community nurses, therapists, pharmacists, psychologists, social workers and other staff (NHS 2014). Public Health England supports the 'Five year forward view' through its pledge to develop its partnership with pharmacy, as well as enable the profession to become an integral part of the primary care family (Lawrence 2014).

Nevertheless, the recent observation by the General Pharmaceutical Council (GPhC), that the present Master of Pharmacy (MPharm) degree offered by British universities fails to prepare pharmacists with the skills needed to deliver the care and services expected of them in the future, further problematises the situation (Anon 2015a). According to the GPhC, there is now a need to produce pharmacists who are competent in delivering patient-centred care and at the same time, have people skills and are able to work in a multi-disciplinary team (Anon 2015a). This becomes important when we also consider the results of a recent Ipsos/MORI poll carried out for the General Pharmaceutical Council (GPhC), which revealed that although the public trusts the advice given by a community pharmacist,

the degree of trust is lower than that afforded to other health professionals (Ipsos MORI 2014).

Regarding new developments in the public health agenda, the motivation for Modernising Pharmacy Careers Programme proposal for reform (Smith and Darracott 2011), is the need to develop Day 1 pharmacists who can:

- engage patients and carry out relevant consultations, encouraging and embedding safe and more effective use of medicines,
- support public health through the promotion of healthier lifestyles and the delivery of public health services, including aspects of behavioural change,
- respond to a diagnosis, usually developed by a medical practitioner, formulate a plan for initial and ongoing treatment in partnership with the patient, carers and other health professionals as appropriate, applying prescribing skills where appropriate,
- lead the pharmacy team and work effectively within a multi-professional team.

Based on the authors' review of what was then current arrangements, their ambition for the future of pharmacy, as well as their realistic assessment of capabilities, they suggested fundamental proposals for reforming pharmacist education and training as a starting point for discussions and action:

- Creating a single five-year MPharm programme, which includes two periods of work-based learning (and assessment) and leads to graduation and registration as a qualified pharmacist.
- Building an infrastructure which brings together universities and employers to jointly design and deliver the five-year MPharm programme including the planning and management of major work-based placements, and the academic and professional assessments necessary for satisfactory completion of training and registration.

The main drawback with this document seem to lie with the authorship of the document, particularly as it did not include key individuals from other sectors of pharmacy practice, notably, the hospital, pharmaceutical industry, primary care or even public health. It is

therefore possible that this oversight might have biased the document in favour of mostly commercially-led community pharmacy practice, and to some extent, the academia, at the disadvantage of other key sectors, whose contribution and role in advancing and sustaining the public health (as well as the clinical pharmacy) role of pharmacists cannot be deemed insignificant.

1.2.1 - Overall effectiveness and cost effectiveness of community pharmacists in public health

In terms of the effectiveness of community pharmacists in public health, the US literature suggests that the essential public health service where pharmacy presence is most felt is in evaluating the effectiveness, accessibility, and the quality of the services they provide (Strand, et al. 2016). Next is to link people to needed personal health services and assure the provision of health care when otherwise unavailable (Strand, et al. 2016). On the other hand, the core competency of Health Policy and Administration was most frequently utilised in pharmacy practice (Strand, et al. 2016). Yet, Strand, et al. (2016) also argues that core competencies of biostatistics and epidemiology are vital to contribute to many of the essential services such as monitor health status to identify and solve community health problems; diagnose and investigate health problems and health hazards in the community; evaluate effectiveness, accessibility, and quality of personal and population-based health services; and research for new insights and innovative solutions to health problems. As is probably the case in many countries (including the UK), there is no indication until now that neither biostatics nor epidemiology has been high priorities in the US pharmacy curriculum (Strand, et al. 2016).

In the UK, a number of studies have investigated the effectiveness of community pharmacists in public health. Notably, is a study that looked at the effectiveness of a community pharmacy weight management programme (Boardman and Avery 2014), and demonstrated that reductions in weight and waist circumference can be achieved in patients who participate in a community pharmacy weight management programme. In this study, 281 patients attended the programme across four Primary Care Trusts. The results of the study indicated that at 3 months, patients had lost weight (mean change = -3.07 kg) and waist circumference (mean change = -3.87 cm), but had no difference in blood pressure. However, after 6 months weight and waist circumference were further reduced from

baseline (mean change = -4.59 kg, -4.79 cm respectively) and there was a reduction in blood pressure (mean change systolic = -9.5 mmHg; diastolic = -4.7 mmHg) (Boardman and Avery 2014).

Still, in another UK study that aimed to enhance community pharmacists' involvement in pharmacy practice research through peer interview training, the study revealed that positive themes from five interviewees included the importance of the topic and their wish to learn skills beyond their everyday role (Morecroft, et al. 2015). The small group format of the training day helped to build confidence, in addition, interviewees felt that their shared professional background helped them to encapsulate relevant comments as well as probe effectively (Morecroft, et al. 2015). On the negative, there were challenges, particularly as it relates to interviewees balancing research activities with their daily work. Moreover, interviewees had trouble when it came to getting uninterrupted time with interviewees, which sometimes affected data quality by 'rushing' (Morecroft, et al. 2015).

On the cost effectiveness of community pharmacists in public health, a recent report by the UK Pharmaceutical Services Negotiating Committee (PSNC) indicates twelve services carried out by community pharmacies delivered £3.0bn in savings in 2015, offsetting the £2.8bn of total funding from the Department of Health (Oswald and Adcock 2015). However, self-care support contributed the largest share of overall value, at 40%, followed by 31% for medicines support and 29% for public health (Oswald and Adcock 2015). In the United States of America, it has been estimated that total spending on healthcare grew by 7.9% in 2004 and accounted for 16% of the gross domestic product (Tanne 2006), with this amounting to \$6,280 (£3,520) per person (Smith, et al. 2006). However, in a study that estimated the cost-effectiveness of a pharmaceutical care intervention program in Dutch community pharmacies that improved patients' adherence to lipid-lowering therapy, it was noticed that patients in the MeMO (Medication Monitoring and Optimisation) program had a lower risk for therapy discontinuation, RR = 0.49 (0.37 to 0.66), while the effectiveness was found to be similar in primary and secondary prevention (Vegter, et al. 2014). The study also reported that in a cohort of 1,000 primary and secondary prevention patients, the MeMO program led to a reduction of 7 nonfatal strokes, 2 fatal strokes, 16 nonfatal myocardial infarctions (MIs), 7 fatal MIs, and 16 revascularizations over patients' lifetime (Vegter, et al. 2014). While additional medication, disease management, and intervention costs in the

MeMO program were €411,000, the cost savings that came from reduced CVEs were found to be €443,000. In terms of quality-adjusted life, the MeMO program resulted in 84 quality-adjusted life-years (QALYs) gained and net cost savings of €32,000, while the clinical benefits and cost savings were found to be highest in the secondary prevention population (Vegter, et al. 2014).

Similarly, in another study that performed an economic analysis from the Belgian healthcare payer's perspective, the average overall costs in the base-case analysis per patient for the PHARMACOP-intervention and usual care were €2,221 and €2,448, respectively within the 1-year time horizon (van Boven, et al. 2014). According to the authors, this reflects cost savings of €227 for the PHARMACOP-intervention. The PHARMACOP-intervention resulted in the prevention of 0.07 hospital-treated exacerbations per patient (0.177 for PHARMACOP versus 0.244 for usual care), and at the same time, revealed robust cost-savings in various sensitivity analyses (van Boven, et al. 2014).

In a UK study that screened patients potentially at risk of chronic obstructive pulmonary disease (COPD) with validated tools, it was reported that smoking cessation initiation gave a project gain of 38.62 life years, 19.92 quality-adjusted life years and a cost saving of £392.67 per patient screened (Wright, et al. 2015a). In a related study (Wright, et al. 2015b) that evaluated the effect of a community pharmacy-based COPD service on patient outcomes, that there were significant improvements in patient reported adherence, utilisation of rescue packs, quality of life and a reduction in routine general practitioner (GP) visits. The intervention cost was estimated to be offset by reductions in the use of other NHS services [GP and accident and emergency (A&E) visits and hospital admissions] (Wright, et al. 2015b). These savings in the public health activities provided by community pharmacists are also supported by the findings of another study (RPS 2014a; Watson, et al. 2014) which reports that the cost of treating common ailments (e.g. head lice, threadworms, athlete's foot, etc.) in community pharmacies was about £29.30 per patient. However, when A&E were used for the same ailments, the cost was found to be nearly five times higher at £147.09 per patient and nearly three times higher at GP practices at £82.34 per patient (Watson, et al. 2014).

In sum, in the USA, the effectiveness of community pharmacists in public health is felt most in evaluating the effectiveness, accessibility, and the quality of the services they provide (Strand, et al. 2016). In a Dutch study that looked at adherence to lipid-lowering therapy,

the MeMO program resulted in 84 quality-adjusted life-years (QALYs) gained and net cost savings of €32,000 (Vegter, et al. 2014).

In the UK, there is evidence that it is possible to achieve reductions in weight and waist circumference in patients who participate in a community pharmacy weight management programme (Boardman and Avery 2014). In addition, it is also possible to build community pharmacists' confidence in public health through a small group format training (Morecroft, et al. 2015). In another UK study it was reported that smoking cessation initiation gave a project gain of 38.62 life years, 19.92 quality-adjusted life years and a cost saving of £392.67 per COPD patient screened (Wright, et al. 2015a). Still, in a related study it was revealed that there were significant improvements in patient reported adherence, utilisation of rescue packs, quality of life and a reduction in routine general practitioner (GP) visits (Wright, et al. 2015b). To support the argument for community pharmacists' enhanced role in public health, the Watson, et al. (2014) reveals that the cost of treating minor ailments in community pharmacies was almost three to five times lower than when GP practices or A&E departments were used.

1.3 - Defining Public Health

The definition of public health has changed and developed since the term first appeared in the nineteenth century (Baum 2008), with definitions varying between times and contexts (Hamlin 2002). The health of populations rather than individuals is often thought to be the concern of Public health; therefore, it frequently refers to wider determinants of health (DoH 2010a). Unlike other healthcare services, public health is mainly concerned with long-term health issues and trends (Hunter, et al. 2007). Based on Acheson's (1988) initial definition, Wanless has defined public health as:

'The science and art of preventing disease, prolonging life and promoting health through the organised efforts and informed choices of society, organisations, public and private, communities and individuals.' (Hunter, et al. 2007, p.22)

The monograph published by the Canadian Federal Minister of Health 'A new perspective on the health of Canadians' (Lalonde 1974), enormously influenced the definition of public health as fundamentally different from medicine, and stated that health did not depend mostly on medical care but on non-medical factors such as socio-demographic, lifestyle and environmental influences (Baum 2008). According to Hunter, et al. (2007), since the end of

the 1970s there has been a broad political movement focused on developing what later became 'the new public health' (Ashton and Seymour 1988) (see Figure 1).

Nevertheless, for the purpose of my project, I prefer the following definition of public health from the UK's Faculty of Public Health:

'The science and art of promoting and protecting health and well-being, preventing ill health and prolonging life through the organised efforts of society.' (FPH 2010).

The Faculty of Public Health definition is unique, in that it sees public health as population-based; it focuses on collective responsibility for health, its protection and disease prevention (FPH 2010). In addition, it recognises the important role of the state, as well as socio-economic and wider determinants of health; and it stresses partnerships with all those whose actions contribute to the health of the population (FPH 2010). According to the FPH (2010), there are three key domains of public health practice, namely: Health Improvement (inequalities, education, housing, employment, family/community, lifestyles, and surveillance and monitoring of specific diseases and risk factors); Improving Services (clinical effectiveness, efficiency, service planning, audit and evaluation, clinical governance and equity); and Health Protection (infectious diseases, chemicals and poisons, radiation, emergency response and environmental health hazards).

1.4 - Definition of Health and Determinants of Health

The World Health Organisation (WHO) has defined health as a 'state of complete physical, mental and social well-being and not merely the absence of infirmity' (Hunter, et al. 2007, p.5). According to Dahlgren and Whitehead (1991) (see Figure 2), the main determinants of health include non-modifiable factors (age, sex, hereditary factors) and modifiable ones (individual lifestyle factors, social and community influences, living and working conditions and general socio-economic, cultural and environmental conditions). Since the determinants of health were identified by Dahlgren and Whitehead (1991), there has been increased awareness of health as a global issue, with the present threats to global health including bioterrorism, climate change and potential pandemics such as the severe acute respiratory syndrome (SARS) and Ebola outbreaks (Hunter, et al. 2007). This awareness has also led to an enhanced understanding of the factors that can control people's well-being and positive health (see Figure 3).

1.5 - The Concept of Advanced Practice

The United Kingdom Central Council (UKCC), defines advanced practice as,

‘Adjusting the boundaries for the development of future practice, pioneering and developing new roles responsive to changing needs and with advancing clinical practice, research and education to enrich professional practice as a whole.’ (UKCC 1994: 20; McGee and Castledine 2003: 18)

In the case of nursing (which is relevant to pharmacy), it was widely agreed that formal preparation beyond the level of initial registration was a necessity, and that advanced practice should contain a clinical component that included advanced assessments, ordering diagnostic tests, treating patients and referring them to other sources of help, as well as acting as a source of professional advice to colleagues (McGee and Castledine 1998, 1999; Wilson-Barnett, et al. 2000). Interestingly, several developments in healthcare delivery in the UK have been the driving force for advancing professional practice (Por 2008; McGee and Castledine 2003). They include, the reduction in junior doctors' hours (Por 2008; McGee and Castledine 2003), development of user involvement and consumer groups, patient demands for greater choice and accessibility of healthcare, recruitment and retention of staff in some specialities, new personal medical services initiatives in primary care, national frameworks and government targets for health outcomes (Por 2008). Other demands have come from new initiatives in the organisation of care such as, ‘re-engineering’ (Humphreys 1996), ‘patient-focused care’ (Department of Health NHS Management Executive 1994), and the need to streamline the health service to make it more efficient and more acceptable to patients. The additional influences driving the advanced practice agenda in the UK are health policies and reforms introduced by the Labour government during the late 1990s and early 2000s, designed to improve the quality of services based on local needs and to reduce health inequalities (McGee and Castledine 2003; Bradshaw and Bradshaw 2004). However, the term ‘advanced practice’ hardly existed in the pharmacy literature until recently (Meadows, et al. 2004). In the UK, the limited engagement of community pharmacists in advanced practice, no doubt, has had huge implications for community pharmacists' ability to enhance their public health role from the basic activities with which they have always been associated, e.g. smoking cessation, emergency oral contraception provision and health advice (Agomo 2012a; Anderson 1998; Anderson and Blenkinsopp 2003) to more advanced roles, such as emergency preparedness and response to bioterrorism, climate change and

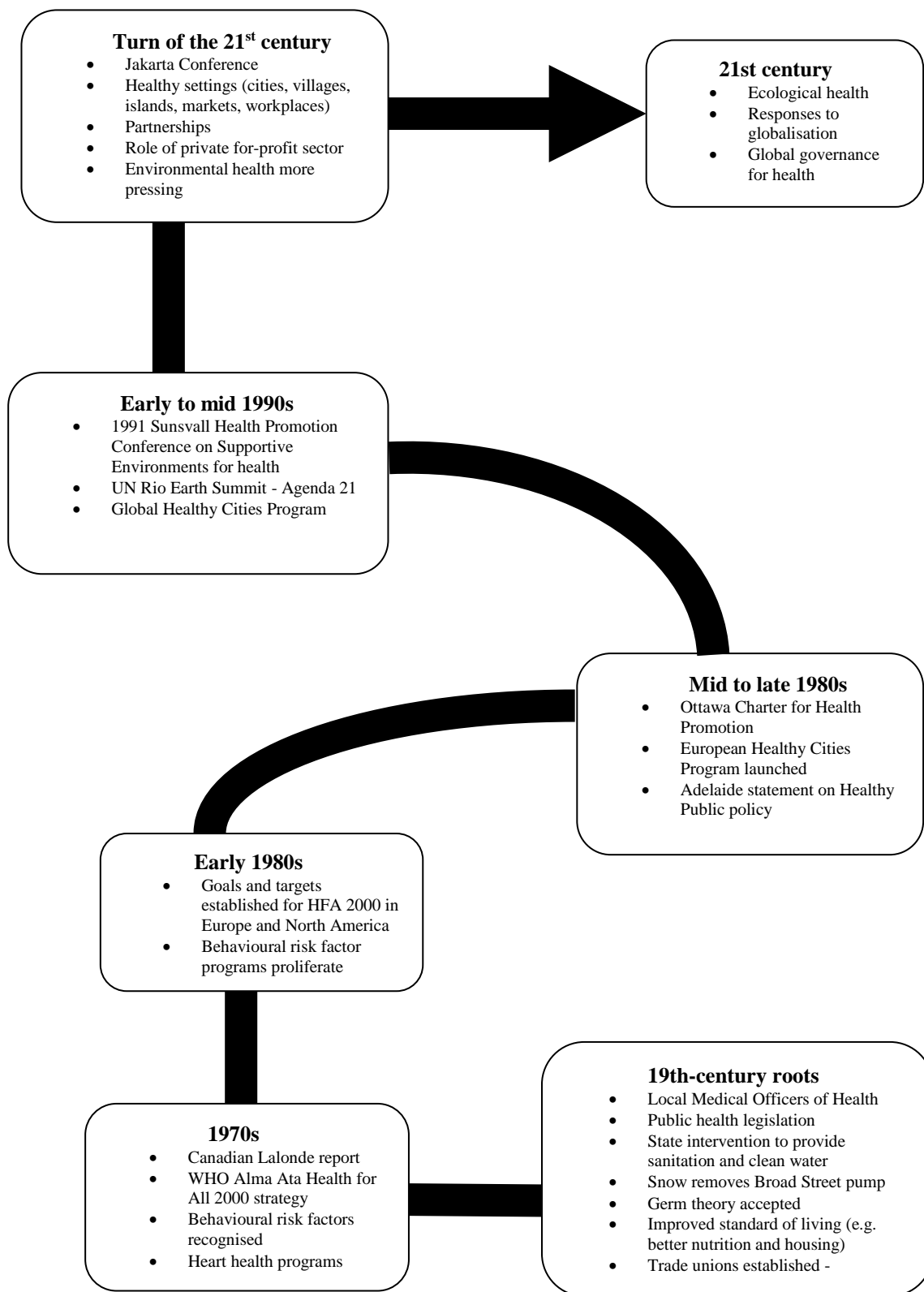


Figure 1. International Milestones in the Development of the New Public Health (Adapted from Baum 2008: 32)

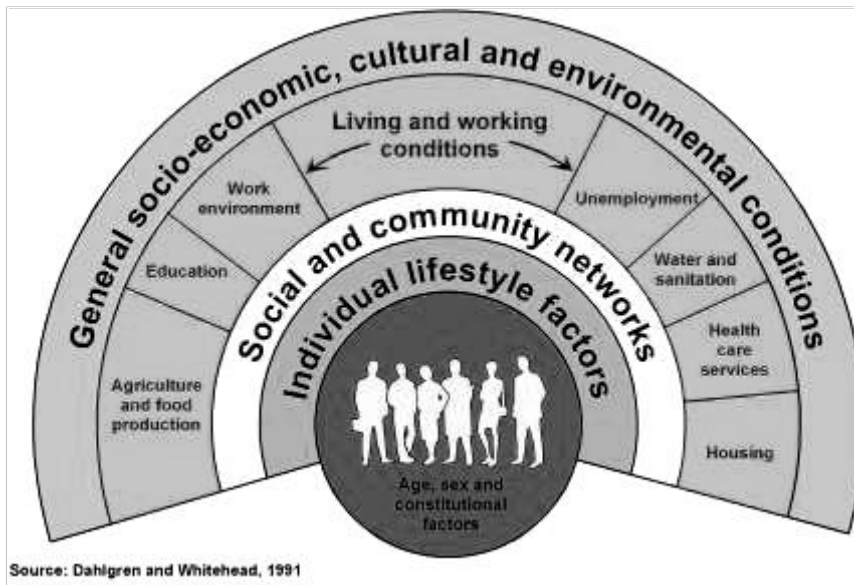


Figure 2. Main Determinants of Health (Hunter, et al. 2007: 5)



Figure 3. Global Determinants of Health (Hunter, et al. 2007: 7)

potential pandemics, tackling inequalities, and surveillance and monitoring of specific diseases and risk factors (Agomo 2012a; Patterson 2008).

Chapter 2 – Terms of Reference/Objectives and Review of Relevant Literature

2.1 - Terms of Reference

In my service-focused study (Agomo 2012a); I identified a wide range of roles that community pharmacists around the globe were providing in public health. They included, smoking cessation services; infection control and prevention; promoting cardiovascular health and blood pressure control; provision of emergency hormonal contraception (EHC); prevention and management of drug abuse, misuse and addiction; and healthy eating and lifestyle advice. This study contributed to the decisions of an important UK public health paper (Public Health England 2014). In the same study (Agomo 2012a), I also noted that despite the input from various governments to enhance the public health agenda for pharmacy, and the numerous opportunities that exist in public health services for community pharmacists (DoH 2010a, 2010c; Bjorkman, et al. 2008), UK community pharmacy public health practice still remains at a basic level (Agomo 2012a; Anderson 1998; Anderson and Blenkinsopp 2003). This observation is supported by Truong and Patterson (2010), who argue that although the pharmacy profession has evolved from product-orientated to patient-centred care, with pharmacists contributing to micro-level public health activities (e.g., disease management, health and wellness screening, immunisations, medication therapy management), there remain unmet needs for pharmacists in macro-level public health functions (i.e., assessment, policy development, and assurance at the population-based level).

However, it has been recognised that community pharmacists are in a prime position to help combat health issues, many of which are identified risk factors for chronic diseases (DoH 2008). This is particularly important, as community pharmacies are easily accessible and provide a convenient and less formal environment for those who cannot or do not wish to visit other kinds of health services (DoH 2008; McGuire, et al. 2007).

2.2 - Ontological Reflection

Reflecting on my ontology, values such as ethics (Fox, et al. 2007), accountability, hard work and perseverance guided me. Although I am able to locate the source of my values mainly

from my Christian and cultural upbringing, over the years my values have been influenced by both my formal and informal education, and my empathy for the unwell. In my role as a community pharmacist, I strive to ensure that my values do not influence adversely the services I provide to the public. This is in line with the General Pharmaceutical Council's standards of conduct, ethics and performance that stipulate the behaviours, attitude and values expected of pharmaceutical professionals (GPhC 2012). Guiding these behaviours, attitude and values are the seven principles set out by the GPhC. They include: ensuring that patients are my first concern; using professional judgement in the interest of patients and the public; showing respect to others; encouraging patients and the public to participate in decisions about their care; developing my professional knowledge and competence; being honest and trustworthy; and taking responsibility for my working practices. However, living and working in the UK and experiencing practice that is hugely different from what I experienced earlier in Nigeria (in terms of advanced practice), has also changed my practice and influenced my values in a positive way.

2.3 – My Professional Journey

Briefly, my career as a pharmacist started in Nigeria in 1991 after I had completed a five-year undergraduate pharmacy programme at the University of Benin, Benin City, Nigeria. The unique point about the University of Benin pharmacy programme was its clinical orientation, which is slightly different from the science-based pharmacy curriculum offered, for example, in the UK. I was later to use this experience to enter the pharmaceutical industry in Nigeria as a medical representative, to register and work in the UK as a pharmacist, and to develop my role as a freelance pharmaceutical writer and a postgraduate student.

On arrival in the UK in 2000, I went through a conversion programme that involved studying independently and taking pharmacy examinations at the University of Sunderland (2001), taking another internship programme, this time in a community pharmacy practice in London (2001–2002), and taking the Royal Pharmaceutical Society of Great Britain's pre-registration examination. Essentially, my role as a community pharmacist revolves around dispensing patients' prescriptions, counselling patients, answering queries from doctors and other healthcare providers, providing minor ailment, smoking cessation and emergency hormonal contraception services. Moreover, I am also involved in stock control

and ordering, training and mentoring pre-registration pharmacists, technicians and counter staff, providing medicine use reviews (MURs) and the new medicines service (NMS), providing health checks that involve blood pressure, cholesterol and basal metabolic index monitoring, and other general duties.

Using the MUR or the NMS as an example, my role as a community pharmacist involves identifying, during the dispensing process, patients who are on long-term medication, such as medicines used in asthma (MUR), or identifying those who are using long-term medication for certain conditions for the first time (NMS). I follow this identification of patients with discussions that try to establish patients' knowledge and understanding of their medicines, how compliant they are with the regimen and any signs of side effects. MURs also provide an opportunity for me to give lifestyle advice (on healthy diets, exercise, etc.) to patients. In situations where, for example, patients are taking asthma inhalers for the first time, I often use this opportunity to teach them how to use and maintain their inhalers correctly.

However, the area that I have found the most challenging as well as motivating in my role as a community pharmacist has been in the support of patients with drug addiction problems. Normally the role of the community pharmacist in drug addiction lies in the dispensing, and sometimes supervision of the consumption of methadone and buprenorphine to drug addicts. In the many years I have worked as a community pharmacist in the UK, I have noticed that often most community pharmacists do not consider counselling drug addicts to get them to quit drug addiction as part of their role. It is therefore not unusual to find many addicts taking the same dose (sometimes, high doses) of methadone or buprenorphine for a number of years, without any sign of them making an effort to reduce the dose or even quit drug addiction entirely. My engagement in a community pharmacy in London, where several drug addicts (including a patient with a suicidal tendency) were served, therefore provided the opportunity for me to apply indirectly some of the things I learnt with the behavioural change models at St. George's Hospital Medical School, Tooting, London (now St. George's, University of London).

In terms of learning, my experience with drug addicts has also strengthened my conviction about the role of community pharmacists in public health (Agomo 2006, 2012a). My DProf project, which investigates strategies enhancing the public health role of community

pharmacists in the UK (excluding Northern Ireland), enables me to advance this learning.

2.4 - Reflecting on my Role as a Change Agent

In addition to my role as a community pharmacist, I am also actively engaged in pharmaceutical writing, for example dealing with the restructuring of the UK undergraduate pharmacy curriculum to enhance both the clinical (Agomo 2004, 2006, 2011) and managerial skills (Agomo 2007, 2008a) of pharmacists. I have also published papers on the role of the community pharmacist in public health (Agomo, et al. 2006; Agomo 2012a; Agomo and Ogunleye 2014), which have contributed immensely to the conceptualisation and development of my DProf project.

In the MSc dissertation I conducted while studying at St. George's Hospital Medical School (now St. George's, University of London) (2005), I looked at 'the current provision of smoking cessation services by community pharmacists in an inner-city area'. This was a descriptive, cross-sectional survey, in which I mailed questionnaires to all 62 participating community pharmacists in Wandsworth PCT. A total of 44 usable responses were collected, a response rate of 72%. The results of the survey indicated that the majority of respondents (86%) were involved in the management of Nicotine Replacement Therapy (NRT), with most (71%) of the NRT services being funded by the Primary Care Trust (PCT) – now replaced by the Clinical Commissioning Group (CCG). In that study, I noted that the main difficulties with the then pharmacy-based NRT schemes were the pharmacists' lack of freedom to prescribe NRT, the recruitment of patients, high dropout rates and low success rates reported by many respondents (Agomo, et al. 2006).

However, in my service-focused study (King's College, London); I used the scoping review of the literature to identify 'the role of community pharmacists in public health'. My main objectives for the study were to identify relevant literature from the UK and overseas regarding the role of community pharmacists in public health, through electronic database searches and grey literature. I limited the search period from January 1985 to November 2010. In terms of findings, I identified a wide range of roles that community pharmacists were providing in public health. The dominant themes being in the areas of smoking cessation services, healthy eating and lifestyle advice, provision of emergency hormonal contraception, infection control and prevention, promoting cardiovascular health and blood pressure control and prevention and management of drug abuse, misuse and addiction. In

addition, I also identified several barriers and gaps in the UK evidence base. The gaps were significant in themes with no identified UK studies, such as preventing falls in the elderly, emergency preparedness and response to bioterrorism, climate change and potential pandemics, immunisation and vaccination services and prevention and risk assessment of osteoporosis.

2.5 - Motivation to Study for the DProf

In terms of my motivation, I will however argue that it was the Population Health module I studied during my MSc programme at St. George's Hospital Medical School (now St. George's, University of London), that actually kick-started my interest to investigate further the role of pharmacists in public health. Hence, my area of focus in the MSc dissertation - smoking cessation, the Service-Focused Study (SFS) and then the DProf programme. In the Population Health module, I learnt about a number of public health topics, such as measuring the health of populations; sources of information; epidemiological methods; patterns of disease; planning and provision of healthcare; effects of health care interventions; prevention and screening; and communicable disease control.

At the same time, the preparatory materials on statistics and research methods enabled me to understand research issues such as the main types of study design, their advantages and disadvantages. Also, how to select appropriate designs in practice and the importance of study design issues, for example, random sampling, random allocation, placebos, blind assessment, intent to treat analysis, and eliminating sources of bias. I consider that bringing some of these topics (particularly with regard to Public Health) into the undergraduate pharmacy curriculum could help to enhance both the knowledge base and the role of community pharmacists in public health.

In 2012, I published a summary of my SFS at King's in the *Journal of Pharmaceutical Health Services Research* (Agomo 2012a). I am extending this work through the opportunity created by my DProf programme.

2.6 - Enhancing the Study's Viability

For my project to be viable I believe I need to address both the quantitative and qualitative aspects and that by combining the post-positivist and constructivist paradigms; the project will deliver results that are more meaningful. While the post-positivist approach will allow

for hypothesis testing, through the constructivist approach I will be able to give voice to the experiences and perceptions of the other participants (IWBL 2011). Hence, a mixed methods approach incorporating both quantitative and qualitative elements creates a significantly more coherent project which both analyses the past and develops solutions for the future in a sufficiently robust manner to represent a piece of work to be assessed at doctoral level. In addition, by integrating qualitative and quantitative data collection methods, it is possible to develop a better understanding of the strategies needed to enhance the public health role of community pharmacists in the UK (Creswell and Plano Clark 2007). Using these methods, my project will therefore involve a postal survey of UK community pharmacists, content analysis of UK pharmacy schools' curricula and semi-structured telephone interviews with community pharmacists and other healthcare professionals.

2.7 - Theoretical Framework

Regarding the application of social theories to pharmacy practice, there is agreement on the role played by the social sciences in pharmacy and pharmacy education (ACPE 2006).

According to Davies (2010), a good theory not only helps to prevent overlooking of factors that may be important determinants of practice, when you link theory to outcomes, it is possible to explore why, or why not, any intervention was effective. The Theoretical Domains Framework (TDF) is an integrative framework, which is as a vehicle to help apply theoretic approaches to interventions aimed at behavioural change (Cane, et al. 2012; Duncan, et al. 2012). According to Cane, et al. (2012) behaviour change is vital to improving healthcare and health outcomes. Such behaviours may be those of healthcare workers, for example, implementation of evidence-based practice of patients, medication adherence of the general population, or even smoking cessation and increasing physical activity (Cane, et al. 2012). While it has been noted that the TDF enables a wide range of possible theoretical explanations for behaviours to be considered (Duncan, et al. 2012), yet McKenzie, et al. (2008) argues that the framework is not a theory, as it does not propound relationships between its elements. Notwithstanding, the TDF been used to identify barriers to quality improvement in healthcare in order to develop interventions (McKenzie, et al. 2008).

To enable implementation of health care interventions, the TDF can be used prospectively (Dyson, et al. 2013; French, et al. 2013; Tavender, et al. 2014) as well as retrospectively in theory-based process evaluation (Cane, et al. 2012; Curran, et al. 2013; French, et al. 2013).

According to Dyson, et al. (2013), to facilitate the use of theory in implementation research and practice, it requires the use of a tool to permit researchers and practitioners to measure prospectively the theoretical determinants that represent barriers and levers to practice change. It is then possible to use this knowledge to design appropriate theory-informed strategies to support change (Dyson, et al. 2013). Hence, the Theoretical Domains Framework (TDF), which I chose for my study, brings together the models and theories of behavioural change (Jones, et al. 2015). According to Jones, et al. (2015), Susan Michie and team at University College London (UCL) developed the TDF. It had 12 domains originally, later this was increased to 14 domains – each domain obtained from the constructs of many behavioural change theories (Jones, et al. 2015). A domain is defined as comprising, a set of similar theoretical constructs (Michie, et al. 2005). The TDF is however intended to be used in changing professional behaviour (Jones, et al. 2015).

In terms of development, experts – theorists, researchers/implementers and health psychologists who generated 33 theories and 128 constructs and then grouped constructs into domains (Jones, et al. 2015), created the TDF. There was also an interdisciplinary validation process by health psychologists, with further validation involving the use of the TDF in a number of settings with a variety of topics (Jones, et al. 2015). The fourteen domains include the following: *knowledge; skills; social influences; memory, attention and decision processes; behavioural regulation; professional/social role & identity; beliefs about capabilities (self-efficacy); beliefs about consequences; optimism; intentions; goals; emotion; environmental context and resources (environmental constraints); and reinforcement* (Jones, et al. 2015).

According to Lipworth, et al. (2013), in the TDF, “knowledge” refers to an awareness of the existence of something”. “Knowledge” therefore is seen to be important as a person’s perceived awareness of the scientific rationale, procedure(s), and task environment related with a desired behaviour is likely to determine whether or not a person implements it (Lipworth, et al. 2013). “Skills” refer to “an ability or proficiency acquired through practice”, and considered important, as a person’s perceived sense of their own competence in carrying out a desired behaviour is likely to determine whether they will be interested to implement it (Lipworth, et al. 2013). In TDF, “beliefs about capabilities” refers to “acceptance of the truth, reality, or validity about an ability, talent, or facility that a person

can put into constructive use" (Lipworth, et al. 2013). Again, this is relevant as the level of confidence a person has about their ability to carry out a particular behaviour is also likely to influence whether or not they execute it (Lipworth, et al. 2013). In regard to "beliefs about consequences", this refers to an "acceptance of the truth, reality, or validity about the outcomes of a behaviour in a given situation" (Lipworth, et al. 2013). Hence, the beliefs a person has about the outcomes of a particular behaviour will influence if or not they decide to conform (Lipworth, et al. 2013). On the other hand, "social and professional role and identity" refers to a "coherent set of behaviours and displayed personal qualities of an individual in a social or work setting (Lipworth, et al. 2013). Here, it argues that the extent to which someone believes that a particular behaviour evens up with his or her social/professional identity will determine whether he or she will implement it (Lipworth, et al. 2013).

In the TDF, "social influences" refer to "those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours". Hence, factors such as pressure, encouragement, or support from others can frequently affect the performance of a desired behaviour (Lipworth, et al. 2013). In regard to "environmental context and resources", this domain refers to "circumstances of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour" (Lipworth, et al. 2013). Therefore, the nature of the environment in which a person is expected to carry out a specific behaviour is likely to influence their ability and willingness to perform it (Lipworth, et al. 2013).

On "optimism", this refers to "the confidence that things will happen for the best or that desired goals will be attained". Here, it argues that the extent to which a person believes a goal will be attained, will influence the probability of the individual carrying out the behaviour(s) that will lead to that goal (Lipworth, et al. 2013). Concerning "emotion", it concerns "a complex reaction pattern, involving experiential, behavioural, and psychological elements, by which an individual attempts to deal with a personally significant matter or event". Hence, it is believed that negative emotions such as fear and anxiety, as well as positive emotions for example joy and pride, linked with a desired behaviour, are expected to influence whether or not a person chooses to do it (Lipworth, et al. 2013).

According to the TDF, "reinforcement" relates to "increasing the probability of a response

through a dependent relationship, or contingency, between the response and a given situation” (Lipworth, et al. 2013). Reinforcement is also important as perceived rewards and punishments affiliated with performance or non-performance of a specific behaviour can determine whether a person decides to perform it (Lipworth, et al. 2013). On “intention”, this is “a conscious decision to perform a behaviour or a resolve to act in a certain way” (Lipworth, et al. 2013). Therefore, the level of motivation or commitment a person has to behave in a specific manner will determine whether they carry it out (Lipworth, et al. 2013). On the other hand, “goals” refer to “mental representations of outcomes or end states that an individual wants to achieve” (Lipworth, et al. 2013). Here, the presence of a goal and the value set on it in regards to a particular behaviour, is likely to determine whether or not the behaviour will be performed (Lipworth, et al. 2013).

Yet, in the TDF, “memory, attention and decision processes” refer to “the ability to retain information, focus selectively on aspects of the environment, and choose between one or more alternatives” (Lipworth, et al. 2013). In this case, it argues that remembering to execute a particular behaviour or remaining focused on it, is likely to influence whether or not the individual performs the behaviour (Lipworth, et al. 2013). Finally, “behavioural regulation” refers to “anything aimed at managing or changing objectively observed or measured actions” (Lipworth, et al. 2013). This is considered relevant as the availability of an action plan or monitoring progress towards a behaviour is likely to affect whether or not a behaviour is implemented or an outcome is attained (Lipworth, et al. 2013).

Although the TDF is known to have a number of strengths that might include, the fact that it provides a clear structure as well as has multidisciplinary application, however, it is known to have a number of limitations that might include, the fact that it is still on trial; the confusion surrounding if it is a theory of itself or just a framework of theories, and the challenge associated with the large number of constructs it has (Jones, et al. 2015). In addition, many consider the operationalization of the TDF challenging, due to a perceived lack of familiarity with the framework, hence, considerable variations in the reported understanding of the framework (Phillips, et al. 2015). Still, the lack of clear operational definitions can complicate the development of a clear understanding of the domains and associated constructs for each domain (Phillips, et al. 2015).

While, for example, through the survey questionnaire, it is possible for me to assess community pharmacists' knowledge, attitude and behaviour regarding enhancing their public health role and determine their perceived barriers or facilitators to enhancing this role; through the interview of UK healthcare professionals and content analysis of UK undergraduate pharmacy curriculum, I am also able to determine any perceived social pressure, etc., against this role.

Regarding public health interventions, Blenkinsopp, et al. (2002) have argued that during the last decade, the Transtheoretical Model (TTM) has become pre-eminent in health promotion in the UK. This is significant, as TTM is a theoretical model of behaviour change, which used in interventions to encourage the cessation, for example, of smoking and drug misuse or the adoption of specific behaviours such as exercise and healthy eating (Blenkinsopp, et al. 2002). Anyway, as some of the anticipated strategies in enhancing the role of community pharmacists in public health might also involve changing their attitudes and behaviours towards the public health role, one would therefore anticipate that a greater appreciation and application of these behavioural change models by pharmacists, their trainers and possibly employers, will lead to better outcomes in public health practice. Having said that, the motivational theories are not without limitations, particularly as many of them tend to give little consideration to the social, economic and cultural environments in which people's behaviours occur (Baum 2008), hence, my choice for the TDF. For this project, I have used the TDF throughout to underpin the research. My research project focused throughout on public health.

2.8 - Review of Literature and Information

2.8.1 - Introduction

In a service-focused study (Agomo 2012a), I identified smoking cessation services; infection control and prevention; promoting cardiovascular health and blood pressure control; provision of emergency hormonal contraception (EHC); prevention and management of drug abuse, misuse and addiction and healthy eating and lifestyle advice as the main roles provided by community pharmacists in public health. There were, however, gaps in methodological issues, and in the UK evidence base, particularly as it relates to preventing falls in the elderly, immunisation and vaccination services, and prevention and risk assessment of osteoporosis.

In that study, I also noted that despite the input from various governments to enhance the public health agenda for pharmacy and the numerous opportunities that exist in public health services for community pharmacists (DoH 2010a, 2010c; Bjorkman, et al. 2008), UK community pharmacy public health practice still remains at a basic level (Agomo 2012a; Anderson 1998; Anderson and Blenkinsopp 2003). This observation is supported by Truong and Patterson (2010), who argue that although the pharmacy profession has evolved from product-orientated to patient-centred care, with pharmacists contributing to micro-level public health activities (e.g., disease management, health and wellness screening, immunisations, medication therapy management), there remain unmet needs for pharmacists in macro-level public health functions (i.e., assessment, policy development and assurance at the population-based level).

2.8.2 - Search Strategy

In 2012, I conducted a literature search by searching five databases: Google Scholar, CINAHL, Biomedical Reference Collection database, MEDLINE and International Pharmaceutical Abstracts. The aim of my literature search was to determine what earlier work on strategies enhancing the public health role of community pharmacists had already been conducted. The search terms I used were: 'enhancing' or 'enhance' or 'enhanced' or 'advancing' or 'advance' or 'advanced' and 'public health' and 'community pharmacy' or 'pharmacy' or 'community pharmacists' or 'pharmacists'. I limited the search dates from January 2007 to May 2012 to ensure that I used only recently published materials. I also limited the search to full text, experiments on humans and English language. Most of the papers I identified originated from outside the UK (mainly from the USA). I considered all citations, read abstracts of interest, and selected final references. I only included original papers, excluding materials published before 2007 or studies not related to enhancing the public health role of community pharmacists. In addition, I excluded publications in foreign languages due to the cost and time involved in translating materials, as well as Bachelor's and taught MSc dissertations and book reviews. The initial search using the search terms and before using the filters, generated 1.3 million references, most of which were unrelated to my topic of interest. I then used the filters above and removed all duplicates: the searches performed for the five electronic databases generated 36 usable references, which are summarised in Tables 1a and 1b.

2.8.3 - Results

In terms of distribution, I found that 27 of my 36 identified papers were empirical studies (75%), one paper was a literature review (2.8%) and eight papers were reviews (reports and commentaries, 22.2%). While the majority of the papers I identified originated from the USA (21, 58.3%), I however noticed a significant gap in the UK evidence base (7 papers, 19.4%), particularly for those themes where I identified no UK papers (see Table 1a and 1b; for definition of categories, see Table 2). In terms of the composition of the empirical studies, I noticed that the majority of the papers used a quantitative approach in their study, while only three papers (8.3%) used a mixed method approach (Trapskin, et al. 2009; McDaniel and Malone 2011; Johnson, et al. 2009). There was also a significant gap in the quality of evidence of the papers I reviewed, as I identified only one literature review study (Eades, et al. 2011).

Following my review of knowledge and information on strategies for enhancing the public health role of community pharmacists, a number of themes emerged (see Tables 1a and 1b).

2.8.3.1 - Use of Social Media in Public Health Education

According to Cain, et al. (2010), it is now possible to use social media through, for example, facilitating the organisation of people and distribution of content, to enhance the public health role of community pharmacists. Hence, through evolutions in social media (e.g., Facebook, Text messaging, Skype, Twitter, YouTube, etc.) (Cain, et al. 2010; Lam 2013), we are beginning to see a change in the way society communicates. While the authors acknowledge that implementing health interventions via social media poses challenges, they also highlight the fact that several examples exist that display the potential for pharmacists to use social media in health initiatives. The only concern I have with the paper was that it provides no information about how the provision of public health services by pharmacists through social media will be funded. This paper, however, strengthens my position on the adoption of new technologies in UK pharmacy practice (Agomo 2008b, 2012b).

Considering the impact which the use of social media could have in helping pharmacists deliver education and public health content, as well as its ability to enable pharmacists deliver public health activities at a distance, particularly to those individuals who are not

able to visit pharmacies in person, the use of these tools in practice could be seen as an enabler in the public health role of the pharmacist.

2.8.3.2 - Developing Good Adherence Strategies for Patients

In a retrospective study, evaluating the factors associated with compliance with thiazide diuretics in a Chinese hypertensive population, Wong, et al. (2011a) show that paying fees and follow-up visitors are significantly associated with better anti-hypertensive compliance. However, patients who were newly prescribed thiazide diuretics and those with poorer socio-economic status are more likely to be non-compliant with anti-hypertensive therapies. The identified link between fee paying and compliance is helpful in tackling medicine wastage, with recent estimates in England currently in the order of £300 million per year (Trueman, et al. 2010). Community pharmacists developing good compliance strategies will help minimise medicine wastage, as well as guaranteeing better health outcomes for patients. However, closely related to this, is the findings of a US cross-sectional mail survey that investigated the influence of pharmacists' attitudes to their intention to report serious adverse drug events (ADEs) to the Food and Drug Administration (Gavaza, et al. 2011). While 90% of the respondents felt that reporting serious ADEs would improve patient safety, 72.6% indicated that reporting serious ADEs was time-consuming. Over half (55.5%) of the respondents felt that reporting serious ADEs would disrupt the normal workflow (Gavaza, et al. 2011). Developing good adherence strategies for patients (such as, paying fees, follow-ups, reporting serious ADEs and simplifying regimens) is an enabler in the public health role of pharmacists, particularly as it concerns minimising medicines wastage and ensuring that patients take their medicines correctly, as prescribed.

2.8.3.3 - Enhancing the Public Health Content of Pharmacy Curricula

According to Brown-Benedict (2008), doctorally prepared public health officials design, implement and evaluate health programmes and policies, translate research and communicate for policy and health system change (Drexel University 2015). In an investigation of the public health content of US pharmacy schools, through a web-based survey, DiPietro, et al. (2011) found that about 21% of respondents offered a joint Master of public health degree (PharmD/MPH), while approximately 14% indicated that a minor in public health was available. While the PharmD programmes offered by most US pharmacy schools tended to include more curricular elements related to assessment and assurance

than policy development, the public health topics offered were most often reported to be part of a broader course rather than stand-alone courses. The Doctor of Public Health (DrPH) degree is not yet popular with UK pharmacists (Anderson 2012). However, one of the objectives of my project will be to assess if a change in the UK undergraduate pharmacy curriculum (Agomo 2012c) to increase its public health content could help enhance the public health role of community pharmacists in the UK. It has been argued that one possible reason for the low popularity of the DrPH degree in the UK might be that universities offering the programme have yet to 'define a market for the graduates' of the programme (Paccaud, et al. 2011), unlike in the USA where the market for DrPHs is fully developed. Also related to this is the finding of a UK systematic review study (Eades, et al. 2011) that investigates pharmacist and consumer views concerning public health in community pharmacy. According to Eades, et al. (2011), to improve public health services in community pharmacy, there will be a need to increase pharmacists' confidence in providing public health services through enhancing their training. Still, in a US study in which Brown, et al. (2007) evaluate the effectiveness and impact of an elective service-learning course, it is noted that by exposing students to issues affecting individuals and the community, brought about a positive change in the students' perception of their knowledge and understanding of broader issues facing the community. Enhancing the public health content of pharmacy curricula will help wide the knowledge base and skills of students/pharmacists in public health, irrespective of the practice setting of the graduating pharmacists (Addo-Atuah 2014). This is therefore an enabler in the public health role of the pharmacist, as enhancing the public health content of the UK pharmacy curricula will widen and enhance the knowledge base of graduates in public health, as well as give pharmacists the confidence to collaborate actively with other public health practitioners.

Table 1a. Overview of Papers Included in the Review of Knowledge and Information - Demonstrating Strategies that can Enhance the Public Health Role of Community Pharmacists

Theme	No. of papers per theme	Countries of origin and type	*No and categories of papers	No. of empirical studies	No. of lit. reviews	No. of guidelines	No. of reviews (reports and commentaries)	Total no. of UK papers
<i>Minimising the spread of infections</i>	1	1 Ghana, empirical	1 B3	1	0	0	0	0
<i>Use of social media</i>	1	1 USA, review	1 D	0	0	0	1	0
<i>Developing good adherence strategies for patients</i>	2	2 USA, empirical	2 B3	2	0	0	0	0
<i>Promoting patients' self-management capacities</i>	3	1 UK, review 2 Hong Kong, empirical	1 D 2 B3	2	0	0	1	1
<i>Enhancing communication techniques</i>	5	2 USA, empirical 2 Australia, empirical 1 Thailand, empirical	1 B1, 1 B3 2 B3 1 B3	5	0	0	0	0
<i>Promoting interdisciplinary initiatives</i>	2	1 USA, review 1 UK, empirical	1 D 1 B3	1	0	0	1	1
<i>Strengthening safe medication disposal methods</i>	1	1 USA, empirical	1 B3	1	0	0	0	0
<i>Enhancing the management of polypharmacy and long-term conditions</i>	1	1 USA, review	1 D	0	0	0	1	0

<i>Remunerating pharmacists directly for providing public health services</i>	2	1 USA, empirical 1 UK, empirical	1 C1 1 B3	2	0	0	0	1
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*See Table 2 for the definition of categories.

Table 1b. Overview of Papers Included in the Review of Knowledge and Information - Demonstrating Strategies that can Enhance the Public Health Role of Community Pharmacists (contd.)

Theme	No. of papers per theme	Countries of origin and type	No. and categories of papers	No. of empirical studies	No. of lit. reviews	No. of guidelines	No. of reviews	Total no. of UK papers
<i>Innovating smoking cessation activities of pharmacists</i>	2	1 Finland, empirical 1 USA, empirical	1 B3 1 C2	2	0	0	0	0
<i>Advancing pharmacy practice experience of students in public health</i>	6	5 USA, empirical 1 USA review	3 B2, 2 B3 1D	5	0	0	1	0
<i>Managing legitimate medication needs to prevent drug-related problems</i>	3	1 USA, review 1 USA, empirical 1 Australia, review	1 D 1 B1 1 D	1	0	0	2	0
<i>Enhancing the public health content of pharmacy curricula</i>	4	2 USA, empirical 1 USA, review 1 UK, literature review	2 B3 1 D 1 A2	2	1	0	1	1
<i>Other identified studies</i>	3	2 UK, empirical 1 NZ/England, empirical	2 B3 1 B3	3				3
Total number of studies	36			27	1	0	8	7

*See Table 2 for the definition of categories.

Table 2. Evidence Categories used by the Department of Health in the National Service Frameworks (Anderson, et al. 2004: 194)

Evidence from research and other professional literature	
A1	Systematic reviews which include at least one Randomised Controlled Trial (RCT), e.g. systematic reviews from Cochrane or NHS centre for reviews and dissemination.
A2	Other systematic and high-quality reviews, which synthesise references.
B1	Individual RCTs.
B2	Individual non-randomised, experimental/intervention studies.
B3	Individual well-designed non-experimental studies, controlled statistically if appropriate. Includes studies using case control, longitudinal, cohort, matched pairs or cross-sectional random sample methodologies, and well-designed qualitative studies; well-designed analytical studies including secondary analysis.
C1	Descriptive and other research or evaluation not in B (e.g. convenience samples).
C2	Case studies and examples of good practice.
D	Summary review articles and discussions of relevant literature and conference proceedings not otherwise classified.

2.8.3.4 - Enhancing the Effectiveness of Students' and Pharmacists' Communication Techniques

In a survey that explores the self-reported techniques used by health care professionals to enhance communication with patients with low health literacy, Schwartzberg, et al. (2007) found that using simple language (94.7%), handing out printed materials (70.3%) and speaking more slowly (67.3%) were the most commonly used strategies. While the most frequently used techniques were basic in nature, there was little attempt made by health care professionals to assess patient understanding. Of the more advanced techniques examined, none were used by a majority of those surveyed. In a related study, Emmerton, et al. (2010), through structured interviews, explored the health literacy competencies of a sample of community pharmacy consumers. According to their study findings, 87% of respondents recognised a sample prescription, while 20% could not readily match the prescription to a labelled medicine box. Although 82% of respondents interpreted 'three times a day' appropriately, the interpretation of a standard ancillary label was highly variable. Independently related to lower performance in some variables were, advanced age, less formal education, non-English-speaking background and male gender were. Also confirmed in a recent study in England, is the need for healthcare practitioners to improve their communication techniques (Rowlands 2012).

The findings of an Australian study also supported this need for enhanced communication techniques for pharmacy students and pharmacists (Roughead, et al. 2011). According to the paper, enhanced communication and transfer of information between healthcare providers and healthcare settings can reduce medication and healthcare errors post-hospital discharge (Roughead, et al. 2011). Still, in a separate study conducted in Thailand (Sookaneknun, et al. 2009) that reported the results of providing health information through a university community pharmacy to its surrounding community, it is noted that the community living near the community pharmacy responded positively to the health information centre service provided by pharmacists or PharmD students, especially with reference to chronic diseases. Finally, a US study (Carter, et al. 2008) looks at the background and methods of an on-going study to determine the effects of hospital pharmacists' enhanced communication with patients and their community providers; the study hoped to address the value of a pharmacist case manager in improving the communication of care plans between the inpatient and community settings, hence

optimising the use of medication.

One of my project objectives is to assess the opinion of practitioners on the teaching of content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists. Enhancing the effectiveness of communication techniques is an enabler in the public health role of the pharmacist, in the sense that assessing patients' understanding, enhancing communication and transfer of information between healthcare providers and healthcare settings can reduce medication and healthcare errors post-hospital discharge (Roughead, et al. 2011).

2.8.3.5 - Promoting Interdisciplinary Initiatives in Pharmacy Education and Practice

There is now an emphasis in the UK on interdisciplinary initiatives in the management of many causes of ill health (News Team 2012b). In the USA, inter-professional education is driven by health professional education associations such as the Association of American Medical Colleges, the American Association of Colleges of Pharmacy and so on (AAMC 2012). However, in a commentary provided in another study, Sampelle, et al. (2010) summarise current clinical research directives, as well as other interdisciplinary initiatives. According to the authors, the National Institutes of Health Clinical and Translational Science Award (CTSA) initiative is driven by the 'urgent need to transform health and medicine from the curative and onerous paradigm of today to the vision of a more predictive, personalized, and pre-emptive world of health care' (Zerhouni 2006: 1090). To accomplish this paradigm shift, a mandate for greater interdisciplinarity has been issued (Zerhouni 2003). Supporting the interdisciplinary initiative are the findings of a UK study that investigates the community pharmacy 'minor ailment scheme' (MAS) across three primary care trusts in the North East of England (Baqir, et al. 2011). During the observation period, 396 patients used the MAS, of whom 230 (58.1%) indicated they would have made an appointment with their general practitioner (GP) if the MAS was not in place. In addition, there was an estimated reduction in local healthcare costs by £6739 per month through MAS. The authors therefore conclude that the MAS released National Health Service (NHS) resources (especially in relation to GP consultations) by preventing (or minimising) patient use of alternative and costlier branches of the NHS (Baqir, et al. 2011). This study is also complemented by the findings of a fairly recent study (RPS 2014a; Watson, et al. 2014) that reports that the cost of treating common ailments (e.g. head lice, threadworms, athlete's foot, etc.) in community pharmacies was

about £29.30 per patient, however, when the same ailments were treated at A&E, the cost was found to be nearly five times higher at £147.09 per patient and nearly three times higher at GP practices at £82.34 per patient. In total, the study estimated that 3% of all A&E consultations and 5.5% of GP consultations for common ailments could be managed in community pharmacies (Watson, et al. 2014). This translated to over 650,000 visits to A&E and over 18 million GP consultations per year that could be diverted, with a total annual cost saving of over £1billion (RPS 2014a; Watson, et al. 2014). My project hopes to enhance interdisciplinarity by assessing if pharmacy students training closely with other healthcare students and, later, graduates working closely with other healthcare providers could help to enhance the public health role of community pharmacists in the UK. Due to its ability to bring considerable savings and better health outcomes to the NHS, as well as encouraging collaborative practice, promoting interdisciplinary initiatives in pharmacy education and practice is also an enabler in the public health role of the pharmacist.

2.8.3.6 - Supporting Efforts Aimed at Preventing the Development of Antimicrobial Resistance and the Spread of Infections

Antibiotic resistance continues to be a global problem. However, in my service-focused study (Agomo 2012a); I identified the role of community pharmacists in infection control. In a structured questionnaire conducted in the Ashanti region of Ghana, Buabeng, et al. (2007) found that the majority of severe malaria cases (89%) were in children aged five years or less. In terms of sourcing, medicines came from licensed chemical sellers (50%), pharmacies (21%), neighbouring clinics (9%), or 'other' sources (20%), including leftover medicines at home. Some of the identified limitations in the paper included 247 (49%) of the study participants being lost to follow-up for outcomes assessment at the health facilities due to untraceable addresses or living too far from the facilities, and the study targeting only one region in the country and two facilities within that region. In the UK, there has been an active effort to encourage prescribers to minimise the way they prescribe antibiotics to patients, to reduce the development of resistant bacteria (Parkes 2014). Pharmacists supporting this initiative is an enabler in the public health role of pharmacists, as it promotes a healthier society. It is also possible for pharmacists to support other healthcare practitioners to minimise the spread of various communicable diseases, such as, human immunodeficiency virus (HIV), tuberculosis, herpes, chlamydia through educational activities and public awareness.

2.8.3.7 - Promoting Patients' Self-Management Capacities

According to Taylor and Bury (2007), there are three areas relevant to enhancing NHS patients' self-management capacities. They include the policy formation process leading up to the Expert Patients Programme's (EPP) present stage of development; the evidence base supporting claims made for its effectiveness; and the significance of psychological concepts such as self-efficacy in approaches to improving public health. However, some of the issues raised in the paper that concern funding would no longer be valid, particularly as new bodies - the NHS Commissioning Board Authority and the Clinical Commissioning Groups (CCGs), now control NHS funding.

In a cross-sectional phone survey, You, et al. (2011) examine Hong Kong public knowledge, attitudes and behaviours regarding self-medication, self-care and the role of pharmacists in self-care. Although in this study, the majority of respondents supported the idea that patients with chronic illness can self-manage their diseases, the revelation that less than half agreed to use a pharmacist-led approach in self-care is an issue that should concern EPP development in the UK. However, in related work, Wong, et al. (2011b) explore the perspectives of physicians, pharmacists, traditional Chinese medicine (TCM) practitioners and dispensers on the self-management of patients with chronic conditions, in addition, they explore the possibilities of developing pharmacist-led patient self-management in Hong Kong. Similar to the findings of You, et al. (2011), UK pharmacists ought to be worried about the concerns of some professionals who believed that pharmacists were drug experts only and could therefore only play an assisting role. This perception of pharmacists having insufficient training in disease management highlights once again my view that there is a need to strengthen both the clinical and the public health training of UK pharmacists (Agomo 2004, 2006, 2011, 2012c). As promoting patients' self-management capacities can empower patients to take greater control of their health and wellbeing, as well as save money to the NHS, by minimising day-to-day involvement of other healthcare practitioners in patients' care, this theme is an enabler in the public health role of pharmacists.

2.8.3.8 - Strengthening Patients' Education in Safe Medication Disposal Methods

In a US, cross-sectional survey to determine the public's current method of medical disposal and knowledge of the environmental impact of inappropriate medication disposal, Abrons, et al. (2010) found that respondents frequently flushed medications down the toilet (27.2%)

or incorrectly dumped medications in the trash (34.6%). While only 30.9% had received previous advice on safe medication disposal, post-education survey results indicated that 80.1% of respondents were willing to change their disposal methods, and increased numbers of respondents viewed inappropriate medication disposal as a moderate to substantial problem (from 57.2% pre-education to 83.9% post-education). There is evidence suggesting that the trend may not be much different in the UK (Fradgley and Smith 2012). Strengthening patients' education in safe medication disposal methods is an enabler in the public health role, as contamination and injury (from sharp items) are minimised. As many patients (including addicts) may not even be aware that their local pharmacies have facilities for safe medication disposal practices, awareness is important for better uptake and outcome.

2.8.3.9 - Enhancing the Management of Polypharmacy and Long-term Conditions

According to a US study that looks at polypharmacy and combination therapy (Munger 2010), the risks of polypharmacy and the potential for inappropriate therapy must be considered and balanced against the possible benefits of multiple drug therapies. The paper suggests that an optimal approach to reducing the risks and maximising the benefits of polypharmacy should include regular reviews of patients' medication lists, which can then be changed to include, where appropriate, combination therapy and the use of single-pill combinations (Munger 2010). This is similar to what community pharmacists now do in England, known as the 'Medicines Use Review' - a service that may require further overhaul to make it more relevant to patients. Interestingly, The Scottish Government has recently published guidance on tackling polypharmacy at a national level (NHS Scotland and The Scottish Government 2012). Deviating from the widely accepted definition of polypharmacy, which is 'the taking of four or more medicines', the Scottish solution is to redefine polypharmacy to 'mean when a patient is taking more drugs than needed' (NHS Scotland and The Scottish Government 2012). Considering the several benefits associated with the management of polypharmacy and long-term conditions, such as, regular reviews of patients' medication lists to minimise drug-drug interaction, non-compliance and side effects, this theme is enabler in the public health role of the pharmacist.

2.8.3.10 - Managing Legitimate Medication Needs to Prevent the Accidental use of Banned Substances

According to a US study that looks at the educational opportunities and anti-doping roles and responsibilities of pharmacists (Ambrose 2011), pharmacists can assist in anti-doping activities by managing the legitimate medication needs of athletes to prevent them from accidentally using a banned substance, as well as educating athletes and the public about the health consequences of using performance-enhancing substances. While pharmacists can also work with anti-doping agencies, the main barrier to pharmacists' involvement in anti-doping activities is that there are presently very few established educational opportunities for pharmacists and pharmacy students; hence the need to develop educational programmes in sports pharmacy and doping control for postgraduate training and for experiential (internship) programmes (Ambrose 2011).

The findings of another US study (Lee, et al. 2009) support the role of pharmacists in managing the legitimate medication needs of the public. This study determined the effectiveness of TIMER (Tool to Improve Medications in the Elderly via Review) in helping pharmacists and pharmacy students to identify drug-related problems during patient medication reviews. According to the paper, TIMER resulted in an increase in the number of drug-related problems identified by practising pharmacists and pharmacy students during medication reviews of hypothetical patient cases (Lee, et al. 2009). Chaar, et al. (2011) have also argued for a need to highlight the role of pharmacists in opioid substitution therapy (OST), as well as the scope for expanding this role in the future. In terms of advantages, Chaar, et al. (2011) also note that for public clinics, patient transfer to community pharmacies eases workload and costs and increases capacity for new OST patients. From a patient's perspective, they argued that OST dispensing at a pharmacy is more flexible and often preferred compared to other service providers. Pharmacists are well placed to gain clientele, profit and receive small incentives from state governments in Australia for their involvement. Managing legitimate medication needs to prevent the accidental use of banned substances can extend the role of pharmacists in sports medicine and anti-doping activities. Pharmacists can become the first point of contact for advice, thereby enabling specialist role in this area of practice. This theme is definitely an enabler in the public health role of the pharmacist.

2.8.3.11 - Remunerating Pharmacists Directly for Providing Public Health Services

In earlier studies I conducted, I identified inadequate remuneration as a major barrier to pharmacists' involvement in public health services (Agomo, et al. 2006; Agomo 2012a). A pilot project that described the Wisconsin Pharmacy Quality Collaborative (Trapskin, et al. 2009) demonstrated that collaboration among payers and pharmacists is possible; moreover, this can result in the development of an incentive aligned programme that stresses quality patient care, standardised services and professional service compensation for pharmacists. Hence, there is a need to change the present community pharmacy model (Agomo 2012e), as well as contract and remunerate individual pharmacists/groups of pharmacists (partners) directly for providing public health/pharmacy services, as is being proposed in Scotland (The Scottish Government 2013). This may not only save money for funding organisations, but could also become a huge incentive for pharmacists to engage actively in public health services.

Related to this is the impact the corporation of community pharmacy has on pharmacists' general well-being, as well as on their willingness to provide public health services. Hence, a UK paper (Bush, et al. 2009) notes that the level of provision of EHC on patient group direction (PGD), supervised administration of medicines and needle-exchange schemes were lower in supermarket pharmacies than in other types of pharmacy. While supermarkets and multiple pharmacy chains were better in their ability to raise finance for service development, the premises of such pharmacies may not be the most suitable for the provision of such services (Bush, et al. 2009). Hence, the study argues that there is a need for a mixed market in community pharmacy to maintain a comprehensive range of pharmacy-based public health services for maximum benefit to all patients. As remunerating pharmacists directly for providing public health services can serve an incentive for enhanced role in public health, this is also an enabler in the public health role of the pharmacist. This can also act as a catalyst for the development of independent pharmacist practitioners (IPPs) – pharmacists who are able to work independently or alongside health-visitors to handle medicine related challenges faced, for example, by elderly patients, those with learning difficulties or disabilities.

2.8.3.12 - Innovating Smoking Cessation Activities of Pharmacists

Several studies have confirmed the role of pharmacists in smoking cessation (SC) (Sinclair and Lennox 2001; Hudmon, et al. 2001; West, et al. 2005; Agomo, et al. 2006; Agomo 2012a). A mail survey that explores the familiarity and implementation of the national SC guidelines in Finnish community pharmacies (Kurko, et al. 2010) found that almost half (47%) of respondents ($n = 1190$) were familiar with the SC guidelines and that familiarity enhanced guideline implementation. Familiarity was associated with the respondents' perceptions of their personal SC skills and knowledge (OR 3.8), the value customers placed on counselling on nicotine replacement therapy (NRT; OR 3.3) and regular use of a pocket card supporting SC counselling (OR 3.0) (Kurko, et al. 2010). In addition to recommending NRT, pharmacists familiar with the guidelines more frequently used other guideline-based SC methods, such as recommended non-pharmacological SC aids, compared with unfamiliar respondents (Kurko, et al. 2010). However, the association identified in the study (Kurko, et al. 2010) between professional self-esteem (Agomo 2012f) and SC activities is a possible barrier to the service, which service planners/developers will need to be aware of. The main limitation of the study was that the survey was conducted between 2006 and 2007, almost 4 years before the paper was published. Many aspects may have changed since then.

In a case study conducted in the USA, the investigators seek to understand what motivated retailers to discontinue tobacco sales and what employees and customers thought about their decision (McDaniel and Malone 2011). For independent pharmacies, the only reason given for the decision to end tobacco sales was that tobacco caused disease and death (McDaniel and Malone 2011). Grocers listed health among several other factors, including regulatory pressures and wanting to be seen to be 'making a difference'. While pharmacy employees were delighted to no longer be selling a deadly product, grocery store management saw the decision to end tobacco sales as enhancing the stores' image and consistent with their inventory of healthy foods. It might be of interest to those pharmacy retailers that continue to sell tobacco products that many customers said that knowing that retailers were no longer selling tobacco products made them more likely to shop at the store. I hope that the recent announcement by CVS Caremark Corp (owners of CVS Pharmacy) to stop selling tobacco products at its 7600 stores should encourage other retail pharmacies in the UK and globally to follow suit (Wahba and Steenhuisen 2014). The main

drawback of the study (McDaniel and Malone 2011) is that it excludes those who could not speak English in a state (California) with many Spanish-only speakers. Nonetheless, the recent interest shown by the public in the use of e-cigarettes (Hogenboom 2013) has created the need for pharmacists to recognise the existence and possibly the effectiveness of other non-traditional methods in smoking cessation. This line of thought is supported by a recent expert independent evidence review published by Public Health England (PHE), which concluded that e-cigarettes are significantly (about 95%) less harmful to health than tobacco, with the potential to help smokers quit smoking (McNeill, et al. 2015). The role of community pharmacists in smoking cessation is huge, in that they can supply a wide range of nicotine products to patients (Agomo, et al. 2006; Agomo 2012a). However, evidence from a UK study (West, et al. 2000) also suggests that enhancing the training of community pharmacists in the behavioural sciences means that they will be better equipped to use behavioural change methods in their counselling sessions. As smoking cessation can help minimise the onset of a number of conditions such as, asthma, chronic obstructive pulmonary disease (COPD), emphysema, cancers, etc., pharmacists' enhanced role in smoking cessation is an enabler in the public health role of the pharmacist.

2.8.3.13 - Advancing Pharmacy Practice Experience of Students in Public Health

However, as the education of future pharmacists in the provision of public health expands, so, too, will there be a need for colleges and Schools of Pharmacy to provide opportunities for students to develop public health skills through experiential learning (Patterson 2008). Supporting this need, the findings of a US intervention study/survey (Patterson 2008) identify high satisfaction with the advanced pharmacy practice experience (APPE) in a variety of different domains, including provision of pharmaceutical care, providing patient education, exercising cultural competency, referring to community resources and utilising medication assistance programmes. Interestingly, because of their community experience, the students recognised that working behind a pharmacy counter does not give an accurate picture of health care beyond the pharmacy (Patterson 2008). Another US intervention study (Whitley 2010) observes that post-APPE discussion definitions were broader and more accurate. Unsolicited comments about the discussion series documented in post-APPE reflections described students' initial lack of knowledge, improved knowledge base and improved interest in participating in public health initiatives (Whitley 2010). The paper

concludes that time devoted to public health discussions during an APPE can substantially affect student pharmacists' knowledge base and interest in public health (Whitley 2010). While there is presently no pharmacy school in the UK offering the undergraduate PharmD programme, it is hoped that introducing a dual pharmacy/MPH degree, or at least enhancing the public health content of UK pharmacy curricula, will go a long way towards raising the confidence of UK pharmacists as public health practitioners.

Closely related to this, the findings of another US study (Johnson, et al. 2009) determine, among other things, the availability of experiential learning opportunities in culturally diverse areas. The paper argues that exposure to diverse populations during advanced community practice experiences has parallels with the strategic college objectives of expanding and diversifying experiential sites to enhance pharmacy students' abilities to meet emerging patient-care challenges and opportunities. However, the small number of faculty participants (two), who were involved in the interview, limits the generalisability of their findings. However, in a review paper (Truong and Patterson 2010) that aims to identify existing professional and educational initiatives for the pharmacist's expanded role in public health, it was noted that some of the strategies and opportunities for pharmacists to pursue advanced educational training in public health will include residency programmes with an emphasis on public health, fellowship programmes in healthcare policy or public health policy, and graduate degree programmes such as the Master of public health (MPH) and public health certifications. Nonetheless, in 2006, the American Pharmacists Association put forward a policy statement on the role of the pharmacist in public health, with a call for an increase in PharmD/MPH dual degree programmes (Truong and Patterson 2010). This policy statement might also benefit UK pharmacy education and practice, and my call for a dual pharmacy degree programme in the UK strengthens it (Agomo 2012c). Again, a US study (Westrick, et al. 2009) notes that pharmacy college/school-affiliated community pharmacies were more likely than non-affiliated pharmacies to participate in immunisation and emergency preparedness. Furthermore, a US intervention study (Cerulli and Malone 2008) observes that there was an enhancement of women's awareness about health issue through the APPE and health promotion interventions, while guiding students also to achieve the desired curricular outcomes. Advancing pharmacy practice experience of students in public health can enable students to learn from other healthcare practitioners, as well as widen

and enhance their knowledge base and skills in public health, including provision of pharmaceutical care, providing patient education, exercising cultural competency, referring to community resources and utilising medication assistance programmes. This theme is also an enabler in the public health role of the pharmacist.

2.8.3.14 - Other Identified Studies

Other identified papers include those that look at supporting community pharmacy-based services for alcohol misuse (Horsfield 2011) and community pharmacy travel medicine services (Hind, et al. 2008), as well as a study that investigate the general public's and health providers' perspectives on public health utilisation in community pharmacies (Saramunee, et al. 2012). On travel medicine services, a UK paper (Hind et al, 2008) is of the view that community pharmacists in the UK presently provide limited travel medicine services. However, community pharmacists can enhance this service by offering the travelling public general advice on various issues such as bite prevention, provision of immunisations and malaria prophylaxis, with the public in many cases also willing to pay for some of the services. This willingness to pay for community pharmacy public health services seems to agree with the findings of my pre-registration pharmacy audit (Agomo C, unpublished observation, 2002). According to a UK paper that looks at how to enhance public health service utilisation in community pharmacy (Saramunee, et al. 2012), all four groups of participants (the general public, community pharmacists, general practitioners, other stakeholders of pharmacy-based public health services) agreed that community pharmacies are a good source of advice on medicines and minor ailments, but were less supportive of public health services. On barriers, some of the identified factors affecting utilisation of pharmacy services, hence, barriers to the public health role of the pharmacist include the community pharmacy environment, the pharmacist and support staff, service publicity, the public, GP services, and the healthcare system and policies (Saramunee, et al. 2012). Also disturbing for service planners and funders (barrier) is the perception of both the general public and other health care providers of pharmacists' competencies, privacy and confidentiality in pharmacies, the high dispensing workload and inadequate financial support (Saramunee, et al. 2012).

There is little empirical evidence of the effectiveness of community pharmacy-based services for alcohol misuse (Dhital 2004; Fitzgerald and Stewart 2006; Watson and

Blenkinsopp 2009). However, a New Zealand/England study (Horsfield 2011) that explored the views of 40 pharmacists on the prospect of providing screening and brief intervention (SBI) for alcohol health promotion purposes, found that there appears to be potential for alcohol SBI services in community pharmacy. Nonetheless, for this service to be successful, the authors argue that interventions designed to reduce barriers such as apprehension about implementing SBI services due to concerns about offending or alienating customers, lack of experience and confidence, problems faced with other health promotion initiatives, time constraints, privacy and the need for enhanced incentives will need to be addressed and evaluated (Horsfield 2011). Enhancing the role of pharmacists in travel medicine and alcohol misuse are both enablers in the public health role of pharmacists, as both roles can reduce medicines and alcohol related harms (respectively) to the public.

2.8.3.15 - Conclusions

In a service-focused study (Agomo 2012a); I identified a wide range of roles that community pharmacists were providing in public health. There were, however, gaps in methodological issues and in the UK evidence base. In my review of literature and information, I identified a wide range of strategies that could help enhance the public health role of community pharmacists in the UK. The dominant themes included strategies to enhance the public health role community pharmacists through Expert Patients Programme; enhanced communication techniques; smoking cessation activities; advanced pharmacy practice experience in public health; and the enhancement of the public health content of pharmacy curricula. On communication, a study shows that assessing patients' understanding, enhancing communication and transfer of information between healthcare providers and healthcare settings can reduce medication and healthcare errors post-hospital discharge (Roughead, et al. 2011). On the other hand, Eades, et al. (2011) notes that to improve public health services in community pharmacy, there will be a need to increase pharmacists' confidence in providing public health services through enhancing their training.

There were, however, gaps in the evidence base, particularly instances where there were no indications that the studies were piloted (e.g. Patterson 2008; Kurko, et al. 2010; Whitley 2010; McDaniel and Malone 2011), and ethical considerations (e.g. Patterson 2008; DiPietro, et al. 2011) and consent approval (e.g. Schwartzberg, et al. 2007; Patterson 2008; Kurko, et al. 2010; Whitley 2010; DiPietro, et al. 2011) were not discussed. In addition,

instances where either the sample size was not stated (e.g. Whitley 2010) or the response rate was low (e.g. DiPietro, et al. 2011). However, in some of the papers, the outcome measures (e.g. Emmerton, et al. 2010; DiPietro, et al. 2011; McDaniel and Malone 2011; You, et al. 2011; Wong, et al. 2011b), recommendations for further studies (e.g. Patterson 2008; McDaniel and Malone 2011) and limitations of the study (e.g. Patterson 2008; Trapskin, et al. 2009; Whitley 2010; Wong, et al. 2011b) were not discussed. The fact that most of the identified studies originated from outside the UK, with findings that often could not be generalised to the UK, due to differences in health systems, practices and laws, to some extent justifies a need for my study.

2.9 - Aims, Objectives and Outcomes

Title: Strategies enhancing the public health role of community pharmacists in the UK.

2.9.1 - Assumptions

It is widely assumed that because community pharmacies are extensively and conveniently located, they are better placed than other healthcare professionals to provide public health services to patients (DoH 2008). There is also an assumption that pharmacists are highly educated in drugs, diseases and their management, and that patients can easily visit their community pharmacists without making any prior arrangements. However, several barriers, such as time pressure and workload (O'Loughlin, et al. 1999; Ursell, et al. 1999; Agomo, et al. 2006; Agomo 2012a; Agomo and Ogunleye 2014); the training of pharmacists and their staff (Kotecki, et al. 2000; Watson, et al. 2003; Agomo 2012a; Agomo and Ogunleye 2014); inadequate remuneration and lack of support from stakeholders (Le and Hotham 2006; Kotecki, et al. 2000; Agomo, et al. 2006; Agomo 2012a; Agomo and Ogunleye 2014); safety concerns (Peterson, et al. 2007; Agomo and Ogunleye 2014); and lack of documentation (Hogue, et al. 2006; Saramunee, et al. 2012; Agomo and Ogunleye 2014) have also been recognised as hindering the provision of public health services from community pharmacies. Based on these and earlier identified gaps, this study seeks to investigate strategies enhancing the public health role of community pharmacists in the UK using a mixed methods approach.

2.9.2 - Aims of my Project

A number of UK studies (for example, Anderson 1998; Blenkinsopp, et al. 2002; Anderson and Blenkinsopp 2003; Agomo 2012a) have looked at the role of pharmacists in public health. However, the focus of these studies has been mainly on identifying the different types of public health service provided by pharmacists; investigating the attitude of patients or service providers towards the public health role of pharmacists; or identifying barriers hindering the public health role of pharmacists. There seem to be no studies that focus specifically on identifying strategies that can enhance the public health role of community pharmacists in the UK. To contribute to the public health agenda of the UK government for community pharmacists (DoH 1999, 2010a; Watson, et al. 2014; NHS 2014) and to address gaps in the evidence base, my project aims mainly at identifying strategies enhancing the public health role of community pharmacists in the UK (Table 3).

2.9.3 - Objectives of my Project

Table 3. Relation between aims, objectives, and methods

Aims	Objectives	Data collection tools
To review the literature about strategies enhancing the public health role of community pharmacists in the UK	To review the literature about strategies enhancing the public health role of community pharmacists	Review of literature and information
To identify strategies enhancing the public health role of community pharmacists in the UK	To examine why the public health role of community pharmacists in the UK remains basic in the 21st century	Questionnaire
	To assess community pharmacists' knowledge, attitude and behaviour regarding enhancing their role in public health and determine the perceived barriers to enhancing this role	Questionnaire
	To assess the opinion of practitioners on changing the UK undergraduate pharmacy curriculum to increase its public health content and, maybe, UK pharmacy schools offering dual MPharm/MPH degrees	Interview

Table 3. Relation between aims, objectives, and methods (contd.)

	To assess the opinion of practitioners on pharmacy students training closely with other healthcare students and, later, graduates working closely with other healthcare providers (for example GPs and nurses) to enhance the public health role of community pharmacists in the UK	Interview
To identify strategies enhancing the public health role of community pharmacists in the UK	To assess the opinion of practitioners on the teaching of content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists, as well as, the adoption of new technologies in community pharmacy practice to enhance the public health role of community pharmacists in the UK	Interview
	To examine the pattern of UK undergraduate pharmacy curriculum, teaching and learning policy	Content analysis

2.9.4 - Research Questions

Based on my project objectives, my research (project) questions were:

1. What are the identified themes and gaps from my review of literature and information on strategies enhancing the public health role of community pharmacists in the UK?
2. Why is the public health role of community pharmacists in the UK still basic in the 21st century?
3. What is the knowledge, attitude and behaviour of community pharmacists regarding enhancing their role in public health and their perceived barriers to enhancing this role?
4. What is the opinion of practitioners on changing the UK undergraduate pharmacy curriculum to increase its public health content and, maybe, UK pharmacy schools offering dual MPharm/MPH degrees?
5. What is the opinion of practitioners on pharmacy students training closely with other healthcare students and, later, graduates working closely with other

healthcare providers (for example GPs and nurses) to enhance the public health role of community pharmacists in the UK?

6. What is the opinion of practitioners on the teaching of content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists, as well as the adoption of new technologies in community pharmacy practice to enhance the public health role of community pharmacists in the UK?
7. What is the pattern of UK undergraduate pharmacy curriculum, teaching and learning policy?

2.9.5 - Outcomes of the Project

The findings of my project will be of interest to relevant stakeholders, for example, the UK pharmacy/health schools, the NHS Commissioning Board, the Clinical Commissioning Groups (CCGs), the General Pharmaceutical Council (GPhC), the Royal Pharmaceutical Society (RPS), the Department of Health (DoH) and the Faculty of Public Health, in terms of public health commissioning and funding of community pharmacies, the regulation and training of pharmacists and the development of collaborative (interdisciplinary) initiatives between the various health professions in the UK. I plan to produce and distribute to relevant stakeholders, a summary of my project with key findings. In addition, I also plan to publish refereed journal articles (and possibly, a book/book chapter), as well as convey my project findings to the research community through the presentation of papers at relevant conferences.

2.10 - Resources

The findings of my project can also contribute to the public health agenda of the UK government for community pharmacists (DoH 1999, 2010a; NHS 2014) and hence enable community pharmacists in the UK to deliver health improvements and promote healthy lifestyles. I am able to control or gain access to the resources needed in this study, and this includes any contingency plans needed. As a teacher-practitioner at the UCL School of Pharmacy, London, as well as a member of both the General Pharmaceutical Council and the Royal Pharmaceutical Society, I am able to recruit for my project, without much difficulty, readily available and accessible participants and relevant stakeholders.

Chapter 3 - Methodology

3.1 - Introduction

In my review of knowledge and information, I identified a wide range of strategies needed to enhance the public health role of community pharmacists in the UK (see Tables 1a and 1b and Figure 4). The dominant themes included strategies enhancing the public health role of community pharmacists through the Expert Patients Programme, enhanced communication techniques, smoking cessation activities, advanced pharmacy practice experience in public health, and the enhancement of the public health content of pharmacy curricula. Most of the studies I identified in my review of knowledge and information however originated from outside the UK, with findings that often could not be generalised to the UK, due to differences in health systems, practices and laws. To make some of these findings relevant to the UK, there was therefore a need for me to conduct a survey of UK community pharmacists. In addition, examine the pattern of UK undergraduate pharmacy curricula, teaching and learning policy through a content analysis of the curricula of UK Schools of Pharmacy, and interview healthcare professionals to identify strategies enhancing the public health role of community pharmacists in the UK.

The findings of my survey of UK community pharmacists largely confirmed many of the key findings from my review of knowledge and information. At the same time, the majority of my survey respondents also confirmed most of the barriers identified in my review of knowledge and information. I either confirmed various barriers or identified new ones in the free text comments, including commercial pressure, difficulty following up with patients, conflict of interest, lack of awareness, community pharmacists being under-utilised, etc.

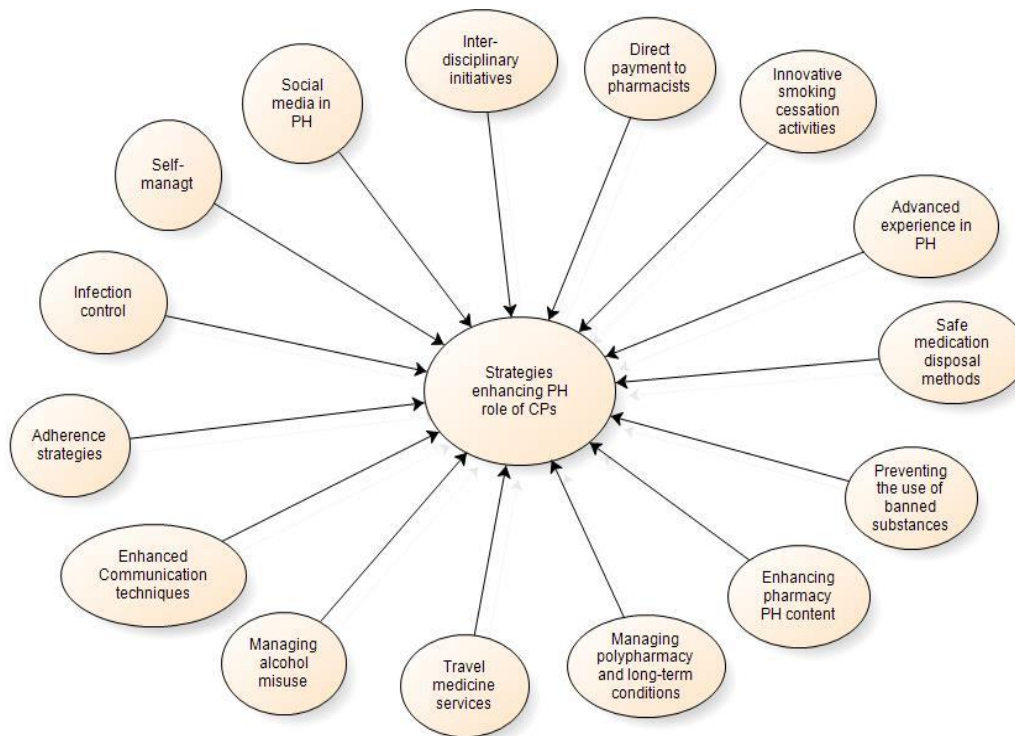


Figure 4. Themes identified from my review of knowledge and information

3.2 - Project Design: Methodologies

Supporting my project proposal is my role as a change agent (Havelock 1973). Since 2004, I have been engaged in many of the issues concerning pharmacy practice in the UK (as described briefly in my Review of Learning). My interest in the role of community pharmacists in public health (Agomo, et al. 2006; Agomo 2012a; Agomo and Ogunleye 2014), as well as my role as an insider-researcher-practitioner, put me in a good position to investigate and identify strategies enhancing the public health role of community pharmacists in the UK. My guide are values such as ethics (Fox, et al. 2007), accountability, hard work and perseverance. In addition, the General Pharmaceutical Council's standards of conduct, ethics and performance that stipulate the behaviours, attitude and values expected of pharmaceutical professionals (GPhC 2012) guides my professional practice.

3.3 - Plan of Investigation

My research project focused throughout on public health. In order to achieve the aims of my project, I used a mixed methods approach. I divided my project into three phases: Phase 1, 2 and 3. By using the combined method, qualitative approaches can assist quantitative

work in a number of ways, such as providing hypotheses to be tested by quantitative research; validating survey data; interpreting statistical relationships and deciphering puzzling responses; helping to construct scales and indices for survey items; and offering case study illustrations (Burton 2000). Moreover, survey data can identify individuals for qualitative study, as well as representative and unrepresentative cases (Bryman 1993; Fielding and Fielding 1986). Cohen and Manion (1989) suggest further advantages of combining methods, such as when a complex phenomenon requires analysis, when some controversial aspects require investigation and when an established approach provides a limited and perhaps distorted picture. Again, using more than one method to study the same research question provides researchers with the additional advantage of being able to support the validity of their findings, particularly if both methods can give mutual confirmation (Bryman 1993). Although Fielding and Fielding (1986) support the mixed methods approach, they also warn that the use of multiple methods is not an absolute guarantee of the validity of the results, as using multiple sources can also increase the chance of error.

3.4 - Phase 1: Survey

3.4.1 - Study Population

In 2014, there were around 50,000 pharmacists in the UK, of which approximately 70% were community pharmacists (population size, 35,000) (NHS England 2013). I calculated the study sample size needed for my postal survey (at 95% confidence level and ± 7.5 confidence interval - margin of error) to be around 170 community pharmacists. Because I was expecting a minimum response rate of 50%, I needed to send out at least 340 (170×2) questionnaires to achieve that sample size. However, in my actual project, I selected 385 community pharmacies randomly from the lists of community pharmacies (total eligible population, 456) in Barnet, London, and its surrounding area, Cardiff and Edinburgh, as listed on yell.com. My assumption was that each community pharmacy as listed on yell.com would employ one permanent pharmacist. I determined the sample size needed for my survey (170) using a sample size calculator (CRS 2012), and then generated the individual numbers (community pharmacies) to be included in my survey using a random integer set generator (RANDOM.ORG 2015). The target response rate for my survey was between 50–60%.

3.4.2 - Design

This phase of my project took the form of a descriptive, cross-sectional survey that generated mostly quantitative data. I selected this study method as can easily be repeated in different locations and at different times (Hakim 1987). In addition, it enables researchers to identify associations between factors (Hakim 1987). The main disadvantage with this type of design is that the structured nature of the questionnaire may have an effect on the quality of information obtained (Bowling 1997). I selected and included items in the questionnaire based on the themes identified in my review of literature and information, with assistance from my academic adviser and academic consultant (content or face validity) (Oparah and Arigbe-Osula 2002). I designed the questionnaire to take approximately 20 minutes to complete with assurance of the confidentiality of responses.

To address the issues of the validity and reliability of the instrument, I pilot tested the questionnaire for content, clarity and format of the questions on a group of 150 randomly selected community pharmacists in the Bedfordshire area, England, as listed on the NHS Choices website (eligible population, 517) (NHS Choices 2015). I explained the purpose of the study, and my response rate for the pilot study was 39% (59/150), after two reminders (three weeks apart). According to Fink (2003), for a pilot test, one usually requires 10 or more individuals who are willing to complete the survey. In addition, I calculated Cronbach's alpha to estimate the internal consistency of my pilot survey questionnaire. Based on the 56 items tested on my pilot questionnaire, my SPSS reliability test indicated that the Cronbach's alpha was 0.787 (see Appendix 1). As this number was greater than 0.7, there was no need to alter the questionnaire (Nunnally 1978).

The pilot study enabled me to determine the adequacy of the sampling frame; assess non-response rates; evaluate the appropriateness and effectiveness of my chosen data collection method; establish the adequacy of my questions and determine whether they worked; and determine whether the questions and responses were understood (Burton 2000). In addition, it enabled me to determine whether some questions needed be removed; assess whether my questionnaire 'flowed' and questions 'fitted' together; assess whether the transition from one section to another was smooth and whether my question filters actually worked and did not lead to subjects skipping more questions than necessary (Burton 2000). The pilot study also helped me to assess the layout of the questionnaire, hence provided a

clear idea of how long it took to complete the questionnaire in order to advise potential respondents correctly and judge respondents' interest and attention to questions (Burton 2000). I studied the responses from my pilot questionnaires carefully, and since the pre-testing did not result in major modification of the instrument, I used the instrument in my final study (Oparah and Arigbe-Osula 2002).

I designed the questionnaire to collect demographic characteristics of respondents, such as gender, age, role and years of post-qualification experience (Oparah and Okojie 2005). I also requested respondents to describe their involvement in public health services. Hence, respondents were asked to tick 'Yes' or 'No' on three sub-questions: offering over-the-counter advice; participating in a local authority-run scheme (e.g. immunisation) for pharmacists; and collaborating with a local practice in a shared care kind of scheme? Furthermore, respondents were requested to give their opinion on the strategies enhancing the public health role of community pharmacists in the UK as well as the perceived barriers, using a scale of 1-5 (1 = disagree, 2 = strongly disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree) (Oparah and Okojie 2005). I balanced the questions by including questions that concerned the negative and positive aspects of strategies enhancing the public health role of community pharmacists in the UK. My academic adviser (Dr. James Ogunleye) and academic consultant (Prof. Jane Portlock) approved my questionnaire before use.

I chose a postal survey for Phase 1 of my project to save time and cost, ensure anonymity, and minimise social desirability and interviewer bias (Bowling 1997). According to Cline (2011), a single researcher can conduct this type of data collection. Moreover, mail surveys are self-administered, increasing anonymity (Cline 2011). Hence, respondents are more likely to respond truthfully to sensitive questions (Cline 2011). However, the main disadvantages of the mail questionnaire are its limited usefulness in populations with low literacy as well as in groups who are homeless (Cline 2011). When compared against other methods of self-reports, e.g., structured face-to-face interviews and telephone interviews, response rates for mail surveys are generally low (Cline 2011). However, Dillman (2000) reports that close adherence to techniques known to increase response rates (e.g., multiple contacts, financial incentives) can boost response rates to 70-80%.

For my postal survey, I used self-addressed envelopes (SAEs) to improve the response rate and reduce the financial burden on participants. I then mailed the questionnaires (Appendix 2) with covering letters (see Appendix 3) to 385 randomly selected community pharmacists from Barnet, London, and its surrounding areas, Cardiff and Edinburgh. The covering letter introduced the researcher and the academic adviser, summarising the purpose of the study and guaranteeing confidentiality. Finally, I sent two reminders at three-weekly intervals to non-responders to enhance the response rate.

3.4.3 - Data Analysis

My initial assumption was that I was collecting parametric data. I performed all statistical analyses using the Statistical Package for the Social Sciences (SPSS version 19.0). Tests for significance of variables were included in my analysis. In addition, I used the statistical procedure correlation (Diamond and Jeffries 2001) to ascertain any association and its strength between variables. According to Diamond and Jefferies (2001), correlation measures the association between two continuous variables, that is, the strength of the relationship between the values of two variables. In situations where both variables (x or y) are not normally distributed, Spearman's correlation is tested (Reid 1996).

3.4.4 - Justification for Effect Size Calculation

According to Wright (2003), effect sizes tell the reader how big the effect is, something, which the *p* value does not do. Hence, the purpose of reporting the effect size is to communicate to the reader the size of the effect and to allow comparisons with other effects (Wright 2003). It is, therefore, simply a way of quantifying the difference between two groups; hence, it is mathematically expressed as the difference between the mean values of the two groups, divided by the standard deviation (Equation 1) (Coe 2000).

$$\text{Effect size} = \frac{\text{Mean of experimental group} - \text{Mean of control group}}{\text{Standard deviation}}$$

Equation 1

Hence, an effect size of 1.0 is equivalent to a change of one standard deviation in the study sample (Bowling 2002). However, according to Cohen's table of effect size magnitude [r] (Cohen 1992):

- $<.10$: trivial
- $.10 - .30$: small to medium
- $.30 - .50$: medium to large
- $>.50$: large to very large

For Eta squared, η^2 , with Anova, effective size magnitude is as follows (Nandy 2012),

- 0.01 = small
- 0.06 = medium
- 0.14 = large

According to Wright (2003), it is important to report the units of measurement of the effect size. The American Psychological Association's 'Publication Manual' has highlighted the importance of reporting the effect size, which identified 'failure to report effect sizes' as one of the 'defects in the design and the reporting of research' (APA 2001: 5). Moreover, the British Psychological Society now has a statement in its 'Notes for contributors', which requires for all its journals under normal circumstances to incorporate effect size in their reports (Clark-Carter 2003). Clark-Carter (2003) also warns of the dangers of not reporting the effect size when only the probability is reported, for example, the risks of making a Type I error – rejecting the null hypothesis when it is true, and the introduction of an alternative hypothesis, which could lead to the possibility of making a second type of error (a Type II error) of rejecting the alternative hypothesis when it was true.

One advantage of effect size over an inferential statistic, such as the t test is that the effect size is relatively unaffected by the sample size (Clark-Carter 2003; Abelson 1995). Hence, effect size can be used to compare studies that have used different sample sizes, unlike their test statistics and probabilities, which can only sensibly be compared if the sample

sizes are the same (Clark-Carter 2003). Another advantage of effect size is that it is expressed directly in the units of the scale of the dependent variable, and sizes of difference along the scale are supposed to be meaningful to the researcher (Abelson 1995). Although Cohen's d (Cohen 1988) is one of the most popular effect sizes, and measures the difference between the means of the two groups compared, Spearman's ρ , can be treated as a measure of effect size - as ranks are involved and not measurements (McDonald 2014).

Limitations of the correlation coefficient include the following (Reid 1996):

1. As the correlation coefficient is a measure of the linear (i.e. straight-line) relationship between two variables, it therefore means that if some kind of non-linear relationship exists, then the correlation coefficient will not be appropriate, and it may even be misleading. It is therefore important to check the data on a scattergram first, before calculating a correlation coefficient.
2. Extreme or outlying observations can have an overwhelming effect on the size of the correlation coefficient, thereby creating an artificially low value of r .
3. Care needs to be taken when the data relate to two separate underlying groups, as the overall relationship may be distorted by the different relationships.
4. Correlation is a measure of **association, not causation**. Just because two variables are highly correlated, this does not imply that one causes the other. There are usually many factors involved.

3.5 - Phases 2 and 3: Content Analysis and Interviews

3.5.1 - Methods and Sample

Phase 2 of my study (content analysis) employed aspects of both the quantitative and qualitative methods of analysis. Phase 3 of my study (interviews) involved the use of mainly qualitative methods. First, I used content analysis to examine the pattern of UK undergraduate pharmacy curricula, teaching and learning policies. This involved choosing concepts for examination, and then quantifying and tallying their presence as well as exploring the relationships between the concepts identified (Busch, et al. 2012). Following the analysis of my survey (Phase 1) as well as the content analysis (Phase 2), I identified a sample of healthcare practitioners (eleven pharmacists, three general practitioners and a

nurse) and then invited them to participate in the interviews (Phase 3). The aims of my interviews were to assess the opinion of practitioners on changing the UK undergraduate pharmacy curriculum to increase its public health content and, maybe, UK pharmacy schools offering dual MPharm/MPH degrees; to assess the opinion of practitioners on pharmacy students training closely with other healthcare students and, later, graduates working closely with other healthcare providers (for example GPs and nurses) to enhance the public health role of community pharmacists in the UK. In addition, to assess the opinion of practitioners on the teaching of content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists, as well as the adoption of new technologies in community pharmacy practice to enhance the public health role of community pharmacists in the UK. I determined the sample size during the process, hence continued with the interviews until they yielded no new information, or the data became saturated (Morse 2000; Cline 2011). I outlined the nature and format of the study to participating practitioners.

I selected individual participants purposively from a list of interested respondents, and based on their willingness to participate in the study. I obtained informed consent prior to inclusion in the study. The qualitative design of my interview enabled the objectives of my project to be met (Maxwell 1996); particularly as it enabled me to explore the different issues surrounding strategies enhancing the public health role of community pharmacists in the UK. I collected my data through interviews conducted by telephone (supported by Skype) using an interview guide (Appendix 4), together with open-ended questions, to both frame the interviews and probe for additional information (Miles and Huberman 1994). I recorded my interviews using 'HD Call Recorder for Skype', and each lasted approximately 20 to 30 minutes. I facilitated these interviews and remained consistent with the method suggested for in-depth interviews (McCracken 1988). I compiled the interview guide from the identified themes in my review of knowledge and information as well as the findings of my survey (Phase 1).

I asked my academic adviser and academic consultant to review the potential topics to determine their suitability, as this ensured that the proposed methods were workable, acceptable to the subjects and manageable (Burton 2000). Participation was voluntary, with confidentiality guaranteed (Fox, et al. 2007). During the interviews, I ensured that relevant

issues were clarified and understood. To ensure the validity of the study, my interview questions were open-ended; these enabled respondents to raise issues they believed were important to the study area, as well as enabling me to explore these in detail (Smith 2002). Furthermore, this ensured that what guided the content and direction of the interviews were the responses of the interviewees rather than merely following my agenda, with the data truly reflecting respondents' perspectives on the issue of interest (Smith 2002).

3.5.2 - Justification and Limitations of Qualitative Methods

The qualitative research methodology was included in my project as it is a method of naturalistic enquiry, which is normally less obtrusive than quantitative investigations and does not manipulate the research setting (Bowling 2002). The qualitative method therefore, enabled me to explore in depth strategies enhancing the public health role of community pharmacists in the UK. By adopting this method, the findings of my survey were enhanced, as the qualitative study focused on the meanings that participants in the study setting placed on their social world (Bowling 2002), something that could not be achieved with quantitative research. Bowling (2002) also argues that qualitative research has advantages over quantitative research in areas where the issues being studied are sensitive in nature or complex, when there is minimal pre-existing knowledge and where the need for exploration and inductive hypothesis generation is vital (Bowling 2002).

However, I was also mindful of the possibility of bias entering my data collection process (Smith 2002). These biases include the preconceptions of the interviewer (Weiss 1994) and the fact that the issues raised may be a reflection of the interviewees' pressing concerns at the time of the data collection (Cotter and Mckee 1997). The interviewer's pre-knowledge of the respondent may also affect both the issues raised (Anderson 1998) and the respondent's willingness to share certain views (De Young 1996).

The main weaknesses in qualitative research are that it is usually more difficult to analyse qualitative data, and that these studies are only possible with small samples (Bowling 1997). This then leads to the questionable representativeness of the data (Bowling 1997). There is also the problem of knowing whom to recruit, knowing which people will fit the research aims and objectives most appropriately, and how to convince participants that participating is pertinent and worthwhile, as the entire process is very time-consuming (Burton 2000). Devising an interview guide can also be difficult (Burton 2000). Another important weakness

with qualitative research is that it is difficult for researchers to accommodate the interactive nature of interviewing (Burton 2000).

3.5.3 - Content Analysis

According to Cole (1988), content analysis is a method of analysing written, verbal or visual communication messages. Content analysis as a research method is a systematic and objective means of describing and quantifying phenomena (Krippendorff 1980; Sandelowski 1995). Content analysis enables the researcher to test theoretical issues to improve understanding of the data (Elo and Kyngäs 2008), at the same time, it is a research method for making replicable and valid inferences from data to their context, with the aim of providing knowledge, new insights, a representation of facts and a practical guide to action (Krippendorff 1980). Often, the main purpose of those concepts or categories is to develop a model, conceptual system, conceptual map or categories (Elo and Kyngäs 2008). Content analysis as a research method also has received some criticisms, particularly in the quantitative field, where it is perceived as a simplistic technique that does not involve detailed analysis, as well as criticism that it is not sufficiently qualitative in nature (Morgan 1993).

Content analysis is popular in nursing research, and its advantages include the fact that it is a content-sensitive method (Krippendorff 1980), which also offers some flexibility in terms of research design (Harwood and Garry 2003). In terms of process, content analysis can be used with either qualitative or quantitative data, and the analytical method used is either inductive or deductive (Elo and Kyngäs 2008). According to Lauri and Kyngäs (2005), the inductive approach is ideal where there is not enough former knowledge about the phenomenon or if this knowledge is fragmented. Other the other hand, we use the deductive approach when the structure of analysis is operationalised based on previous knowledge and the goal of the study is theory testing (Kyngäs and Vanhanen 1999). While there are no systematic rules for analysing data; however, for both methods the analysis process is said to involve three main phases: preparation, organising and reporting, with the main attribute being that the many words of the text are grouped together into much smaller content categories (Weber 1990; Burnard 1996).

According to Guthrie, et al. (2004), the preparation phase begins with selecting the unit of analysis, which can be a word or a theme (Polit and Beck 2004). Cavanagh (1997) notes that

the decision on what to analyse in what detail and sampling considerations are vital factors prior to choosing the unit of analysis. Concerning sampling Krippendorff (1989) notes that sampling units enable the drawing of a statistically representative sample from a population of potentially available data. Moreover, Krippendorff (1989) also argues that while the process of drawing representative samples is not indigenous to content analysis, it is still important to eliminate the statistical biases intrinsic in much of the symbolic material analysed and to make sure that the often-conditional hierarchy of selected sampling units becomes representative of the organisation of the symbolic phenomena being investigated.

According to Elo and Kyngäs (2008), a unit of meaning can constitute more than one sentence, and at the same time have several meanings. This means that using it as a unit of analysis makes the analysis process hard and demanding (Catanzaro 1988; Graneheim and Lundman 2004). According to Graneheim and Lundman (2004), the most appropriate unit of analysis is whole interviews or observational protocols that are large enough to be seen as a whole and small enough to be remembered as a context for a meaning unit during the analysis process. To decide the contents to be analysed, Robson (1993) therefore argues that researchers are more often than not guided by the aim and research question of the study.

For my project, the aim of my content analysis was to examine the pattern of UK undergraduate pharmacy curricula teaching and learning policies. I obtained copies of the UK pharmacy schools' curricula from the various schools' websites, where available, or directly (by email) from the respective pharmacy school officers. I then uploaded these documents to NVivo for analysis. In the analytic process, I immersed myself in the data by reading through the written materials (curricula) several times, enabling new insights/theories to emerge (Polit and Beck 2004). The process of content analysis of the curricula of UK pharmacy schools involved open coding, creating categories and abstraction (Elo and Kyngäs 2008). With NVivo, which I utilised for my study, open coding meant writing notes and headings through NVivo memos and annotations while reading the data (Elo and Kyngäs 2008). I read the written materials through again, writing down as many headings as needed in NVivo memos and annotations to describe all aspects of the content (Burnard 1991, 1996; Hsieh and Shannon 2005). With the headings and notes in NVivo, I was able to generate categories freely at this stage (Burnard 1991).

With my open coding completed, I then grouped the list of categories under higher order headings (McCain 1988; Burnard 1991). I grouped data mainly to reduce the number of categories by collapsing those that were similar or dissimilar into broader higher order categories (Burnard 1991; Dey 1993). According to Dey (1993), the idea of creating categories is not simply to bring together observations that are similar or related; rather, data are being classified as 'belonging' to a particular group and this means that it is possible to make a comparison between these data and other observations that do not belong to the same category. Still, Cavanagh (1997) also notes that the purpose of creating categories is to have a way of describing the phenomenon, to enhance understanding and to generate knowledge. With NVivo, it was also possible for me to present some numerical (Seale and Silverman 1997) as well as visual representations in my analysis.

Regarding trustworthiness, GAO (1996) advises that there is a need to describe the analysis process and the results in sufficient detail to inform readers properly on how the analysis was conducted, together with its strengths and limitations. Also, as the results of the content analysis often reflect the contents or meanings of the categories (Elo and Kyngäs 2008); Dey (1993) also notes that creating categories is both an empirical and conceptual challenge, because categories must be conceptually and empirically grounded. Nonetheless, the credibility of the research finding relates also, to how well the categories cover the data (Graneheim and Lundman 2004). On the other hand, showing how well the results relate to the data can enhance the reliability of the study (Polit and Beck 2004). As it pertains to transferability of findings, Graneheim and Lundman (2004) also suggest that the researcher describing clearly the context, selection and characteristics of participants, as well as the process of data collection and analysis can achieve this. Nevertheless, it is possible to enhance the trustworthiness of the analysis through authentic citations that indicate to readers from where or from what kinds of original data the categories are contrived (Patton 1990; Sandelowski 1993).

Regarding confidentiality, Ford and Reutter (1990) also note the importance of not identifying informants by quotes from the data. Weber (1990) suggests that it is possible to assess the internal validity of content analysis as face validity or by using agreement coefficient. However, Graneheim and Lundman (2004) highlight some of the differing opinions regarding seeking agreement, particularly as each researcher interprets the data

depending on their subjective perspective, not forgetting the fact that co-researchers could bring forth alternative interpretations (Sandelowski 1995). Bazeley and Jackson (2013: 93) seem to agree with Graneheim and Lundman (2004), when they argue:

‘While we support the need to check for reasonable consistency across coders in team research, driven by their need to work towards a common goal, we question the value of doing so in a project with a solo investigator. Each person approaching the data will do so with their own goals and perspective, and so each will see and code differently. Coding is designed to support analysis – it is not an end in itself. What becomes important, then, is that the coder records the way he or she is thinking about the data, keeps track of the decisions made, and builds a case supported by the data for the conclusions reached. The alternative is to train someone, like a machine, to apply the same codes to the same data – but all this proves is you can train someone, not that your codes are ‘valid’ or useful. What can be of value is to have someone else review your data and some of your coding for the purpose of having a discussion about what you are finding there, especially if you are new to the task of qualitative coding.’

According to James (2008), authenticity is an important part of establishing trustworthiness in qualitative research, so that the research findings become relevant to society. Having said that, authenticity also means getting away from concerns about the reliability of research to concerns about its impact on members of the culture or community being researched (James 2008). In my project, I have followed the approach suggested by Bazeley and Jackson (2013), hence, utilised the input of my academic adviser and my academic consultant in order to validate my content analysis process.

On the other hand, content analysis is not without its limitations, which include its sheer quantity, which can be daunting, and even overwhelming; during the analysis, it is possible to come up with many fascinating points, which are not related to the topic under study (Elo and Kyngäs 2008). Moreover, reporting the study and presenting its results can be tasking, particularly as the results are developed through a process constituting a number of phases (Elo and Kyngäs 2008). Content analysis also has other limitations (Krippendorff 1989), one of which comes from its commitment to scientific decision-making. Statistically significant findings need many units of analysis, and an attempt to derive such findings means a commitment to be quantitative, which can also prevent the analysis of unique communications (Krippendorff 1989). The next limitation stems from the replicability requirement - this implies fixed and observer-independent categories and procedures that must be codified without reference to the analyst and the material being analysed

(Krippendorff 1989). One of the resultant effects is computer content analysis, which favours the use of data in contexts that entail stable and unambiguous interpretations and leaves little room for those whose meanings evolve in the process of communication and in ways characteristic of the different communicators or social groups involved (Krippendorff 1989). The last limitation is the expectation of content analysis to contribute to social theory (Krippendorff 1989). If categories are obtained from the very material being analysed, the findings are not generalisable much beyond the given data. On the other hand, if they are derived from a general theory, the findings tend to ignore much of the symbolic richness and uniqueness of the data in hand (Krippendorff 1989).

Finally, Elo and Kyngäs (2008) also warn that compressing qualitative data too much can prevent the integrity of the narrative materials from being maintained during the analysis phase. Still, in situations where conclusions are just summarised without including several sustaining excerpts, the wealth of the original data may fade away (Elo and Kyngäs 2008).

3.5.4 - Data Analysis for Interviews

I used the qualitative data software package NVivo (version 10) for the storage, retrieval, and analysis of data. I transcribed the interviews verbatim. I also ensured that I checked all transcripts independently against the original recordings. As a validity check on the interpretative process, I requested the coding procedure to be independently verified by an experienced researcher. To further enhance the validity of my project, I returned to respondents to request their views and comments on the preliminary findings (Smith 2002), mainly by sharing my interpretations of the categories or themes that emerged with the informants; conducting a second brief interview with respondents to clarify or verify various issues emerging from the data; and asking informants to read the analysis and share their reactions to my interpretations (De Young 1996).

In order to become familiar with the collected data, I read the transcribed interviews through carefully several times and then summarised them. I used NVivo in the condensation stage for category development (Pope, et al. 2000). In the analysis, I used thematic analysis (Braun and Clarke 2006; Caulfield and Hill 2014). According to Braun and Clarke (2006), thematic analysis (TA) is a poorly demarcated and rarely acknowledged, still widely used qualitative analytic method within and beyond psychology. However, the main benefit of thematic analysis lays with its flexibility (Braun and Clarke 2006). It is possible to

use TA in a realist or descriptive way; still, it is not limited to that (Braun and Clarke 2014). There are presently different variants of TA. While the Braun and Clarke method offers a theoretically flexible approach; others (for example, Boyatzis 1998; Guest, et al. 2012; Joffe 2011) locate TA implicitly or explicitly within more realist/post-positivist paradigms (Braun and Clarke 2014). Yet, the version of TA they developed offers a strong, systematic framework for coding qualitative data, and for then using that coding to identify patterns across the dataset in relation to the research question (Braun and Clarke 2014). The questions of what level to seek patterns, and the interpretations given to those patterns, are therefore up to the researcher to decide, the reason being that techniques are distinct from the theoretical positioning of the research (Braun and Clarke 2014).

As noted, thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data, therefore, minimally organises and describes data set in (rich) detail (Braun and Clarke 2006). Although, Braun and Clarke (2006) have argued that there is no clear agreement about what thematic analysis is, how to go about doing it; however, they have also noted that some of the phases of thematic analysis are similar to the phases of other qualitative research. Essentially, the phases include familiarising yourself with your data; generating initial codes; searching for themes; reviewing themes; defining and naming themes and producing the reports (Braun and Clarke 2006).

In terms of the advantages of thematic analysis, it is not a complex method (Braun and Clarke 2006; Bryman 2008; Caulfield and Hill 2014). It is flexible, and a relatively easy and quick method to learn and do; it is accessible to researchers with minimal or no experience of qualitative research; results are generally accessible to educated general public; and useful method for working within participatory research paradigm, with participants as collaborators. In addition, it can usefully summarise main features of a large body of data, and/or give a 'thick description' of the data set; can highlight similarities and differences across the data set; can generate unanticipated insights; allows for social as well as psychological interpretations of data; and can be useful for producing qualitative analyses suited to informing policy development (Braun and Clarke 2006).

Yet, thematic analysis is not without some disadvantages (Kvale 2007; Bryman 2008; Caulfield and Hill 2014), many of which depend more on poorly conducted analyses or inappropriate research question, than on the method itself (Braun and Clarke 2006). While

the flexibility of the thematic analytic method allows for a wide range of analytic options - such that potential range of things that can be said about one's data is broad; this advantage can also be a disadvantage as it makes developing specific guidelines for higher-phase analysis difficult (Braun and Clarke 2006). This can be potentially paralysing to the researcher aiming to decide what aspects of their data to focus on (Braun and Clarke 2006). Another disadvantage is that thematic analysis has limited interpretative power beyond basic description if it is not used within an existing theoretical framework that connects the analytic claims that are made (Braun and Clarke 2006).

Still, unlike narrative or other biographical approaches, it is not possible to preserve a sense of continuity and contradiction through any one individual account, and these contradictions and consistencies across individual accounts may be revealing (Braun and Clarke 2006). Also, unlike discourse analysis (DA) and conversation analysis (CA), a simple thematic analysis does not allow the researcher to make claims about language use, or the fine-grained functionality of talk (Braun and Clarke 2006), or to analyse what patterns of speech tell us about the power relationships between individuals (Caulfield and Hill 2014). Another disadvantage is the time it takes to do a thematic analysis well (Caulfield and Hill 2014). Finally, thematic analysis currently has no fame as an analytic method, reasons being that it is poorly demarcated and claimed, though widely used (Braun and Clarke 2006).

For this project, I used throughout the TDF to underpin the research. For my analysis, I assigned initial codes to data of interest for the analytical framework through a process of repeated reading, with the emphasis on including all relevant data. Further re-reading and analysis of subsequent transcripts led to my refinement of the initial codes, thereby ensuring that I took into account the contexts of any extracts. As the analysis progressed, the number of new initial codes reached a maximum, with the process of refinement taking precedence. I aligned pieces of text to a particular code across the transcripts, grouped them together as individual reports and then printed them out to aid further analysis. Afterwards, I reflected these reports back to the transcripts to identify connections involving the index codes. Next, I considered the initial codes together to identify patterns and connections to form what became sub-categories, which I then connected across higher order categories (Burnard 1991). I considered the emerging categories with the transcripts to establish whether the categories were related to the data and their contexts. Through the

process of refinement and identifying relationships between categories, theme areas emerged.

I also reviewed the emerging themes for counter-themes (Abu-Omar et al 2000), as well as presenting some numerical data in the analysis to assure the reader that the findings presented are representative of the full data set, thereby ensuring that attention has been given to rare events and deviant cases (Seale and Silverman 1997). Concerning the reliability of the study, Smith (2002) argues that the aim of the researcher is not to ensure consistent interpretations or responses. Rather, the aim is to understand the underlying contexts and reasons for the differences (Smith 2002). Such differences and inconsistencies, which may merit further exploration, may then be illuminated in terms of the study objectives (Smith 2002). This will be valuable in terms of informing the analysis and development of hypotheses or theories (Smith 2002).

To enhance reliability and hence tackle some of the biases mentioned earlier, my project employed various methods, such as ensuring consistency in data processing, analysis and coding procedures; the use of open and non-leading questions to ensure success in the interviews; and digital recording (HD Call Recorder for Skype) of interviews, which enabled my practices to be reviewed (Smith 2002). In addition, I kept meticulous records on the research process, which required keeping a separate diary of feelings and interpretations (Bowling 2002).

3.5.5 - Improving data reliability

I improved data reliability by comparing data from phases 1, 2 and 3 of my project; by consulting participants to agree or refute my interpretation of the information they provided; and including a 'critical friend' as part of my research design, with whom I also checked data, especially interpretative data (IWBL 2011).

3.5.6 - Ethical Considerations

I have already discussed some of the issues concerning ethical considerations above. As an insider-researcher-practitioner, my project is likely to influence and, I hope, enhance the public health practice of community pharmacists in the UK (Costley, et al. 2010). This project will be of benefit to my own development, not just as a pharmaceutical writer, community pharmacist and researcher, but also in my role as a teacher-practitioner at the UCL School of

Pharmacy, London. In addition, as an insider-researcher-practitioner, I take responsibility for, recognise and understand the ethical codes of practice and principles that exist within the context in which my project is being researched (Darley, et al. 2001).

In terms of personal and professional perspectives, I privately funded this project hence; I was not constrained as such to fulfil any particular stakeholder's expectations other than those of the university (Murray 1997). The main responsibility therefore lay with me: to carry out a project which was right for me and for my professional area, as well as adopting an appropriate approach to collecting data from colleagues that felt right for me and did not impose on others (Costley, et al. 2010). Again, as an insider-researcher, I proceeded carefully in negotiating with colleagues, ensuring that I followed research protocols designed for insider-researchers (if they were available) rather than researchers coming new to a particular situation (Costley, et al. 2010). To avoid the risks of exploitation and betrayal (Griffiths 1998), I made clear to the participants what was expected of them in terms of both the project itself and the research element of the project, as well as ensuring that I explained exactly what I meant by anonymity and confidentiality (Fox, et al. 2007; Costley, et al. 2010). I clearly stated to participants the purpose of my project, which is part of my DProf degree, as well as the objectives of my project and what I intended to do with the information they provided.

Again, due to my close familiarity with my research and the micro-politics of my community of practice (pharmacy), as well as the power I have in interpreting and writing up my findings using my own constructions, I minimised this power imbalance by calling on others to verify or contest my accounts (Costley, et al. 2010). My interests, particularly what I believed would benefit community pharmacy practice in the UK based on evidence dominate my project. I own the intellectual property rights to this academic work and was therefore the person who decided about the nature of the project, the research and the output. However, the development process and implementation of my project will require some input from UK pharmacy bodies, the DoH and Schools of Pharmacy. I also ensured that I did not put participants in a difficult position because they were friends or colleagues. In addition, I ensured that the interviewing process with senior and junior colleagues was fair and balanced, and took due care to ensure that interviews with colleagues (participants) did not act as a kind of 'therapy' and a 'venue to air grievances' (Costley, et al. 2010).

The General Pharmaceutical Council's standards of conduct, ethics and performance that stipulate the behaviours, attitude and values expected of pharmaceutical professionals guided my ethical considerations (GPhC 2012). Guiding these behaviours, attitude and values are the seven principles set out by the GPhC. They include ensuring that patients are my first concern; using professional judgement in the interest of patients and the public; showing respect to others; encouraging patients and the public to participate in decisions about their care; developing my professional knowledge and competence; being honest and trustworthy; and taking responsibility for my working practices. According to the GPhC, 'It is important that you (pharmacy professionals) meet our standards and that you are able to practise safely and effectively. Your conduct will be judged against the standards and failure to comply could put your registration at risk. If someone raises concerns about you we will consider these standards when deciding if we need to take any action' (GPhC 2012). The GPhC goes further to state, 'If you are a pharmacy professional these standards apply to you, even if you do not treat, care for or interact directly with patients and the public' (GPhC 2012).

In addition, I submitted a Research Ethics form (REf) to the programme approval panel (PAP) and research ethics sub-committee (RESC) of Middlesex University, for approval. They approved the project. Participation in the study was voluntary, with informed consent obtained from participants. I coded the data to make participants unidentifiable, and stored in a password-protected personal computer. Questionnaires, coding sheets and other confidential materials were stored in different secured cabinets.

Chapter 4 - Project Activities and Findings

4.1 - Introduction

The main aim of my project was to identify strategies enhancing the public health role of community pharmacists in the UK. Following my project activity, which involved a survey of 147 UK community pharmacists, content analysis of the curricula of 28 UK pharmacy schools and interviews with 15 healthcare professionals, I identified several key findings on strategies enhancing the public health role of community pharmacists in the UK. I report some of these below. I linked my project findings throughout to public health.

4.2 - Survey Findings

In my main survey, I collected a total of 88 usable responses, representing a response rate of 22.8% (88/385). Of the 385 surveys mailed to community pharmacists I randomly selected in Barnet, London, and its surrounding area, Cardiff and Edinburgh, I initially received 49 responses (12.7%). After 3 weeks, I reminded non-respondents with another letter (sometimes with phone calls), together with another copy of the questionnaire. I received thirty-four more surveys, bringing the total to 83 (21.5%). This response rate meant that I did not meet my initial response rate target of 50-60%, even with the reminder letters and phone calls. Some pharmacists requested that I posted another questionnaire to them, while others promised to return their completed questionnaires as soon as possible. I received five more completed questionnaires by mail, bringing the total questionnaires collected from the main study to 88, a response rate of 22.8% (88/385).

Seven questionnaires (from the main study) were returned to me incomplete for a number of reasons, that included wrong address, no reason stated, not having a pharmacist in the premises. When I put this into consideration in my calculation, my response rate for questionnaires received became 23.28% (88/378).

4.2.1 – Pharmacists' Characteristics

Both men (39/44.3%) and women (49/55.7%) responded to the survey, C.I. ± 10.37 . Their age-range distribution, shown in Figure 5, indicate that the youngest and the highest number of respondents were aged between 20-29 years (30.7%, C.I. ± 9.63), while the oldest and fewest number of respondents were aged between 70-79 years (2.3%, C.I. ± 3.13). In

addition, I measured the experience level of respondents, which was determined by the number of years since qualification in the UK. The majority of respondents (56.3%, C.I. ± 10.41) qualified between 2000 and 2014. The role distribution of respondents, which is presented in Figure 6, indicated that the majority of my respondents were working as employee community pharmacists (77.3%, C.I. ± 8.74), rather than as pharmacy owners or self-employed pharmacists. In terms of location (place of work), 36.5% of my respondents were working in Edinburgh, 34.1% in Cardiff, and 29.4% in Barnet and the surrounding areas (Figure 7).

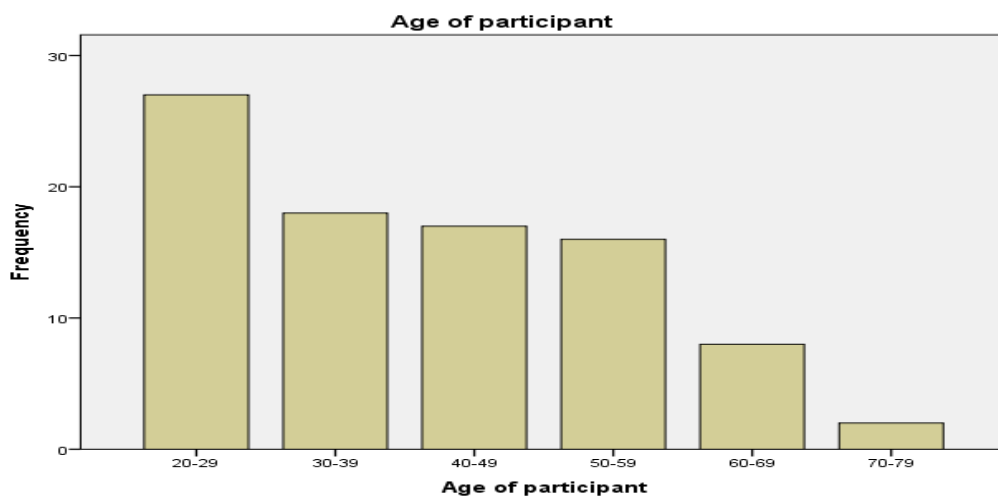


Figure 5. Age of Participants

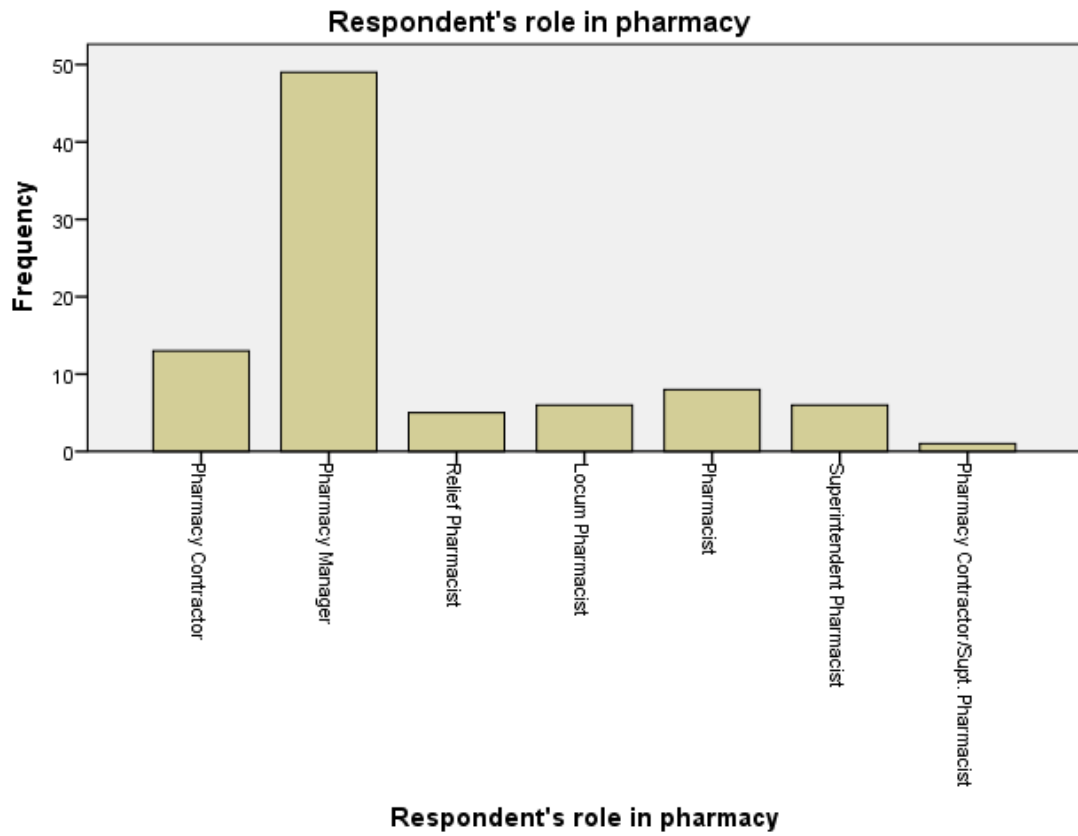


Figure 6. Respondent's Role in Pharmacy

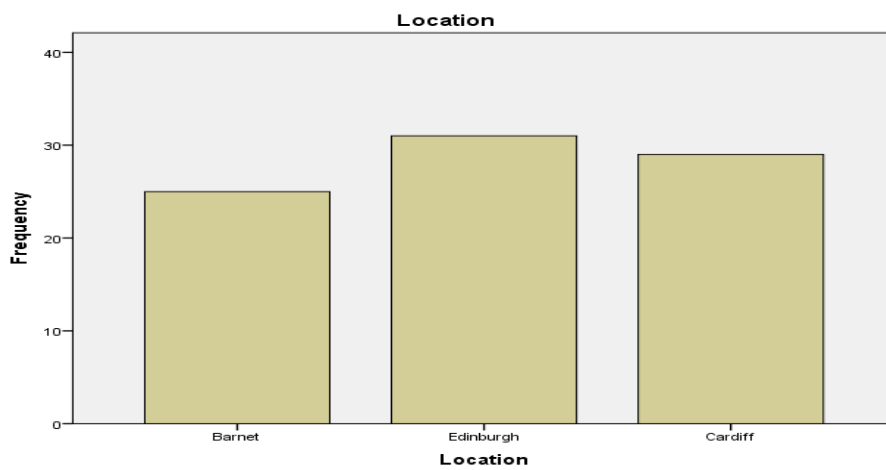


Figure 7. Location of Respondents

4.2.2 - Survey Responses

4.2.2.1 - Involvement of Community Pharmacists in Public Health Services

To ascertain the level of involvement of community pharmacists in public health services, my questionnaire began by asking community pharmacists if their involvement in public health services was in the form of offering over-the-counter advice; participating in a local authority-run scheme (e.g. Nicotine Replacement Therapy (NRT)) for pharmacists; or collaborating with a local practice in a shared care kind of scheme? Their Yes or No responses (see Table 4) showed that most of my respondents (98.9%, C.I. ± 2.19) were offering over-the-counter (OTC) advice, 76.5% of respondents (C.I. ± 9) participated in local authority-run schemes, while 33.7% of respondents (C.I. ± 10.16) said they were collaborating with a local practice in a shared care kind of scheme.

4.2.2.2 - Funding for Public Health Services from Community Pharmacies

The majority of respondents (83.6%, C.I. ± 8.49) indicated that the local authority fully funded the public health programme they were involved. Sixteen percent of the respondents said 'No'.

Table 4. Different forms of Public Health Services Provided by Respondents

Different forms of services	Yes (%)	No (%)
Offering over-the-counter advice (n = 87)	98.9	1.1
Participating in local authority-run scheme (n = 85)	76.5	23.5
Collaborating in a shared care scheme (n = 83)	33.7	66.3
Is programme fully funded by local authority? (n = 73)	83.6	16.4

The next question asked, if not fully funded by your local authority, who else or which organisation is involved in the funding? The responses I received indicated that these programmes were funded through several sources. Four respondents indicated that the programme was privately funded, for example:

“The patients through private payments – weight loss – ineligible for NHS (and) Flu jab.” [RC 196]

In the case of another four respondents, they were getting some financial support from various health authorities:

“Health Promotion Wales.” [RC 210]

“NHS Board.” [E347]

For another respondent, the company he/she was working for funded the costs of providing those services:

“Company.” [C168]

4.2.2.3 - Strategies Enhancing the Public Health Role of Community Pharmacists

Next, I asked several questions to ascertain the level of community pharmacists' agreement, based on the findings of my review of the literature, on strategies enhancing the public health role of community pharmacists in the UK. I present their responses in Table 5.

Notably, on changing the public health content of the UK undergraduate pharmacy curriculum, 64.8% (C.I. ± 9.97) of respondents indicated that there was a need to increase the public health content of the UK pharmacy schools' undergraduate curriculum. Four per cent of respondents rejected the idea. The majority of respondents (81.4%, C.I. ± 8.21) indicated that they would like to see pharmacy students training closely with other healthcare students, with 93.1% of respondents (C.I. ± 5.32) also indicating that they wanted to see pharmacy graduates working closely with other healthcare providers, e.g. GPs and nurses.

Regarding communication skills, 79.3% of respondents (C.I. ± 8.5) indicated that they would want UK undergraduate pharmacy students and pharmacists taught content-specific/advanced communication techniques. In terms of other strategies needed to enhance the public health role of community pharmacists in the UK, 88.5% of respondents

(C.I. ± 6.7) also felt that there was a need to develop good adherence strategies for patients; 79.5% of respondents (C.I. ± 8.42) would like community pharmacists' role in preventing the spread of infections as well as managing antimicrobial resistance to be enhanced; 89.8% of respondents (C.I. ± 6.32) would like community pharmacists to enhance patients' self-management capacities; while 78.5% of respondents (C.I. ± 8.57) want pharmacists to enhance their safe medication disposal methods.

In addition, the majority of the respondents indicated that they would like community pharmacists to enhance their skills in the management of polypharmacy and long-term conditions (87.5%, C.I. ± 6.9); to manage the medication needs of athletes (66.6%, C.I. ± 9.9); and to enhance their involvement in smoking cessation (80.6%, C.I. ± 8.25). As well as these, the majority of respondents also indicated that they would like to see pharmacy students provided with advanced experience in public health (86.2%, C.I. ± 7.24); pharmacists provided with advanced experience in public health (89.8%, C.I. ± 6.32); and pharmacists remunerated directly for providing public health services (89.8%, C.I. ± 6.32). However, in terms of UK universities offering dual MPharm (or even PharmD)/MPH degrees and community pharmacists adopting the use of new technologies and social media in practice, 37.5% (C.I. ± 10.1) and 43.2% (C.I. ± 10.34) of respondents respectively indicated that they were in support of these.

In addition to the above questions, the questionnaire also provided an option for respondents to supply other comments on what they considered necessary for enhancing the public health role of community pharmacists in the UK.

Table 5: Possible Ways to Enhance the Public Health role of Community Pharmacists

Questions (Responses with significant agreement in bold)	Disagree (%)	Strongly disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)
Increase PH content of undergraduate curriculum? (n = 88)	3.4	1.1	30.7	52.3	12.5
Offer dual MPharm (or even PharmD)/MPH degrees? (n = 88)	12.5	5.7	44.3	30.7	6.8
Pharmacy students training with other HC students? (n = 86)	5.8	2.3	10.5	66.3	15.1
Pharmacists working closely with HC practitioners? (n = 87)	2.3	1.1	3.4	62.1	31.0
Teach advanced communication techniques? (n = 88)	1.1	1.1	18.4	56.3	23.0
Adopt new technologies and social media? (n = 88)	17.0	9.1	30.7	34.1	9.1
Develop good adherence strategies for patients? (n = 88)	0	0	11.5	73.6	14.9
Enhancing role in preventing antimicrobial resistance? (n = 88)	2.3	1.1	17.0	60.2	19.3
Enhance patients' self-management capacities? (n = 88)	0	0	10.2	61.4	28.4
Enhance safe medication disposal methods? (n = 88)	5.7	2.3	13.6	58.0	20.5
Enhance the management of polypharmacy? (n = 88)	1.1	1.1	10.2	52.3	35.2
Managing the medication needs of athletes? (n = 87)	2.3	1.1	29.9	47.1	19.5
Enhancing involvement in smoking cessation? (n = 88)	4.5	1.1	13.6	51.1	29.5
Providing students with advanced experience in PH? (n = 88)	1.1	0	12.6	63.2	23.0
Providing pharmacists with advanced experience in PH? (n = 88)	1.1	0	9.1	65.9	23.9
Remunerate pharmacists directly for PH services? (n = 88)	1.1	3.4	5.7	48.9	40.9

Role expansion

A number of respondents cited role expansion and skill development (Knowledge and Skills) as strategies needed to enhance the role of community pharmacists in public health:

“Expansion of minor ailments service – local arrangement. [Also, the] provision of vaccinations including Flu, travel, etc.” [E390]

“There is a need to develop both [the] consultation skills [and the] business skills [of pharmacists].” [B37]

In terms of the barriers to enhancing the public health role of community pharmacists in the UK (see Table 6), the majority of respondents identified insufficient training of pharmacists in public health (69.3%, C.I. ± 9.63); insufficient skill of pharmacists in public health (51.1%, C.I. ± 10.43); lack of professional autonomy for pharmacists (64.8%, C.I. ± 9.97); difficulties in recruiting patients (64.8%, C.I. ± 9.97); lack of input from public health practitioners (64.8%, C.I. ± 9.97); lack of support from public health practitioners (61.7%, C.I. ± 10.26); and difficulty in communicating with other public health providers (72.4%, C.I. ± 9.38), as significant barriers.

As well as these, the majority of respondents also identified lack of support from GPs (61.4%, C.I. ± 10.16); insufficient funding from the government (76.1%, C.I. ± 8.9); time pressure and workload (90.9%, C.I. ± 6); lack of patients' records (78.4%, C.I. ± 8.59); lack of documentation of interventions (52.8%, C.I. ± 10.48); lack of instrumentation (59.1%, C.I. ± 10.26); lack of understanding by the public of the training and skill-sets of pharmacists (72.1%, C.I. ± 9.47); and lack of understanding by healthcare providers of the training and skill-sets of pharmacists (69.4%, C.I. ± 9.79), as barriers to enhancing the public health role of community pharmacists in the UK. However, a number of respondents (majority) did not accept that lack of demand for public health services (45.5%, C.I. ± 10.39); safety concerns by GPs (43.2%, C.I. ± 10.34); language barrier (57.5%, C.I. ± 10.38); and safety concerns of patients (57.9%, C.I. ± 10.3) were barriers to enhancing the public health role of community pharmacists in the UK.

Table 6. Barriers to Enhancing the Public Health Role of Community Pharmacists

Questions (Responses with significant agreement in bold)	Disagree (%)	Strongly disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)
Insufficient training of pharmacists in PH? (n = 88)	14.8	5.7	10.2	60.2	9.1
Insufficient skill of pharmacists in PH? (n = 88)	20.5	10.2	18.2	46.6	4.5
Lack of professional autonomy for pharmacists? (n = 88)	8.0	1.1	26.1	45.5	19.3
Difficulties in recruiting patients? (n = 88)	13.6	2.3	19.3	48.9	15.9
Lack of demand for public health services? (n = 88)	30.7	14.8	29.5	22.7	2.3
High drop rates for public health services? (n = 88)	9.1	8.0	37.5	36.4	9.1
Low success rates for public health services? (n = 87)	27.6	11.5	34.5	23.0	3.4
Lack of input from public health practitioners? (n = 88)	9.1	0	26.1	52.3	12.5
Lack of support from public health practitioners? (n = 86)	12.8	0	25.6	47.7	14.0
Difficulty in communicating with other PH providers? (n = 87)	12.6	1.1	13.8	62.1	10.3
Lack of support from GPs? (n = 88)	11.4	2.3	25.0	36.4	25.0
Insufficient funding from the government? (n = 88)	9.1	1.1	13.6	35.2	40.9
Difficulty in fee collection? (n = 88)	13.6	4.5	33.0	36.4	12.5
Time pressure and workload? (n = 88)	2.3	1.1	5.7	36.4	54.5
Safety concerns among pharmacists? (n = 88)	17.0	6.8	28.4	34.1	13.6
Safety concerns by GPs? (n = 88)	27.3	15.9	28.4	18.2	10.2
Safety concerns of patients? (n = 88)	40.9	17.0	25.0	11.4	5.7
Lack of patients' records? (n = 88)	5.7	4.5	11.4	52.3	26.1
Lack of documentation of interventions? (n = 87)	14.9	4.6	27.6	42.5	10.3
Physical design of community pharmacies? (n = 88)	28.4	5.7	28.4	25.0	12.5
Misperception that counselling is not needed? (n = 88)	26.1	6.8	20.5	31.8	14.8
Lack of instrumentation? (n = 88)	17.0	3.4	20.5	52.3	6.8
Language barrier? (n = 87)	41.4	16.1	24.1	10.3	8.0
Lack of understanding by the public? (n = 86)	8.1	7.0	12.8	50.0	22.1
Lack of understanding by HC providers? (n = 85)	10.6	4.7	15.3	51.8	17.6

In addition, I provided an option for respondents to supply free text comments on what they considered as barriers to enhancing the public health role of community pharmacists in the UK. Barriers, which the respondents highlighted, were various and included funding issues and time pressure from employers:

Various [environmental context and resources and lack of knowledge]

“Lack of co-ordinated approach by utilising all parties; lack of understanding and acceptance of health promotion before treatment; as well as ring-fenced funding arrangements.” [E390]

Follow-up [environmental context and resources]

“Follow-up is difficult to find out why a patient hasn’t continued, e.g. NRT. Time constraints to phone, each individual patient who hasn’t returned.” [E454]

Conflict of interest [social/professional role and identity]

“GPs and GP practices don’t want pharmacies in their team – conflict of interest.” [B37]

“GPs think we are taking money from them by providing a service.” [RC185]

Publicity [knowledge]

“Government/NHS should emphasise pharmacists’ roles more publicly – ever-likely as mandatory for those using NHS services regularly, e.g. mandatory MUR for all on long-term medications.” [P133]

According to two respondents, ensuring consistency in service delivery across sectors and/or locations can also help to tackle some of the identified barriers:

“More nationally consistent strategies, that is, National Minor Ailment Scheme.” [B115]

“Firstly, pharmacists themselves need to quantify and specify what they're able to do for the public and patients rather than just taking on what GPs don't want to do anymore for no more money.” [E382]

On the other hand, five of my respondents highlighted the need for collaboration [*social influences - team working*] between healthcare professionals as well as with government bodies. For some, this would also mean various healthcare professionals seeing pharmacists more as colleagues and recognising each other’s roles and abilities:

“GPs and NHS need to recognise the ability of a pharmacist and collaborate and work together.” [RB27]

“Better co-operation between pharmacies and GPs/nurses/carers to allow more seamless care.” [E448]

“Training GPs, etc., and pharmacists together. All groups need to be aware of skills of other. Time – there’s a lot to do already!” [RE336]

Two of my respondents would like pharmacies to employ more than one pharmacist (enhancing *resources*), which would, for example, allow pharmacists’ roles to be split between dispensing activities and clinical (and public health) activities:

“Have two pharmacists on duty at all times, [one] dispensing [and the other] clinical. Make it law, so pharmacy chains are forced into doing this.” [B63]

“More pharmacists per branch.” [RE406]

Another area of emphasis for many of my respondents was on improving funding for community pharmacy public health activities (*resources*), which five of them identified as a barrier to enhancing the role of pharmacists in public health:

“Money, education of healthcare professionals.” [RC185]

“More funding.” [RC245]

“More funding/training and better collaboration” [RC 280]

“Funding.” [C210]

At the same time, there were several and wide ranging suggestions for more support (minimising *social influences*) and training for pharmacists (*knowledge and skills*) (fourteen respondents); enhancing awareness (*knowledge*) for the services community pharmacists were providing (eight respondents); and community pharmacists becoming more proactive with public health (enhancing *beliefs about capabilities*). As well as, improving communication between healthcare professionals by encouraging *team working*; tackling the undervaluing of pharmacists [*improving social support and identity*] as well as reducing community pharmacists’ workload [*through social support, enhanced resourcing and decreasing emotional stress*].

Support and training (knowledge, skills, and environmental context and resources)

“The introduction of protected learning time such as how GPs [are] currently allowed to close the practice once a month for 2 hours to allow for training.” [B32]

“More funding/training and better collaboration.” [RC 280]

“Better training for pharmacists and other healthcare professionals on public health and how pharmacists can get involved.” [RE411]

“More training and greater understanding of problems and consequences.” [RB50]

“Provide more training at suitable times and provide remuneration.” [B48]

“More training with other healthcare professionals.” [B109]

“Better training and communication/relationship building with other healthcare professionals.” [C157]

“Adequate training of pharmacists; public health services campaigns to inform public co-operation between NHS and all contractors to pay and provide public health services.” [E444]

“Improve training in public health of qualified pharmacists – not at university level.” [E454]

“Increase knowledge of what pharmacists can/cannot do to patients and other healthcare professionals.” [E363]

“Better education of public, higher profile for pharmacists.” [B30]

“More training.” [B117]

“Education, training and CPD.” [B35]

“Improved education and training.” [E405]

Awareness (education)

“Pharmacy to make its case effectively.” [B123]

“An ‘ask your pharmacist’ campaign on Facebook, buses and newspapers.” [C257]

“Greater promotion of pharmacists’ role and qualifications.” [C272]

“Better education of public, higher profile for pharmacists.” [B30]

“Better advertising of our skills, to change patients’ perception of us.” [C239]

“Educate public more on role of a pharmacist. Advertise services, e.g. on TV or in GP surgeries, that pharmacists carry out, for example, Nicotine Replacement Therapy (NRT).” [E310]

“Better promotion of pharmacies by NHS.” [E347]

“Public and health professional.” [C267]

Proactive with public health activities (beliefs about capabilities)

“It takes too long to dispense and check prescriptions. Due to clawbacks, I cannot employ an Accuracy Checking Technician (ACT). As I work for a multiple, our targets are not incentivised for services. I get paid either way with or without services. Currently, if I provide extra services it will not justify hiring extra staff, as payments are too low and not guaranteed income to employ full-time staff.” [RE442]

“Pharmacists need to understand the bigger picture and must be proactive in promoting the services – public health.” [B121]

“The barriers have gone down – pharmacists are no longer seen as just a dispensing machine – I think we are seen as healthcare practitioners.” [B77]

“Government and health boards [CCGs] to accept health promotion as important part of clinical care that can save money in long term. Expansion of pharmacists’ clinical skills in this area.” [E390]

Communication (education)

“Better communication between healthcare professionals. Training together with other healthcare professionals.” [RC191]

“Highlighting outcomes to other health professionals. Improved training.” [RE359]

“Better communication with other healthcare professionals.” [RC244]

“Better communication and funding.” [RE414]

“Better communication and understanding of the skill set of pharmacists.” [RB148]

Undervalued (professional/social role & identity)

“More discussion with NHS and various national bodies, i.e. GP; nurses; hospital; pharmacists. They need to understand how undervalued pharmacists are.” [B37]

“The barriers have gone down – pharmacists are no longer seen as just a dispensing machine – I think we are seen as healthcare practitioners.” [B77]

Workload (environmental context and resources)

“Although I enjoy getting involved in public health services, the demands of workload and pressure mean that we don’t have the time to spend with patients. The amount of paperwork/electronic forms that need to be completed before registration/payment.” [RE362]

When my questionnaire then asked community pharmacists how essential is it that patients get public health services from community pharmacies, 43.7% of respondents (C.I. ± 10.41) indicated that this was ‘very essential’; 27.6% indicated ‘essential’ (C.I. ± 9.38); 16.1% indicated ‘quite essential’ (C.I. ± 7.71); and 12.6% said, ‘sometimes’ (C.I. ± 6.96).

I asked community pharmacists to provide in free text format what they considered the positive aspects/successes of the present public health services from the community pharmacy and how these can be strengthened. Their responses were diverse, with more than forty respondents highlighting the fact that community pharmacy was accessible. In addition, I also received responses that suggested that public health services offered from community pharmacies were a method of role extension [*knowledge and skills*] (seven respondents) and recognition/status for community pharmacists [*social/professional role and identity*]; enabled teamwork and collaboration between pharmacists and other healthcare professionals [*social influences - team working*]; however, more funding [*resources*] and training [*knowledge and skills*] were needed to boost outcomes.

Various (environmental context and resources, and beliefs about capabilities)

“Accessible, infrastructure and logistical support to deliver these services. Need to reduce pressure on A & E and GPs, by utilising pharmacists’ skills. Acceptance on part of all stakeholders that this is cost-effective to do.” [E390]

Role extension (professional/social role & identity)

“Smoking cessation – referral from GPs. Weight management – (needs) funding.” [B83]

“Extends job role.” [E374]

“Minor Ailment Service; Nicotine Replacement; EHC; Needle Exchange; Flu Vaccination; AAH Services; Malarial Tablet Prescribing; and Travel Vaccinations.” [E405]

“Smoking cessation; weight clinic.” [RE406]

“Medicine interventions. Better access to medical records.” [RC191]

“Uptake is great, but outcomes depend on how strong is the willingness of the patient.” [RB144]

“Many aspects of health are covered by services, which is very good in who wants to get improvement.” [RE354]

Recognition (beliefs about capabilities and reinforcement)

“By recognition from government of the role played by pharmacists, by keeping people healthy in many ways.” [B123]

Status (professional/social role & identity)

“Strengthens the standing of the profession with patients and other healthcare professionals.” [C157]

“Less waiting time for patients, improving the image of pharmacists.” [C272]

Teamwork/collaboration (social influences – team working)

“Get the whole pharmacy team – counter assistants, dispensers and technicians involved in providing the services. Healthy living pharmacies/champions.” [B121]

“Minor ailments – saves doctors’ time.” [B35]

“Relieve pressure on GPs. [Develop] professional working relationship with other health practitioners.” [C255]

“Regular meetings with all pharmacists in [the] area.” [B60]

Funding (environmental context and resources)

“When funded by NHS, all pharmacies are involved, e.g. NRT, so funding is essential for universal service.” [E444]

Accessibility (environmental context and resources)

“Always visible and open to neighbours.” [B115]

“Can be seen without an appointment, see both well and unwell people.” [B32]

“Always available - weekends, late nights, etc. – accessible.” [RC185]

“Quick and easy access to professional advice and services.” [RE411]

“Easily accessible.” [RE372]

“Long hours. See well people.” [C210]

“Access, opening hours.” [RC196]

“Easy access for patient to professional advice.” [RE359]

“Ease of access.” [RE442]

"Knowledge of customers. They are sometimes more likely to tell pharmacists what they are eating, etc. than GPs." [RE362]

"Easy instant access to pharmacists – no appointments, etc. [RB148]

"Ease of access. Continued training and on-going training." [RE336]

"Accessibility and local knowledge of patients." [RC 280]

"Familiarity with patients and ease of access can make it easy for patients." [RE414]

"Opening times and less waiting." [RE385]

"Don't need an appointment to see us, so are available more readily than GPs." [E448]

"Ease of access, flexible access." [B109]

"Accessibility, cost effectiveness to NHS. Need strengthened by adapting pharmacy workforce, e.g. ACTs; move away from chasing items." [E347]

"Ease of access to pharmacy by public." [C198]

"Nationally commissioned services through NHS Scotland." [E315]

"Easy access/availability. Education and funding." [C300]

"Easy access, more funding." [RB27]

"Accessible, infrastructure and logistical support to deliver these services. Need to reduce pressure on A & E and GPs, by utilising pharmacists' skills. Acceptance on part of all stakeholders that this is cost-effective to do." [E390]

"Saves time for GPs and patients - don't need to make appointments for services such as NRT with pharmacists." [E310]

"Always visible and open to neighbours" [B115]

"Localised services for smoking cessation, needle exchange, EHC, chlamydia screening, that is, services for local communities." [B37]

"Good access. Two pharmacists on duty." [E446]

"Accessible and non-threatening." [C264]

"Easy to access, qualified staff." [C239]

"Easy access." [B86; RC245]

"No appointment needed - accessible, non-judgemental and free." [E382]

"Accessibility and approachability – patients know and trust pharmacy staff." [C296]

"Most accessible of health care professionals." [E420]

"More accessible through community pharmacy." [B108]

"Easy access." [C243]

"Accessibility." [C257]

"Easy to access, approachable but can improve by advertising campaign." [B30]

“Ease of access for the public – don’t need an appointment to see a pharmacist.” [E454]

“Easy access to services – no appointment needed.” [E363; C302]

“Easy accessibility”. [E357]

"Location." [C267].

“Pharmacists have more time, so can offer better support than GPs.” [B77]

The next free text question asked community pharmacists what they considered the negative aspects of public health services from community pharmacy and how these could be improved. I again received a number of diverse comments. Points raised included, commercial pressure from employers [due mainly to *organisational climate/culture – social influences*]; lack of training [*knowledge and skills*]; funding challenges [*environmental context and resources*]; and lack of privacy and premises arrangements [*environmental context and resources*]. As well as, distractions and lack of commitment from community pharmacists [*environmental context and resources and behavioural regulation*]; lack of awareness [*knowledge*] (ten respondents); lack of time [*environmental context and resources*] (seventeen respondents); workload and stress [*environmental context and resources and emotion*] (six respondents); inconsistency in service delivery [*environmental context and resources*]; and isolation [*social influences - team working*]:

Various (environmental context and resources)

“Too much expected in a working day, funding is the major issue.” [B32]

Lack of training (knowledge and skills)

“Lack of training for certain services for pharmacists, for example, advising patients on Orlistat if diet and exercise not solely effective.” [E310]

“Lack of training. Non-regular pharmacists.” [RC196]

Funding (environmental context and resources)

“Not paid enough for services that are provided.” [B132]

“Cost to patient.” [C257]

“Seen as an ‘add-on’ by staff, for which we are not directly remunerated.” [C296]

“Too many free items and services available. Many people take just advantage of that without any real improvement.” [RE354]

Privacy/Premises (environmental context and resources)

“Lack of discretion.” [B115]

“Lack of privacy.” [E420]

“Small space and little time. Second pharmacist [is needed].” [RE406]

Distraction/Lack of commitment (environmental context and resources, and intentions)

“Lack of support by employers to deliver services.” [C157]

“Pharmacist(s) too bogged down with dispensing and not focused on the other services.” [B121]

“People can easily abuse the system – visit multiple pharmacies for free services. There should be electronic registration in place like Scottish Electronic Minor Ailments System (eMAS).” [E454]

Lack of awareness (knowledge)

“Lack of knowledge from patients and others that services are offered.” [RC191].

“Not enough advertising.” [B48]

“Archaic mentality of what pharmacists do.” [C255]

“Lack of understanding of pharmacists’ skills and capabilities by patients; and lack of engagement from GPs and other clinical disciplines. Media score stories, which represent only a small, tiny minority of profession.” [E390]

“Negative connotation, due to association with ‘commerce’, that is, ‘just a shopkeeper’.” [B30]

“Some essential services need to be more appreciated (e.g. MUR, NMS).” [B60]

“Public reception.” [B108]

“Perception as prescription providers; public awareness campaigns; national services.” [E347]

“Misconception we’re shopkeepers.” [B86]

“Some people don’t want to be helped or have interference in their lives.” [E448]

Lack of time (environmental context and resources)

“Not implemented properly. No time for pharmacists to spend all day on front counter.” [RE442]

“Lack of time means services are done half-heartedly.” [RC244]

“More time should be allocated to provide services.” [RB144]

“Time constraints.” [RE372]

“Time constraints and commercial pressure.” [RC185]

“Time restraints.” [RE414]

“Time again!” [RE336]

“Space and time.” [RE362]

“Time pressure, lack of funding/resources.” [RC280]

“Pharmacist has too many roles and too little time.” [RE385]

“Lack of pharmacist’s time.” [C243]

“Pharmacists have too many tasks to do constantly.” [C169]

“Time constraints and remuneration.” [C300]

“Not enough time to carry out all services.” [E374]

“Lack of time/workload.” [E363]

“Lack of time.” [E446]

“Time-consuming.” [RC245]

Workload/stress (environmental context and resources, and emotion)

“Extra workload on top of overcrowded daily work,” [C198]

“Workload of pharmacists is dangerously high, so potential issues with more work,” [C239]

“Workload and insufficient staff,” [B35]

“Pharmacists have too many tasks to do constantly,” [C169]

“Because free and no appointments, patients come in together and expect to be seen right away, which isn't always possible,” [E382]

“Can be distraction from dealing with medication issues,” [RE359]

Inconsistency (environmental context and resources)

“Inconsistent – national programmes should be developed.” [B109]

“Sporadic services dependent on what a company offers and funds, no consistency due to lack of either funding or willingness of companies to fund services.” [E444]

“We need to work as one – multiples and independents. Some service specification in every pharmacy you go to.” [B37]

“Companies that own pharmacies should not be involved in activities which show conflict of interest, e.g. selling cigarettes.” [B123]

Isolation (social influences – team working)

“No mechanism for sharing with other members (of the healthcare profession) what we have done.” [C264]

None

“None.” [C267]

Interestingly, 83.3% of my respondents (C.I., ± 7.97) also agreed with the statement, ‘The public health role of community pharmacists in UK is still undeveloped in the 21st century’. For those respondents that said ‘yes’ to this question, some of the reasons they gave revolved around the quality of services provided from community pharmacies, hence, the problem of lack of consistency in service delivery [*environmental context and resources*]; and lack of time to deliver public health services [*environmental context and resources*]. In addition, lack of training [*knowledge and skills*]; lack of awareness [*knowledge*]; difficulty

adapting to changing needs [*behavioural regulation*]; feeling undervalued and unrecognised [*social influences, lack of identity*]; and lack of focus [*inadequate behavioural regulation*]. However, some of my respondents also highlighted the fact that community pharmacy practice is highly accessible. I listed these comments below:

Consistency (environmental context and resources)

“Too much variation between areas, doesn’t allow us to build continuity of service.” [B115]

“Pharmacists’ role in medicine optimisation should be championed as this the mainstay of most treatments and concordance would help with prevention and wastage.” [B32]

“People still visit their GP for minor ailments. One reason for this could be because prescriptions are free in Wales.” [C257]

“By now pharmacists should be delivering National Minor Ailment Schemes across the UK. Pharmacists should be funded to deliver enhanced services beyond smoking cessation; EHC; methadone provision; and weight management.” [E390]

“Pharmacists should interact more with patients/customers, as there are too many intermediate professional figures between pharmacist and customer/patient.” [RE354]

Lack of time (environmental context and resources)

“Pharmacists have so much to do, all at once, it is difficult to spend time – devoted time – and concentrate on public health services.” [RE372].

“We have a lot of experience and knowledge but not the time to provide the services.” [RC244]

“No time.” [RE406]

Training (knowledge and skills)

“Knowledge of public health varies within pharmacy due to lack of adequate training. So NHS seems to ignore the potential of health on the high street and tends to signpost to nurses or GPs.” [E444]

“We are expected to provide a service without specific teaching or training – all we do is learning on our own or through one’s own experiences.” [E382]

“We need more scope to be able to discuss issues with patients.” [E448]

Awareness (knowledge)

“Pharmacists can do a lot more to contribute to public health. Our biggest hurdle is educating the public that we are the first point of call and recognised by NHS.” [RB27]

“Patients are still unaware of the extent of our role within the healthcare structure.” [C157]

“Not enough publicity.” [B83]

“Still not perceived by many of the public that pharmacy has a role to play.” [C296]

“The general public is still unaware of the role of a pharmacist. More advertising of these services would highlight role.” (E310)

Adaptation (beliefs about capabilities)

“Pharmacist(s) are not adapting to the changing needs of this service. Pharmacist(s) [are] really placed to provide public health services.” [B121]

“Less checking of prescriptions and more time to counsel.” [RE385]

“Can do more.” [RC245]

Access (environmental context and resources)

“Easy access for the public.” [RB144]

Undervalued/Recognition (professional/social role & identity, and reinforcement)

“The IT systems are a joke and in my opinion not enough is being actually done to free up pharmacist time. Our profession is being devalued constantly by reduced payments and ever increasing pressure to perform.” [RE442]

“There are good new examples such as the flu vaccination, but on the whole pharmacy is under-utilised or not remunerated for services done free.” [B123]

“Look at the role of pharmacists in other countries. We are good, but not world leaders.” [RC185]

“Many patients will still prefer to go to the doctor as they don’t fully understand the role of the pharmacist.” [RE411]

“We seem to be 10 years behind everyone else. GPs have all the power.” [RC 196]

“So much knowledge gone to waste.” [RC162]

“Lack of funding/resources, poor collaboration with other healthcare professionals, poor understanding of pharmacists’ skills among public.” [RC280]

“There are many services, e.g. vaccinations that can be handed over completely to pharmacies and haven’t.” [B29]

“The pharmacist role isn’t seen as provider of this role, it’s seen as only provider of patients’ medication.” [B109]

“Under-used.” [RE414]

“Shopkeeper, not seen as a professional person.” [B86]

“Massive, trained workforce, (but, are) criminally under-used and unpaid.” [B30]

“Role of pharmacists not recognised, appreciated or remunerated.” [C198]

“Public health bodies don’t seem to realise the potential pharmacists can offer.” [B37]

“We are not used efficiently.” [C300]

“Underdeveloped pharmacists; qualifications not advertised to public properly.” [C239]

“Not enough responsibilities given to pharmacists; too many hurdles to get accredited.” [B117]

“Not even credit given to pharmacists.” [B108]

“More can be done. Pharmacists are under-utilised.” [C267]

Focus (intentions and goals)

“Yes, pharmacy could do more but can’t do everything.” [C169]

“Pharmacists do loads of work that doctors less do, which should be done by doctors.” [B60]

“There is still too much focus on high volume dispensing.” [E347]

In addition, my questionnaire also sought the opinion of UK community pharmacists on how community pharmacy-based public health services could be developed in the future (Table 7). Their responses revealed that a minority of community pharmacists (34.1%, C.I. ± 10.07) would like pharmacies to employ their own public health advisers. Thirty-four percent of respondents (C.I. ± 10.07) indicated that they were unsure, with 31.7% (C.I. ± 9.88) rejecting the idea. However, only 8.2% (C.I. ± 5.83) of my respondents said they would like community pharmacies to devolve all such work to non-pharmacy-based public health practitioners. The majority of respondents (67.1%, C.I. ± 9.98) rejected the suggestion.

On the other hand, the majority of respondents also indicated that they would want community pharmacists to reach out to the community and run public health programmes in libraries or other community meeting places (53%, C.I. ± 10.6); community pharmacies to develop into Healthy Living Pharmacies (68.7%, C.I. ± 9.96); and pharmacists to develop their own expertise in public health (89.3%, C.I. ± 6.6).

Table 7. Suggestions on How Community Pharmacy-based Public Health Services Could Be Developed in the Future

Survey questions	Disagree (%)	Strongly disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)
Pharmacies employing their own PH advisers? (n = 140)	28.2	3.5	34.1	25.9	8.2
Devolve all work to PH practitioners? (n = 139)	45.9	21.2	24.7	3.5	4.7
Pharmacists reaching out to public places? (n = 140)	15.3	11.8	20.0	42.4	10.6
Community pharmacies developing into HLPs? (n = 138)	3.6	6.0	21.7	43.4	25.3
Pharmacists developing their own expertise? (n = 139)	2.4	2.4	6.0	63.1	26.2

The provision made for other comments revealed many other suggestions:

Opportunity (optimism)

“One library in one local area, but many pharmacies in one local area. Uptake is great, far more than channelling the services to other places.” [RB144]

Referral (social influences – team working)

“GPs and clinicians actively referring patients to pharmacists for intervention.” [E390]

4.2.3 - Tests for Significance and Correlation of Variables

4.2.3.1 - Tests for Significance of Variables

I also performed tests for the significance of variables in my analysis (Significance level = $p < 0.05$) (Appendix 5a-20). I noticed some significant differences in the manner my male and female respondents answered the questions on enhance patients’ self-management capacities ($p = .012$; $\eta^2 = .071$) [see Appendix 5a-7], time pressure and workload (median = 4.0; 5.0 respectively, $p = .028$; $\eta^2 = .055$), insufficient funding from the government (5.0; 4.0, $p = .007$; $\eta^2 = .082$) and how essential community pharmacists provide public health services (1.0; 2.0, $p = .023$, $\eta^2 = .060$) (Appendix 5a-7)? This means that the likelihood of the result being a matter of chance is only 5 in 100. My male respondents were more likely to agree with the suggestion to enhance patients’ self-management capacities.

On the question on low success rates for public health services, those aged 40-49 (median =

1.5), 50-59 (median = 2.5), 60-69 (median = 2.0) and 70-79 years (median = 2.0) were less likely than other age groups to agree that this was a barrier to enhancing the public health role of community pharmacists in the UK (total median = 3.0; $p = .019$; $\eta^2 = .152$) (Appendix 8c, 9 and 10). In addition, those respondents aged 60-69 (median = 5.0) were more likely to agree than other respondents (total mean = 4.0) that UK community pharmacies should develop into Healthy Living Pharmacies ($p = .005$; $\eta^2 = .191$) (Appendix 8f, 9 and 10).

Regarding the questions on safety, while 'pharmacists' (median = 4.0) were more likely, 'pharmacy managers' (median = 2.0), 'superintendent pharmacists' (median = 2.5) and pharmacy contractors/superintendent pharmacists (median = 1.0) were less likely to agree than the rest of respondents that 'Safety concerns by GPs' was a barrier ($p = .042$; $\eta^2 = .146$; total median = 3.0) (Appendix 14d, 15 and 16). At the same time, 'pharmacists' were more likely (median = 4.0), and 'pharmacy contractors/supt. pharmacists' (median = 1.0), 'supt. pharmacists' (median = 1.0) and 'locum pharmacists' (median = 2.0) less likely than other respondents ($p = .016$; $\eta^2 = .178$; total median = 3.0) to agree with the suggestion that pharmacies should employ their own public health advisers (Appendix 14e, 15 and 16).

Based on location, respondents from Cardiff (median = 2.0) were more likely to participate in local authority-run schemes than other respondents ($p < .001$; $\eta^2 = .296$; total median = 1.0) (Appendix 17a, 18 and 19). However, when it came to changing the UK undergraduate pharmacy curriculum, respondents from Cardiff (median = 3.0) were less likely than other respondents to agree that the public health content of the UK undergraduate curriculum should be increased ($p = .024$; $\eta^2 = .087$; total median = 4.0) (Appendix 17a, 18 and 19). Respondents in Edinburgh (median = 5.0) were more likely than other respondents to agree to the suggestion that pharmacists should enhance their role in the management of polypharmacy (total median = 4.0). This difference was significant ($p = .040$; $\eta^2 = .076$) (Appendix 17b, 18 and 19). Moreover, I also found a significant difference on the question 'Lack of support from GPs', with respondents from Edinburgh (median = 3.0) less likely than other respondents to agree that this was a barrier ($p = .001$; $\eta^2 = .155$; total median = 4.0) (Appendix 17d, 18 and 19). However, respondents from Cardiff (median = 3.0) were more likely, and respondents from Barnet and the surrounding areas (median = 1.0) less likely to agree that it was essential that patients get public health services from community pharmacies ($p < .001$; $\eta^2 = .185$; total median = 2.0) (Appendix 17f, 18 and 19). Also

significant was the fact that respondents from Cardiff (median = 3.0) were less likely than other respondents to support community pharmacies developing into Healthy Living Pharmacies ($p = .026$; $\eta^2 = .090$; total median = 4.0) (Appendix 17f, 18 and 19).

4.2.3.2 Tests for Correlation of Variables

At the same time, a number of variables also correlated to a significant level of $p < .05$ (Spearman's ρ , ρ) (see appendix 20). I found a correlation between the gender of respondents and the way respondents answered the question 'Offer dual MPharm (or even PharmD)/MPH degrees?' Spearman's correlation coefficient, $\rho = -.247$, significant to level (2-tailed), $p = .020$ (Appendix 20). Male respondents were more likely than female respondents to support dual MPharm (or even PharmD)/MPH degrees. I found a similar pattern of significance with the question 'Enhance patients' self-management capacities?' ($\rho = -.268$; $p = .012$) (Appendix 20).

In addition, there were correlations between the age of respondents and the way they answered the questions on 'is programme fully funded by local authority?' ($\rho = -.240$; $p = .041$), pharmacy students training with other healthcare students ($\rho = -.261$; $p = .015$), and pharmacists working closely with healthcare practitioners ($\rho = -.221$; $p = .040$) (Appendix 20)? In other words, as the age of respondents increased, their support decreased for students training with other healthcare students; pharmacists working closely with healthcare practitioners; and their 'yes' answer to the question, 'is programme fully funded by local authority?'. Still, there were correlations between the year of qualification and the way respondents answered the questions on, 'enhancing community pharmacists' involvement in smoking cessation' ($\rho = .243$; $p = .023$) and 'remunerate pharmacists directly for public health services' ($\rho = -.242$; $p = .024$)?

Regarding barriers, my male respondents were more likely to agree that 'Insufficient funding from the government' was a barrier ($\rho = -.269$; $p = .011$). There were also negative correlations between age of respondents and their likelihood of agreeing that difficulties in recruiting patients ($\rho = -.224$; $p = .036$) (Appendix 20); low success rates for public health services ($\rho = -.281$; $p = .008$) (Appendix 20); and language barrier ($\rho = -.212$; $p = .049$) (Appendix 20) were barriers to enhancing the public health role of community pharmacists in the UK. Moreover, my female respondents were more likely to say 'yes' to the question, 'how essential is it that patients get public health services from community pharmacies?' [ρ

= .216; $p = .045$].

4.2.4 - Strengths and limitation of the survey

4.2.4.1 – Strengths

This survey identified a number of strategies as well as barriers (which if tackled), could help enhance the role of UK community pharmacists in public health. Inclusion of free text comments in the report supported my survey findings. This study also incorporated effect size, which is relatively unaffected by the sample size (Clark-Carter 2003; Abelson 1995), in its calculations. This has an advantage in that it is possible to compare the findings of this survey with studies that have used different sample sizes (Clark-Carter 2003). In this study, I have also included p values as well as confidence intervals (C.I.) in the reports. Still, the test for correlation and significance of variables enabled me to determine any relationship or even association between variables. Finally, I maintained confidentiality throughout by ensuring that I did not identify informants by quotes from the data (Ford and Reutter 1990).

4.2.4.2 – Limitations

The response rate for my survey was very low (23.28%), with added limitation in that I selected respondents only from certain regions of the UK. This could have implications on the ability to generalise my findings to wider UK population. Highlighted above, are some the limitations associated with the measurement of correlation coefficient (section 3.4.4). Yet it is worth reiterating that correlation is a measure of association, not causation. Just because two variables are highly correlated, this does not imply that one causes the other. There are usually many factors involved (Reid 1996), particularly as there could be other variables affecting the relationship that the researchers may not know about (Jaffe 2010).

4.2.5 - Conclusions

My survey of UK community pharmacists helped confirm many of my key findings in the review of knowledge and information, particularly concerning increasing the public health content of the undergraduate curriculum (*knowledge and skills*); pharmacy students training closely with other healthcare students (*social influences - team working*); pharmacy graduates working closely with other healthcare providers (*social influences - team working*); teaching students about content-specific/advanced communication techniques (developing communication *skills* and *team working*); and developing good adherence

strategies for patients (enhancing *behavioural regulation*). In addition, there were also indications that the majority of my respondents would want community pharmacists preventing the spread of infections and managing antimicrobial resistance (*behavioural regulation*), enhancing patients' self-management capacities (*behavioural regulation and beliefs about capabilities*), and enhancing safe medication disposal methods (*behavioural regulation*). However, the majority of respondents would like community pharmacists to enhance their *skills* in the management of polypharmacy and long-term conditions and their involvement in smoking cessation (*behavioural regulation*), and for students to be provided with advanced experience in public health (*knowledge and skills*).

Interestingly, the majority of my survey respondents also confirmed most of the barriers I identified in my review of knowledge and information. Notably they included insufficient funding from the government (*environmental context and resources*); time pressure and workload (*environmental context and resources*); lack of patients' records (*memory, attention and decision processes*); lack of understanding by the public of the training and skill-sets of pharmacists (*knowledge*); and lack of understanding by healthcare providers of the training and skill-sets of pharmacists (*knowledge*). In addition, I reconfirmed a number of these barriers in the survey's free text comments. I also identified additional barriers from the free text comments, including commercial pressure (*environmental context and resources*), difficulty following up with patients (*environmental context and resources*), conflict of interest - notably, between GPs and community pharmacists (*professional identity/boundaries/role*), lack of publicity (*knowledge*) and the complaint that pharmacists are being under-utilised (*beliefs about capabilities and identity*).

In addition, tests for significance indicated that there were a number of significant differences in the way respondents answered some of the questions, in terms of gender, age, role in the pharmacy and location of practice ($p < .05$). In some instances, the effective size magnitude of these differences (Eta squared, η^2 , with Anova), were 'large' (0.14) (Nandy 2012). In addition, a number of these variables were significantly correlated ($p < .05$). There is therefore a need to put these differences into consideration when policies around the role of community pharmacists in public health are developed.

4.3 - Content Analysis

The aim of my content analysis was to examine the pattern of the UK undergraduate pharmacy curricula, teaching and learning policy. Hence, I present below the characteristics of the 28 UK Schools of Pharmacy included in my analysis, as well as the nature of their curricula, in terms of the components (subject areas), with emphasis on how Public Health as a module, is taught in various schools.

4.3.1 - Characteristics of UK Schools of Pharmacy

At the time of my research activity, there were 29 Schools of Pharmacy in the UK (GPhC 2015). Of these, 28 were included in my study. The only school that was not included in my study, the School of Pharmacy, University of Lincoln, was omitted because it was not fully functional at the time I started my analysis in May 2014. In 2014, the University of Sussex, was undergoing the GPhC accreditation, and was meant to begin its pharmacy programme in 2016 (Anon 2015b). Characteristics of the UK Schools of Pharmacy included in my content analysis (Figure 8 and 9) indicated that 12 of the 28 schools analysed (42.8%) were established after the year 2000. The remaining schools were established in 1800-1849 (17.8%) [five]; 1850-1899 (14.3%) [four]; 1900-1949 (39.3%) [eleven]; and 1950-1999 (7.1%) [two]. In terms of location, two schools were located in Northern Ireland; one in Wales; two in Scotland, and twenty-three in England (Figure 9). All twelve pharmacy schools established after 2000 are located in England.

Following my content analysis, I found that UK pharmacy schools were teaching a number of different subjects in the undergraduate pharmacy education. These included pharmacology, biochemistry, anatomy, physiology, pharmaceuticals, pharmaceutical technology, pharmaceutical chemistry, microbiology, clinical pharmacy and pharmacy practice (dispensing, counselling, etc.), drug discovery and formulation, pharmacognosy, medicinal chemistry, business/management related topics, research, public health, etc. Often, some of these subjects were arranged or grouped together under different names and headings.

According to the curriculum of one of the pharmacy schools I analysed (School of Pharmacy, King's College, London),

“... Staff-led ‘contact’ time includes timetabled classes such as lectures, lab practicals, tutorials, workshops, seminars and demonstrations.” (KCL 2015)

In addition to contact time, students are also expected to undertake directed private study, including independent work, such as lab reports, essays, assessments and project work, which could amount to approximately 2,000 hours over the four years' training (*knowledge and skills* development) (KCL 2015).

However, based on the Group Query and Visualisation results with NVivo, I was able to also confirm that the curricula of most UK pharmacy schools were more dominated by the sciences, clinical studies, modules on skills development (e.g. production (formulation) and dispensing activities), research and law and ethics. Some of these are presented in Appendix 21-32. On the other hand, their emphasis on subject areas such as management/business studies and public health were often minimal, and in some cases optional. The fact that many aspects of the theoretical domains framework (Michie, et al. 2005), are not adequately covered in the curricula of UK Schools of Pharmacy is the most obvious impact.

4.3.2 - Clinical Studies

For clinical studies (*knowledge and skills*), some of the topics covered by UK Schools of Pharmacy included cancer care, case studies, diagnosis of illnesses, illnesses, infection control, one-to-one interactions with patients, patient-centred care, pharmacology of medicines, prescribing, psychiatry, treatment, etc.

In particular, for 'patient-care', which was the most coded word under the main coding 'clinical', I found statements in the pharmacy schools' curricula, such as:

“... Patient-based case studies to develop your patient-centred skills” “... and the use of medicines for individual patients.” (Aston SoP)

In the case of the pharmacy curriculum at Durham University, I found patient-care statements such as,

“You will meet patients during this level (Level 1) and will be exposed to various areas of practice as well as a range of healthcare settings outside of pharmacy.”

4.3.3 - Skills Development

Regarding skills development (*skills*), many of the UK Schools of Pharmacy felt that this was relevant to students' employability and future career progression. Hence, some of their curriculum statements reflected this:

“The curriculum is presented as integrated modules that develop your understanding of the pharmaceutical and biomedical sciences in ways that demonstrate their importance to problems encountered by pharmacists in practice – so that you understand the relevance of what you are learning for your future

practice.” [University of Bradford, School of Pharmacy].

4.3.4 - Sciences

One of the criticisms against the UK undergraduate pharmacy curriculum has been its huge emphasis on the sciences (*knowledge* and *skills*) at the expense of public health (as well as clinical) modules, at a time when this has changed in many countries such as the USA, Canada, France, etc. (Agomo 2011, 2012c; Chapman 2014). According to pharmacist Mathew Smith from Cardiff School of Pharmacy and Pharmaceutical Sciences:

“I would get rid of loads of the science ... Around 99% of our students are going to be pharmacists and not going in to the pharmaceutical industry; if you look at those who do, it’s training on the job now, rather than at undergraduate [level].”
(Chapman 2014)

The curricula of most UK Schools of Pharmacy reflected this emphasis on the sciences, for example:

“The first year develops your knowledge of the basic scientific principles underpinning pharmacy” and, “The second year extends your understanding of the pharmaceutical sciences – the chemistry of different drug groups ...” [Aston SoP].

4.3.5 - Research

As regards research (*knowledge* and *skills*), the curricula of UK pharmacy schools also revealed that this was an important component of the undergraduate pharmacy training. For example, at Birmingham SoP, its curriculum stated that:

“In this year [Year 4], you’ll also be introduced to healthcare research methodology and undertake a substantial individual research project, which may have a laboratory-based scientific theme, or a professional or clinical focus in a healthcare environment.”

4.3.6 - Law and Ethics

Law and ethics have always been part of pharmacy practice (*beliefs about consequences* and *behavioural regulation*), particularly as it pertains to the use of medicines and the care of patients. The curricula of many UK pharmacy schools indicated this association. An example being the Level 2 curriculum at Durham SoP, which stated that:

“Finally you will learn how the law relates to the practice of pharmacy and how we are involved in protecting the public from the potential harm associated with the use of medicines.”

4.3.7 - Management

Due to the commercial nature of the profession, particularly community pharmacy practice, I expected business and management studies to be important topics in the undergraduate

pharmacy curriculum. However, from the findings of my content analysis, there was nothing to suggest that this importance was widely reflected in the curricula of UK pharmacy schools. The exception may be the School of Pharmacy, University of Brighton, where a ten-credit module in 'Business Studies for Pharmacists' is offered at Level 7 (final year). The school, however, provided no further information in their curriculum concerning the content of this module.

4.3.8 - Public Health

During my code development stage, I developed the following main codes for public health: accessibility; addiction; adherence; ageing; assessment; barriers; benefits; communicable disease; deficiency; definition; delivery; devices; emergency; empowerment; epidemiology; errors; evaluation; holistic; organisation; pharmacoeconomics; pharmacovigilance; poverty; prevention; risk factors; safety; self-care; surveillance; and well-being (see Figure 10 and 11). In addition, as revealed by another Group Query I conducted, in terms of coding, I noticed that there were a number of variations with the public health content of the curricula of UK pharmacy schools. Visually, the curricula of pharmacy schools such as the University of Portsmouth, Robert Gordon University and the University College London (UCL) seemed to contain more topics related to public health than those of the other UK pharmacy schools (see Figure 11). Regarding the specific topics covered in public health (see Figure 11), I also noticed that the emphasis of many UK pharmacy schools seem to be on safety (*emotion – fear and threat*), risk factors (*emotion - threat*), disease prevention (*emotion - threat*), adherence (*behavioural regulation – goal priority*) and addiction (*behavioural regulation*). Many of these fit within what Truong and Patterson (2010) describe as micro-level public health activities. On the other hand, there seems to be less teaching on public health areas such as assessment, pharmacovigilance (*knowledge and skills*), poverty alleviation (*beliefs about capabilities – empowerment*), surveillance (*knowledge and skills*), emergency preparedness (*environmental context and resources (stressors) and emotion – threat*), evaluation and epidemiology (*knowledge and skills*)- topics that represent more macro-level public health functions (Truong and Patterson 2010).

4.3.9 - Word Frequency Query

One activity with NVivo involved performing a Word Frequency List Query of the curricula of the 28 UK Schools of Pharmacy (for the 100 most frequent words, with a minimum word

length of three letters). A summary of the word frequency query results (Table 8) showed that the most frequently used words were: 'pharmacy' (count, 442; weighted percentage, 1.25); 'drug' (count, 277; weighted percentage, 0.78); 'course' (count, 274; weighted percentage, 0.77); 'students' (count, 254; weighted percentage, 0.72); and 'pharmaceutical' (count, 247; weighted percentage, 0.70). Ranked much lower in the word frequency query results was the word, 'public', which may or may not necessarily be associated with the term of interest, 'public health' (count, 60; weighted percentage, 0.17). However, the word, 'health' was ranked much higher in the table (count, 205; weighted percentage, 0.58).

Table 8. Word Frequency Query Results (with 100 most frequent words; minimum word length of 3 letters) - Summary

Word	Length	Count	Weighted Percentage (%)
pharmacy	8	442	1.25
drug	4	277	0.78
course	6	274	0.77
students	8	254	0.72
pharmaceutical	14	247	0.70
year	4	231	0.65
practice	8	223	0.63
health	6	205	0.58
module	6	204	0.58
clinical	8	194	0.55
skills	6	186	0.53
medicines	9	176	0.50
credits	7	174	0.49
learning	8	171	0.48
drugs	5	157	0.44
describe	8	142	0.40
understanding	13	141	0.40
coursework	10	135	0.38
patient	7	134	0.38
professional	12	134	0.38
knowledge	9	125	0.35
study	5	125	0.35
use	3	122	0.34
based	5	120	0.34
assessment	10	111	0.31
research	8	111	0.31
care	4	105	0.30
also	4	104	0.29
hours	5	103	0.29
lectures	8	102	0.29
level	5	101	0.29
development	11	99	0.28

disease	7	99	0.28
including	9	99	0.28
bradford	8	98	0.28
modules	7	95	0.27
pharmacology	12	94	0.27
mpharm	6	93	0.26
management	10	92	0.26
teaching	8	92	0.26
practical	9	89	0.25
student	7	88	0.25
chemistry	9	87	0.25
programme	9	86	0.24
pharmacist	10	85	0.24
treatment	9	81	0.23
studies	7	80	0.23
university	10	80	0.23
used	4	80	0.23
patients	8	77	0.22
pharmacists	11	77	0.22
systems	7	75	0.21
linked	6	74	0.21
within	6	73	0.21
demonstrate	11	72	0.20
principles	10	72	0.20
first	5	71	0.20
semester	8	70	0.20
structure	9	70	0.20
formulation	11	69	0.19
may	3	69	0.19
medicine	8	69	0.19
two	3	68	0.19
methods	7	66	0.19
aspects	7	65	0.18
introduction	12	65	0.18
therapeutics	12	65	0.18
develop	7	64	0.18
stage	5	64	0.18
information	11	63	0.18
science	7	63	0.18
academic	8	62	0.18
team	4	62	0.18
work	4	62	0.18
cancer	6	61	0.17
design	6	61	0.17
school	6	61	0.17
able	4	60	0.17
delivery	8	60	0.17
physiology	10	60	0.17
public	6	60	0.17
role	4	60	0.17
diseases	8	59	0.17
provide	7	59	0.17

products	8	58	0.16
time	4	58	0.16
material	8	57	0.16
action	6	56	0.16
new	3	56	0.16
review	6	56	0.16
system	6	56	0.16
issues	6	55	0.16
case	4	54	0.15
current	7	54	0.15
outline	7	54	0.15
mechanisms	10	53	0.15
staff	5	53	0.15
dosage	6	51	0.14
understand	10	51	0.14
one	3	50	0.14

However, Weber (1990) argues that several assumptions underlie this mode of analysis, the salient one being that the most frequently appearing words indict the greatest concerns. While this is likely to be generally true, Weber (1990) warns about two cautions, which need not to be ignored. The first caution is that it is possible to use one word in a variety of contexts, and in some cases, one word may have different meanings. Word frequencies may indicate far greater uniformity in usage than actually exists; raising some questions about the validity of inferences from word frequency data (Weber 1990).

The second caution is that the use of synonyms and/or pronouns for stylistic reasons can lead to the understating of actual concern with particular words or phrases (Weber 1990).

While word frequency lists can disclose changes or differences in emphasis between documents, Weber (1990) also warns that they need to be used with caution, particularly as word frequencies do not disclose a lot about the associations among words. Instead, he advises that having employed ordered word frequency lists to flag up words of possible interest; the researcher should then use Key-Word-In-Context (KWIC) lists for retrievals from text to test hypotheses concerning the larger context of symbol usage. In my content analysis, I employed both the NVivo visualising method and the search for key words, based on the word frequency list and my coding, to collect some meaning regarding the pattern of UK undergraduate pharmacy curricula, teaching and learning policies.

Next, I used NVivo to visualise the pattern of my coding for individual Schools of Pharmacy [with the source selected in *List View*: **Right-click > Visualize > Chart Document Coding**].

Some of these representations are presented in Appendix 21-32, and revealed that in many of the Schools of Pharmacy, my most coded words were often 'clinical', 'science', 'dispensing', 'production' and then 'research' (*Knowledge and skills*). The exceptions included, for example, the Schools of Pharmacy at Kingston, Huddersfield, Reading and De Montfort, where 'experiential', 'public health issues', 'professionalism' and 'skills' were the most coded words, respectively. In general, from both the word frequency search and visual representation of my coding, 'public health' was often a lesser priority in the curricula of UK pharmacy schools.

When I investigated further some of the specific public health-related issues covered by UK pharmacy schools, I found that only a number of Schools of Pharmacy, namely, Bath, Bradford, De Montfort, Hertfordshire, Manchester, Portsmouth and UCL (all in England) mentioned the word 'safety' (*beliefs about consequences – perceived risk/threat*), in whatever form (including 'public health safety', 'patient safety', 'health and safety', etc.), in their curricula. This was further confirmed when I performed a text search of the UK pharmacy schools' curricula. There were also some indications from the content analysis that the older Schools of Pharmacy and those established in England between 1900 and 1949, discussed 'safety' more in their curricula than other schools (see Figure 12). This query was performed by selecting the coding 'safety' from Nodes (NVivo), then **Right-click > Visualize > Chart Document Coding by Attribute Value**].

An example of 'public health safety' being reflected in the school curriculum was in the 'Clinical Pharmaceutics module' provided by the UCL SoP for Year 4 students. Here the university stated that one of the aims of the module was to enable students to "Appreciate safety, efficacy and quality of medicines for children". In the University of Manchester, School of Pharmacy 'Pharmaceutical Care' module for Year 4 students, the curriculum stated that this was:

"An integrated unit covering evidence-based practice, health economics, prescribing, *patient safety* and pharmaceutical care," and aimed at, "develop(ing) students' core knowledge and problem-solving skills relating to *patient safety*, prescribing and pharmaceutical care."

Regarding my coding for 'risk factors', I realised that these were coded for programmes run by five universities: Hertfordshire, UCL, Queens University Belfast, Huddersfield and

Portsmouth. At the School of Pharmacy, University of Hertfordshire, the Year 4 module, 'Travel Health' (optional) had the following description:

"The aims of this module are to give the student advanced understanding of theoretical and practical knowledge in all elements of travel health. The module will cover the role of the pharmacist in travel health promotion and prevention of illness. ... The course content will include risks of travel in different countries ..."

At the School of Pharmacy, University of Portsmouth, the Year 1 Pharmacy Practice Syllabus Outline covered among other topics, 'factors affecting the treatment process'. During the Year 2 module in 'Public Health (Promoting Public Health)', students were then taught 'Adverse Drug Reactions (ADRs) – their prevention, detection and management; the role of the pharmacist in minimising risk associated with drug therapy.' Yet, the school taught students in the same module,

"Epidemiology of disease and determinants of public health, including lifestyle, employment status, air quality, crime, housing; health education and promotion roles for pharmacists in areas such as: child health, smoking cessation, exercise, diet and obesity, contraception and sexual health, alcohol consumption, vaccination, patients with long-term conditions, services for drug misuse and encouraging self-care."

In addition to these, I also coded for the word 'prevention' against a number of pharmacy schools. However, it seems that the teaching of preventative care at different pharmacy schools, were in a variety of ways. For example, in the Year 1 programme of the School of Pharmacy, University of Wolverhampton, I found statements such as, "... you look at infection and immunity ..." and in the final year, "... your studies will deal with treatment of infectious diseases, pharmaceutical public health and clinical pharmacy". During the Level 2 pharmacy programme at Durham University, the curriculum stated:

"You will learn how medicines are preserved and the process that cause premature breakdown of medicinal products ... and how we are involved in protecting the public from the potential harm associated with the use of medicines."

Other methods adopted by other UK Schools of Pharmacy to teach illness prevention included, for example, the 'Pharmacy Practice' module at Queen's University Belfast, 'Promoting Healthy Lifestyle'; teaching to final year pharmacy students at Keele University about public health and health promotion; and a topic at Nottingham University that ensured that students,

“Appreciated the causes and systems of cardiovascular diseases ... [as well as] ... patient counselling and lifestyle advice.”

There were also indications from my content analysis of the curricula of UK pharmacy schools that some of the schools were also providing some level of training in issues surrounding ‘adherence’ and ‘addiction’. Regarding adherence, Cardiff University School of Pharmacy delivered this topic through a Year 3 module titled ‘Optimisation of Pharmaceutical Care’. At the UCL SoP, the ‘Pharmacy Practice’ module in Year 2 helped students to ‘distinguish the concepts of compliance, adherence and concordance’. The understanding of adherence was further enhanced during the Year 3 training at UCL SoP, in another pharmacy practice module, by enabling students to ‘undertake a basic medication review’. However, at the School of Pharmacy, University of Portsmouth, ‘adherence’ was introduced early to students in the Year 1 module, ‘Pharmacy Practice’. Some of the topics covered in the module included:

“Factors affecting the treatment process. The function of medicines and the rational use of medicines. Sociological and behavioural aspects of the use of medicines. Medicines adherence. The placebo effect.”

In addition, I also examined some of my less frequently coded words for public health further, e.g. surveillance, poverty, pharmacovigilance, evaluation, epidemiology, emergency and assessment, with some interesting findings. A unique module taught in the pharmacy programme at Robert Gordon University, Aberdeen, titled ‘Public Health for Pharmacists’ included the,

“...Topics include: healthcare policy relating to pharmacy; health surveillance; health-related data; health needs assessment; epidemiology; pharmacovigilance; pharmaco-economics; application of evidence-based practice; health technology assessment; systematic review; pharmaceutical service development; service specification and implementation; business case; audit; evaluation; governance.”

However, the need to tackle global poverty was the focus of the Year 4 module, at UCL SoP, ‘Health Care, Drug Use and Pharmacy in Developing Countries’:

“The World Health Organisation believes that pharmacists could make a greater contribution to health care in developing countries. This module will provide an overview of health care, disease patterns, the use of medicines in low-income countries ...”

Interestingly, the module also highlighted the fact that:

“Examination of these issues requires an interdisciplinary approach drawing on

material and research from a range of perspectives ...”

Finally, while the role of pharmacists in ‘emergency preparedness’ is identified in my paper (Agomo 2012a), surprisingly this was not much reflected in the curriculum of UK pharmacy schools, as my content analysis identified the words ‘emergency’ and ‘emergencies’ in the curricula of only three Schools of Pharmacy: University of Hertfordshire, University of Portsmouth and University College London. I found for example that at the School of Pharmacy, University of Portsmouth, one of the topics taught in the Year 3 module, ‘Pharmaceutical Care’, was on:

“Dealing with medical emergencies and the provision of first aid.”

The word ‘emergency’ when it appeared at UCL SoP was referring to hormonal replacement, taught under a pharmacology module, ‘Endocrinology and Associated Diseases’.

However, Truong and Patterson (2010) argue that there is a need for pharmacists to contribute to macro-level public health functions (i.e., assessment, policy development and assurance at the population-based level). In my content analysis, I therefore determined the extent to which these macro-level public health activities were represented in the curricula of UK pharmacy schools.

The word ‘assessment’, which I found in the curricula of some Schools of Pharmacy, for example, at Bath, Keele, Brighton, Durham and Ulster, was referring to coursework assessment(s), rather than to public health or health needs assessment. The only exception I identified was at the School of Pharmacy, Robert Gordon University, Aberdeen where the indicative module content for the Year 4 module, ‘Public Health for Pharmacists’ included,

“Healthcare policy relating to pharmacy; health surveillance; health-related data; health needs assessment; epidemiology; pharmacovigilance; application of evidence-based practice; health technology assessment; systematic review; pharmaceutical service development; service specification and implementation; pharmacoconomics; business case; audit; evaluation; governance.”

Again, the word ‘policy’, was often not related to public health policy development, but instead, was in many cases broadly associated with pharmacy practice, as I found at the School of Pharmacy, Medway University (‘Integrated Patient Care’):

“The course will cover developments in pharmacy legislation taught in previous years and other legislation and policy relevant to the practising pharmacist.”

Although I identified that policies as related to public health/health were being taught in Schools of Pharmacy such as, Huddersfield, Portsmouth and RGU, none of them seemed to be about influencing policy development in public health (*behavioural regulation – action planning*).

Regarding assurance at the population level, when the word 'assurance' appeared in the curricula of UK pharmacy schools (e.g. at Brighton, UCL, Cardiff and Manchester), they were referring to the quality assurance of pharmaceutical products rather than to public health assurance:

"K11 - an appreciation of the principles of quality and quality assurance mechanisms in appropriate aspects of scientific and professional activities." [Brighton SoP - Part 2 course details for CH143 and CH344]

"Design, Formulation and Quality Assurance of Medicinal Products" [Year 3 – Cardiff SoP].

4.3.10 – Strengths and limitations of my content analysis

4.3.10.1 – Strengths

I enhanced the reliability of my analysis by showing how well the results were linked with my data, linking references, describing clearly the context, selection and characteristics of my participants, as well as my process of data collection and analysis. Part of the process involved comparing codes within and across participants, noting patterns and discrepancies, and drawing conceptual maps to examine relationships between themes (see also Graneheim and Lundman 2004; Polit and Beck 2004).

4.3.10.2 - Limitations

My data analysis relied mostly on information available from Schools of Pharmacy websites. These curricula contents may not necessarily be an accurate reflection of the state of affairs in these institutions, in terms of completeness or being up-to-date, at the time the analysis was undertaken. I cannot therefore rule out the possibility of bias. Finally, the sheer quantity of the data analysed, was both daunting and overwhelming (Elo and Kyngäs 2008).

4.3.11 - Conclusions

In my content analysis of the curricula of UK Schools of Pharmacy, I found that the number of UK Schools of Pharmacy has more than doubled since the year 2000, to its present

number (> 29). There was however, no indication that this sharp increase in the number of pharmacy schools has had any massive impact on the way public health is taught to students in the UK, particularly as public health remains an optional module in many UK Schools of Pharmacy. In many UK pharmacy schools, several issues related to public health were often taught integrated with other modules. However, dominated in most of the curricula I analysed were traditional pharmacy modules designed to enhance students' *knowledge* and *skills* in the sciences, dispensing, production, research, law and ethics, and clinical pharmacy (see Figure 13). Nonetheless, as argued by Truong and Patterson (2010) on the US pharmacy system, there is also a need to develop the skill-sets of UK pharmacy students in macro-level public health activities.

Reflecting on my content analysis process, the fact that a few number of UK pharmacy schools had a summarised version of their curricula on their websites hampered slightly its robustness. Some of these schools did however provide a more detailed curriculum when I approached them for assistance. A couple of pharmacy schools were, however, unwilling to provide further information about their curricula.

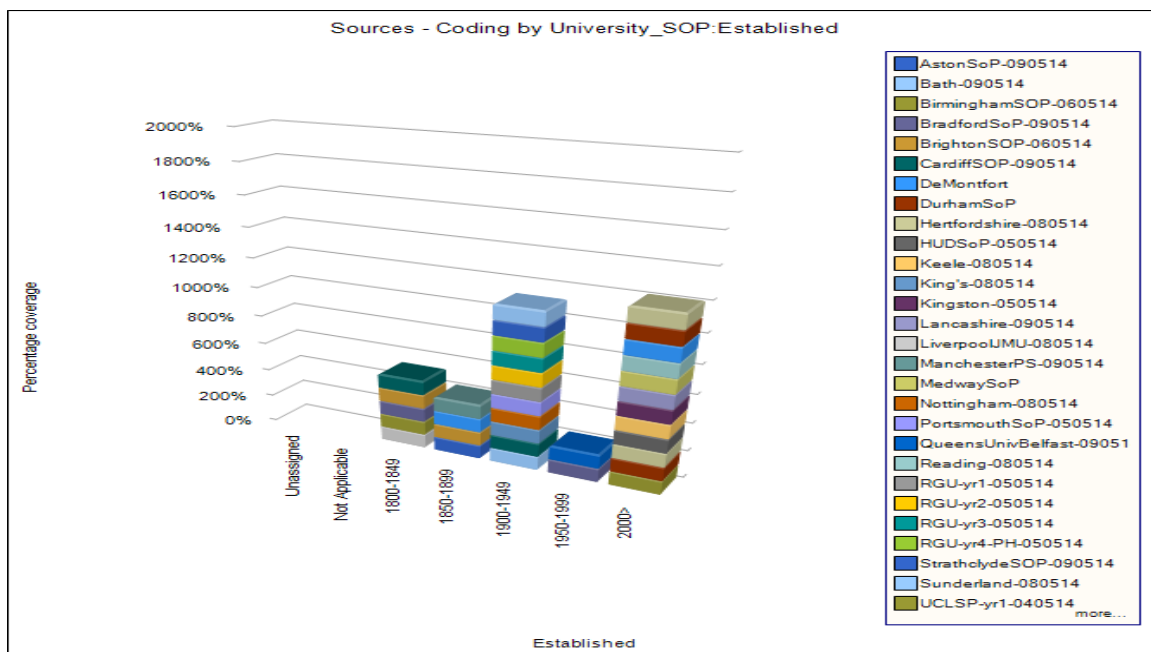


Figure 8. Characteristics of UK Schools of Pharmacy - Year Established

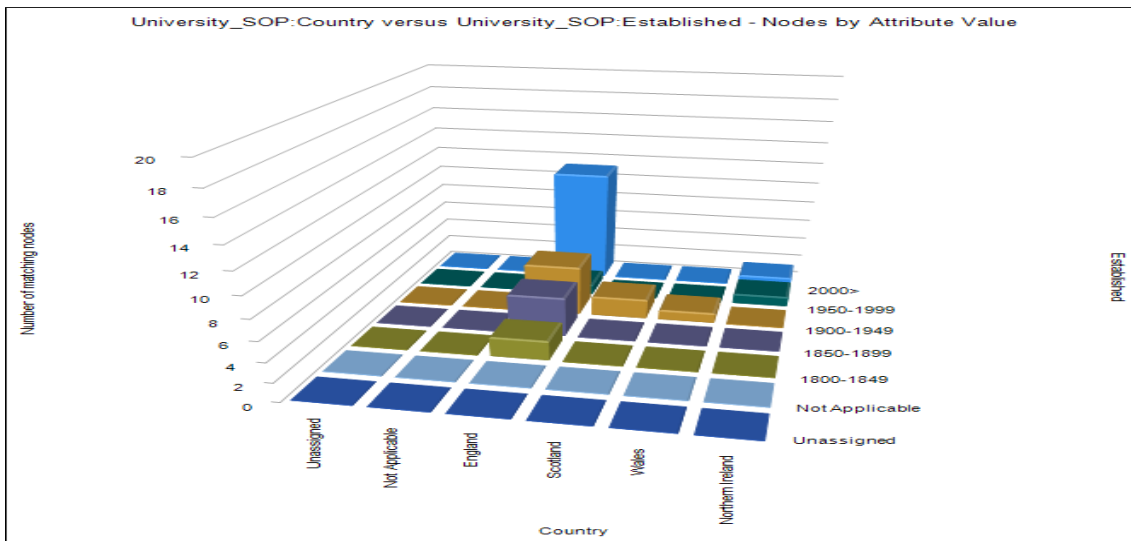


Figure 9. UK Schools of Pharmacy - Location Versus Year Established

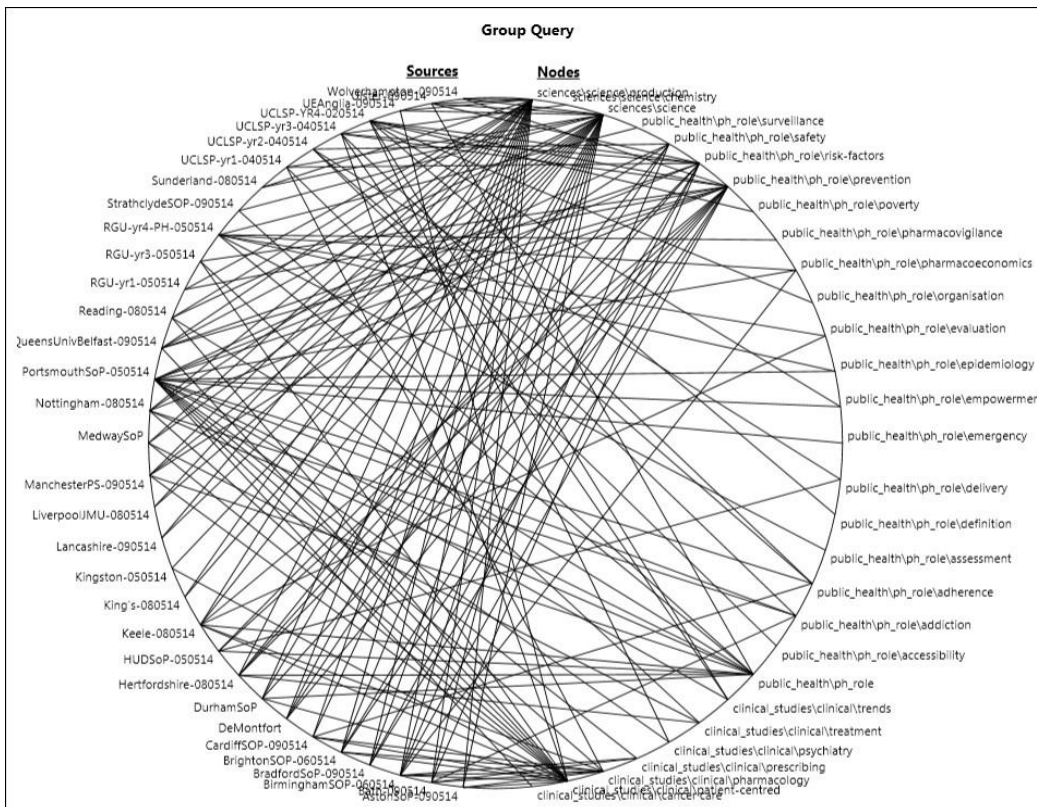


Figure 10. Group Query Indicating Public Health, Clinical and Science Curricula of UK Schools of Pharmacy

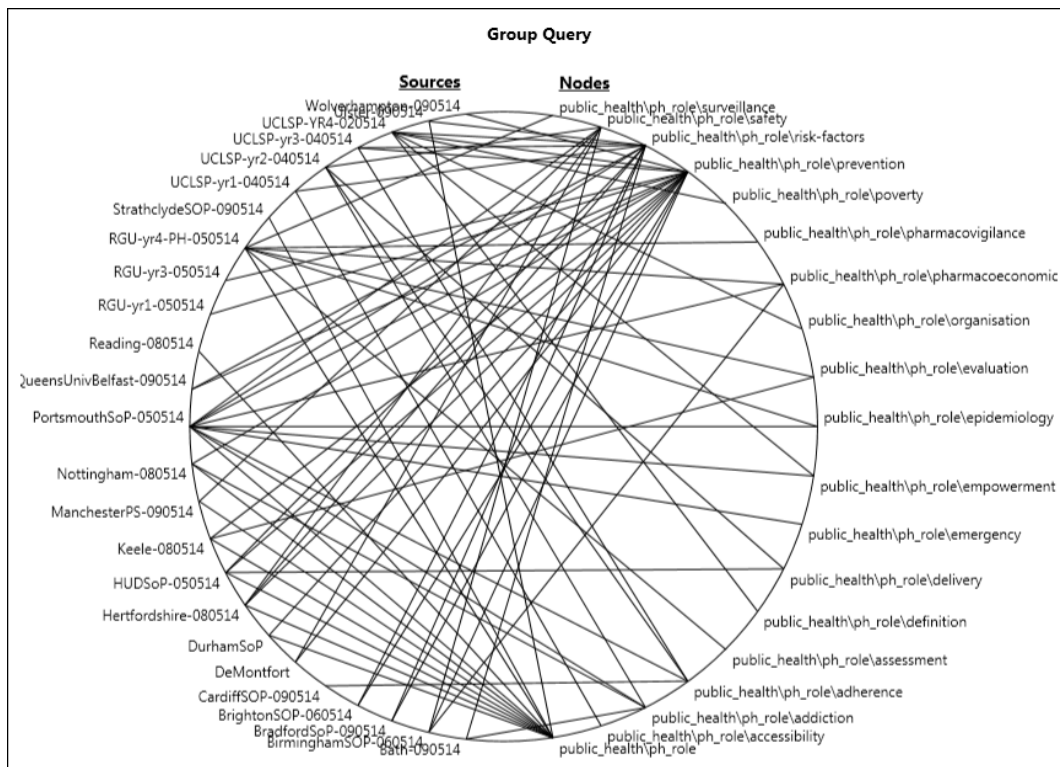


Figure 11. Group Query Indicating the Public Health Curricula of UK Schools of Pharmacy

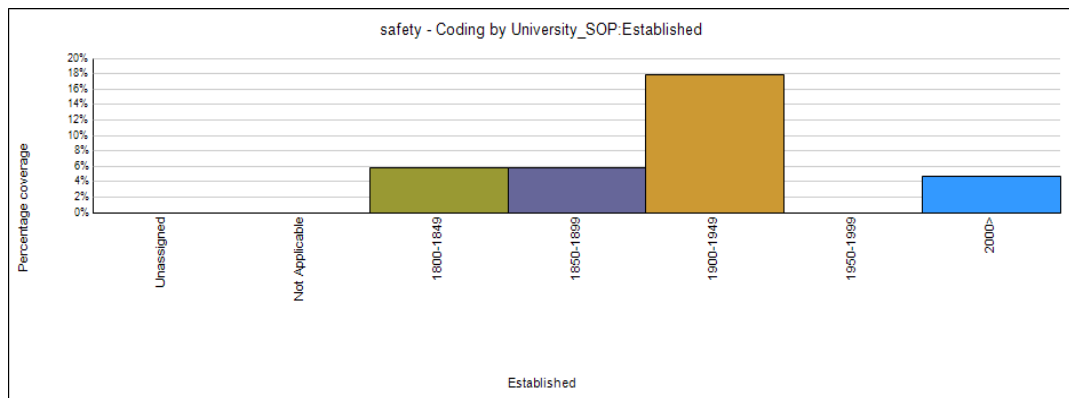


Figure 12. Coding for 'safety' by Schools of Pharmacy (England)

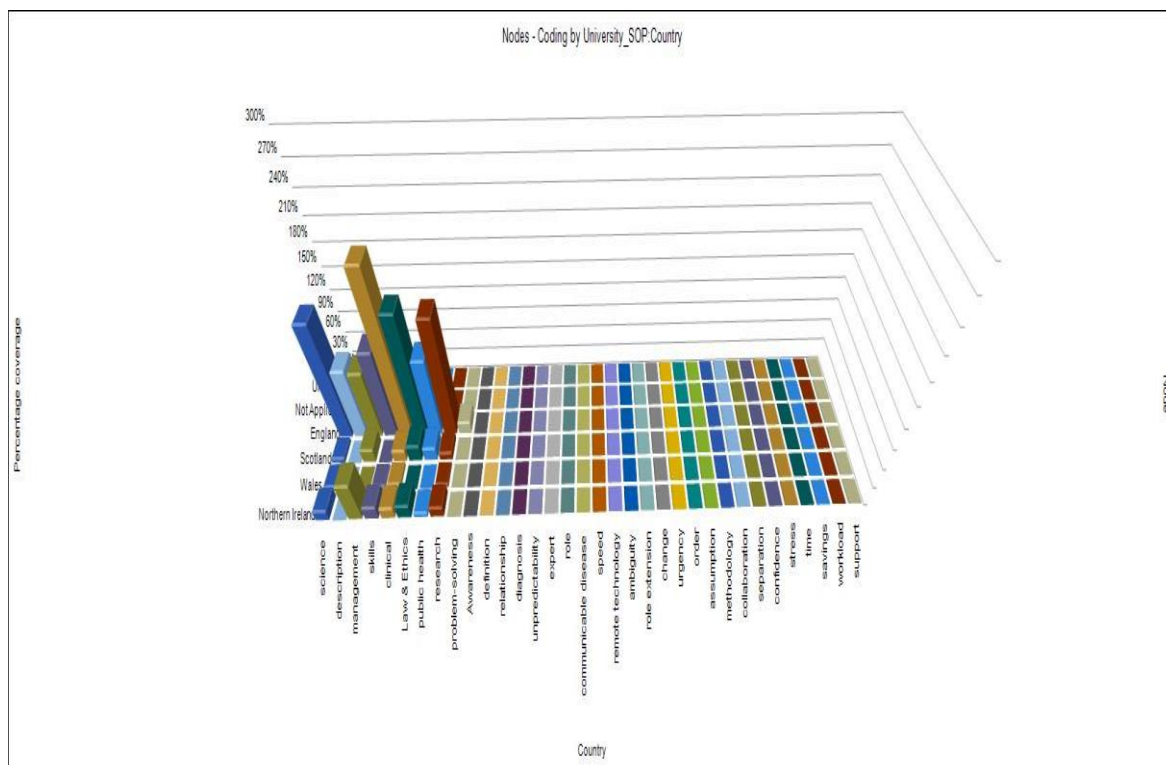


Figure 13. Node Coding by University vs Country

4.4 - Interviews with Healthcare Professionals

4.4.1 - Introduction

In my review of knowledge and information, I identified a wide range of strategies needed to enhance the public health role of community pharmacists in the UK (see Tables 1a and 1b). The dominant themes included strategies enhancing the public health role of community pharmacists through the Expert Patients Programme, enhanced communication techniques, smoking cessation activities, advanced pharmacy practice experience in public health, and the enhancement of the public health content of pharmacy curricula.

The findings of my survey of UK community pharmacists largely confirmed many of the key findings from my review of knowledge and information. At the same time, the majority of my survey respondents also confirmed most of the barriers identified in my review of knowledge and information. I confirmed various barriers or identified new ones in the free text comments, including commercial pressure, difficulty following up with patients, conflict of interest, lack of awareness, community pharmacists being under-utilised, etc. In my content analysis of the curricula of UK Schools of Pharmacy, I found that while many schools

discussed issues related to public health, traditional modules, designed to enhance students' knowledge and skills in the sciences, dispensing, production, research, law and ethics and clinical pharmacy, dominated most curricula. Most of the studies I identified in my review of knowledge and information however originated from outside the UK, with findings that often could not be generalised to the UK, due to differences in health systems, practices and laws. Hence, to make some of these findings relevant to the UK, there was a need for me to conduct a survey of UK community pharmacists as well as interviewing healthcare professionals to identify strategies enhancing the public health role of community pharmacists in the UK.

In my interviews with healthcare professionals, I explored further some of my findings by assessing the opinion of practitioners on: changing the UK undergraduate pharmacy curriculum to increase its public health content and UK pharmacy schools offering dual MPharm/MPH degrees; pharmacy students training closely with other healthcare students and, later, graduates working closely with other healthcare providers (for example GPs and nurses); teaching content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists; and the adoption of new technologies in community pharmacy practice.

I conducted my interviews by telephone (supported by Skype) using the interview guide (Appendix 4), which I developed with the assistance of my academic adviser and academic consultant. My interview guide also explored some of the benefits of and barriers to enhancing the public health role of community pharmacists in the UK. I present below the characteristics of the healthcare professionals I interviewed and my interview findings.

4.4.2 - Characteristics of Healthcare Professionals Interviewed

Fifteen healthcare professionals were included in my interviews. Nine (60%) were female (Figure 14) and the majority of interview participants (seven [46.7%]) were aged 50-59 (Figure 15). The following groups of healthcare professionals were included in my interviews (Figure 16): GP partner (1); pharmacy manager/superintendent pharmacist (1); pharmacist/PhD student (1); hospital pharmacists/tutor (1); nurse practitioner (1); GP locum (2); community intern pharmacist (1); community locum pharmacist (4); community relief pharmacist (1); pharmacy manager/pharmacist (1); and community pharmacist (1).

Fourteen of the healthcare professionals I included in my interviews were based in the

United Kingdom, and one (a community pharmacist), was previously based in the UK, but had now relocated to the United States of America.

Following my telephone interviews with the healthcare professionals, I identified a number of themes (categories) that emerged from my data analysis. The most frequently cited issues by interview participants regarding enhancing the public health role of community pharmacists in the UK were around accessibility of public health services, benefits in the public health role, barriers in the public health role, public health safety, and public health issues such as, illness prevention and empowerment (Figure 17). However, my interview participants said not much on public health issues such as managing risk factors, managing errors, communicable diseases, or public health topics such as epidemiology, assessment and ageing.

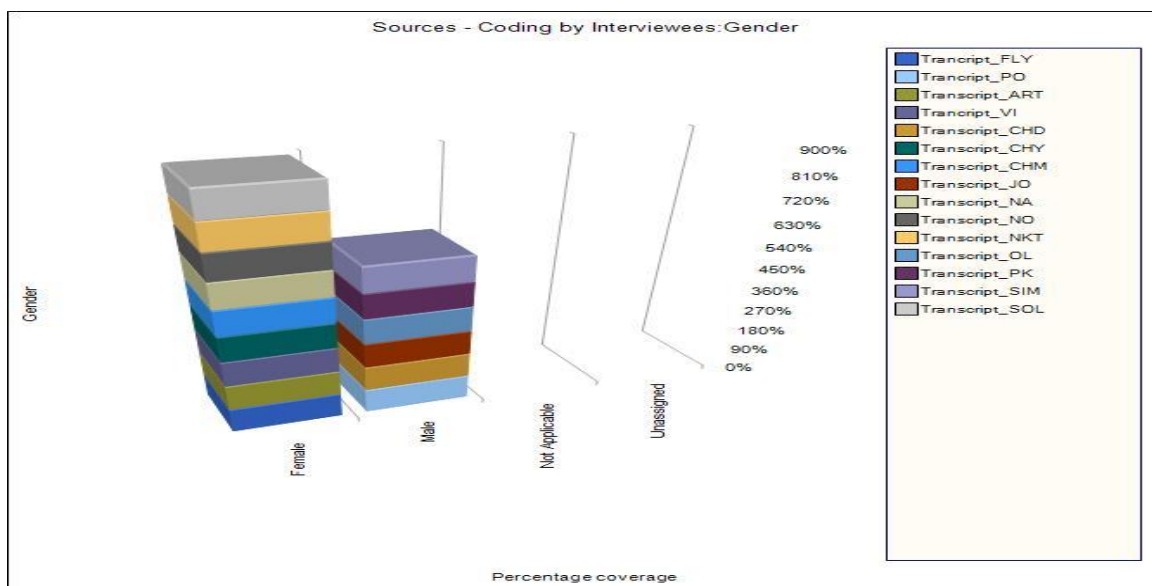


Figure 14. Gender of Interview Participants

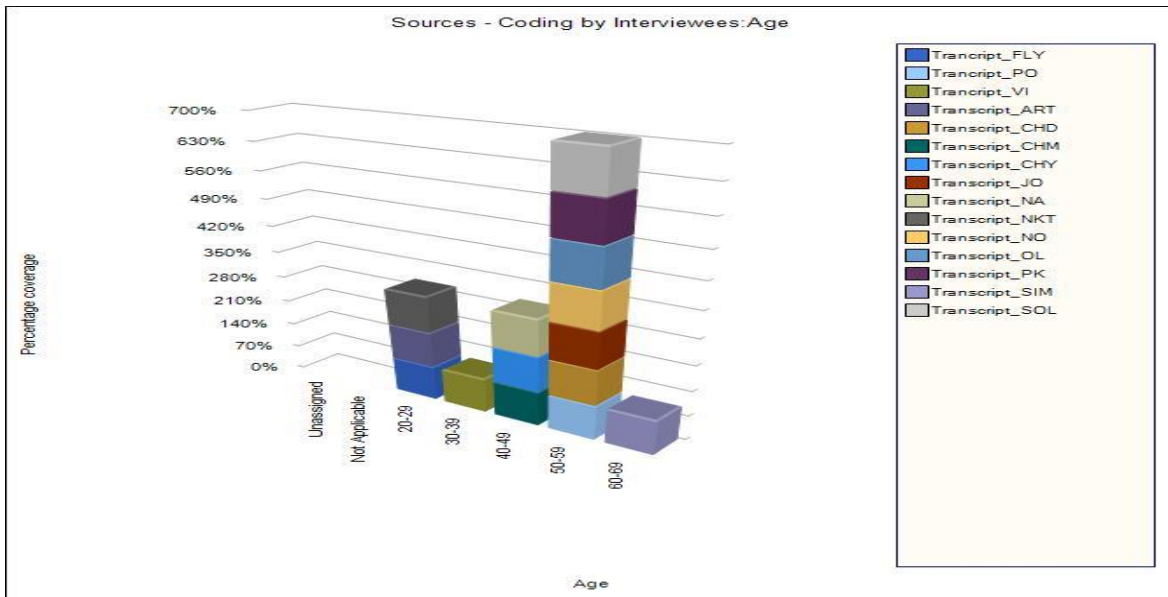


Figure 15. Age of Interview Participants

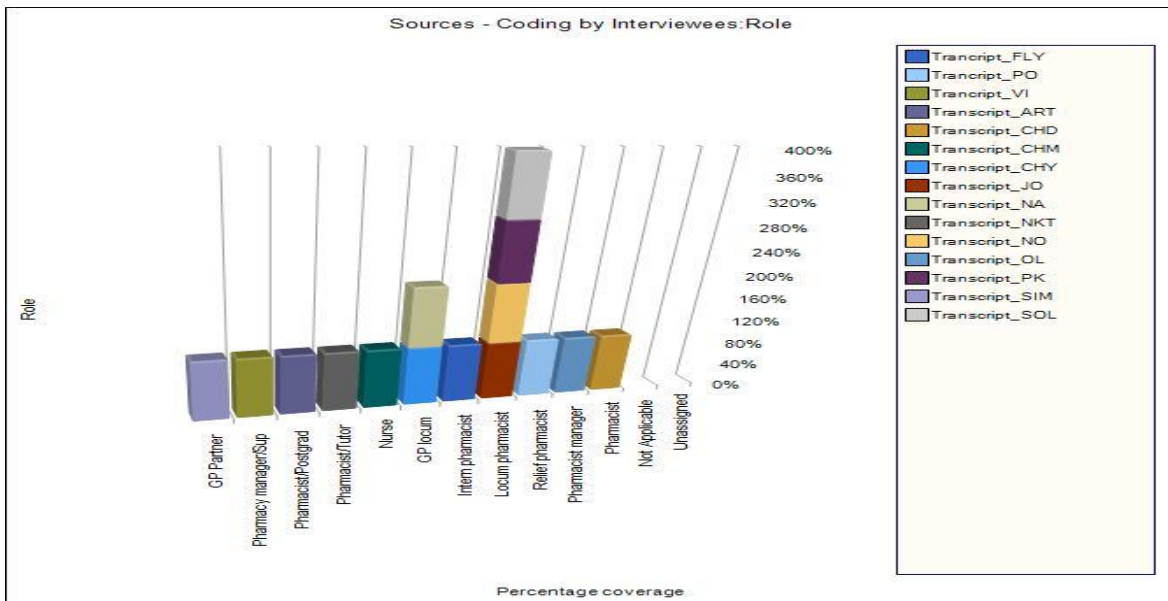


Figure 16. Role of Interview Participants

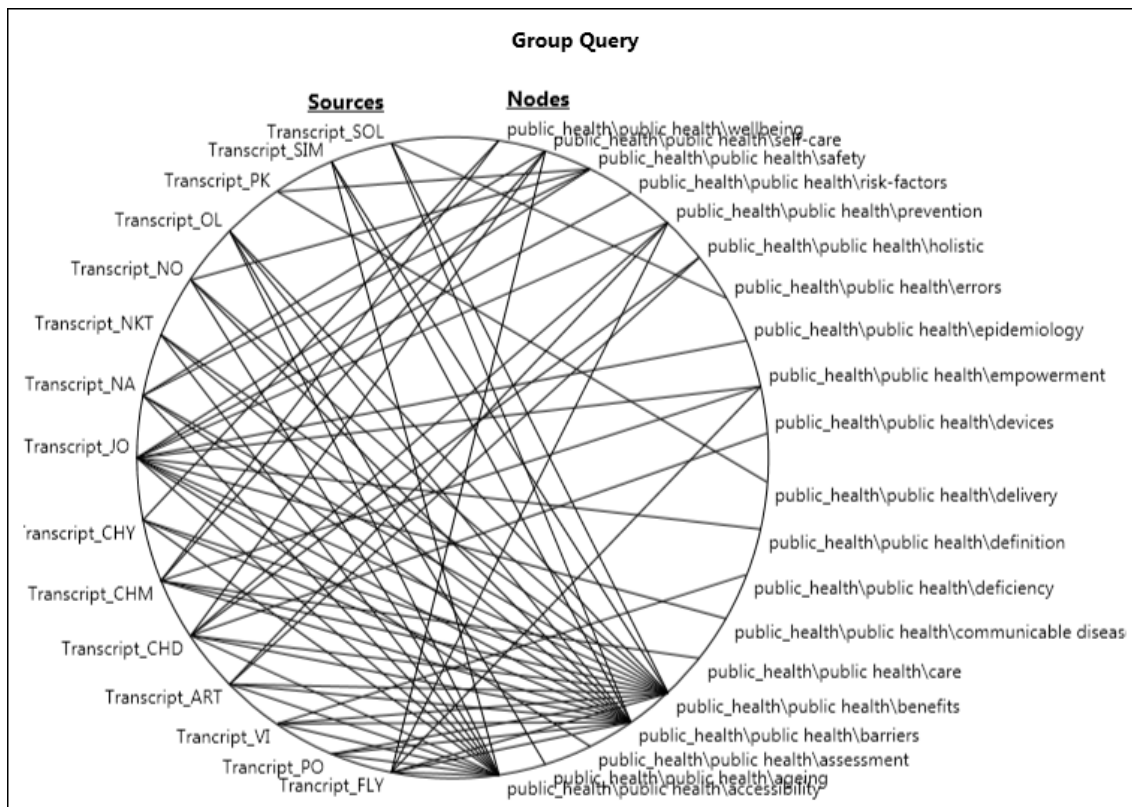


Figure 17. Nvivo Group Query for Public Health Coding

4.4.3 - Enhancing the Public Health Role of Community Pharmacists in the UK

My participants suggested a number of strategies needed to enhance the public health role of community pharmacists in the UK.

4.4.3.1 – Enhancing training in public health and clinical skills

One of my participants highlighted the need to enhance the undergraduate and postgraduate training/awareness of pharmacists in public health (as well as clinical skills), as I identified in my survey of community pharmacists (Agomo and Ogunleye 2014) and the literature (Brown, et al. 2007; Patterson 2008; Truong and Patterson 2010; Whitley 2010; Eades, et al. 2011) [*knowledge and skills*]. Based on his experience from overseas, the US-based pharmacist, who is also fairly experienced with the UK pharmacy practice, highlighted how the health system in the US, is presently utilising the skills as well as the accessibility of community pharmacists (*environmental context and resources*) in the delivery of public health services, particularly as it relates to flu, pneumonia and childhood immunisations.

“I think then they're supposed to undertake a more in-depth training during the

under-graduation. If they were given to have more clinical skills, because at the moment, like if I take smoking cessation as an example, it's like we only do it like as impromptu service, and yes I know that they say that pharmacy people don't need appointments and things like that, but I feel that for the public to trust us more, we need to really do more clinical stuff, during our undergraduate training or even post-graduation, to say to people who will be going into a public health role, be it smoking cessation, weight loss management, I think we need a bit more clinical knowledge.” [PR_FLY]

4.4.3.2 – Creating awareness among pharmacists

At least two other participants also highlighted the need to create more awareness (*knowledge*), as well as enhancing the public health training of pharmacists (*knowledge and skills*). One of these, a pharmacist, also suggested that pharmacists should also work with other healthcare professionals (*social influences [Norms] – team working*). The other participant, a GP partner, would like pharmacists to be more accessible to the public (*environmental context and resources*); particularly as this will help meet patients’ demand for greater choice and accessibility of healthcare (Por 2008). Another GP speaking from her experience, also reinforced the need for public awareness, in addition suggesting a referral system (*social influences - team working*), with the overall impact being that this could help minimise the present wastage of NHS resources (*environmental context and resources*).

“I know from my own experience, we see a lot of patients with minor illnesses that come to the GP and I think this is a waste of time. A person says I have had fever yesterday; my nose is running ... that's it. You see them, especially in the winter months; you see a lot of that. So, what can be done more is ... patients can be educated more ... like give them a list of conditions that, 'these things, you don't really need to see your GP, you don't really need to be crowding the A&E, go to your pharmacist'. Your pharmacist obviously is the one that will say, that thing is beyond me, and you go and see your GP. But, I think also, maybe providing, I don't know whether you can have like, triage services?” [GP-CHY]

4.4.3.3 – Empowering pharmacists in public health activities

However, two other pharmacists who felt that not much could be achieved without the support of these very important groups also highlighted the wider issue of empowerment by the public, the commissioning and regulatory bodies (*beliefs about capabilities*). Yet, this might also mean enhancing the public health training of pharmacists [*knowledge and skills*] (Brown, et al. 2007; Eades, et al. 2011), remunerating pharmacists directly for providing public health services [*environmental context and resources*] (Trapskin, et al. 2009; The Scottish Government 2013), as well as enhancing the professional autonomy of pharmacists (*social/professional role and identity*), as also suggested by some respondents.

“I think quite a lot can be done, but then again you know, this effort has to come from the top people really, people, government, pharmacists, or [those] shaping pharmacy into how it is ... They say community pharmacists ... have a major role to play in everything, but the way the pharmacy system works, this should come from the people, the governing bodies ... so that it flows down to we, the pharmacists, and ultimately down to the communities.” [P-VI]

A participant had specifically suggested that pharmacists should be remunerated directly (*environmental context and resources; reinforcement*) rather than their employers for providing public health services. According to him, as pharmacists are responsible for public health services from the pharmacy (*skills*), he reasoned that direct remuneration could be an incentive (*reinforcement*) for them to provide more of such services:

“So, whoever is acting in the capacity of the function for today, is taking responsibility for every aspect of public health, they're responsible for and they should be remunerated accordingly and not the business. You understand? So, that is what I am saying. So, there are many, many roles pharmacists can do, if value is place on them to do it, if they're remunerated accordingly and they are able to fill the gap, they're going to be paid for the purpose.” [P-OL]

4.4.4 – Enhancing public health through the use of new technologies and social media

On the use of new technologies in public health, including some of the evolutions in social media (Cain, et al. 2010), the views were also varied, with some of my participants identifying beneficial impacts on the wider public health activities provided by pharmacists (*skills*) and a few highlighting concerns (*emotion – fear and threat*) about confidentiality and safety.

4.4.4.1 – Benefits associated with the use of new technologies and social media

One participant talked about the use of popular software such as Twitter, Instant Messaging and Facebook in public health activities; citing an example where Instant Messaging is used in non-pharmacy organisations such as Currys®. On the other hand, the nurse practitioner saw the use of new technologies as an avenue, which community pharmacists could use to attract the younger population, who are often hard to reach, to the pharmacy (memory, attention and decision processes - attention). Yet, another of my participants saw the use of new technologies in public health as innovative and likely to bring benefits to community pharmacy public health campaigns (*behavioural regulation – facilitator*). Highlighting his experience in the United States of America, my US-based community pharmacist participant described other situations where the use of new technologies could help enhance the public health role of community pharmacists, for example, for recording public health activities from community pharmacies (*memory, attention and decision processes*), which could also be useful in emergency situations. He went on to describe the use of visual technologies to help patients learn how to use medical devices (*beliefs about capabilities: self-efficacy*), even from a distance.

“I think it can only be a good thing isn't it? We are living in such a technologically advanced world, everything is online, and everything is on Twitter, Facebook, or whatever. I think if we can utilise that in some way for pharmacists that will be great. I know for instance, like some of our colleagues at [a named university], they work for online pharmacies, so people just submit their prescriptions online and it's all dispensed and ready to collect ... so it's going that way, isn't it? ... But in terms of public health, I do not know, maybe, if there was a number you could call that [had] more pharmacists at the other end. Then again, nurses, which is what the NHS 111 often is or NHS direct, when you rang it ... I mean it will be great to maybe have a line like, that that was more pharmacists ... You could ask for help.” [P-NKT]

While, one of the GP participants had also argued that not making use of new technologies could amount to a waste of time and resources (*environmental context and resources*), one of my pharmacist participants reckoned that the use of new technologies could also be extended to other pharmacy services, such as Medicines Use Reviews (MURs) in patients' homes (*knowledge, and beliefs about capabilities: self-efficacy*), and linked to the GP practice (and maybe, pharmacy and hospital) computers [*social influences - team working*]. In addition, some participants also believed that the use of new technologies could also

serve as a useful tool for public awareness (*knowledge; memory, attention and decision processes - attention*). Although, Cain, et al. (2010) acknowledge that implementing health interventions via social media poses challenges, they also highlight the fact that several examples exist that display the potential for pharmacists to use social media in health initiatives.

4.4.4.2 – Drawbacks Associated with the Use of New Technologies and Social Media

On the negative side, one participant (a GP) revealed her concerns regarding confidentiality (*emotion – fear and threat*). While she was personally not too keen on the use new technologies, however, she did acknowledge that social media could be useful in hard-to-reach groups. One pharmacist participant was however, against the use of new technologies, purely for the reason that he did not believe that the use of new technologies is the direction pharmacy should be heading; stressing that pharmacy is a personal service. Instead, he would prefer community pharmacies to be stocked with basic instruments for health checks, etc. (*environmental context and resources*). A similar comment on the use of new technologies was also expressed by another GP (an older GP Practice Partner), who saw their use in practice as a waste of resources by the government that desperately wants to save NHS money (*manage resources*). He seemed to agree with the pharmacist participant that there is nothing compared to personal service (*skills – interpersonal skills*). Although another older pharmacist participant (P-SOL), was not a friend of new technologies (*emotion - fear*), she did however see some benefits in the use of new technologies in practice, particularly as they reflected the changing times (*environmental context and resources - person x environmental interaction*).

“There is a plus side of it, but patient confidentiality is important that we protect that. So, it is one-to-one advice. Not so sure, I will be keen on the new technologies. However, in appealing to a broader and perhaps, harder to reach groups, who may not actually present to the health professionals, then I think social media will be useful in that respect.” [GP-NN]

4.4.4.3 – Suggestions on the use of new technologies and social media in public health

When I asked my interview participants if they had any specific suggestions of new technologies that could be used in community pharmacy practice, I received a number of suggestions, including the “development of diagnostic tools” (P-PO), the use of the “EPS 2 system” (P-VIV), “telephone systems”, social media tools such as “Smart Messaging Service

(SMS)", "Twitter" and "Facebook" (P-JO), with one participant suggesting the use of "robots" (N-ART) as well as some of the implications associated with its use. For one of the participants, there is a need to extend the use of new technologies to include Patients' Medication Records (PMR). This could then be linked to software on iPads (*environmental context and resources*). "The pharmacists must be able access that information [patients' medication record – PMR]" (P-NO). However, for one of my participants, what pharmacists need most are basic computer skills (*skills*), which will also help them adapt to Evidence-Based Practice (*behavioural regulation*). There was however nothing to suggest from the interviews that participants themselves were making use of these tools in their practice.

"Yes, obviously there are. Technology in diagnosis is important, because if you look at the minor ailment scheme, which we do, it is more or less guesswork. So, a technology that guarantees, that tells you that look, this is a bacteria sore throat and so should be referred to the doctor, or that is this cough, is reflective of cancer that should be referred or that knows that the cough is probably due to, dust inhalation or something like that. Yes." [P-PO]

However, for one of my participants, what pharmacists need most are basic computer skills, which will also help them adapt to Evidence-Based Practice:

"I mean examples of computing skills. People need to know things like Excel, Words and how to transfer information on Internet and how to check information quickly, for example, if somebody comes to the pharmacy with any disease that you don't know, people should be able to assess information online, it will be good to be able to check what some other people have written about that condition, without any problem. So, if you haven't either Googled before or you don't know how to log on to the Internet that will be a little difficult." [P-SOL]

4.4.4.4 – Benefits in teaching the Use of New Technologies and Social Media

When it comes to teaching the use of new technologies for public health/pharmacy practice in UK pharmacy schools, most participants indicated that they were happy with this arrangement, even in situations where the same participants had earlier been sceptical about the use of new technologies in practice. One participant felt that teaching the use of new technologies in pharmacy schools will help bridge the gap that exists between what students are taught in pharmacy schools and the real pharmacy world (*knowledge and skills*), arguing also, that often you find that many of the UK pharmacy schools are not up-to-date, technology-wise (*environmental context and resources*). For another participant, the

benefits of such teaching will be in the area of savings in costs and time (*environmental context and resources*).

“... So this sort of saves costs, saves time, and it maximises benefits.” (USP-CHD)

“Yes ... it would really go a long way to open their mind-sets, into understanding how practical it is, a pharmacy is actually run. But unfortunately, what we actually see in most pharmacy schools today is the opposite of how a pharmacy and new technologies are being run ...” [P-VIV]

For yet another participant, it seems logical that UK pharmacy schools should include the use of new technologies in the undergraduate curriculum; bearing in mind that the pharmacists of today will have no choice, but to face the challenges of the computer age (*skills – competence/ability/skill assessment, practice/skills development*).

“People need to know, because when they qualify they can't escape new technologies” (P-SOL).

This need for pharmacists to embrace the use of new technologies was also reaffirmed by many other participants, who argued that there was no way the UK pharmacy profession could move forward (*intentions*) without pharmacists embracing modern technologies:

“Obviously, as we advance it seems like the computer is here to stay and the robot is here to stay. So, definitely, it needs to be on the curriculum.” [GP-NA]

Welcoming the idea of the use of new technologies, another participant however argued that there was only so much you can teach in pharmacy schools, due to time and resource constraints (*environmental context and resources*). Instead, she suggested that some of these new technologies might be better taught during practice and experiential learning in pharmacies (*skills – practice/skills development*).

“... There will be some things that the practitioners or pharmacy students can only learn in a simulated or real life practice environment ...” (P-ART).

In another case, one participant wanted the use of new technologies taught in pharmacy school, but he was also concerned about the impact such a move would have on pharmacists' jobs (*emotion – fear and threat*).

“New technologies are welcome, but we will have to be conscious of the fact that, inasmuch as new technologies are used, such technologies will not pose a threat to the job of pharmacists.” [P-PO]

For another participant, these technologies will be relevant in the UK, however, this acceptance might be different in third world countries as well as in the elderly (*social*

influences [Norms]), particularly as these groups of people might be more concerned with other things (*emotion - stress, fear, anxiety and tiredness*) than how to use new technologies:

“In a place like UK, for example, where you know that access to technology is easier, then it makes sense here. But if you're looking at a third world country, for example, where there are old people ... a phone is the least of their worries. They're trying to feed themselves.” [P-CHY]

While one pharmacist participant was against the use of new technologies in pharmacy practice, probably due to an earlier negative experience with robots (*memory, attention and decision processes*), he felt that this should not prevent UK pharmacy schools from teaching their use to students (*skills*). His reasoning was that it is the responsibility of the universities (*social influences*) to ensure they provide sound education to students (*skills*):

“It is the role of the university to be robust in their teaching ... they must consider every possible angle. The professional needs to be prepared. Even though I do not support the use of such in community practice, it doesn't mean that they shouldn't teach them ... They should teach it, but not focused on it as a primary goal.” [P-OL]

Interestingly, I did also capture the tendency of older professionals to be averse to the use of new technologies (*emotion – fear, threat and anxiety*) from the responses of another participant, who suggested that it is possible to manage this through further training (*knowledge and skills*):

“Yes, I know, my view is a lot of new technologies ... you know, some pharmacists who graduated many years ago, they may not be all that interested in handling these machineries, so it has to be a kind of organising workshops that would help many pharmacists to have that technological know-how in handling these new technologies in the pharmacy for public health enhancement.” [P-PK]

Despite these benefits, Safdar argues that there is a possibility that pharmacy practice in general is not taking up the opportunity offered by social media (Safdar 2015). One challenge is that many pharmacy schools are failing to match theory with practice (Torjesen 2015b).

4.4.5 - Benefits of pharmacists' involvement in public health

In terms of benefits, one participant felt that pharmacists' involvement in public health could help enhance their role in preventative care (*professional identity/boundaries/role*). This benefit, he continued, was not only for pharmacists, but also for every healthcare professional (*social influences - team working*):

“Yes, I think there is a benefit, I will say, not just for pharmacists, but for every healthcare professional, to be involved in public health. Because, it is a preventative measure. Why give people statins, when you can start by just educating them about health, about exercise, about not smoking?” [PR-FLY]

Another benefit mentioned by some participants relates to accessibility (*environmental context and resources - availability*), particularly, as this will enable community pharmacists to be better trusted and respected by the public.

“The benefits I would say, will include, the fact that community pharmacists are in regular contact with a wide majority of members of the community ...” (P-PO).

However, one of my participants also noted that there was a need to address the issue of target setting (*intentions and goals; behavioural regulation – goal/target setting*), which according to him defeated the whole purpose of public health service from community pharmacy (*availability*).

“I am not a community pharmacist, but speaking to my friends who are community pharmacists, it does seem like so much of their time is spent on meeting business targets and initiatives and things like that. Maybe, if they had a bit more time to focus on public health issues that will be great.” [HP/TP-NKT]

There was also a belief from some participants that enhancing the role of community pharmacists in public health, will encourage collaboration between pharmacists and other healthcare professionals (*social influences - team working*), help enhance the profile of pharmacists and help extend the public health role of community pharmacists (*social/professional role and identity*).

“And patients too will see, will begin to ... see pharmacists as not just as 'the lazy workers' as they used to term us before, or as laid back workers, but begin to see us as more of professionals, who have more to take on board and be able to offer to their communities.” [P-VI]

This might also mean creating more awareness (*knowledge*) to the public and other stakeholders about the role of community pharmacists in public health (Cain, et al. 2010; Agomo 2012a; Lam 2013). For one of my GP participants, this will also mean less pressure from patients over matters (*emotion - stress*), which could easily be resolved by pharmacists.

“Saves you listening to cough and cold, every minute! Every minute, cough and cold, coming to me, you know, when the pharmacist can just give advice for that.” [GP-CHY]

For some of my participants, the benefits were linked to financial savings to the NHS (*environmental context and resources*); enhancing the viability of community pharmacies and increasing POM (Prescription Only medicines) to P (Pharmacy Medicine) switches; reducing over-dependence on doctors and saving on doctors' time, which can then be used for other serious matters (*environmental context and resources – availability and management*). However, for one of my participants, this was not just about treatment, it was also about preventing long-term diseases, which could then save lives through lifestyle changes, etc. (*beliefs about capabilities*). Again, this benefit was not for doctors alone, but also for other healthcare professionals and the entire health system (*social influences – team working and organisational development*). However, to enable community pharmacists to achieve these aims, it will also be necessary to enhance the undergraduate pharmacy curriculum, to enable pharmacists to identify disease patterns easily, even at a global level (*skills*). "... You could be part of the global team necessary to enhance global health." (P-JO).

"There is a lot of economic savings that will come out of that, in terms of saving doctor's time ... for more serious issues, because the thing with public health is not just treatment, it also has to do with prevention ... due to lifestyle choices, lifestyle adjustments ... There is clearly gonna be a lot of benefits from there, in terms of the patients themselves, for the practitioners themselves, for the health profession as well, as a whole." [P-ART]

... You could be part of the global team necessary to enhance global health." [P-JO]

4.4.6 - Barriers to enhancing the public health role of community pharmacists

As well as these benefits, my participants also highlighted several barriers (*behavioural regulation*), which they felt needed to be tackled in order to enhance the public health role of community pharmacists in the UK. Nonetheless, I identified in the literature some of the factors affecting utilisation of pharmacy services to include, the community pharmacy environment, the pharmacist and support staff, service publicity, the public, GP services, and the healthcare system and policies (Saramunee, et al. 2012). There is also the perception of both the public and other health care providers of pharmacists' competencies, privacy and confidentiality in pharmacies, the high dispensing workload and inadequate financial support (Saramunee, et al. 2012).

4.4.6.1 - Lack of awareness and education

A number of participants raised the issue of lack of awareness and education about the public health role of the community pharmacists. Invariably, this hinges around social influences, such as, lack of social support, social pressure and feedback; hence, to what extent social influences hinder the public health role of community pharmacists (Michie, et al. 2005).

“Yes, the barrier is that because health is free, people think that once they go to A&E, they will get free treatment ... This barrier is educating people. People are not aware that ... they can access health in different ways, apart from going to the GP and A&E. So they need to create awareness and education.” [Nurse –CHM]

“And a lot of these trivial cases, they can do it ... So, the barrier obviously is ignorance, and then that's where advertising, education, is to come into play. People are sitting in the waiting area; you have this advert all over the place, saying you can see your pharmacist first.” [GP-CHY]

4.4.6.2 - Lack of empowerment

There was also a call for the government to elevate the status of the pharmacist (*professional role and identity*), bearing in mind also that there are many health anxieties (*emotion*), especially among ethnic minorities. Interestingly, considered as a barrier were pharmacists also, in terms of their preparedness, willingness and desire to provide public health services (*intentions and goals*).

“The barriers could also be the pharmacists themselves ...” (GP-NN).

According to one participant, there seems to be a culture within pharmacy whereby pharmacists are often reluctant to put themselves forward for new challenges (*beliefs about capabilities, and emotion – anxiety and fear*), unlike nurses, who continue to extend their roles into specialist areas. According to this participant, this way of practice seems to have been initiated right from the universities (*knowledge, skills and social influences – organisational climate/culture*), hence has made pharmacists focus more on minor things rather than the big picture, such as enhancing their diagnostic and consultation skills (*skills*). According to the theoretical domains framework (Michie, et al. 2005), it seems, there is here a lack of belief among pharmacists about their capabilities (*beliefs about capabilities*). This

raises the issue of how confident pharmacists are that they can provide public health roles, despite the challenges. (Michie, et al. 2005). In addition, it also seems that enabling community pharmacists to have access to patients' medical records can empower them to engage more in public health activities.

“Pharmacists were maybe a little bit slow to do that or more focused on business, and how much money they can get from dispensing fees, and mix and match? So, we really lost out and we didn't add that value. I think going forward, our values really gonna be at diagnostic levels, so minor ailments, and things ... so we need to improve our communication and diagnostic skills, so that we actually have a presence in the public health minor ailment arena ... So, maybe it comes back to the degree, maybe at that point we need to start diagnosing minor ailments a bit more ...” [HP/TP-NKT]

4.4.6.3 - Commercial pressure

Commercial pressure (due to lack of *resources*), with the resultant effect on *emotions (stress and anxiety)*, which can also be considered as part of the social influences on pharmacists (Michie, et al. 2005) was also highlighted, with many participants identifying this as a barrier to enhancing the public health role of community pharmacists. Not only has this restricted pharmacists (unlike nurses) in terms of service provision, it seems also that some of the challenges faced by pharmacists lie with the undergraduate pharmacy education (*knowledge and skills*), lack of initiative (*beliefs about capabilities and intentions*) and culture (*social influences*). One participant also drew my attention to the way in which big chain community pharmacies were operating, with a concern that this was limiting the number or quality of activities that community pharmacies could offer. The same participant also highlighted the over-supply of pharmacists (*resources*) as a barrier.

“Commercial pressure will be one. I think also, there is culture within the pharmacy I have noticed ... nurses are very keen to forge out in different parts, so that they can be involved ... I do not get that sense from pharmacy. I get the sense that our pharmacists are happy plodding along and doing what we are doing, and there hasn't really been, sort of, reaching out to get services for ourselves ... In the hospital setting, there is respiratory nurse, she comes in and reviews asthma medication. There are diabetes nurse specialists, they come and review all the diabetic medications. I am looking at it and I am thinking ... I am just saying, surely a pharmacist should be reviewing specialist diabetic medications, that kind of thing ... this is something that was brought up in the universities. I think nurses were quicker to grab and say yes, we can put ourselves forward and do these things.” [HP/TP-NKT]

4.4.6.4 - Resistance to change

Also highlighted was the difficulty associated with those pharmacists who were resistant to any form of change (*beliefs about consequences*), particularly as some of these changes will be new to many (due to lack of *knowledge and skills, as well as, beliefs about capabilities*). Closely related was a concern that other healthcare professionals often see community pharmacists as a threat – something which one of my participants described as ‘rivalries’ (*social/professional role and identity; emotion – fear and threat*). This can therefore affect community pharmacists’ ability to engage in collaborative and inter-professional public health roles (*social influences - team working*) (Michie, et al. 2005; Agomo and Ogunleye 2014).

“The barriers and I would say the major barrier is rivalries. I will put it that way, from other healthcare providers.” [P-PO]

4.4.6.5 - Inadequate training and skills

For some participants, there was also a need to enhance the training as well as the diagnostic skills of community pharmacists, with the benefit that this will help extend the public health role of community pharmacists to other areas. This is in line with Eades, et al. (2011) argument, that to improve public health services in community pharmacy, there will be a need to increase pharmacists’ confidence in providing public health services through enhanced training.

“I think they [community pharmacists] should also expand in more areas, in the area of diagnosis and also training so that pharmacists can have access to medical history of patients.” [P-SOL]

4.4.6.6 – Lack of time to provide public health activities

In addition, tackling the issue of lack of time (*environmental context and resources*), which can be a big problem in very busy pharmacies, would help. Lack of time does not only affect pharmacists’ willingness to provide public health services, but can also affect the quality of service they are able to provide (Horsfield, et al. 2011; Gavaza, et al. 2011; Agomo, et al. 2016a).

“In community pharmacy, there isn't time. You only spend; I think a prescription can be dispensed in less than 5 minutes, that is it. There are so many people who will come into community pharmacy.” [PR-FLY]

4.4.6.7 – Lack of confidence

There was also the issue of whether pharmacists have actually asserted themselves as primary care providers (*beliefs about capabilities - perceived competence, self-confidence/professional confidence*), particularly when you consider the fact that many patients tend to visit GPs first before even remembering that community pharmacists are also available for minor ailments.

“I don't think community pharmacists have necessarily asserted themselves as people who can provide primary health care services ... like treating common illness, like common cold and the rest of it.” [P-ART]

4.4.6.8 – Government policy on the public health role of the pharmacist

My US-based participant also identified the UK government's policy around the public health role of the pharmacist (*social/professional role and identity*), as a barrier. This was important particularly as it relates to empowering and financing public health activities, as seen in the US, where almost every community pharmacy is involved with public health services, e.g. immunisation. Accordingly, this type of empowerment has not only raised the public health profile of US community pharmacists, but is also a time-saving strategy, which helps reduce the demand for doctor services. A number of participants did also highlight the need for UK government to develop enabling policies (*reinforcement*) that can support the public health role of the pharmacist.

“Well, the barrier will have to do with the laid down policies of the government. The pharmacy profession will have to be given the opportunity to go into areas that will benefit the public and improve public health ... In the US, almost every community pharmacist administers immunisation, and you have so many people that could not wait to make appointments to go to the doctors, going to the community pharmacist to administer immunisation. So, they should actually try to encourage the pharmacy profession by giving some incentives.” [USP-CHD]

4.4.7 - The use of Independent Pharmacist Practitioners

On the role of the Independent Pharmacist Practitioners (IPPs), that is, pharmacists who are independently employed, e.g. locums, pharmacist-visitors, etc., in public health, I received a mixture of comments, some of which were slightly confusing, as they were referring to Independent Prescribers rather than IPPs, until I explained the term further. A UK pharmacists' organisation has argued that, enabling the development of IPPs who are not

attached to any employers (PDA 2013), could help change the status quo and at the same time motivate pharmacists to enhance their role in public health (APA 2008)

4.4.7.1 - Independent pharmacist practitioners in GP surgeries

From some of the responses, it was evident that at least one participant would like to see locum pharmacists working in GP surgeries (*skills – practice/skills development; social influences - team working*). My pre-registration participant was not familiar with pharmacists visiting patients' homes for public health activities. However, from the comments of one of my GP participants, it was obvious that the use of independent practitioners was a common feature in general practice, as she reckoned that this group of practitioners can also have useful roles in public health activities.

“They do, but they're pharmacists? Isn't it? Yes, they do. It is just like for us as doctors, it is not everybody that is affiliated to a practice ... but, when they need us, because they know where we are, we go and help them out. So, in the same way, if there is a list of IPPs ... saying look, we need this shift covered from this period to this period ... Like right now, I'm not affiliated anywhere.” [GP-CHY]

4.4.7.2 – Asserting ownership of qualifications

On the other hand, one participant also raised the issue of ownership of public health qualifications (*knowledge and skills*), which he reckoned often belongs to the practitioner rather than the practice, and hence places IPPs at the centre of public health services. Using the recent Ebola outbreak in West Africa as an example, one of my participants described IPPs as 'stakeholders in public health', particularly as in this case, IPPs (not pharmacies) had to work collaboratively with other practitioners to contain the situation. He cited another example of the global Vitamin D deficiency, which he argued could also be tackled by IPPs, and hence the need for pharmacists and IPPs to take up leadership positions in public health.

“Every pharmacist, by virtue of their training, has a role to play in public health, whether employed by the chain, whether they are independent or whether employed by the hospital. Because, the training is such that if a pharmacist is trained on how to immunise, it is the individual pharmacist that immunises, it is he that has the qualification to immunise.” [USP-CHD]

For another participant, the advantage with this model lies in the fact that practitioners will be working for the benefit of patients, rather than being constrained by some of the

limitations associated with commercially orientated pharmacy establishments (*social influences – alienation/organisational commitment*).

“...I think that could intentionally be a good thing, because hopefully, they are actually working for the benefit of the patient, as opposed to maybe some sort of business.” [HP/TP-NKT].

4.4.7.3 – Concern about the independent pharmacist practitioner role

There was however some concern over how IPPs would be practising, with one participant also raising some questions regarding the quality of their training (*knowledge and skills*) and the kind of support they will be receiving (*environmental context and resources; reinforcement*), describing IPPs as ‘silo-practitioners’.

“Well again, that is a very peculiar area, because, like I said before, it's more of, training for example of work force, is more of an employer-led initiative ... so you find yourself wondering will these practitioners be that well-positioned to provide quality information, quality services, or not just quality, but in terms of relevance, essential services that are relevant to key and emerging needs ... whether you like it or not, they're more or less silo-practitioners, because they're practising on their own.” [P-ART]

For another participant, the role of IPPs in public health will only develop if the NHS is privatised (*environmental context and resources*):

“I doubt it, because of the only time they will, is if the NHS is privatised. But for now, I do not think they have any role. I might be wrong.” [N-CHM]

4.4.8 - Teaching communication methods to students and pharmacists

A number of studies have identified the need for healthcare practitioners to improve their communication techniques (Schwartzberg, et al. 2007; Carter, et al. 2008; Sookaneknun, et al. 2009; Emmerton, et al. 2010; Roughead, et al. 2011; Rowlands 2012) (*skills*). None of my interview participants disagreed that that teaching communication method to UK pharmacy students and pharmacists could help enhance the role of community pharmacists in public health.

4.4.8.1 - Developing professional skills through the teaching of communication methods

In terms of benefits, I found from some of the responses that this would help develop the professional skills of pharmacists (*skills*), particularly with regard to teaching students and pharmacists on how to communicate with people from different ethnic groups and health

conditions. In addition, it will also help students and pharmacists develop skills in the use of pharmacy consultation tools in practice.

“Oh yes, because I went to [named university], and communication was taught from Year 1 to Year 4, and it did help a lot, definitely. It helps on how you talk to people, not judging people, even according to the GPhC’s ethics, code of conduct. There is a way to communicate with people without demeaning them, because we meet people from different nationalities, different languages, different religion; how you approach them, putting aside my own faith and belief, everything, professionalism. So yes, communication does work, even when it comes to consultation ...” [PR-FLY]

“Communication method is very important, just like saying bedside manner, isn't it, of a doctor? ...The thing is this; they talked to us about communication skills as doctors, that we need to be empathetic ..., a need for confidentiality, you know. And communication methods are very important, because you're looking at people from all kinds of life, religion, beliefs.” [GP-CHY]

One participant recounted a time when she was a student at one of the popular UK pharmacy schools (about 10 years ago), stating that in those days, teaching of communication methods hardly existed, and left students graduating without any meaningful communication skills. According to her, this limitation was often obvious during pharmacy practice modules, with the effect being that interactions between students and their tutors were often one-way communication, rather than the desired two-way communication. She reckoned that the use of scenarios (case studies) in classes enabled enhanced communication skills to develop (*skills*), as it allowed interaction between students to occur (*social influences - team working*), which can then be further enhanced through feedback from tutors (*behavioural regulation*). This point was further reinforced by another participant (P-JO), who also supported the idea of developing a two-way communication method for students and pharmacists, supported with feedback:

“... When I was in school ... not a lot of our scenarios were done. It was more of reading and writing, reading and writing, reading articles and flipping the BNF and checking things. So, you find out those students, their communication levels were really limited, because they were not allowed to be part of that pharmacy practice ... I do remember that it actually had a negative impact on most of us, obviously because in the pharmacy practice, you were not allowed to interact, in other words, you were not allowed to learn more ... communication should be a two-way thing.” [P-VIV]

The PhD student/pharmacist stated that teaching communication methods throughout the four-year undergraduate programme would enable pharmacists to interact better with patients as well as other healthcare professionals (*social influences – team working*). Other

benefits lie in pharmacists' positioning to prevent diseases, as well as the ability to provide patients with information on the use of medical equipment and devices when needed (*knowledge and skills*). Teaching communication methods to students and pharmacists can help develop some uniformity across healthcare professions (*knowledge and skills*), in terms of service delivery and information provision; help pharmacists reinforce public health messages from other healthcare practitioners; and help enhance the profile of pharmacists (*professional identity*):

“That is one key area that needs to be really addressed, right from the beginning of undergraduate studies, because in the practice environment, pharmacy practice is about communication. I think it is an illusion to think communication has occurred when in reality it hasn't, and to be honest, communication is central to everything you do, and health practitioners for them to be effective, they have to be good communicators ... It's not going to overburden or freeze the number of modules students are currently having to undergo to pass ... that is something that can be negotiated ...” [P-ART]

“Sometimes, you find in general practice that you give a patient advice on how to do something, how to take a particular medication and how to self-manage, and they forget it when they leave the door.” [GP-NN]

4.4.8.2 - Improvement in the teaching of communication methods

There seemed to have been some improvement in the teaching of communication methods in a named school lately. Another participant, [P-SOL], who attended the same school some years earlier, refuted the feedback from participant P-VIV on the lack of use of scenarios in communication methods:

“When I was in the university ... doing pharmacy practice, we normally do like role play about somebody coming into pharmacy and how we are going to phone the doctor and that kind of thing ... but, until you actually experience it real, when they're doing a role play, it doesn't actually stick to you.” [P-SOL]

A teacher-practitioner from the same school, who qualified not too long ago, also confirmed this new trend of teaching. She however complained that the teaching of communication methods was more tailored towards community pharmacy practice than hospital pharmacy practice (*knowledge and skills*). A possible explanation could be that most of the teaching fellows in that school were originally from the community pharmacy background, hence, their default to tailor their teaching materials to practice in the community pharmacy setting:

“I think it's pretty good, because I gave two lectures on communication ... when I was a student ... I'm sure I did get lectures on communication or something, but I think it's certainly improved like now being involved in teaching ... So it's certainly improving. So much more of an emphasis from community pharmacy than hospital pharmacy.” [HP/TP-NKT]

4.4.9 - Integrating UK undergraduate healthcare programmes

There is now an emphasis in the UK on interdisciplinary initiatives in the management of many causes of ill health (News Team 2012b). In terms of inter-professional education, in the USA, health professional education associations (AAMC 2012) drive it. At the University of Manchester, UK, health students have now developed an initiative to promote inter-professional education (*social influences [norms] – team working*), by arranging numerous events each year, ranging from lectures to healthcare-based quizzes that focus on a variety of issues (Owen 2016). On the interview question that asked if UK pharmacy students should be educated with other health students, e.g. medical and nursing students, most participants thought that this was a good idea.

4.4.9.1 - Benefits associated with integrated learning

Some of their thoughts on this included the idea that this will help break down barriers and facilitate communication between healthcare practitioners (*social influences – team working*), as well as helping foster better understanding of roles and skill-sets. In addition, it can develop trust, widen the professional field of pharmacists and help enhance their knowledge base as well as their ability to pass on information easily (*knowledge, skills and team working*). “It would actually boost their field ... makes it much easier to pass information around ...” (P-VIV). Another reason to integrate the undergraduate teaching, according to one participant, rests on the fact that some of the modules taught to students are health-related, therefore, teaching can be across professions, with the added benefit of efficiency and savings (*environmental context and resources*):

“So, it is good for all to understand what the physiotherapist does, what the special nurse does, what they do, how to communicate, what they do ... Because even professions got their own case of pride, it is always good to hear them, students, to see their views and to hear their views about us, ... so it's all good to get that even during education, so that when it happens in the real world, it doesn't get you by surprise, you're better prepared to deal with nurses, doctors, with physiotherapists, etc.” [PR-FLY]

Related to this, one GP participant also mentioned that allowing undergraduate health students to study together (*social influences - team working*) would also enable graduates to appreciate some of the roles, responsibilities and boundaries of other health professionals (*professional identity/boundaries/role*), particularly as it relates to long-term management of chronic conditions:

“You know; chronic condition is a drain in health care in this country? So, I feel like each person will have to play a part and respect each other... A lot of times when we go to college or university or whatever, we just learn about ourselves, our roles, and all what not ... We are not intertwined with other people who are also health professionals, who play an important part. And then when you get to working with them, you have no clue how to handle them, so, taking certain courses together will help.” [GP-CHY]

Some of the points raised by this GP participant supports the thoughts of a pharmacist participant, based on his experience with integrated teaching, as an undergraduate pharmacy student and as a PhD student in Russia and France respectively. For him, other advantages would come in terms of savings and ensuring that resources are used efficiently (*environmental context and resources*) in areas such as teaching, research and administration, as well as enabling lasting relationships to develop and flourish among future healthcare professionals (*social influences – team working*).

"If you look at a number of countries, medical schools and pharmacy schools are together ... you find that the basic subjects both parties need to know are always taught together in one class ... I had background training where I spent together with medical students and dentists, so at a given stage, then we separated to different lines. So, you find that the basic understanding of what a pharmacist knows, that the doctor is aware, or that the dentist is aware ... in practice, when there is a common problem, we could all be speaking on the same wavelength, rather than what you find at times in this country, they [pharmacists] are not even confident to speak to doctors ... In some areas, doctors don't even know the role of pharmacists! So going back to education.” [P-JO]

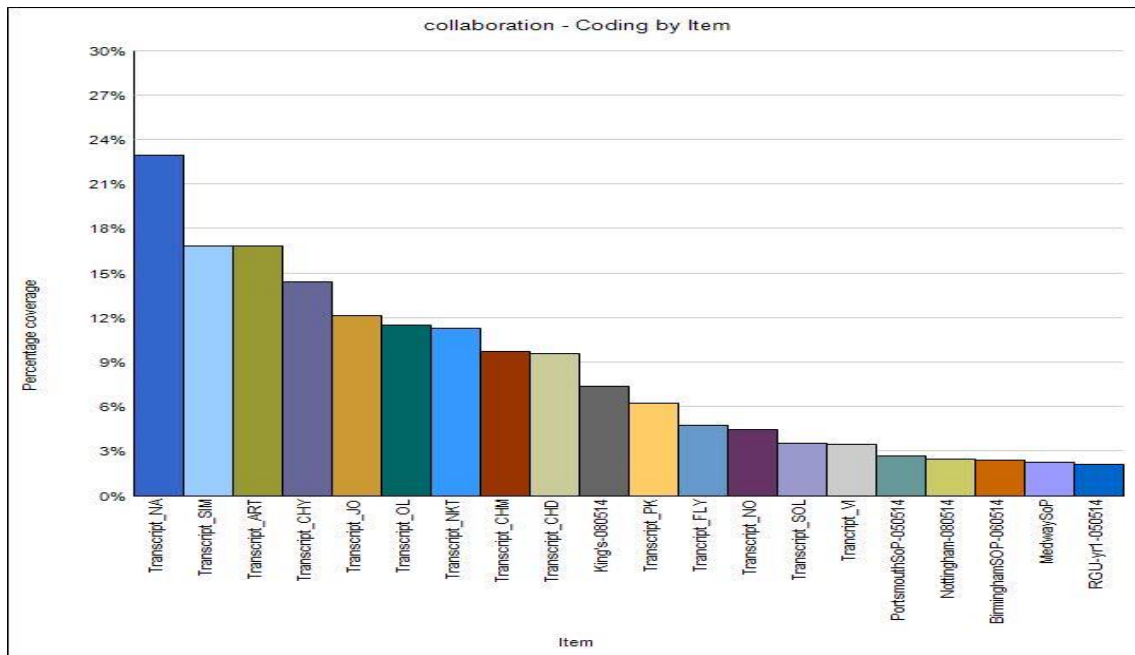


Figure 18. Coding by Item for Collaboration

Other than managing health outcomes, I noticed also from some participants' responses that integrated work patterns can help pharmacists to get better career progression and fulfilment in practice (*beliefs about capabilities – empowerment, optimism; and social influences - leadership*), hence becoming the way forward (see Figure 18).

“There should be more pharmacists linked to GP surgeries, in fact wouldn't it be great if each GP surgery had within it a pharmacy, because it makes sense, you know. What is the point having a pharmacy around the corner, when you can have it in-house? I think it is so much better. I think, that will be so good in the future. There was all these talk about polyclinics, back in the days, wasn't it? They were like, 'everything going to be under one roof', GPs, pharmacists, nurses, and that, I don't know, didn't really sort of happen, did it?” [P-NKT]

Notwithstanding this, the GP Partner participant also hinted that some of the benefits associated with integrated practice, particularly as it relates to financial rewards to GP practices, could be affected depending on where the practices are located – rural or urban (*environmental context and resources – constraints*).

“They should be anyway ... Rural GPs have pharmacists working within the same building, and the GPs are responsible for the financial aspects and they make a lot of money out of it. But GPs in urban areas, they are not allowed to. They will stop it.” [GPP-SIM]

This position is also confirmed by the views of a legal expert in pharmacy about the difficulties associated with establishing community pharmacies in GP practices (Reissner 2015).

Another participant also reminded me that GP practices that employ pharmacists seemed to make less prescribing errors (*behavioural regulation – self-monitoring*). This is due to the fact that, enhanced communication and transfer of information between healthcare providers and healthcare settings reduces medication and healthcare errors (Roughead, et al. 2011). Hence, being in-house meant that pharmacists were able to correct any errors before prescriptions left the GP practice to the pharmacies. In addition, these GP practices were also more likely to follow the NICE (National Institute for Clinical Excellence) guidance (*behavioural regulation: moderators of intention - behaviour gap*) in their prescribing patterns, hence helping to minimise harm to patients. Furthermore, they were also more likely to consider the price of medicines and other items in their prescribing habits (*environmental context and resources*), which can translate to large savings to GP practices and the wider NHS. Pharmacists employed in GP practices, particularly those with sound clinical knowledge and skills (*knowledge and skills*), I was also told, were often in a better position to advise doctors regarding the best therapeutic choices in complex clinical issues than GP practices without an in-house pharmacist (*beliefs about capabilities – perceived competence*). Having said that, not all practices are able to employ in-house pharmacists, due to financial constraints (*environmental context and resources*).

“This is actually a good idea, because if you see doctors that have pharmacists inside their surgeries, they don't actually make a lot of mistakes, when it comes to [prescribing] and everything ... So, it is difficult for the prescription to leave the surgery with any query, because the pharmacist inside would have checked it ... Not a lot of doctors can afford to have a pharmacist, even though ...” [P-SOL]

4.4.9.2 - Concerns with integrated learning

Interestingly, while one of my participants highlighted also some of the advantages associated with integrated learning, for example, the ability to develop collaborative practices with other health professionals, she was however concerned about the logistics associated with this arrangement (*material resources [availability and management], and social influences – crew resource management*). Her concern was that often these other schools (e.g. medicine and nursing) tend to have large classes, which might be difficult to

manage across schools. There is also the issue of breaks, which she argued are not always aligned between schools and faculties:

“The argument is neither here or there. It is not about, is it good or bad? ... I think the argument has always been about the practicalities of this kind of inter-professional learning, in terms of logistics, how this learning will take place, how it will occur, because when it comes to inter-professional learning for example, you're going to be talking about a large number class, a large class, including doctors, nurses, pharmacists and all of that ... sometimes the calendars are not the same. So it's more about practicalities than benefits ... But, having said that, I would say inter-professional learning is important because students can begin to learn to work collaboratively ... it makes it even far easier for them to be able to work in the health team as they graduate and as they go into real life practice.” [P-ART]

Another concern from one participant was that integrated learning could lead to the dominance and the prioritisation of other healthcare students during lectures (*professional role and identity*), which could then put pharmacy students in a difficult situation (*emotion – anticipated regret, fear and threat*).

“No, I really don't like that idea. I do not like that idea. One of the main reasons I choose [a named School of Pharmacy] back in the days, as supposed to something like [another named School of Pharmacy], is because I like the idea of being taught by pharmacists, only pharmacy students, the whole university was geared towards pharmacy. I realised that, because I think I was told there was a risk of when you're having lectures by medics and dentists, they take over and they prioritise and you won't want to be in that situation as a pharmacist. On the other hand, I know it is good to start integrating with other health disciplines, because then they respect us too and we can all work together as a team, we can all respect each other. So like maybe, certain lectures can be done jointly ...” [HP/TP-NKT]

In terms of organisation, a pharmacist participant also suggested it was possible to teach communication methods at the same time to a group of healthcare professionals (*social influences – team working*):

“There are elective courses that both pharmacy and the health sciences or the medical sciences, that they share together because somehow, both of them need ... for example, the communication method you were talking about, we all need it, in the medical profession, isn't it?” [P-NO]

While another participant also recognised the need for this integration, he was however, concerned that unlike in the hospital where such interactions seem to be natural, particularly during ward rounds, in the community this type of integration seems to be difficult with GPs (*social influences: conflict – competing demands, conflicting roles*). However, he also argued that enabling this integration through the development of closer relationships (*social*

influences – team working) between GPs and pharmacists was the only way to ensure optimum and guaranteed health outcomes for patients. I hope that the recent Royal Pharmaceutical Society and the Royal College of General Practitioner's plan for integrated practice will help to tackle this (Robinson 2015a; Anon 2015c).

“There is a real need for it, but it has to start from the fundamental ... let's start from the pharmacy school, from the medical school, and that will help everybody ... In the hospital, it's a lot easier because there is interaction on the ward. I talk to your patients; you talk to my patients, on the ward ... It is unlike the GP; I do not interact with the GP patients. The only thing I interact with is the prescription, which may not be brought to the pharmacy by the patients themselves, anyway. They will just collect the prescription and give it to somebody to bring in, and then I don't get a one-to-one with the patient ... I only see the prescription and because I'm so busy, I don't have the time to even talk to the patient ... so, there isn't that much interaction, but there is a need for it.” [P-OL]

4.4.10 - Changing the curriculum to increase its public health content

In my review of knowledge and information, I identified that there was a need to enhance the public health content of pharmacy curriculum with one of the studies originating from the UK (Eades, et al. 2011). In my survey of UK community pharmacists, the majority of respondents (68.7%) agreed on this need. When I then asked the interview participants about their views on changing the UK undergraduate pharmacy curriculum to increase its public health content, I received a number of interesting responses.

4.4.10.1 – Enhancing public health knowledge and skills

The pre-registration pharmacist participant argued that many of the common chronic conditions we find today are interlinked with lifestyles (*memory, attention and decision processes - decision making*). Hence, there is a need to enhance both public health knowledge and the collaborative skills of healthcare professionals (*knowledge and skills*). This will also entail spending money (*environmental context and resources*) on the public health education of healthcare professionals, as a preventative measure, rather than on certain therapeutic medicines. Another participant also agreed that there was a need to ensure that undergraduate pharmacy students were well informed about public health before graduation (*knowledge and skills*), which could then be enhanced, depending on individual needs.

“I know there are postgraduate courses, I understand that, doctors, every healthcare professional want to do public health ... but, these ailments are linked together. We are looking at diet and we are looking at smoking, smoking is linked to COPD or emphysema, as we used to know it in the day and chronic bronchitis and things like that. If we look at the lifestyle, exercise and the food we eat, that goes on into diabetes, and how many people are diabetic in this country? And how many people are overweight? And that's leading into those with heart conditions ... I will rather, instead of asking the money on simvastatin and things like that, can we not just train our healthcare professionals ... from Day 1 ... No 1, we don't give drugs, No 2, we teach them how to live a healthy lifestyle. I know drug companies will not be happy with this [laughs], but if at the end of the day that will help the patient, it is a preventative measure.” [PR-FLY]

The need became a lot clearer when one participant, a PhD student in pharmacy education (and an overseas pharmacist) in one of the Schools of Pharmacy, brought to my attention the recent review of the UK undergraduate pharmacy curriculum (*knowledge and skills*). The most recent undergraduate pharmacy curriculum discussion paper proposes a single five-year integrated programme of pharmacy education and training, with joint responsibility from universities and employer (News Team 2011). The paper proposes that pharmacy students should receive a clinical supplement for at least 12 months of the five-year programme (News Team 2011). There is however, no indication that this curriculum reviews in any manner incorporated a significant amount of the macro-level public health activities, as described by Truong and Patterson (2010).

“I think the question should be: should the curriculum be changed? I am aware that in the past two years, there has been a review of the curriculum and this review kind of incorporated and addressed some of the disparities and some of the deficiencies that were observed in terms of the lack of key modules or key trainings for pharmacists/pharmacy students. I think public health, in terms of health promotion, and the rest of it ... I do not know the current content, what the percentage is, but I think pharmaceutical public health should be one of the core areas that need to be taught in pharmacy schools. Yeah, if this area is not properly captured in the curriculum, yes, it should be increased.” [P-ART]

4.4.10.2 – Empowering pharmacists to provide public health activities

Another participant also mentioned the need to be in line with the changing world (*environmental context and resources - person X environmental interaction*), as another reason why UK pharmacy schools ought to enhance the public health content of their curricula. According to him, enhancing the public health role of pharmacists will bring professional fulfilment (*professional identity*), empower pharmacists (*beliefs about*

capabilities) to provide public health services and produce financial savings for the NHS (*environmental context and resources*). It also seemed likely that enhancing and broadening the public health knowledge of pharmacists would help widen their role in public health (*professional identity/boundaries/role*), particularly when supported by education, awareness and the NHS triage system (*knowledge and social influences - team working*).

“The world is a changing world ... it is imperative that the pharmacy curriculum in the universities be modified to reflect such, so that graduates ... are better equipped to deliver healthcare services to the public ... That is ... why the pharmacy curriculum should be tailored towards having more public health awareness and training ... If it serves towards promotion of public health, it saves money, both for the government and for the public, and it brings professional satisfaction to pharmacists.” [USP-CHD]

While one GP participant was not too sure about the nature of the undergraduate pharmacy curriculum (*knowledge*), other than that it was about medicines, however, she anticipated some of the advantages that could come with enhancing the public health knowledge of pharmacists (*knowledge*), particularly as it relates to preventative care and managing health demands and financial pressures. This becomes relevant when you consider that in some instances, community pharmacists are even nearer to patients than the GPs (Torjesen 2015a), a point which was also raised by the GP participant.

“OK, if I understand your curriculum, normally is that you're dealing with medicines, whatever, whatever. It is just strictly on what you are doing. Isn't it? There is a need, because preventative medicine is better ... Some patients are constantly in contact with pharmacists, and pharmacists have a broader knowledge of public health, it is going to be easier for them to give advice ... So, if they do not talk about it in medical schools for pharmacists, they need to do it. Because, right now you know what's happening ... because in some places, the pharmacist is even nearer than the GP surgery itself ... and if they can get the answer from a pharmacy, then why are we stressing ourselves?” [GP-CHY]

This lack of awareness of the nature of pharmacists' undergraduate training by other health professionals was also evident from the responses of another GP participant, who also added that pharmacists of the 21st century would need to be independent practitioners (*skills - competence*), if they were to be taken seriously as public health practitioners. The GP emphasizing also that there is a lot of stress on healthcare professionals (*emotion - stress*), particularly, the general practitioners (GPs); with this apparently creating an opportunity for

pharmacists' enhanced role in public health. However, this lack of awareness of the nature of the UK undergraduate pharmacy curriculum by GPs (and possibly, other healthcare professionals), can best be managed through inter-professional learning and practice (*social influences - team working*) (Baqir, et al. 2011; AAMC 2012; Watson, et al. 2014; Robinson 2015a), as also highlighted by some of the participants.

“This is really difficult for me to answer as a GP, as I don't know what the curriculum is, presently ... from what we said already, it's quite important that the pharmacist of the 21st century is a pharmacist who's able to practice independently, safely and effectively in the 21st century ... there is a lot of pressure on the other community health professionals, mainly the GPs. If the pharmacists are able to help and take the pressure off and have more education and training to be more relevant in health protection and health provision, that's all good ... I can't see any reason why it wouldn't be a good idea personally.” [GP-NN]

4.4.10.3 – Enhancing the public health content of pharmacy curriculum

One participant also argued that changing the undergraduate pharmacy curriculum (*knowledge and skills*) would also help students and pharmacists keep abreast of the ever-changing healthcare structure in the UK (*social influences – organisational climate/culture, power/hierarchy*). However, she reckoned that the onus lies with pharmacists to remain up to date with some of these changes (*beliefs about capabilities: self-confidence/professional confidence*). Supporting the need for change, another participant wanted this change to be in the area of Public Health Information.

“Well, when I was at the School of Pharmacy, I had a whole module on public health, it was an option you choose, and I think I choose it and I really enjoyed it. It was looking at NHS policy, white papers, the structure of the NHS and healthcare in this country. I think that was fantastic. ... It is always changing though, isn't it? I mean things like CCGs and all that are all coming now, as opposed to PCTs ... I think it's up to the pharmacist, as well, to remain informed and read up around these topics themselves and keep abreast of changes ... but I think it would be great to have more of it as well.” [HP/TP-NKT]

On the type of change needed, one participant indicated that he was not happy with the dominance of science modules in the present UK undergraduate pharmacy curriculum, which he felt was at the expense of strong public health content. He would prefer that the public health module in UK pharmacy schools was the same as found in many medical schools (*social influences – group conformity*).

“It should be the same in pharmacy schools as medical schools. There is a need to incorporate public health as a major part of the pharmacy curriculum. There is a

need for it. There are some things that might need to be reduced if there is need for it, like the pharmacist is trained to be an industrialist, at the same time, a public health worker ... The pharmacy curriculum includes a lot of scientific training, as to discovery, invention of medications, drug development, drug design, and all of that. While those are important, there is also a need to bring in a strong public health curriculum, which is the way the practice is going ... Then it has to be appreciated.” [P-OL]

4.4.10.4 - Inadequate resources for public health activities

My earlier participant [P-OL] also noted that public health services from community pharmacies were often affected by lack of basic health infrastructure (equipment) in some of the consultation rooms located in community pharmacies (*environmental context and resources*). There is also the issue of lack of comfortable waiting areas (*environmental context and resources*) and continued emphasis by pharmacy owners, most of them non-pharmacists, on the profit and steady growth of the business (*social influences – organisational development and commitment*). A number of my participants did also highlight this limitation in the provision of public health services from community pharmacy.

“To the effect, you must have a consultation room; all we need to do now is to give parameters to consultation rooms, in terms of dimension, in terms of what and what should be there. There are some basic things that are not there now which should be there ... then the commercial aspect of it needs to be reduced. Because everybody is allowed to own a pharmacy, all these multiples, they are all after the profit and not after the patients' health and that is not doing well for the profession. So basically, there is somebody in the head office ... all they are interested in is the money, money, and money. Oh, how many MURs have you done? How many ... have you done? They are not thinking about, what have they provided for you to enhance the patient? Even the books they are providing, it is because the registration makes it compulsory for them to provide it, otherwise, they will cut it off as cost savings ...Then, there must be a waiting area as well, for your customers. Some pharmacies don't have that at all, which is not good, where people can speak and be comfortable.” [P-OL]

4.4.10.5 - The global nature of pharmacy practice

For another participant, the global nature of pharmacy practice was another reason to change the undergraduate pharmacy curriculum, and this might also mean adopting good practices from other systems (*environmental context and resources - person X environmental interaction*), and maybe ensuring that community pharmacies engage more than one pharmacist at any time, as seen in Italy. Interestingly, a UK pharmacists’

organisation is fully in support of this arrangement (PDA 2015a). Yet, other participants have earlier highlighted the global nature of pharmacy practice, particularly when it relates to the benefits of pharmacists' enhanced role in public health.

"The world is a global village. It is good for UK to change the undergraduate pharmacy curriculum and to match with other sectors, so that UK pharmacists will be able to work anywhere in the world, not only in the UK. It can also be matched with other countries ... As in Italy, where I come from, if we are five, all five pharmacists working are qualified pharmacists. Therefore, a patient has enough time and a pharmacist has enough time to attend to each patient. Because they are many, and if a pharmacist is in difficulty, he asks somebody else, a colleague, to assist. Here, it is only one pharmacist in a large pharmacy. So I think they should try to do something about that." [P-PKT]

According to a GP Partner, there is a need to enhance the public health content of the undergraduate pharmacy curriculum, as pharmacy is often the first point of call,

"I think there is a benefit because they are often the first persons that patients will go to ... and if they understood public health issues; then they can guide patients better. Probably, it is good that it is on the curriculum." [GP Partner – SIM]

4.4.11 - Strengths and limitations of my interview

4.4.11.1 – Strengths

I have already covered above some of the strengths of my interview (please, see section 3.5.2). However, interview is a method of naturalistic enquiry, which is normally less obtrusive than quantitative investigations and does not manipulate the research setting (Bowling 2002), and allows more detailed questions to be asked. By adopting this method, the findings of my survey were enhanced, as the qualitative study focused on the meanings that participants in the study setting placed on their social world (Bowling 2002), something that could not be achieved with quantitative research. I tried to enhance the reliability of my analysis by showing how well the results were linked with my data (Polit and Beck 2004), describing clearly the context, selection and characteristics of my participants, as well as my process of data collection and analysis (Graneheim and Lundman 2004). I tried also to enhance the trustworthiness of my analysis through authentic citations. I maintained confidentiality throughout by ensuring that informants were not identified by quotes from the data (Ford and Reutter 1990).

4.4.11.2 - Limitations

Some of the limitations included, my preconceptions about the findings (Weiss 1994), having done some work previously related to this project. In addition, the difficulty

associated with analysing interviews, which is very time-consuming. Some of the issues raised might be a reflection of interviewees' pressing concerns at the time of the data collection (Cotter and Mckee 1997). The out-numbering of the group aged 50-59 years (seven [46.7%]) over the other age groups might have biased considerably the direction of my interview findings. Yet, only one nurse practitioner was included in my interviews of healthcare practitioners. I could have enhanced my study findings by including a wider range of healthcare practitioners, for example, hospital consultants, specialist public health practitioners/consultants, dieticians, even the public, etc. Finally, my pre-knowledge of some of the respondents may also have affected both the issues raised (Anderson 1998) and the respondents' willingness to share certain views (De Young 1996).

4.4.12 - Conclusions

My interviews with healthcare professionals revealed a number of interesting issues that can help enhance the public health role of community pharmacists in the UK. From the interviews, I gathered that enhancing the public health role of community pharmacists could make public health services from the community pharmacy more accessible to the public. Other benefits would include the ability to enhance public safety, enhancing public trust in pharmacists, encouraging collaboration between pharmacists, doctors and other healthcare providers and helping to save money for the NHS. Moreover, enhancing the public health role of community pharmacists could also help reduce stress levels among other healthcare professionals, as well as empowering and making community pharmacists more recognisable as important members of the healthcare team. Nonetheless, my interviews with healthcare professionals also revealed and confirmed a number of barriers that needed to be tackled to enhance the public health role of community pharmacists in the UK. These included free services, lack of awareness and education, lack of empowerment for pharmacists, pharmacists themselves, UK pharmacy education, and lack of support from GPs and other healthcare professionals. In addition, there was also the issue of lack of time and workload, lack of infrastructure, over-supply of pharmacists, commercialism of community pharmacy practice, and lack of clarity in the UK government's policy on the role of the community pharmacist in public health.

From my interviews, I could also confirm that UK pharmacists' contribution to macro-level

public health activities were minimal: my interview participants hardly mentioned or discussed issues such as epidemiology, assessment, pharmacovigilance, policy development and assurance at the population-based level. I did also notice that although some of my participants highlighted issues such as managing risk factors, errors, communicable diseases and ageing, these discussions were often minimal when compared to, for example, to the need for empowerment or tackling some of the barriers associated with pharmacists' role in public health. Interestingly, I captured in my interview all of the 14 domains of the theoretical domains framework and several of its constructs (Michie, et al. 2005). To enhance the public health role of community pharmacists in the UK, it seems there will also be a need to develop pharmacists' capacity in several domain areas, notably, *knowledge, skills, social/professional role and identity, optimism, intentions, goals, and beliefs about capabilities*. As well as these, there seems to be also a need to manage *social influences (Norms), reinforcement, emotion* and the *environmental context and resources* available to pharmacists.

Chapter 5 - Discussion, Conclusions and Recommendations

5.1 - Introduction

A number of UK studies (Anderson 1998; Anderson and Blenkinsopp 2003; Blenkinsopp, et al. 2002; Agomo 2012a) confirm the role of pharmacists in public health. One of those studies (Agomo 2012a) also contributed to the conclusions of a recent Public Health England document on the role of community pharmacy in public health (PHE 2014). In the service-focused study (Agomo 2012a), I identified that the main roles provided by community pharmacists in public health were in the areas of smoking cessation services; infection control and prevention; promoting cardiovascular health and blood pressure control; provision of emergency hormonal contraception; prevention and management of drug abuse, misuse and addiction; and healthy eating and lifestyle advice. These findings largely confirmed the findings of two other UK studies (Anderson and Blenkinsopp 2003; Anderson, et al. 2004).

A white paper (DoH 2010a) proposes a higher priority and dedicated resources for public health, with community pharmacists expected to play greater roles than before. While some of the public health activities provided from the community pharmacy have been successful, several have been unsuccessful due to various factors (Agomo 2012a; Agomo and Ogunleye 2014). Following my review of knowledge and information, I identified a wide range of strategies that could help to enhance the public health role of community pharmacists in the UK. The themes identified include strategies to enhance the public health role of community pharmacists through the following: the use of social media in public health education; developing good adherence strategies for patients; enhancing the public health content of pharmacy curricula; enhancing the effectiveness of the communication techniques of students and pharmacists; promoting interdisciplinary initiatives in pharmacy education and practice; and supporting efforts aimed at preventing the development of antimicrobial resistance and the spread of infections. Other themes included the need for promoting patients' self-management capacities; strengthening patients' education on safe medication disposal methods; enhancing the management of polypharmacy and long-term conditions; managing the legitimate medication needs of the public to prevent the accidental use of banned substances; remunerating pharmacists directly for providing public

health services; innovating smoking cessation activities by pharmacists; and advancing the pharmacy practice experience of students in public health.

Furthermore, in my review of knowledge and information, I also identified other papers that investigated community pharmacy-based services for alcohol misuse (Horsfield, et al. 2011), community pharmacy travel medicine services (Hind 2008) and the general public's and health providers' perspectives on public health utilisation from community pharmacies (Saramunee, et al. 2012). In terms of the limitations of the identified studies, there were instances where there were no indications that the studies were piloted (McDaniel and Malone 2011; Brown, et al. 2007; Roughead, et al. 2011; Lee, et al. 2009; Kurko, et al. 2010; Patterson 2008; Whitley 2010; Westrick, et al. 2009; Cerulli and Malone 2008; Saramunee, et al. 2012), where ethical considerations (Brown, et al. 2007; Patterson 2008; DiPietro, et al. 2011) and consent approval (Brown, et al. 2007; Hind 2008; Gavaza, et al. 2011; Schwartzberg, et al. 2007; Patterson 2008; Bush, et al. 2009; Westrick, et al. 2009; Kurko, et al. 2010; Whitley 2010; Baqir, et al. 2011; DiPietro, et al. 2011) were not discussed, as well as instances where the sample size was either not stated (Whitley 2010) or the response rate was low (Hind 2008; DiPietro, et al. 2011; Gavaza, et al. 2011; Saramunee, et al. 2012). In some of the papers, the outcome measures (Hind 2008; Bush, et al. 2009; Johnson, et al. 2009; Emmerton, et al. 2010; Horsfield, et al. 2011; DiPietro, et al. 2011; McDaniel and Malone 2011; You, et al. 2011; Wong, et al. 2011b; Saramunee, et al. 2012), recommendations for further studies (Brown, et al. 2007; Hind 2008; Patterson 2008; Lee, et al. 2009; McDaniel and Malone 2011; Roughead, et al. 2011; Cerulli and Malone 2008) and limitations of the studies (Patterson 2008; Trapskin, et al. 2009; Whitley 2010; Wong, et al. 2011b) were not discussed. These factors may therefore limit the generalisability of my findings.

While each of the identified papers have contributed individually to the understanding of the strategies needed to enhance the public health role of community pharmacists, the main gap in the UK evidence base lies in the fact that none of the identified papers focused specifically on identifying or investigating strategies that can enhance the public health role of community pharmacists. There was also a significant gap in the quality of evidence in the papers reviewed, as I identified only one systematic review study in my review of knowledge and information (Eades, et al. 2011). However, the fact that most of the identified studies in

my review of knowledge and information originated from outside the UK, with findings that often could not be generalised to the UK due to differences in health systems, practices and laws, to some extent justified the need for my project. My project used mixed methods to develop an understanding of the strategies enhancing the public health role of community pharmacists in the UK.

5.2 - Discussion

My project has enabled me to identify some of the strategies needed to enhance the public health role of community pharmacists in the UK. Although most of the strategies identified in my review of knowledge and information were supported by the majority of my survey respondents, this support was however lower on issues such as offering dual MPharm (or even PharmD)/MPH degrees (37.5%) and community pharmacists adopting new technologies and social media in practice (43.2%). Dual degrees are popular in the USA, where some universities now run the dual PharmD/MPH (DiPietro, et al. 2011), even PharmD/MBA/Law, MD/MPH, MD/PhD, MD/MBA, etc., degrees (Flynn 2010). Dual medical degrees in particular have increased considerably in the US during the last decade or so (Flynn 2010). While obtaining a second degree needs a substantial investment of time, money or both, it can be highly rewarding and offer training and credentials leading to a specialised role within medicine as a physician-scientist, physician-executive or global health leader, as well as many other possibilities (Flynn 2010). The UK pharmacy profession has much to learn from this model, particularly as it concerns enhancing the public health role of pharmacists. Although dual degrees are not popular in the UK, a number of UK medical schools are however known to offer the dual MBBS BSc, MB PhD degrees (ICL 2015; UCL 2015a, 2015b). I have discussed previously (Agomo 2012c, 2014) how the introduction of dual pharmacy degrees in the UK could empower pharmacists and, at the same time, create jobs for pharmacists, particularly now that the UK profession is experiencing an over-production of pharmacists. My content analysis of the curricula of UK pharmacy schools confirmed that none of the UK pharmacy schools included in the study offered dual degrees. Regarding the adoption of new technologies and social media in practice, there was nothing to suggest in my content analysis that UK pharmacy schools were developing the skills of undergraduate pharmacy students in these new ways of providing public health services. In an article entitled 'Telemedicine', I describe how the public health (as well as the clinical)

role of UK community pharmacists could be enhanced (with the added benefit of financial savings), through the use of new technologies that allow pharmacists and other healthcare practitioners to diagnose conditions and give advice to patients at a distance with the help of a webcam, a computer and a broadband Internet connection (Agomo 2008b). Safdar (2015) also argues that social networks can be great tools to obtain professional knowledge and disseminate information globally. Moreover, platforms such as Twitter can offer real-time access to news while allowing people to leave their opinions (Safdar 2015). On the other hand, it is possible to use LinkedIn to build a professional profile and get in contact with other professionals (Safdar 2015). Despite these benefits, Safdar argues that there is a minimal number of pharmacists using social media, raising the possibility that pharmacy practice in general is not taking up the opportunity offered by social media (Safdar 2015).

With the increasing popularity of apps, with estimates in 2014 put at 138 billion downloads worldwide, there are signs that UK pharmacists are slowly catching up with these new technologies in practice (Andalo 2015). Some popular apps include the NHS four-week course in smoking cessation; the NHS app for depression assessment by the public; apps on how to prevent deep vein thrombosis and others to help patients track their blood sugar or blood pressure levels (Andalo 2015). In community pharmacy, a number of pharmacists are now using apps designed to calculate an individual's chance of developing cardiovascular (CV) disease in the next ten years by recording information on height, weight, smoking history and family heart history. There is also, a Diabetes UK risk score app for calculating an individual's risk of developing type 2 diabetes; a Diabetes UK app for type 1 or type 2 diabetes daily blood glucose monitoring; an app for electrocardiograph (ECG) reading within 30 seconds; an app designed as a game to test a person's memory function; and another app which reminds patients when to take their medicine and prompts them if they forget. It seems reasonable to also consider the *emotional* impact (*fear as well as threat*) which the use of new technologies and social media could have on pharmacists, particularly when it comes to their job security (P-PO). Having said that, it also seems rational that UK pharmacy schools should also reflect the teaching of these new ways of delivering public health services strongly in their curricula.

Concerning the present UK community pharmacy IT system, one of my survey respondents described it as a 'joke' and a time waster (*environmental context and resources*):

“The IT systems are a joke and in my opinion not enough is being actually done to free up pharmacist time.” [RE442]

Maybe, delegating some of the dispensing roles to robotic dispensers and offsite dispensers (hub-and-spoke model), particularly with regards to electronic prescriptions, could be a way forward, in terms of minimising environmental constraints on pharmacists as well as *resourcing* them adequately. While most of my interview participants were in support of the use of new technologies and social media in practice (bearing in mind the need of younger service users), a few of them, particularly the older ones, were less supportive of their use in practice. Some of their concerns were around privacy, which is also an environmental constraint, and confidentiality – possibly due to lack of *beliefs about capabilities* of pharmacists and their staff.

“I think it is rubbish ... it is wrong, you can't beat the face-to-face consultation, for sure.” [GP Partner – SIM]

However, the fact that some community pharmacies do not allow Internet access (*environmental context and resources*) to their staff might also be hindering pharmacists' ability to provide public health services,

“If somebody comes to the pharmacy with any disease that you don't know, people should be able to assess information online, it will be good to be able to check what some other people have written about that condition, without any problem.” (P-SOL)

However, the fact that many UK pharmacy schools are failing to match theory (knowledge) with practice (skills) could also affect the public health role of community pharmacists:

‘Unfortunately, what we actually see in most pharmacy schools today is the opposite of how a pharmacy and new technologies are being run’ [P-VIV].

The fact that most lecturers in UK Schools of Pharmacy are non-pharmacist-practitioners, which is the opposite of what one finds in most medical, dental, nursing and other health institutions does not help much this mismatch of *knowledge* and *skills* (Agomo 2012d). Hence, you find that non-public health experts, e.g., health sociologists and psychologists, lead public health courses in some UK Schools of Pharmacy. Interestingly, Peter Noyce, professor of pharmacy practice at the University of Manchester, recently acknowledged this point in a *Pharmaceutical Journal* article (Torjesen 2015b):

“In a number of schools the number of pharmacists would not be over half of the faculty, so that actually means the student can end up having quite a low exposure to practice but also low exposure to pharmacists ... In comparison with other health

disciplines — whether it be medicine, nursing, physiotherapy or dietetics — many more of their practitioners are involved in education, whereas the majority of pharmacy practitioners are not.” [Prof. Peter Noyce]

Although, the Modernising Pharmacy Careers Programme document (Smith and Darracott 2011) aims to correct this by encouraging Schools of Pharmacy to produce more academic pharmacists, yet the challenges faced by pharmacy graduates is not just limited to undergraduate training as noted above, this anomaly continues into practice, with the majority of pharmacists today being managed directly by profit-orientated company non-pharmacist managers, supervisors and directors. According to Michie, et al. (2005) this is a *social influence*, it has a direct link to *organisational commitment and culture*.

However, when we also consider the fact that estimates indicate that medicine wastage in England is in the order of £300 million per year, the importance of developing good adherence strategies for patients, is further appreciated (Trueman, et al. 2010). Still, poor adherence by patients could also be associated with poor monitoring and reporting of serious adverse drug events (ADEs) by pharmacists (Gavaza, et al. 2011). The magnitude of the problem is also dependent on the condition being treated (Sukkar 2015), with a study showing that in type 2 diabetes, for instance, adherence rates have ranged from 60% to 85%, for hypertension 26% to 51%, for asthma from 28% to 70% and for HIV adherence from 37% to 83% (Aitken and Gorokhovich 2012). Still, the cost of non-adherence is not just about the cost of wasted drugs but also include increased health costs to payers if a patient’s condition worsens (Sukkar 2015).

Nonetheless, based on recent evidence that suggests that you would need to have 12 or 13 different drugs to mimic all the effects of exercise, focus of good adherence may no longer be on patients taking their medicines correctly, but could soon shift to patients also adhering correctly to their exercise prescription regimens (Dolgin 2015). Eighty-eight per cent of my respondents indicated that they would want UK community pharmacists to be developing good adherence strategies for patients. However, the word 'adherence' was not widely featured in the curricula of UK Schools of Pharmacy (*knowledge*), as I found it only in the curricula of the School of Pharmacy, University of Portsmouth and UCL SoP (Year 2). A closely associated word, 'optimisation', appeared only in the curricula of the School of Pharmacy, Cardiff University and UCL SoP (Year 3). It seems to me therefore that the teaching of many of the issues concerning medicines adherence or optimisation to

pharmacists is during postgraduate courses, such as, through continuous professional development programmes (CPDs) or in taught diploma and master's programmes. Bringing some of these topics to the undergraduate pharmacy curriculum could help enhance students' *knowledge* and *skills* in public health as well as prepare them for future public health roles in GP practices and community pharmacies.

Regarding smoking cessation, several studies confirm the role of community pharmacists in this area (Anderson 1998; Anderson and Blenkinsopp 2003; Agomo, et al. 2006; Agomo 2012a). In my review of knowledge and information, I identified a gap in the evidence base, particularly on the willingness of retail pharmacies to stop the sale of tobacco products. My survey of UK community pharmacists indicated that 80.6% of my respondents would want community pharmacists to enhance their involvement in smoking cessation. A free text comment by one respondent further amplified this point:

“Companies that own pharmacies should not be involved in activities which show conflict of interest, e.g. selling cigarettes.” [B123]

Not much was said in my interviews with UK health professionals regarding the role of community pharmacists in smoking cessation, with the exception being the pre-registration participant (PR-FLY), who cited smoking cessation as a good example of a service which community pharmacists could use to enhance their role in public health, through brief intervention (utilising, for example, the transtheoretical model and stages of change – tools for *motivation*). Surprisingly, my Text Search with NVivo revealed that the word 'smoking' appeared in the curricula of only three UK Schools of Pharmacy: Huddersfield, Portsmouth and UCL SoP (Year 4). I did not identify the related words 'smoke' or 'smoker' in the curricula of these schools. However, I found the word 'tobacco' at UCL SoP (Year 4). Although this may not necessarily indicate that the other UK Schools of Pharmacy were not teaching smoking cessation to their students, it does give some indication as to how this very important public health topic is prioritised in many UK pharmacy schools - (*goal target/setting and goal priority*).

On effective communication, a number of studies identify the need for healthcare practitioners to improve their communication techniques (*skills - interpersonal skills*) (Schwartzberg, et al. 2007; Carter, et al. 2008; Sookaneknun, et al. 2009; Emmerton, et al. 2010; Roughead, et al. 2011; Rowlands 2012). My survey of UK community pharmacists,

which indicated that majority of my respondents (79.3%) would want UK undergraduate pharmacy students and pharmacists taught content-specific/advanced communication techniques, further confirmed this need. I noticed the same trend both in the free text comments provided by my survey respondents and my interviews with healthcare participants.

“If you have knowledge and you are not able to communicate, you will not be able to impact that knowledge to the person that needs it.” [USP-CHD]

While there was nothing to suggest that UK Schools of Pharmacy were teaching advanced communication methods to students, from my content analysis of the curricula of UK pharmacy schools, it was obvious that many schools were developing students' *skills* in communication through written assignments, oral presentations, etc. However, it has been noted that in practice, little attempt is made by healthcare professionals to assess patients' understanding of any health advice given (Schwartzberg, et al. 2007). This could be due to lack of *skills, beliefs about capabilities or environmental context and resources*, particularly as it relates to *competing tasks and time constraints*. This is even more concerning when we also consider the findings of a recent study that assessed how 102 patients with an allergy used an epinephrine (adrenaline) auto-injector device and how a group of 44 patients used a metered-dose inhaler (MDI) to treat their asthma (Bonds, et al. 2015). In that study, the researchers found that only 7% of asthma patients used their MDI properly, and in the case of patients using an epinephrine auto-injector device, the success rate was only 16%. According to the study, there was a need for better patient training, including practical demonstrations, in the use of their devices (otherwise, enhancing patients' *beliefs about capabilities*). The nurse participant [N-CHM] highlighted the same concern with community pharmacists, 'At the moment now, most pharmacists ... they just give you your usual supply of prescription. They don't advise any more'. However, pharmacists signposting patients to manufacturers' YouTube videos on good device techniques, which *empower* patients through *knowledge* or even using online tools such as Skype to teach patients (*beliefs about capabilities*), could further demonstrate pharmacists' ability to employ readily available new technologies and social media to enhance their role in public health.

Nevertheless, within the UK's NHS, there has been a steady transfer of care from specialist hospital doctors to primary care doctors, especially general practitioners (Martin, et al.

2011), mainly to take healthcare delivery nearer to patients as well as to contain and reduce the cost of treatment. However, this has further increased the workload of GPs (*time constraints*), and some of this work lies within the domain of public health practice (e.g. health education, immunisation, medicines use/clinical reviews, etc.). My review of knowledge and information (Baqir, et al. 2011; RPS 2014a; Watson, et al. 2014), survey of UK community pharmacists and interviews with healthcare professionals revealed that enhancing the public health role of community pharmacists can significantly reduce the cost of treatment as well as the workload of other healthcare professionals, by reducing GP and A&E appointments by patients for minor conditions that can easily be managed by pharmacists.

“I know from my own experience, we see a lot of patients with minor illnesses that come to the GP and I think this is a waste of time.” [GP-CHY]

The easy access of community pharmacists to the public (*environmental context – availability*) was widely highlighted by both the survey respondents and interview participants.

“Easy access to services, no appointment needed” [C302].

However, as a pharmacist practitioner myself, I have also noticed that the main selling point of community pharmacy practice, 'easy access', with no need for appointments, also brings with it some challenges in terms of pharmacists' ability to provide some services from the pharmacy. There is sometimes no time to provide some of these services. Meaning that, community pharmacists claim of *availability*, might actually be misleading due to *time constraints*.

“The pharmacist then hasn't got time; you need two pharmacists.” [GP Partner-SIM]

To enhance the public health role of community pharmacists in the UK, there is also a need to minimise *environmental constraints (environmental context)* and enhance *resources* by engaging more than one pharmacist in community pharmacies during opening hours, as highlighted for example by the GP Partner participant [SIM] above and also by a pharmacist participant [PKT].

“Like in Italy where I come from, if we are five, all five pharmacists working are qualified pharmacists.” [P-PKT]

The Pharmacists' Defence Association supports this initiative, which they believe will help enhance both the clinical and the public health roles of community pharmacists (PDA 2015a).

While it might seem logical that GPs should also transfer, some of their minor clinical and public health roles to pharmacists to enable them to focus on more complicated clinical and public health cases, this is not always an easy transition. The reason is that while it is a lot easier for GPs to take on some of the specialist doctors' roles due to the uniformity of undergraduate training, this is not the case with pharmacists, whose undergraduate training has been developed traditionally as a science rather than a clinical/public health programme. My content analysis of curricula of UK pharmacy schools indicated that science-orientated subjects, in most cases at the expense of public health modules, significantly dominated the UK undergraduate pharmacy programme – highlighting inadequacy of *skills* and *knowledge* of students in public health. In many UK pharmacy schools, the teaching of public health to students, has often been as an optional module or integrated with other topics. There is, therefore, a need to present Public Health as a core module in the curricula of UK Schools of Pharmacy, to broaden and advance the knowledge base and skills of pharmacists in public health. While I could argue that the public health module delivered at the School of Pharmacy, Robert Gordon University, Aberdeen, to a large extent closely resembled what one would expect, at least, in a Diploma in Public Health programme, based on the list of topics covered, it was difficult for me to ascertain how broadly or intensely these topics were delivered to students.

My survey findings supported the need to increase the public health content of UK undergraduate pharmacy curriculum (*knowledge*), with 64.8% of my respondents indicating that they were happy with such an increase. The responses from my interview participants, many of whom saw this as the only way forward to enhance the public health role of community pharmacists support this finding.

"It will be important that before a pharmacist graduates, going into community pharmacy, whatever, as a pharmacist, that they're aware of public health as a discipline, and that in a way, they know what are involved..." [P-PO]

Interestingly, respondents from Cardiff (median = 3.0) were less likely than other respondents (total median = 4.0) to agree that the public health content of the UK

undergraduate curriculum should be increased ($p = .024$; $\eta^2 = .087$). This difference seems to suggest that the pharmacy profession in Cardiff might need more convincing (*intentions*) about the benefits of increasing the public health content of the undergraduate pharmacy curriculum.

Regarding the dominance of the sciences in the undergraduate pharmacy curricula over public health, a pharmacist, Mathew Smith from Cardiff School of Pharmacy and Pharmaceutical Sciences, has questioned the wisdom in this (Chapman 2014). He threatens to get rid of a great deal of the science, as according to him, around 99% of students are going to be pharmacists rather than going into the pharmaceutical industry (Chapman 2014). In the case of one of my interview participants (P-SOL), all of the chemistry she learnt during her undergraduate pharmacy training in the 1990s has made little contribution to her practice as a community pharmacist. More or less, highlighting the fact that she received wrong *knowledge* and *skills* during her undergraduate training, which has no relevance to her present role as a community pharmacist. She reckoned that, shifting the emphasis from the sciences to clinical studies would be more relevant to pharmacists in their clinical and public health roles, a point agreed by another participant.

However, the need to broaden and enhance the public health (including clinical pharmacy) training of undergraduate students and then pharmacists (Agomo 2004, 2011, 2012c, 2015) supports the recent move in the UK to employ pharmacists in GP practices (Robinson 2015a). I hope that pharmacists working in GP practices will help enhance the professional image of pharmacists, particularly as pharmacists' association with the 'shop environment' seems not to be helping their public health role agenda.

At the same time, it seems reasonable that community pharmacists should also be willing to transfer some aspects of their dispensing roles to well-trained and competent dispensers and technicians or even robotic dispensers (*environmental context and resources*), a point I have argued a number of times (Agomo 2008b, 2012b; Agomo and Ogunleye 2014), and reiterated recently in other articles (Bradley, et al. 2013; Torjesen 2015b).

In order to enhance the public health role of community pharmacists, there will also be a need to advance the pharmacy practice experience (*skills*) of students in public health (Patterson 2008). Interestingly, Patterson (2008) also observes that students working behind a pharmacy counter may not give an accurate picture of health care beyond the pharmacy.

In one study, post-APPE discussion definitions were broader and more accurate in students who had the training; in addition, post-APPE reflections showed that students' initial lack of knowledge base improved as well as their interest in participating in public health initiatives (Whitley 2010). Eighty-six per cent of my respondents were in favour of students getting advanced pharmacy practice experience in public health (*skills - practical/skills development*). There was no indication from my content analysis of the curricula, that UK pharmacy schools offered to students advanced pharmacy practice experience in public health. However, from my interviews with healthcare professionals, it was obvious that UK pharmacy students would benefit from additional experience in public health (including clinical pharmacy).

Regarding promoting interdisciplinary initiatives in pharmacy education and later in practice (*social influences - team working*), these were widely supported by my survey respondents (81.4% and 93.1% respectively). The negative correlations that existed between the age of respondents and their support for the suggestions on pharmacy students training with other healthcare students ($\rho = -.261$; $p = .015$) and pharmacists working closely with healthcare practitioners ($\rho = -.221$; $p = .040$), tends to suggest that interdisciplinary initiatives might soon become the way forward for both UK pharmacy education and practice.

My interview participants were also in support of interdisciplinary initiatives. The reflection of this in practice was however weak. For example, while most of my survey respondents (98.9%) indicated that they were offering over-the-counter (OTC) advice, with another 76.5% participating in local authority-run schemes, when it came to collaboration with other healthcare providers, only 33.7% of my survey respondents said they were collaborating with a local practice in a shared care kind of scheme. Nonetheless, my observation that respondents from Cardiff (median = 2.0) were more likely to be participating in local authority-run schemes than other respondents ($p < .001$; $\eta^2 = .296$; total median = 1.0) might necessitate further investigation, bearing in the mind the large effective size of the difference ($\eta^2 > .14$).

However, some of the benefits highlighted around integrated learning and practice included its ability to encourage inter-professional learning and practice, easy transfer of knowledge between practitioners (*knowledge and skills enhancement*), minimising wastage of resources and duplication of efforts in some institutions (reducing *environmental*

constraints through efficient *resource* management), facilitating patients' care services (*beliefs about capabilities and empowerment*), as well as its ability to enhance the profile of pharmacists (*social/professional role and identity*). I have previously highlighted some of these benefits, which also include creating jobs for new pharmacy graduates and giving them the skills needed to work in various environments (Agomo 2006, 2012c). There was minimal evidence from my content analysis that interdisciplinary initiatives (*social influences - team working*) were being practised at the UK undergraduate pharmacy training level. Nonetheless, the programme at the School of Pharmacy, University of Birmingham may encourage other UK pharmacy schools to develop interdisciplinary initiatives, as it reflected Birmingham's commitment to offering integrated medical training and education (News Team 2011). The system in most UK pharmacy schools, where students had little or no interaction with other healthcare students at the undergraduate level, was therefore, a deviation from the experience of some of my interview participants who had witnessed many of the benefits of integrated training overseas.

Antibiotic resistance continues to be a global problem (WHO 2015b). In the UK, the National Institute for Health and Care Excellence (NICE) recommends that everyone engaged in providing healthcare should understand the standard principles of infection control (NICE 2012). In both my service-focused study and my review of knowledge and information, I identified the role of community pharmacists in infection control (Agomo 2012a; Agomo and Ogunleye 2014). Other studies also discuss the role of community pharmacists in infection control (Bruce and Scott 1998; Watson, et al. 2003). In my survey of UK community pharmacists, 79.5% of respondents indicated that they would want community pharmacists to enhance their role in preventing the development of antimicrobial resistance and the spread of infections. My content analysis of the curricula of UK pharmacy schools revealed that various issues related to infection were taught in a number of schools, notably, at Bath, Brighton, UCL, De Montfort, Durham, Keele, Manchester and Wolverhampton. The curricula of the Schools of Pharmacy, Keele, Portsmouth and UCL indicated that their undergraduate pharmacy students received training in drug resistance. However, in my interviews with healthcare professionals, I noticed that my interview participants said hardly anything regarding infection control or drug resistance. The only mention of antibiotics by a participant [USP-CHD] was referring to pharmacists' role in preventing allergic reactions.

“A patient comes into the doctor's office, forgets to tell the doctor that he's allergic to maybe, a quinolone, gets Levaquin [a brand of levofloxacin]. He gets to the pharmacist, the pharmacist finds out that this patient is allergic to Levaquin, gives the doctor a call, that problem gets solved and then another medication that the patient is not allergic to is prescribed.” [USP-CHD]

I also noticed that the only use of the word ‘infection’ in my interviews with healthcare professionals was by a pharmacist participant [P-PO] who was talking about the desire of GPs to have a diagnostic tool that will enable them to differentiate viral infections from bacterial infections easily, without the usual need to wait for laboratory results.

Nevertheless, some of the challenges faced by Britain in areas such as sexually transmitted infections (STIs) have been highlighted (DoH 2010a); however, the role of community pharmacists in infection control is still limited mainly to advisory roles, as not many community pharmacists presently have prescribing qualifications or responsibilities. Maybe, there is a need for *knowledge* enhancement and *skills* development in this area as well as the use of *motivational* tools to enhance pharmacists’ interest in preventing the spread of infections as well as managing antimicrobial resistance.

Still, promoting self-management capacities (*beliefs about capabilities*) is likely to empower patients and ensure better health outcomes and savings to the NHS (Taylor and Bury 2007). From my content analysis of the curricula of Schools of Pharmacy, I was able to confirm that the Schools of Pharmacy, University of Portsmouth and UCL were teaching self-management capacities to students. It is possible that other UK Schools of Pharmacy were teaching self-management capacities as part of other modules. However, my survey of UK community pharmacists indicated that 89.8% of my respondents would want community pharmacists to be enhancing patients' self-management capacities, an idea further endorsed by a number of interview participants [N-CHM, PR-FLY, USP-CHD and GP-NN]. Again, from the comments I received from my US pharmacist participant [USP-CHM], it seemed reasonable to argue that the NHS could learn a few things from the practices of US health insurance companies, which minimise the need to make huge treatment payouts by paying community pharmacies/pharmacists to provide immunisation services to patients. In the UK, several insurance and utility companies do exactly the same by offering online self-care tips, which they hope will help reduce costs by limiting the need for call-outs. The recent call by the Royal Society of Public Health (RSPH) for pharmacists to join a wider public health workforce

(Kennedy 2015a), as well as the recent announcement for national flu service involving community pharmacists (Weinbren 2015), could therefore bring large savings to the NHS.

On the strengthening of patients' education on safe medication disposal methods (*skills and beliefs about capabilities*), there are indications that inappropriate medication disposal is still a problem, not just in the USA (Abrons, et al. 2010), but also in the UK (Fradgley and Smith 2012). In my survey of UK community pharmacists, 78.5% of respondents indicated that they would want community pharmacists to enhance their role in safe medication disposal methods. While none of my interview participants said anything regarding the need to enhance community pharmacists' role in medication disposal, there was also a lack of emphasis in the curricula of UK undergraduate pharmacy schools regarding medication disposal methods. This relates to lack of *goal priority*, particularly as it relates to *behavioural regulation*. It is possible that teachings on safe medication disposal methods occur with students after graduation.

According to Munger (2010), the risks associated with polypharmacy and the potential for inappropriate therapy need to be considered and balanced against the possible benefits of multiple drug therapies. The Scottish Government has also identified the need for pharmacists' greater contribution in polypharmacy, to minimise risks to patients (NHS Scotland and The Scottish Government 2012). Interestingly, the position of The Scottish Government on polypharmacy was also reflected in the way respondents from Edinburgh more strongly supported pharmacists' enhanced role in polypharmacy than did other respondents ($p = .040$; $\eta^2 = .076$). While the majority of my interview respondents (87.5%) said they would want community pharmacists to enhance their skills in the management of polypharmacy and long-term conditions, to my surprise, I did not see the term 'polypharmacy' in the curricula of any UK pharmacy schools. This could also highlight a mismatch between *goal priority* in terms of *knowledge* and *skills*. However, at the School of Pharmacy, University of Nottingham, there were indications that Year 4 students were receiving teaching on polypharmacy, in the 'Integrated Pharmaceutical and Patient Care' module.

"Students will develop their problem-solving skills and their abilities in application of therapeutics to individual patients with complex medical conditions and multiple medicines use."

There were also indications that in other UK Schools of Pharmacy, the teaching of issues pertaining to polypharmacy were often in modules related to medicines management and drug reconciliation. Although some of my interview participants made general statements regarding medicines use, none of them raised any specific issue about polypharmacy.

Remunerating pharmacists directly for providing public health services can help enhance their role in public health (The Scottish Government 2013), as against the present system, where only pharmacists' employers are remunerated for public health services provided by pharmacists. The majority of my survey respondents (89.8%) would like pharmacists to be remunerated directly for providing public health services (*environmental context and resources*).

However, for one of these respondents, pharmacists are 'seen as an "add-on" by staff, for which we are not directly remunerated' [C296]. Supporting this initiative, one of my interview participants [P-OL] also argued that, 'they (pharmacists) should be remunerated accordingly and not the business'. On the other hand, enabling the development of Independent Pharmacist Practitioners who are not attached to any employers, as proposed by a pharmacist organisation (PDA 2013), could help change the status quo and at the same time motivate pharmacists to enhance their role in public health (APA 2008). Another benefit of this model is that it limits some of the constraints often associated with employer-led public health services, such as targets and financial considerations (Bush, et al. 2009; PDA 2013).

As stated by the DoH (2010a), Britain has a relatively large population of problem drug users and increasing levels of harm from alcohol consumption. A number of studies have identified the role of pharmacists in drug addiction, substance abuse and misuse (Lee, et al. 2009; Chaar, et al. 2011; Ambrose 2011). There were indications from my content analysis that many UK pharmacy schools, notably, Bath, Brighton, RGU, Nottingham, Portsmouth and UCL were teaching students issues related to drug addiction, substance abuse and misuse (*behavioural regulation*). While 66.6% of my survey respondents indicated that they would like community pharmacists to manage the medication needs of athletes to prevent them from accidentally using a banned substance, none of my interview participants highlighted the role of pharmacists in these areas. There was also a lack of information from my project findings that pharmacists and students were being made aware of the

educational opportunities and responsibilities of pharmacists in anti-doping activities (Ambrose 2011), highlighting once again lack of knowledge, skills and possibly, self-confidence/professional confidence in this area. Moreover, Europe is considered to be the region that consumes the largest amount of alcohol in the world (Kaczmarek 2015), with consumption levels in some European countries estimated as twice the global average (WHO 2014). Not only is alcohol the third biggest risk factor in Europe for non-communicable diseases (NCDs), ill health and premature death (WHO 2014), alcohol is also known to directly or indirectly induce over 60 different types of illness (WHO 2012). These include mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular disease, immunological disorders, lung diseases, skeletal and muscular diseases, liver disease, reproductive disorders and prenatal harm (WHO 2012). Alcohol consumption is also known to be associated with crime, violence, domestic abuse, child sex abuse and road traffic accidents (Kaczmarek 2015), with drink-driving being the second biggest killer on EU roads (European Commission 2014).

While, there seems to be a potential for alcohol screening and brief intervention (SBI) services in community pharmacy (Horsfield 2011), still, there exists little empirical evidence of the effectiveness of community pharmacy-based services for alcohol misuse (Dhital 2004; Fitzgerald and Stewart 2006; Watson and Blenkinsopp 2009). In my survey of community pharmacists, a number of my respondents highlighted the role of community pharmacists in alcohol misuse (*behavioural regulation*). In addition, there was some evidence from the curricula of UK Schools of Pharmacy that alcohol misuse was one of the public health topics often discussed with students (*knowledge - knowledge about condition/scientific rationale*). There is however a need for UK Schools of Pharmacy to further develop their curricula, particularly as it relates to the use of motivational tools such as the Transtheoretical Model of Change (TTM) (Prochaska and DiClemente 1986; Prochaska 1994), Ajzen's Theory of Planned Behaviour (Ajzen 1991) or even the Goal-setting theory (Locke and Latham 1990) in lifestyle and addictive behaviours (*intentions and goals*). I have also discussed some of these motivational tools in a commissioned continuing professional development (CPD) article (Agomo 2008a).

Concerning travel medicines, Hind, et al. (2008) note that UK community pharmacists provide limited services in this area; highlighting, yet another area where community

pharmacists could be lacking *self-confidence/professional confidence (beliefs about capabilities [Self-efficacy])*. However, they have also argued that community pharmacists can enhance travel medicines service, by offering the travelling public general advice on various issues such as bite prevention, provision of immunisations and malaria prophylaxis, with the public in many cases also willing to pay for some services (Hind, et al. 2008). According to a recent study from Australia (Tudball, et al. 2015) there is more to travel medicine, which might also include community pharmacists managing patients' medicines properly before they embark on any journey. Sadly, prior to travelling, patients seldom ask for advice regarding their regular medicines from healthcare professionals (Tudball, et al. 2015). However, community pharmacists and other health professionals are well positioned to advise and assist patients with complex drug regimens who are planning to travel, and at the same time, provide general awareness regarding the need for maximum care with multiple medicines (Tudball, et al. 2015).

As well as these, it is also imperative to address many of the identified barriers hindering the public health role of community pharmacists in the UK, such as the community pharmacy environment (*environmental context and resources*), which sometimes may not be suitable for the delivery of public health services; the perceptions of both the general public and other health providers of pharmacists' competencies (*beliefs about capabilities*); privacy and confidentiality in pharmacies (*environmental context and resources*); time pressure; and high dispensing workload (*environmental context and resources and social influences respectively*). As well as, address other barriers, such as, lack of awareness of the role of the pharmacist (*social/professional role and identity [self-standards]*); the UK healthcare system and its policies towards the public health role of the pharmacist (*environmental context and resources and social influences*); inadequate training of pharmacists in public health (*knowledge and skills*); lack of documentation of activities (*memory, attention and decision processes*); and inadequate financial support (*environmental context and resources*) (Bush, et al. 2009; Agomo 2012a; Saramunee, et al. 2012; Agomo and Ogunleye 2014). Other barriers that will also need to be tackled to enhance the public health role of community pharmacists include lack of professional autonomy for pharmacists (*social/professional role and identity and beliefs about capabilities - empowerment*), lack of input from public health practitioners (*social influences - team working*), lack of support from GPs and public health

practitioners (*social influences - team working*) and difficulty in communicating with other public health providers (*social influences and skills*), lack of patients' records (*environmental context and resources*), and lack of understanding by the public and healthcare providers of the training and skill-sets of pharmacists (*knowledge and social influences*).

In addition, it seems there is also a need to enhance professionalism in UK community pharmacy practice (*social/professional role and identity*), as highlighted previously (Agomo 2012f), as well as tackling commercial pressure from employers (*environmental context and resources, and social influences*), difficulty following up with patients (*social influences*), the conflict of interest that exists between pharmacists and GPs and the underutilisation of pharmacists' skills (*social influences and beliefs about capabilities*).

According to some of my survey respondents, some of these barriers could be tackled by, for example, getting rid of target-driven services (*social influences and goal/target setting*), opening up channels of engagement between pharmacists and stakeholders, reducing professional isolation (*social influences – team working*), tackling many of the barriers highlighted above, ensuring consistency in service delivery across sectors and localities (*environmental context and resources*), enhancing collaboration between community pharmacists and other healthcare providers (*social influences – team working*), and ensuring that more than one pharmacist works in community pharmacies at any one time (*environmental context and resources*), as seen in some European countries, for example, Italy. Besides this, role delegation between pharmacists and other healthcare professionals and pharmacy support staff will also be necessary. It seems there is also a need for better funding of public health services by the government (*environmental context and resources*); as well as direct remuneration of pharmacists for public health services and ensuring that the professional image of pharmacists (particularly in community pharmacy) is enhanced. Pharmacists themselves might also benefit from the application of motivational tools to make them more proactive, assertive and committed to public health activities.

Other challenges faced by community pharmacists in their aspiration to provide public health services relate to the structure of community pharmacies (*environmental constraints*) (Agomo 2012f), lack of a well-defined career structure and progression channels in community pharmacy, unacceptable work-life balance (*social influences*) – leading to high

stress levels among community pharmacists (Agomo 2012g), the unavailability of individually contracted community pharmacists (*environmental context and resources*) (The Scottish Government 2013) and the declining ownership of community pharmacies by independent pharmacists (lack of *empowerment*) (Bush, et al. 2009; Agomo 2012e). The main implication of the declining ownership of community pharmacies by pharmacists is that we find that the role of the community pharmacist in public health is often shaped by the commercial interests of the organisations they work for rather than by their undergraduate pharmacy training or the aspiration of individual pharmacists to advance their public health roles.

"Because everybody is allowed to own a pharmacy, all these multiples, they are all after the profit and not after the patients' health and that's not doing well for the profession." [P-OL]

The effect of workload (which can lead to *stress and burn-out [emotion]*) on community pharmacists' ability to provide public health services seems to be huge, based on the number of comments I received from my survey respondents and interview participants. According to the same pharmacist respondent above (P-OL), 'I only see the prescription and because I'm so busy, I don't have the time to even talk to the patient'. Such comments not only create doubt among patients about the seriousness of community pharmacists as public health providers, but can also defeat the whole perception of community pharmacists being readily accessible for public health services.

On the conflict of interest which one of my respondents raised as a barrier to enhancing the public health role of community pharmacists in the UK – 'GPs and GP practices don't want pharmacies in their team – conflict of interest' [B37], this might be managed through the development of Independent Pharmacist Practitioners, who could also work as group practitioners or partners, as well as encouraging GP practices to employ more pharmacists as recently proposed by the Royal Pharmaceutical Society (RPS) and the Royal College of General Practitioners (RPS) (Robinson 2015a) (*social influences - team working*). According to Butterfield (2015), closer ties with general practice – and primary, secondary, tertiary, mental health and social care (*social influences - team working*) – are essential to improve the contribution of pharmacist to patient care and to secure better prospects for the profession. Nonetheless, tackling comments such as, 'Better funding. Remove services from GPs that are under-performing' [RC196] also brings questions that require answers, for

example, do community pharmacists have the necessary education, skills and practice environment needed to provide such services?

The underutilisation of pharmacists has often been described as a huge waste of resources and the intellectual skill of pharmacists (The Scottish Government 2013), particularly at a time when other healthcare professionals are barely coping with demands that can easily be provided by pharmacists. My survey of UK community pharmacists and interviews with healthcare professionals revealed that both pharmacists and other healthcare professionals would want this underutilisation of pharmacists to stop - minimising *social influences (Norms)* and enhancing *social/professional role and identity* of pharmacists.

“Patients can be educated more ... like give them a list of conditions that, 'these things, you don't really need to see your GP'.” [GP-CHY]

To address some of these challenges, the profession might also need to consider a recent proposal to separate the dispensing role of pharmacists from the pharmacy/public health services role - creating *professional identity/boundaries/role* (Smith, et al. 2013), as well as promoting the establishment of Healthy Living Pharmacies (*skills*) (Kennedy 2015b).

According to the Pharmaceutical Services Negotiating Committee,

“The Healthy Living Pharmacy (HLP) framework is a tiered commissioning framework aimed at achieving consistent delivery of a broad range of high-quality services through community pharmacies to meet local need, improving the health and well-being of the local population and helping to reduce health inequalities.” (PSNC 2015)

Demonstrating the impact of HLPs, a recent Portsmouth study found that significantly more clients per pharmacy were seen in HLPs than non-HLPs for the following services: targeted respiratory medicine use reviews (medians: 29 vs 11; $P = 0.0167$); smoking cessation at initiation (62 vs 18; $P < 0.001$) and at 4-week (26 vs 10; $P < 0.001$) and 12-week (5 vs 1; $P = 0.023$) follow-ups (Browns, et al. 2014). Supporting the role of HLPs in enhancing the public health role of community pharmacists in UK, my survey of community pharmacists also revealed that the majority of my respondents (68.7%) would like to see UK community pharmacies developing into HLPs. Maybe creating an opportunity for more education and awareness is also behind the fact that respondents from Cardiff (median = 3.0) were less likely than other respondents to support community pharmacies developing into Healthy Living Pharmacies ($p = .026$; $\eta^2 = .090$; Total median = 4.0). While three UK Schools of

Pharmacy (Huddersfield, Portsmouth and UCL) indicated that they were teaching about HLPs to students, none of my interview participants talked about HLPs.

Public Health England has recently announced that it plans to ‘accelerate the role of HLPs’, by ensuring that they grew from ‘around 1,000’ to ‘more than 2,000 over the next three to five years’ (Kennedy 2015b). While this plan is likely to be slowed down due to the recent proposed £200m cuts to public health budgets for local authorities (Gidley 2015), it can be further accelerated and strengthened by enabling Independent Pharmacist Practitioners (IPPs) to establish HLPs in local communities. This seems reasonable as IPPs can operate without the dispensing burden sometimes highlighted as a barrier to the public health role in the community pharmacy. To support the role of healthy living pharmacists, there might also be a need for community pharmacists reaching out to the community and running public health programmes in libraries or other community meeting places, at the same time, developing their own expertise in public health. A good example of this reach out could be, pharmacists/pharmacy engaging in employee health fairs – defined as, services provided to employees at local businesses, including cholesterol screenings, blood pressure screenings, and height, weight, and body mass index measurement; (with) written results given to patients (Doucette, et al. 2012).

In my survey analysis, I found that respondents aged 60-69 were more likely to agree than other respondents that UK community pharmacies should develop into Healthy Living Pharmacies ($p = .005$; $\eta^2 = .191$). This calls for greater awareness among younger pharmacists about the benefits of HLPs compared to traditional models of community pharmacy practice. Better awareness of these age-related and geographical differences will help policy-makers develop sustainable conditions for enhanced public health practice in UK community pharmacies.

I considered two other free text comments from my survey of community pharmacists to be thought provoking:

“Look at the role of pharmacists in other countries. We are good, but not world leaders.” [RC185]

“GPs and clinicians actively referring patients to pharmacists for intervention.” [E390]

The question might still be; why are the referrals not happening? Could the solution lie with

the undergraduate training of pharmacists, the public's and other healthcare professionals' perception of pharmacists, the issue of trust, or even the commercial influence on pharmacists, which many of my survey respondents and interview participants highlighted as a barrier to enhancing the public health role of community pharmacists? As I have argued severally, introducing the undergraduate clinical pharmacy (PharmD programme) in the UK (*knowledge and skills* enhancement) might help enhance pharmacists' role in public health as well as help change both the image and the perception of pharmacists (Agomo 2004, 2006, 2011, 2012c, 2015).

In a private conversation I had with a schoolmate who had qualified originally in Nigeria with the BPharm degree, before moving to the USA, where he then completed a further two-year part-time programme to obtain the PharmD degree (*knowledge and skills* enhancement), he revealed that the PharmD degree enabled him to run a HIV clinic in the state of Georgia - a consequence of enhanced *beliefs about capabilities*. According to him, there is no way he could have run the clinic, thereby supporting the public health agenda on HIV, without the extra *knowledge and skills* acquired through the PharmD degree. The main difference between the two qualifications was that the PharmD degree enhanced and broadened his public health/clinical knowledge and skills, as well as enabling him to become a pharmacist prescriber. My project tends to confirm that it might be impossible to enhance the public health role of community pharmacists in the UK without also enhancing both their clinical pharmacy and public health *knowledge and skills*.

In a 2010, a document from the Association of Faculties of Pharmacy of Canada (AFPC) and the Association of Deans of Pharmacy of Canada (ADPC) titled, 'Position Statement and Joint Resolution on the Doctor of Pharmacy (PharmD) for the First Professional Degree at Universities in Canada February 2010' raised some concerns regarding the Canadian undergraduate pharmacy curriculum that could be of relevance to the UK undergraduate public health and clinical pharmacy education (AFPC/ADPC 2010). According to the document:

“The significant commitment the profession has made in recent years to a more patient-focused role for pharmacists that is more responsive to the pressures on the Canadian health care system will necessitate further changes to the curriculum and structure of professional degree program in pharmacy. Specifically, professional leaders and consensus reports have called for changes in the education of pharmacy

students to include: more inter-professional experiences; greater attention to the AFPC general attributes and outcomes; more 'leadership' and management training; more readiness to handle the clinical use of complex biotechnology-derived drugs; added skills in the documentation of care (especially in electronic health records); prescribing skills and the monitoring of drug therapy outcomes; greater proficiency in drug therapy management of chronic diseases; new skills in the technique of vaccine immunisation; and several other curricular enhancements ... However, the explosive growth in the development and use of pharmaceuticals in recent years, particularly drugs with narrow safety and therapeutic profiles, has raised the public health protection responsibility role for pharmacists to a level that was never contemplated when the current academic programme for pharmacy was originally conceived ... parties should make significant effort to ensure that all pharmacy schools have a Doctor of Pharmacy curriculum in place by 2020." (AFPC/ADPC 2010)

Interestingly, I made a similar case for the introduction of the PharmD programme in the UK in 2011 (Agomo 2011), without being aware of the existence of the AFPC/ADPC document.

"Maybe, when the MPharm was conceptualised, there was no immediate need for a clinical pharmacy degree in the UK, but many of the changes that we are now witnessing have made it necessary for pharmacy to position itself strategically or it will be made irrelevant."

The AFPC/ADPC document also talks about the need for public health protection, particularly when we also consider drugs with narrow safety and therapeutic profiles. Gavaza, et al. (2011) also note that poor adherence by patients could be associated with poor monitoring and reporting of serious adverse drug events (ADEs) by pharmacists. In my survey of healthcare professionals, I found that the majority of my respondents did not see 'safety concerns' as a barrier to enhancing the public health role of community pharmacists. Only 28.4% of my respondents agreed that 'safety concerns by GPs', was a barrier. Supporting the notion that there exists a more cordial relationship between GPs and community pharmacists in Edinburgh (and possibly the whole of Scotland) is the revelation that respondents from Edinburgh were less likely than other respondents to agree that 'lack of support from GPs' was a barrier ($p = .001$; $\eta^2 = .155$).

However, it is concerning that 'pharmacists' were more likely and 'pharmacy managers', 'superintendent pharmacists' and 'pharmacy contractors/superintendent pharmacists' less likely to agree that 'safety concerns by GPs' was a barrier ($p = .042$; $\eta^2 = .146$). This difference probably highlights one of the disparities and challenges that often appear in community pharmacy practice between ordinary pharmacists at the "coal-face" of practice and community pharmacy leaders – many of who are non-practitioners (*social influences*). In

my content analysis of the curricula of UK Schools of Pharmacy, I identified the word 'safety' only in the curricula of a number of pharmacy schools, all in England (notably at Bath, Bradford, De Montfort, Hertfordshire, Manchester, Portsmouth and UCL). Strangely, none of my participants used the word 'safety' in the interview, however, a number of participants, for example, P-PKT and USP-CHD, did highlight the importance of pharmacists preventing harm to patients (*beliefs about capabilities and behavioural regulation*).

However, the *Blueprint for Pharmacy: The Vision for Pharmacy* (2008) notes that the future education of pharmacists in Canada needs to emphasise foundational skills (such as communications, clinical decision-making, physical assessment, informatics, confidence building and research) and incorporate management, leadership, advocacy and change management skills (CPA 2008). I envisage these skills to be vital in this aspiration to enhance the public health role of community pharmacists in the UK.

However, for some time, the Royal Pharmaceutical Society and the Pharmacists' Defence Association have been working separately but collaboratively to further develop the clinical and public health role of community pharmacists, and hence have advocated that community pharmacists be given access to patients' Summary Care Records (*environmental context and resources*) (RPS 2014b; PDA 2015b). According to the PDA, the availability of Summary Care Records will mean the application of highly developed clinical skills that only a pharmacist can perform (PDA 2015b). Hence, the recent announcement of the rolling out of SCR access to community pharmacists across the whole of England is therefore an encouraging development (HSCIC 2015). I hope that this will help enhance the public health skills of UK pharmacists. Interestingly, while the majority of my survey respondents felt that lack of patients' records (78.4%) was a barrier to enhancing their public health role, a much lower number of respondents (52.8%) identified lack of documentation of public health interventions as a barrier to enhancing this role. However, as described by the US-based pharmacist participant in the interview [USP-CHD], documentation of public health interventions, e.g., immunisation through a centralised online data system is a norm and enables other healthcare professionals including community pharmacists to track the immunisation status of patients/customers across the US; thereby helping to enhance *memory, attention and decision processes* of practitioners. None of my other interview participants said anything about the need to document interventions. In the curricula of UK

Schools of Pharmacy, the presence of the word, 'documentation' at UCL SoP (Year 4) and Hertfordshire was referring to documentation needs for manufactured products rather than the need to document public health/clinical pharmacy interventions. The related word, 'record' that appeared at Bradford and UCL (Year 3) was not referring to the documentation of interventions.

However, access to summary care health records is not risk-free. According to lawyer Noel Wardle, a partner at Charles Russell Speechlys (Sukkar 2014: 596):

“It may not increase the risk of prosecution, but it could increase the risk of a civil claim for any injury caused by a dispensing error in certain circumstances. For a long time, the courts have told pharmacists they have to exercise an independent judgement when they are supplying medicine, so it is not good enough simply to do what the doctor says on a prescription. That duty implies that a pharmacist has to consider any information he [or she] has or ought to have. If a pharmacist has access to a wider care record, then the risk for a pharmacist is that not only are they deemed to know everything that is in the pharmacy's patient medication record, but they are also deemed to know everything in the summary care record.”

Although pharmacists' prescribing role is becoming an important element of pharmacy practice and public health (AFPC/ADPC 2010; Editorial 2015), surprisingly only a few UK Schools of Pharmacy, for example, Bath, Manchester, Birmingham and Portsmouth, described this role in their undergraduate pharmacy curricula (inadequacy of *knowledge and skills*). None of my interview participants indicated a desire to see UK pharmacists developing their prescribing skills. However, one of my survey respondents [P130] would like UK community pharmacists to go beyond OTC prescribing [P123] to full prescribing roles.

“More freedom in terms of prescribing.” [P130]

Still, bearing in mind the global determinants of health as described by Hunter, et al. (2007), there are several factors that determine health. Hence, for community pharmacists to be effective public health practitioners, they will also need to be cognisant of the different variables that determine health and how to manipulate this to enhance patients' health outcomes. This will therefore mean modifying the present UK undergraduate pharmacy curriculum, as evidenced by my project, to enhance both the knowledge base and the skills of students in public health and clinical pharmacy. While the UK pharmacy profession is on the path of evolving from product-orientated to patient-centred care, with pharmacists

contributing to micro-level public health activities (e.g., disease management, health and wellness screening), there is also a need to extend this role to macro-level public health functions (i.e., assessment, policy development, and assurance at the population-based level (Truong and Patterson 2010), and at the same time, tackling many of the barriers identified in my project.

Another concern raised by one of my participants [P-ART] was the problem of logistics when it comes to integrating undergraduate pharmacy education with other healthcare professions (*environmental context and resources*). While integrated learning might be a challenge for those stand-alone Schools of Pharmacy without a nearby medical, dental or nursing school, these schools could liaise with nearby health facilities, for example GP practices, local health centres and hospitals, as a way forward. Again, exchange training programmes and internships with other schools and health institutions could also be helpful, as well as the use of online technologies, for example Skype or other conferencing software, to enhance communication skills, build rapport and understanding among professions and facilitate integrated learning and exchange of ideas.

5.2.1 - How my Project met its Objectives

In terms of how this project met its objectives, my review of the literature and information identified some of the strategies that could enhance the public health role of community pharmacists. I was able to incorporate most of these findings into the development of my survey questionnaire and interview guide. One of my project objectives was to determine why the public health role of community pharmacists in the UK remains basic in the 21st century. Eighty-three percent of my respondents agreed with the statement that ‘the public health role of community pharmacists in UK is still undeveloped in the 21st century’. The reasons they gave revolved around the quality of services provided from community pharmacies, hence, the problem of trust (*beliefs about capabilities*); lack of consistency in service delivery (*environmental context and resources*); lack of time to deliver public health services (*environmental context and resources*); community pharmacists not feeling empowered enough professionally to provide public health services (*social and professional role and identity; beliefs about capabilities*); lack of training (*knowledge and skills*); lack of awareness (*knowledge*); difficulty adapting to changing needs (*behavioural regulation*); feeling undervalued and

unrecognised (*social and professional role and identity*); and lack of focus (*memory, attention and decision processes*).

The next objective of my project was to assess community pharmacists' knowledge, attitudes and behaviour regarding enhancing their role in public health and determine the perceived barriers to enhancing this role. Community pharmacists' knowledge about the public health role was diverse. The majority of my respondents were in support of pharmacists' enhanced role in public health (*skills*). However, this project did also identify a number of barriers to the public health role of community pharmacists. The test of significance and correlation of variables revealed that there were a number of significant differences of variables in terms of the gender, age, role, years of qualification, and location of practice of the respondents. There is a need to consider some of these differences when developing any public health initiatives involving UK community pharmacists.

The next objective assessed the opinion of practitioners on changing the UK undergraduate pharmacy curriculum to increase its public health content and, maybe, UK pharmacy schools offering dual MPharm/MPH degrees. The majority of my survey respondents (64.8%) indicated that they would like the public health content of the undergraduate pharmacy curriculum to be increased (*knowledge and skills*). There was a support for this in the interview with healthcare practitioners. However, there was no discussion by my interview participants about UK pharmacy schools offering dual MPharm/MPH degrees. This was probably due to the lack of awareness by participants of the existence of such degrees (*knowledge*).

On the objective that assessed the opinion of practitioners on pharmacy students training closely with other healthcare students and, later, graduates working closely with other healthcare providers to enhance the public health role of community pharmacists in the UK (*social influences - team working*), most of the interview participants supported these initiatives. In same manner, this project was also able to assess the opinion of practitioners on the teaching of content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists, as well as the adoption of new technologies in community pharmacy practice to enhance the public health role of community pharmacists in the UK (*skills*). In this case, while most of the interview participants supported the need to

enhance the communication skills of students and pharmacists, when it came to the adoption of new technologies in community pharmacy practice, a few of the older interview participants were less in support of this, as they preferred face-to-face interaction with patients, with some also concerned about confidentiality (*emotion - fear and threat*). There was however, a possibility that their hidden lack of *skills* in the use of new technologies could also be a contributing factor.

Finally, this project also achieved its last objective, which was to examine the pattern of UK undergraduate pharmacy curricula, teaching and learning policy. Through the content analysis of the curriculum of UK Schools of Pharmacy, I found that the pattern, teaching and learning policies of the UK pharmacy programme seemed to be in favour of the sciences (*knowledge and skills*), many of which are hardly used in routine community pharmacy practice, at the expense of public health topics – which in some schools were delivered as optional modules or in some cases integrated with other pharmacy topics (*goal priority*). Often these public health topics cover micro-level public health activities, at the expense of macro-level public health topics, which require the involvement of public health specialists. UK Schools of Pharmacy and the profession will need to work more closely with other healthcare professionals, as well as with various public health organisations, such as Public Health England, the Faculty of Public Health, etc. (*social influences - team working*), in order to enhance the public health role of community pharmacists in the UK.

However, the application of the theoretical domains framework (TDF) (Michie, et al. 2005), in this project revealed that the majority of UK community pharmacists have a positive attitude towards enhancing their public health role, in terms of their perceived advantages and disadvantages of enhancing their public health role. In terms of *knowledge and skills*, my content analysis of the curricula of UK Schools of Pharmacy revealed that the public health knowledge and skills provided to students during the undergraduate pharmacy training were inadequate for the kind of role expected of them later as pharmacists, particularly as it relates to providing macro-level public health activities. Still, there were a number of challenges regarding the *social/professional role and identity* of pharmacists, as well as pharmacists' *beliefs about their capabilities* - especially as it concerns self-efficacy and empowerment.

Their subjective norm (social pressure against engaging in public health) was variable, and their perceived behavioural control, low. While, there seems to be a need for motivation and goal setting pharmacists, to enable them to engage more with public health activities, any anticipated progress is likely to be hampered, particularly if *social influences (Norms)* and environmental constraints identified in the study are not tackled adequately. Yet, the perceived behavioural control was low because the perceived barriers associated with the public health role of community pharmacists outweighed the perceived facilitators. On the other hand, managing *emotions* associated with stress, fear and anxiety in the public health role and enhancing *behavioural regulation*, will enable pharmacists enhance their role in public health.

Based on the application of the theoretical domains framework, it seems logical for me to argue that, based on the evidence from my project the *intention* of UK community pharmacists to enhance their public health role (behaviour) cannot be achieved unless their subjective norm (social influences or pressure) is reduced and their perceived behavioural control increased significantly. It is possible to enhance pharmacists' perceived control (*beliefs about capabilities*) by reducing the perceived barriers, and enhancing the perceived facilitators. In order to enhance the role of pharmacists in public health, there is therefore a need to enhance students'/pharmacists' *knowledge* and *skills* in public health; enhance their *social/professional role and identity*; enhance their *beliefs about capabilities*; manage their *beliefs about consequences*; enhance their *intentions* to engage in public health activities; as well as enhance their ability to maximise *memory, attention and decision processes* in practice. In addition, there is also a need to minimise some of the identified environmental constraints, adverse *social influences (Norms)* and negative *emotions* associated with the public health role; as well as, enhance pharmacists' ability to manage favourably their *behavioural regulations*.

5.3 - Implications of my Project Findings for UK Pharmacy Schools' Curricula and Public Health Policy

The implications of my project findings for UK pharmacy schools' curricula and public health policy are huge. Regarding UK pharmacy schools' curricula, there is a need to adapt their science content to reflect real practice as well as enhance their public health content, particularly as it concerns public health *skills and knowledge* in macro-level activities. At the

same time, it seems that UK pharmacy schools integrating their undergraduate training with other healthcare students, (*team working*), as well as teaching the use of new technologies and social media in practice, will enhance *knowledge and skills* of students and at the same time, prepare students and later graduates to engage more with public health activities. Moreover, there is a need to teach advanced communication techniques to students, which will further enhance their *skills* in public health, with pharmacy schools also enhancing students' *knowledge and skills* in public health by providing advanced experience in public health.

As regards public health policy, which can also help shape *behavioural regulation* of pharmacists, there is a need to minimise, among other things, the shopkeeper image often associated with community pharmacists. This can be achieved, for example, by enhancing the community pharmacy environment (minimising *environmental constraints*), motivating pharmacists adequately (enhancing *intentions*) by remunerating them directly for providing public health services (reinforcement), reducing the high stress level (negative *emotion*) often associated with community pharmacy practice and empowering Independent Pharmacist Practitioners to promote Healthy Living Pharmacies. Policy-makers must also continue to encourage *team working* by enabling pharmacists to work closely with other healthcare professionals in non-traditional places such as in GP practices, NHS 111 call centres, A&E departments, etc., as well as developing *professional identity* for pharmacists by enhancing professionalism in pharmacy practice. Awareness of the demographic differences of community pharmacists, in terms of gender, age, years of qualification, role of the pharmacist and location of practice, might help formulate the appropriate policies to enhance the role of UK community pharmacists in public health. Due to some of these complexities, it seems reasonable to develop students' interest in advanced public health roles during undergraduate pharmacy education.

5.4 - Conclusion

There are numerous opportunities in public health for community pharmacists (Bjorkman, et al. 2008; DoH 2010a, 2010c). I used the theoretical domains framework (TDF) (Michie, et al. 2005) throughout in this project. It revealed that the majority of UK community pharmacists have a positive attitude towards enhancing their public health role. My project however confirmed that UK community pharmacy public health practice is still operating at

a basic level (Anderson 1998; Anderson and Blenkinsopp 2003; Agomo 2012a). While the UK pharmacy profession is gradually evolving from product-orientated to patient-centred care, with pharmacists now contributing to micro-level public health activities, there however remains an unmet need for pharmacists in macro-level public health functions (Truong and Patterson 2010). To achieve this desired objective, both in the UK and globally, there will be a need to enhance, among several matters discussed in this project, both the undergraduate and the postgraduate public health (including clinical pharmacy) (Robinson 2015b) training and skills of pharmacists and the career structure of community pharmacists. In addition, there will also be a need to enable the development of a mixed market in community pharmacy practice, encouraging pharmacists to be employed in GP practices, as well as the government contracting public health services directly to individual or group pharmacists. Pharmacists should also be encouraged to use newer technologies (Robinson 2015b), including social media, to enhance their public health practice.

The tests for significance indicated that there were a number of significant differences in the way respondents answered some of the questions, in terms of gender, age, role in the pharmacy and location of practice ($p < .05$). In some instances, the effective size magnitude of these differences (Eta squared, η^2 , with Anova), were 'large' (0.14) (Nandy 2012). In addition, a number of these variables were significantly correlated ($p < .05$). There is therefore a need to put these differences into consideration when policies around the role of community pharmacists in public health are developed.

5.4.1 - Recommendations for Further Studies

My project identified strategies for enhancing the public health role of community pharmacists based on the findings of my review of the literature and information as well as on the perspectives of community pharmacists and healthcare professionals. I could have made my findings more illuminating by exploring the perspectives of healthcare users. In my survey of community pharmacists, I found that the majority of my respondents were less enthusiastic about UK Schools of Pharmacy offering dual MPharm (or even PharmD)/MPH degrees and community pharmacies adopting new technologies and social media in practice. None of my interview participants highlighted the need for a dual degree in the UK. On the use of new technologies and social media, my older interview participants were less interested in their use in community pharmacy practice. I might be a need for further

research in these areas, to identify how these could help enhance the public health role of community pharmacists in the UK.

5.4.2 - Limitations

There were several limitations in my project, some of which included my preconceptions about the findings (Weiss 1994), having done a great deal of work previously related to this project. I was also concerned that some of the issues raised in my interviews with healthcare professionals might be a reflection of interviewees' pressing concerns at the time of the data collection (Cotter and Mckee 1997). Again, my pre-knowledge of some of the respondents may also have affected both the issues raised (Anderson 1998) and the respondents' willingness to share certain views (De Young 1996). For my survey of UK community pharmacists, the response rate was very low (23.28%). However, low response rates are not uncommon for health surveys (Cook, et al. 2009; Cline 2011; DiPietro, et al. 2011). A major contributing factor for the low response rate might have been the length of my survey questionnaire, which listed 63 items (including free text options). However, the length of my questionnaire was important, as my project aimed at confirming or refuting themes I identified in my review of knowledge and information (Agomo and Ogunleye 2014), at the same time enabling my project to uncover other strategies needed to enhance the public health role of community pharmacists in the UK. In addition, the fact that I did not have multiple contacts with respondents or offer any financial incentives might have negatively affected my survey response rate (Dillman 2000). However, the poor response rate recorded in this study could also be a reflection of how disengaged UK community pharmacists are with the profession. Often, past RPS elections have reflected this (Madlom 2013; Cartwright 2015).

For my content analysis and interviews, creating categories was challenging - empirically and conceptually, with the credibility of the research finding depending on how well the categories covered the data (Graneheim and Lundman 2004). Other limitations were the sheer quantity of the data I analysed, which was both daunting and overwhelming (Elo and Kyngäs 2008). Moreover, the fact that some of my categories were obtained from the very material I analysed might have limited the generalisability of my findings (Krippendorff 1989).

However, I tried to enhance the reliability of my analysis by showing how well the results were linked with my data (Polit and Beck 2004), describing clearly the context, selection and characteristics of my participants, as well as my process of data collection and analysis (Graneheim and Lundman 2004). I tried also to enhance the trustworthiness of my analysis through authentic citations that indicated to readers from where or from what kinds of original data my categories were contrived (Patton 1990; Sandelowski 1993). I maintained confidentiality throughout by ensuring that informants were not identified by quotes from the data (Ford and Reutter 1990).

Chapter 6 – A Reflexive Account of my Personal Learning and Professional Journey

Reflecting on my ontology, values such as ethics (Fox, et al. 2007), accountability, hard work and perseverance are my guide. Although I am able to locate the source of my values mainly from my Christian and cultural upbringing, over the years my values have been influenced by both my formal and informal education and my empathy for the unwell. In my role as a community pharmacist, I strive to ensure that my values do not influence adversely the services I provide to the public. This is in line with the General Pharmaceutical Council's standards of conduct, ethics and performance that stipulate the behaviours, attitude and values expected of pharmaceutical professionals (GPhC 2012). Guiding these behaviours, attitude and values are the seven principles set out by GPhC. They include ensuring that patients are my first concern; using professional judgement in the interest of patients and the public; showing respect to others; encouraging patients and the public to participate in decisions about their care; developing my professional knowledge and competence; being honest and trustworthy; and taking responsibility for my working practices.

However, I acknowledge that there are times when I find myself struggling with the GPhC's principles, for example, in situations where patients or customers expect special treatments from me based on racial commonality. A good example would be when African visitors to the UK, asks for a prescription-only medicine (POM) without a doctor's prescription (a practice that is normal in many third world countries). Many of these patients or customers are shocked and disappointed when I explain to them that I am not able to honour their demands. Again, I have found myself falling back on my values as a support when confronted with practice situations such as the provision of oral contraceptives to under-aged girls (less than 16 years old) from the community pharmacy. What shaped my reluctance to engage in this service were not just by my religious or cultural considerations, but also by my belief that the provision of oral contraceptives to under-aged girls is best left in the hands of other healthcare professionals such as doctors and nurses, due to their situatedness to manage any accompanying social fallouts. These notwithstanding, living and working in the UK and experiencing a practice that is hugely different from what I

experienced in Nigeria (in terms of advanced practice), has also changed my practice and influenced my values in a positive way.

In the Review of Learning (DPS 4520), I reflected on my role as an intern pharmacist in Nigeria, where I helped develop a clinical pharmacy forum for the pharmacy department at the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife. In addition, I reflected on my role in Nigeria as a pharmacist and a medical representative, as well as my role in the UK as a community pharmacist, pharmaceutical writer, postgraduate student and teacher-practitioner. Through my role as a medical representative and my study for the postgraduate diploma in marketing, I have been able to enhance my problem solving, communication, marketing, leadership and managerial skills. As a former pre-registration tutor and a current mentor, I have come to realise how much I love developing and supporting younger colleagues to become confident and successful practitioners. This desire to impact and share knowledge with colleagues also became the main motivating factor for my involvement in publications and teaching.

On completion of the 'Management and Decision-Making' module of the MSc in Health Sciences, I was able to broaden my understanding, at a strategic level, of management practice and its impact on the provision of health care in the UK. Initially, I was not sure how the skills I developed during my medical representative role and the postgraduate studies linked to my later role in the UK as community pharmacist. However, as I reflected on my entire studies and career experiences, in my Review of Learning, I became aware of their connections and the fact that I am constantly using this learning in practice, particularly as it relates to engaging community pharmacy customers in public health services. These learnings have enabled me to develop transferable skills, many of which I have used in my project. Although these roles have helped in strengthening my leadership, management, marketing, communication and problem-solving skills, their impact in furthering my interest in the public health role of community pharmacists has been most illuminating.

Also, in my RAL 7 claim for research and development project capability, I showed how my MSc in Health Sciences dissertation 'The current provision of smoking cessation services by community pharmacists in an inner-city area' and my service-focused study at King's College, London, 'The role of community pharmacists in public health' helped develop my understanding of and my research capability in public health. Writing up the findings of both

studies, as well as the findings of my review of knowledge and information for publication enabled me to develop other skills as well that included, collaboration and learning how to deal with comments from co-authors, peer reviewers and the editor. Publishing these studies also enabled me to develop lasting relationships with the publishers and co-authors. At the same time, I learnt how to critically assess research papers in professional journals, conduct research by employing appropriate methods of study design and tackle statistical analyses. Not only have I used these knowledge and skills in my project; they have also enabled me to become a member of the review panel for the Journal of Pharmaceutical Health Services Research (JPHSR).

Developing my project proposal was a challenging but interesting process, which has enabled me to reflect on my professional and academic experiences and how these experiences could be used in my project on strategies enhancing the public health role of community pharmacists in the UK. Developing my project proposal and then conducting the actual project enabled me to fully appreciate my role as an insider-practitioner-researcher, and how this understanding can help me complete a project that was viable and coherent. I learnt that for my project to be viable, I needed to address both the quantitative and qualitative aspects, and by combining post-positivist and constructivist paradigms, the project would deliver results that are more meaningful. By using a mixed methods approach that incorporated both quantitative and qualitative elements, it was possible for me to create a significantly more coherent project which both analysed the past and developed solutions for the future in a sufficiently robust manner to represent a piece of work to be assessed at doctoral level.

Conducting my project proposal has also enabled me to learn about the importance of a multi-disciplinary public health workforce for handling the main causes of ill health (DoH 1999, 2010a). In this multi-disciplinary initiative, community pharmacists are expected to play greater roles than was previously the case (DoH 2010a; AFPC/ADPC 2010). Hence, in undertaking my project, I have also learnt about the health statistics of the UK (DoH 2010a). This information has helped me to appreciate better the importance of my project. Supporting my project is my role as a change agent. I have learnt that a change agent is a person who facilitates planned change or planned innovation (Havelock 1973). Change agents do not necessarily have the answers to problems, but they are usually dissatisfied

with things the way they are. By making their dissatisfaction known and by upsetting the “status quo”, they energise the problem-solving process, and hence get things started (Havelock 1973). Therefore, by conducting my project as an insider-practitioner-researcher, I was able to bring to the forefront my role as a change agent.

By completing this project, I have also learnt more about my ontological position, and guided mainly by values such as ethics, accountability, hard work and perseverance. This project has also helped me to learn about the different definitions of public health and the determinants of health. At the same time, I have learnt how to tackle the various aspects of my project, such as the literature review; aims, objectives and outcomes; project design and methodologies; data collection, storage and analysis with online tools and software such as, Skype HD Call Recorder, NVivo and SPSS; in-depth interviews; justification of methodology; application of theory (TDF) to research; and how to deal with issues such as ethical considerations, project timescale, resources and the dissemination of findings in journals and conferences.

I have published three papers based on my project findings. (Agomo, et al. 2016a, 2016b, 2016c). Two other papers based on my content analysis of the curricula of UK pharmacy schools and my interviews will follow shortly.

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Appendices

Appendix 1: Cronbach's Alpha Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.787	56

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Sex of participant	183.5366	235.955	.183	.786
Age of participant	182.1707	246.495	-.222	.802
Year of qualification	182.2195	246.226	-.223	.801
Respondent's role in pharmacy	182.1463	229.778	.137	.789
Offering OTC advice?	183.8780	238.710	.043	.787
Participating in local authority-run scheme?	183.7317	237.301	.127	.786
Collaborating in shared care scheme?	183.2439	236.389	.157	.786
Is programme fully funded by local authority?	183.6341	235.488	.236	.785
Increase PH content of undergraduate curriculum?	181.0244	227.874	.353	.780
Offer dual MPharm (or even PharmD)/MPH degrees?	181.8049	231.211	.172	.786
Pharmacy students training with other HC students?	181.0000	222.550	.479	.776
Pharmacists working closely with HC practitioners?	180.5122	230.256	.469	.780
Teach advanced communication techniques?	180.6585	231.930	.376	.782
Adopt new technologies and social media?	181.7317	229.001	.228	.784
Develop good adherence strategies for patients?	180.6585	233.880	.201	.785
Enhancing role in antimicrobial resistance?	180.6098	230.844	.315	.782
Enhance patients' self-management capacities?	180.6585	227.730	.482	.778
Enhance safe medication disposal methods?	180.9512	230.548	.303	.782
Enhance the management of polypharmacy?	180.4146	230.999	.418	.781
Managing the medication needs of athletes?	181.0976	227.990	.373	.780

Enhancing involvement in smoking cessation?	180.5854	234.399	.171	.785
Providing students with advanced experience in PH?	180.7317	227.901	.395	.780
Providing pharmacists with advanced experience in PH?	180.8537	230.128	.368	.781
Remunerate pharmacists directly for PH services?	180.5122	227.206	.423	.779
Insufficient training of pharmacists in PH?	181.2439	231.789	.180	.785
Insufficient skill of pharmacists in PH?	181.6829	224.672	.351	.779
Lack of professional autonomy for pharmacists?	181.0976	223.590	.410	.778
Difficulties in recruiting patients?	181.7073	225.862	.295	.782
Lack of demand for public health services?	182.3902	228.794	.238	.784
High drop rates for public health services?	181.7073	224.662	.354	.779
Low success rates for public health services?	182.0976	224.040	.357	.779
Lack of input from public health practitioners?	181.0244	229.024	.302	.782
Lack of support from public health practitioners?	180.8780	229.460	.315	.782
Difficulty in communicating with other PH providers?	181.3902	227.444	.296	.782
Lack of support from GPs?	180.8293	230.495	.327	.782
Insufficient funding from the government?	180.8537	236.278	.046	.790
Difficulty in fee collection?	181.7317	227.001	.251	.783
Time pressure and workload?	180.6341	230.938	.230	.784
Safety concerns among pharmacists?	181.6585	226.580	.309	.781
Safety concerns by GPs?	181.8537	230.028	.246	.783
Safety concerns of patients?	182.3902	229.794	.238	.784
Lack of patients' records?	180.9024	226.040	.338	.780
Lack of documentation of interventions?	181.6585	232.580	.166	.786
Physical design of community pharmacies?	181.8293	234.045	.089	.789
Misperception that counselling is not needed?	181.7317	223.901	.349	.779
Lack of instrumentation?	181.3902	235.494	.135	.786
Language barrier?	182.3415	234.880	.076	.789
Lack of understanding by the public?	181.2195	227.876	.320	.781
Lack of understanding by HC providers?	181.0000	235.200	.162	.786
How essential CPs provide PH services?	183.2927	235.262	.123	.787

PH role of CPs is still underdeveloped?	183.8049	239.761	-.098	.789
Pharmacies employing their own PH advisers?	181.9268	226.970	.307	.781
Devolve all work to PH practitioners?	182.7073	235.562	.067	.789
Pharmacists reaching out to public places?	181.2195	236.476	.044	.790
Community pharmacies developing into HLPs?	180.6098	236.744	.083	.787
Pharmacists developing their own expertise?	180.4634	234.955	.171	.785

Appendix 2: DProf Project Questionnaire

Ref number:

'Identifying strategies than can enhance the public health role of community pharmacists in the UK.'

Please tick boxes or provide answers as appropriate.

1. How would you describe your gender? Female? Male?
2. Which of these age groups best represent your age?
 [20-29] [30-39] [40-49] [50-59] [60-69] [70-79] [80 and over]
3. Please state the year in which you qualified as a pharmacist
4. Which of the following best describes your role in pharmacy?
A pharmacy contractor? A pharmacy manager?
Relief pharmacist? Locum pharmacist? Pharmacist? Superintendent Pharmacist?
Pharmacy contractor/Supt. pharmacist?
Other
5. Your involvement in public health services, is it in the form of:
(a) Offering over-the-counter advice? Yes No
(b) Participating in a local authority-run scheme (e.g. NRT) for pharmacists? Yes No
(c) Collaborating with a local practice in a shared care kind of scheme? Yes No
6. Is the public health programme you are involved in funded by your local authority? Yes No
7. If not funded by your local authority, who is funding it?
8. The following have been identified as possible ways in which the public health role of community pharmacists could be enhanced in the UK. Please indicate your level of agreement with each of the following statements.
(a) Change the UK undergraduate pharmacy curriculum to increase its public health content?
 Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree
(b) Change the UK undergraduate pharmacy curriculum to allow UK pharmacy schools to offer dual MPharm (or even PharmD)/MPH degrees?
 Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree
(c) Pharmacy students training closely with other healthcare students?
 Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree
(d) Pharmacy graduates working closely with other healthcare providers (for example GPs and nurses)?
 Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree
(e) Teach content-specific/advanced communication techniques to undergraduate pharmacy students and pharmacists?
 Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(f) Adopt new technologies, including social media (e.g. Facebook, Skype, Twitter, etc.) in practice?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(g) Develop good adherence strategies for patients?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(h) Enhance the role of pharmacists in preventing the spread of infections as well as managing antimicrobial resistance?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(i) Pharmacists engaging in programmes that can enhance patients' self-management capacities?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(j) Enhance the safe medication disposal methods by pharmacists?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(k) Pharmacists enhancing their management of polypharmacy and long-term conditions?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(l) Pharmacists managing legitimate medication needs of athletes to prevent them from accidentally using a banned substance?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(m) Pharmacists enhancing their involvement in smoking cessation activities?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(n) Provide pharmacy students with advanced pharmacy practice experience in public health?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(o) Provide pharmacists with advanced pharmacy practice experience in public health?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(p) Develop funding arrangements that allow employee pharmacists to be remunerated directly for providing public health services?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

9. The following have been identified as the major barriers to enhancing the public health role of community pharmacists in the UK. Please indicate your level of agreement with each of the following questions.

(a) Insufficient training of pharmacists in public health?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(b) Insufficient skills of pharmacists in public health?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(c) Lack of professional autonomy and control for pharmacists for the jobs they do?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(d) Difficulties in recruiting patients for public health services?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(e) Lack of demand for public health services?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(f) High dropout rates from community pharmacies for public health services (e.g. NRT, obesity management, etc.)?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(g) Low success rates of community pharmacy for public health services (e.g. NRT, obesity management, etc.)?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(h) Lack of input from public health practitioners and relevant stakeholders?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(i) Lack of support from public health practitioners and relevant stakeholders?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(j) Difficulty in communicating with other public health providers?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(k) Lack of support from GPs?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(l) Insufficient funding from the government for public health services?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(m) Difficulty in fee collection from funding authorities?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(n) Time pressure and workload?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(o) Safety concerns among pharmacists?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(p) Safety concerns of GPs?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(q) Safety concerns of patients?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(r) Lack of availability of patient records?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(s) Lack of documentation of interventions?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(t) Physical design of community pharmacies?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(u) Misperception that counselling is not needed by pharmacists?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(v) Lack of instrumentation (technics and apparatuses) for community pharmacy public health practice?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(w) Language barrier between pharmacists and patients/carers?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(x) Underutilisation due to the lack of understanding of the training and skill-sets of pharmacists by the public?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(y) Underutilisation due to the lack of understanding of the training and skill-sets of pharmacists by other healthcare providers?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(z) Other (please state)

10. What in your view can be done to overcome these difficulties?

.....
.....
.....

11. In your opinion how essential is it that patients get public health services from community pharmacies?

Very Essential Essential Quite Essential Sometimes Not at all essential

12. What in your view are the positive aspects/successes of public health services from community pharmacies and how can they be strengthened?

.....
.....

13. What in your view are the negative aspects of public health services from community pharmacies and how can they be improved?

.....
.....

14. Do you agree with the statement 'that the public health role of community pharmacists in UK is still undeveloped in the 21st century?'

Yes No

15. If yes, please briefly state your reasons

.....
.....

16. The following are some of the suggestions for how community pharmacy-based public health services could be developed in the future. Please indicate your level of agreement with each of the following questions.

(a) Pharmacists employing their own public health advisers, based in the pharmacy?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(b) Devolve all such work to non-pharmacy-based public health practitioners?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(c) Reaching out to the community and running public health programmes in libraries or other community meeting places?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(d) Community pharmacies developing into Healthy Living Pharmacies?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(e) Pharmacists developing their own expertise?

Disagree Strongly Disagree Neither agree nor disagree Agree Strongly Agree

(f) Other? (please state briefly)

END.

Thank you for completing the questionnaire.

Appendix 3: Covering letter

Mr. Chijioke O. Agomo.
DProf. Student (Part 2),
Institute of Work Based Learning,
Middlesex University (Hendon Campus),
London.

Tel. 07576975753

01/04/2013

Dear Pharmacist,

Identifying strategies that can enhance the public health role of community pharmacists in the UK (excluding Northern Ireland).

Mr. C. O. Agomo is a part 2, DProf student at the Institute of Work Based Learning, Middlesex University (Hendon Campus), London. As part of his doctorate research project, we are conducting a survey to identify strategies that can enhance the public health role of community pharmacists in the UK. This project is under the guidance of Dr. James Ogunleye, (academic adviser) and Prof. Jane Portlock (academic consultant).

We are seeking your assistance with the following questionnaire, which will require approximately 20 minutes to complete. Your response to this survey is crucial in providing the necessary information to formulate strategies that can enhance the public health role of community pharmacists in the UK. If you choose to participate in this project, please answer all questions as honestly as possible and return the completed questionnaires promptly. Your anonymity and confidentiality is guaranteed, and you may refuse to participate at any time.

Please feel free to include any additional comments you consider necessary or relevant to enhancing the public health role of community pharmacists in the UK. Your response and time is greatly appreciated. Thank you!

Sincerely,



Mr. C. O. Agomo, MRPharmS, MSc. (student).

Dr. James Ogunleye (academic adviser).

Appendix 4: DProf Project Interview Guide – Strategies enhancing the public health role of community pharmacists in the UK

1. What can be done to enhance the public health role of community pharmacists in the UK?
Prompt: any benefits or barriers?
Prompt: do you see any role for Independent Pharmacist Practitioners?
2. What is your view on the use of new technologies to enhance the public health role of community pharmacists in the UK?
Prompt: any suggestions on such technologies?
3. What is your view on UK pharmacy schools teaching the use of new technologies in pharmacy/public health practice?
Prompt: how would this benefit the public health role of community pharmacists in the UK?
4. What are your thoughts on the teaching of communication methods to UK pharmacy students/pharmacists?
Prompt: how would this benefit the public health role of community pharmacists in the UK?
5. What are your thoughts on pharmacy students being educated with other healthcare students?
Prompt: e.g. medical and nursing students?
Prompt: how would this benefit the public health role of community pharmacists in the UK?
6. What are your views on pharmacists working closely with other healthcare providers?
Prompt: e.g. GPs, nurses and public health practitioners?
Prompt: how would this benefit the public health role of community pharmacists in the UK?
7. What are your thoughts on changing the UK undergraduate pharmacy curriculum to increase its public health content?
8. Any other comments/suggestions on enhancing the public health role of community pharmacists in the UK?

Appendix 5a - Means Table by Gender

		Report								
Gender of participant		Offering O-T-C advice?	Participating in local authority run scheme?	Collaborating in shared care scheme?	Is programme fully funded by local authority?	Increase PH content of undergraduate curriculum?	Offer dual MPharm (or even PharmD)/MPH degrees?	Pharmacy students training with other HC students?	Pharmacists working closely with HC practitioners?	Teach advanced communication techniques?
Male	Mean	1.0000	1.1667	1.7353	1.1892	3.6923	3.4359	4.0270	4.3158	4.0000
	N	39	36	34	37	39	39	37	38	38
	Std. Deviation	.00000	.37796	.44781	.39706	.76619	.94018	.44011	.52532	.73521
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000
Female	Mean	1.0208	1.2857	1.6122	1.1389	3.6939	2.8980	3.6735	4.0816	3.9796
	N	48	49	49	36	49	49	49	49	49
	Std. Deviation	.14434	.45644	.49229	.35074	.89452	1.10387	1.14360	.88593	.77701
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000
Total	Mean	1.0115	1.2353	1.6627	1.1644	3.6932	3.1364	3.8256	4.1839	3.9885
	N	87	85	83	73	88	88	86	87	87
	Std. Deviation	.10721	.42670	.47568	.37319	.83539	1.06330	.92281	.75527	.75474
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000

Appendix 5b - Means Table by Gender contd.

		Report								
Gender of participant		Adopt new technologies and the social media?	Develop good adherence strategies for patients?	Enhancing role in antimicrobial resistance?	Enhance patients' self-managnt capacities?	Enhance safe medication disposal methods?	Enhance the management of polypharmacy?	Managing the medication needs of athletes?	Enhancing involvement in smoking cessation?	Providing students with advanced experience in PH?
Male	Mean	3.3333	4.1053	4.0000	4.3590	4.0000	4.2821	3.9487	4.1282	4.1053
	N	39	38	39	39	39	39	39	39	38
	Std. Deviation	1.10818	.50881	.68825	.58432	1.00000	.64680	.72361	.86388	.79829
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Female	Mean	2.8980	3.9796	3.8776	4.0408	3.7347	4.1224	3.6875	3.8980	4.0408
	N	49	49	49	49	49	49	48	49	49
	Std. Deviation	1.27875	.52001	.85714	.57588	.93040	.83248	.92613	1.00509	.57588
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Total	Mean	3.0909	4.0345	3.9318	4.1818	3.8523	4.1932	3.8046	4.0000	4.0690
	N	88	87	88	88	88	88	87	88	87
	Std. Deviation	1.21897	.51598	.78485	.59780	.96537	.75594	.84687	.94686	.67846
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

Appendix 5c - Means Table by Gender contd.

Report

Gender of participant		Providing pharmacists with advanced experience in PH?	Remunerate pharmacists directly for PH services?	Insufficient training of pharmacists in PH?	Insufficient skill of pharmacists in PH?	Lack of professional autonomy for pharmacists?	Difficulties in recruiting patients?	Lack of demand for public health services?	High drop rates for public health services?	Low success rates for public health services?
Male	Mean	4.0769	4.3333	3.6667	2.8718	3.5128	3.6410	2.3333	3.1538	2.6923
	N	39	39	39	39	39	39	39	39	39
	Std. Deviation	.77407	.77233	.95513	1.19603	1.18925	1.15820	1.17727	.98778	1.10391
	Median	4.0000	4.0000	4.0000	3.0000	4.0000	4.0000	2.0000	3.0000	3.0000
	Mean	4.1429	4.1837	3.2449	3.1837	3.7959	3.4082	2.6531	3.3878	2.5833
Female	N	49	49	49	49	49	49	49	49	48
	Std. Deviation	.54006	.83350	1.34676	1.30182	.93496	1.24027	1.23408	1.09576	1.30194
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	4.0000	3.0000
	Mean	4.1136	4.2500	3.4318	3.0455	3.6705	3.5114	2.5114	3.2841	2.6322
	N	88	88	88	88	88	88	88	88	87
Total	Std. Deviation	.65094	.80587	1.20149	1.25862	1.05832	1.20339	1.21290	1.04989	1.21152
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000

Appendix 5d - Means Table by Gender contd.

Report

Gender of participant		Lack of input from public health practitioners?	Lack of support from public health practitioners?	Difficulty in communicating with other PH providers?	Lack of support from GPs?	Insufficient funding from the government?	Difficulty in fee collection?	Time pressure and workload?	Safety concerns among pharmacists?	Safety concerns by GPs?
Male	Mean	3.5897	3.7027	3.6410	3.7692	4.3590	3.4359	4.1795	3.2308	2.6410
	N	39	37	39	39	39	39	39	39	39
	Std. Deviation	.99255	.90875	1.08790	1.20222	.84253	1.11909	1.02268	1.34676	1.34726
	Median	4.0000	4.0000	4.0000	4.0000	5.0000	4.0000	4.0000	4.0000	3.0000
Female	Mean	3.5918	3.3469	3.5000	3.4898	3.6735	3.1837	4.5714	3.1837	2.7143
	N	49	49	48	49	49	49	49	49	49
	Std. Deviation	1.05906	1.28373	1.14854	1.22683	1.34455	1.21918	.61237	1.21918	1.32288
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000
Total	Mean	3.5909	3.5000	3.5632	3.6136	3.9773	3.2955	4.3977	3.2045	2.6818
	N	88	86	87	88	88	88	88	88	88
	Std. Deviation	1.02426	1.14532	1.11753	1.21704	1.19364	1.17600	.83789	1.26998	1.32652
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000

Appendix 5e - Means Table by Gender contd.

Gender of participant		Report								
		Safety concerns of patients?	Lack of patients' records?	Lack of documentation of interventions?	Physical design of community pharmacies?	Misperception that counselling is not needed?	Lack of instrumentation?	Language barrier?	Lack of understanding by the public?	Lack of understanding by HC providers?
Male	Mean	2.2308	3.7436	3.4211	2.8462	2.8718	3.1282	2.2821	3.6486	3.6216
	N	39	39	38	39	39	39	39	37	37
	Std. Deviation	1.32708	1.11728	1.10604	1.38675	1.30141	1.34124	1.25549	1.13569	1.08912
	Median	2.0000	4.0000	4.0000	3.0000	3.0000	4.0000	2.0000	4.0000	4.0000
Female	Mean	2.2449	4.0000	3.1837	2.8980	3.1429	3.4082	2.2708	3.7551	3.6042
	N	49	49	49	49	49	49	48	49	48
	Std. Deviation	1.21673	.95743	1.25289	1.41782	1.52753	1.07855	1.37979	1.14620	1.21585
	Median	2.0000	4.0000	3.0000	3.0000	4.0000	4.0000	2.0000	4.0000	4.0000
Total	Mean	2.2386	3.8864	3.2874	2.8750	3.0227	3.2841	2.2759	3.7093	3.6118
	N	88	88	87	88	88	88	87	86	85
	Std. Deviation	1.25940	1.03315	1.19015	1.39632	1.43019	1.20295	1.31794	1.13621	1.15567
	Median	2.0000	4.0000	4.0000	3.0000	3.0000	4.0000	2.0000	4.0000	4.0000

Appendix 5f - Means Table by Gender contd.

Report

Gender of participant		How essential CPs provide PH services?	The PH role of CPs is still underdeveloped?	Pharmacies employing their own PH advisers?	Devolve all work to PH practitioners?	Pharmacists reaching out to public places?	Community pharmacies developing into HLPs?	Pharmacists developing their own expertise?	Location
Male	Mean	1.6923	1.1053	2.9487	2.2051	3.0769	3.9231	4.1538	1.9444
	N	39	38	39	39	39	39	39	36
	Std. Deviation	.83205	.31101	1.37551	1.19603	1.28523	.98367	.70854	.86005
	Median	1.0000	1.0000	3.0000	2.0000	3.0000	4.0000	4.0000	2.0000
Female	Mean	2.2083	1.2174	2.7174	1.8261	3.3261	3.7045	4.0222	2.1224
	N	48	46	46	46	46	44	45	49
	Std. Deviation	1.16616	.41703	1.27651	1.06049	1.21206	1.02480	.86573	.75368
	Median	2.0000	1.0000	3.0000	1.0000	4.0000	4.0000	4.0000	2.0000
Total	Mean	1.9770	1.1667	2.8235	2.0000	3.2118	3.8072	4.0833	2.0471
	N	87	84	85	85	85	83	84	85
	Std. Deviation	1.05629	.37492	1.31996	1.13389	1.24493	1.00557	.79469	.80039
	Median	2.0000	1.0000	3.0000	2.0000	4.0000	4.0000	4.0000	2.0000

Appendix 6 - Anova Table by Gender

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Offering O-T-C advice? * Gender of participant	Between Groups	(Combined)	.009	1	.009	.811	.370
	Within Groups		.979	85	.012		
	Total		.989	86			
Participating in local authority run scheme? * Gender of participant	Between Groups	(Combined)	.294	1	.294	1.627	.206
	Within Groups		15.000	83	.181		
	Total		15.294	84			
Collaborating in shared care scheme? * Gender of participant	Between Groups	(Combined)	.304	1	.304	1.349	.249
	Within Groups		18.250	81	.225		
	Total		18.554	82			
Is programme fully funded by local authority? * Gender of participant	Between Groups	(Combined)	.046	1	.046	.328	.568
	Within Groups		9.981	71	.141		
	Total		10.027	72			
Increase PH content of undergraduate curriculum? * Gender of participant	Between Groups	(Combined)	.000	1	.000	.000	.993
	Within Groups		60.716	86	.706		
	Total		60.716	87			
Offer dual MPharm (or even PharmD)/MPH degrees? * Gender of participant	Between Groups	(Combined)	6.284	1	6.284	5.869	.018
	Within Groups		92.080	86	1.071		
	Total		98.364	87			
Pharmacy students training with other HC students? * Gender of participant	Between Groups	(Combined)	2.635	1	2.635	3.174	.078
	Within Groups		69.748	84	.830		
	Total		72.384	85			
Pharmacists working closely with HC practitioners? * Gender of participant	Between Groups	(Combined)	1.173	1	1.173	2.083	.153
	Within Groups		47.884	85	.563		

	Total		49.057	86			
	Between Groups	(Combined)	.009	1	.009	.015	.901
Teach advanced communication techniques? * Gender of participant	Within Groups		48.980	85	.576		
	Total		48.989	86			
	Between Groups	(Combined)	4.116	1	4.116	2.828	.096
Adopt new technologies and the social media? * Gender of participant	Within Groups		125.156	86	1.455		
	Total		129.273	87			
	Between Groups	(Combined)	.338	1	.338	1.274	.262
Develop good adherence strategies for patients? * Gender of participant	Within Groups		22.559	85	.265		
	Total		22.897	86			
	Between Groups	(Combined)	.326	1	.326	.526	.470
Enhancing role in antimicrobial resistance? * Gender of participant	Within Groups		53.265	86	.619		
	Total		53.591	87			
	Between Groups	(Combined)	2.198	1	2.198	6.543	.012
Enhance patients' self-managt capacities? * Gender of participant	Within Groups		28.893	86	.336		
	Total		31.091	87			
	Between Groups	(Combined)	1.529	1	1.529	1.652	.202
Enhance safe medication disposal methods? * Gender of participant	Within Groups		79.551	86	.925		
	Total		81.080	87			
	Between Groups	(Combined)	.553	1	.553	.968	.328
Enhance the management of polypharmacy? * Gender of participant	Within Groups		49.163	86	.572		
	Total		49.716	87			
	Between Groups	(Combined)	1.468	1	1.468	2.073	.154
Managing the medication needs of athletes? * Gender of participant	Within Groups		60.210	85	.708		
	Total		61.678	86			
	Between Groups	(Combined)	1.151	1	1.151	1.288	.260
Enhancing involvement in smoking cessation? * Gender of participant	Within Groups		76.849	86	.894		
	Total		78.000	87			

	Between Groups	(Combined)	.089	1	.089	.191	.663
Providing students with advanced experience in PH? * Gender of participant	Within Groups		39.497	85	.465		
	Total		39.586	86			
	Between Groups	(Combined)	.094	1	.094	.221	.640
Providing pharmacists with advanced experience in PH? * Gender of participant	Within Groups		36.769	86	.428		
	Total		36.864	87			
	Between Groups	(Combined)	.486	1	.486	.747	.390
Remunerate pharmacists directly for PH services? * Gender of participant	Within Groups		56.014	86	.651		
	Total		56.500	87			
	Between Groups	(Combined)	3.863	1	3.863	2.729	.102
Insufficient training of pharmacists in PH? * Gender of participant	Within Groups		121.728	86	1.415		
	Total		125.591	87			
	Between Groups	(Combined)	2.112	1	2.112	1.339	.250
Insufficient skill of pharmacists in PH? * Gender of participant	Within Groups		135.706	86	1.578		
	Total		137.818	87			
	Between Groups	(Combined)	1.740	1	1.740	1.564	.214
Lack of professional autonomy for pharmacists? * Gender of participant	Within Groups		95.703	86	1.113		
	Total		97.443	87			
	Between Groups	(Combined)	1.178	1	1.178	.811	.370
Difficulties in recruiting patients? * Gender of participant	Within Groups		124.811	86	1.451		
	Total		125.989	87			
	Between Groups	(Combined)	2.220	1	2.220	1.518	.221
Lack of demand for public health services? * Gender of participant	Within Groups		125.769	86	1.462		
	Total		127.989	87			
	Between Groups	(Combined)	1.188	1	1.188	1.079	.302
High drop rates for public health services? * Gender of participant	Within Groups		94.710	86	1.101		
	Total		95.898	87			
	Between Groups	(Combined)	.256	1	.256	.172	.679
Low success rates for public health services? * Gender of participant							

	Within Groups		125.974	85	1.482		
	Total		126.230	86			
	Between Groups	(Combined)	.000	1	.000	.000	.992
Lack of input from public health practitioners? * Gender of participant	Within Groups		91.273	86	1.061		
	Total		91.273	87			
	Between Groups	(Combined)	2.668	1	2.668	2.059	.155
Lack of support from public health practitioners? * Gender of participant	Within Groups		108.832	84	1.296		
	Total		111.500	85			
	Between Groups	(Combined)	.428	1	.428	.340	.561
Difficulty in communicating with other PH providers? * Gender of participant	Within Groups		106.974	85	1.259		
	Total		107.402	86			
	Between Groups	(Combined)	1.696	1	1.696	1.147	.287
Lack of support from GPs? * Gender of participant	Within Groups		127.168	86	1.479		
	Total		128.864	87			
	Between Groups	(Combined)	10.205	1	10.205	7.715	.007
Insufficient funding from the government? * Gender of participant	Within Groups		113.750	86	1.323		
	Total		123.955	87			
	Between Groups	(Combined)	1.381	1	1.381	.999	.320
Difficulty in fee collection? * Gender of participant	Within Groups		118.937	86	1.383		
	Total		120.318	87			
	Between Groups	(Combined)	3.336	1	3.336	4.968	.028
Time pressure and workload? * Gender of participant	Within Groups		57.744	86	.671		
	Total		61.080	87			
	Between Groups	(Combined)	.048	1	.048	.030	.864
Safety concerns among pharmacists? * Gender of participant	Within Groups		140.270	86	1.631		
	Total		140.318	87			
	Between Groups	(Combined)	.117	1	.117	.066	.799
Safety concerns by GPs? * Gender of participant	Within Groups		152.974	86	1.779		

	Total		153.091	87			
	Between Groups	(Combined)	.004	1	.004	.003	.959
Safety concerns of patients? * Gender of participant	Within Groups		137.984	86	1.604		
	Total		137.989	87			
	Between Groups	(Combined)	1.428	1	1.428	1.343	.250
Lack of patients' records? * Gender of participant	Within Groups		91.436	86	1.063		
	Total		92.864	87			
	Between Groups	(Combined)	1.206	1	1.206	.850	.359
Lack of documentation of interventions? * Gender of participant	Within Groups		120.610	85	1.419		
	Total		121.816	86			
	Between Groups	(Combined)	.058	1	.058	.030	.864
Physical design of community pharmacies? * Gender of participant	Within Groups		169.567	86	1.972		
	Total		169.625	87			
	Between Groups	(Combined)	1.596	1	1.596	.778	.380
Misperception that counselling is not needed? * Gender of participant	Within Groups		176.359	86	2.051		
	Total		177.955	87			
	Between Groups	(Combined)	1.702	1	1.702	1.179	.281
Lack of instrumentation? * Gender of participant	Within Groups		124.196	86	1.444		
	Total		125.898	87			
	Between Groups	(Combined)	.003	1	.003	.002	.969
Language barrier? * Gender of participant	Within Groups		149.377	85	1.757		
	Total		149.379	86			
	Between Groups	(Combined)	.239	1	.239	.183	.670
Lack of understanding by the public? * Gender of participant	Within Groups		109.494	84	1.303		
	Total		109.733	85			
	Between Groups	(Combined)	.006	1	.006	.005	.945
Lack of understanding by HC providers? * Gender of participant	Within Groups		112.182	83	1.352		
	Total		112.188	84			

	Between Groups	(Combined)	5.730	1	5.730	5.398	.023
How essential CPs provide PH services? * Gender of participant	Within Groups		90.224	85	1.061		
	Total		95.954	86			
	Between Groups	(Combined)	.262	1	.262	1.881	.174
The PH role of CPs is still underdeveloped? * Gender of participant	Within Groups		11.405	82	.139		
	Total		11.667	83			
	Between Groups	(Combined)	1.129	1	1.129	.645	.424
Pharmacies employing their own PH advisers? * Gender of participant	Within Groups		145.224	83	1.750		
	Total		146.353	84			
	Between Groups	(Combined)	3.032	1	3.032	2.398	.125
Devolve all work to PH practitioners? * Gender of participant	Within Groups		104.968	83	1.265		
	Total		108.000	84			
	Between Groups	(Combined)	1.310	1	1.310	.844	.361
Pharmacists reaching out to public places? * Gender of participant	Within Groups		128.878	83	1.553		
	Total		130.188	84			
	Between Groups	(Combined)	.987	1	.987	.976	.326
Community pharmacies developing into HLPs? * Gender of participant	Within Groups		81.928	81	1.011		
	Total		82.916	82			
	Between Groups	(Combined)	.362	1	.362	.570	.452
Pharmacists developing their own expertise? * Gender of participant	Within Groups		52.055	82	.635		
	Total		52.417	83			
	Between Groups	(Combined)	.658	1	.658	1.027	.314
Location * Gender of participant	Within Groups		53.154	83	.640		
	Total		53.812	84			

Appendix 7 - Measures of Association by Gender

Measures of Association

	Eta	Eta Squared
Offering O-T-C advice? * Gender of participant	.097	.009
Participating in local authority run scheme? * Gender of participant	.139	.019
Collaborating in shared care scheme? * Gender of participant	.128	.016
Is programme fully funded by local authority? * Gender of participant	.068	.005
Increase PH content of undergraduate curriculum? * Gender of participant	.001	.000
Offer dual MPharm (or even PharmD)/MPH degrees? * Gender of participant	.253	.064
Pharmacy students training with other HC students? * Gender of participant	.191	.036
Pharmacists working closely with HC practitioners? * Gender of participant	.155	.024
Teach advanced communication techniques? * Gender of participant	.013	.000
Adopt new technologies and the social media? * Gender of participant	.178	.032
Develop good adherence strategies for patients? * Gender of participant	.122	.015
Enhancing role in antimicrobial resistance? * Gender of participant	.078	.006
Enhance patients' self-managt capacities? * Gender of participant	.266	.071
Enhance safe medication disposal methods? * Gender of participant	.137	.019
Enhance the management of polypharmacy? * Gender of participant	.105	.011
Managing the medication needs of athletes? * Gender of participant	.154	.024
Enhancing involvement in smoking cessation? * Gender of participant	.121	.015

Providing students with advanced experience in PH? * Gender of participant	.047	.002
Providing pharmacists with advanced experience in PH? * Gender of participant	.051	.003
Remunerate pharmacists directly for PH services? * Gender of participant	.093	.009
Insufficient training of pharmacists in PH? * Gender of participant	.175	.031
Insufficient skill of pharmacists in PH? * Gender of participant	.124	.015
Lack of professional autonomy for pharmacists? * Gender of participant	.134	.018
Difficulties in recruiting patients? * Gender of participant	.097	.009
Lack of demand for public health services? * Gender of participant	.132	.017
High drop rates for public health services? * Gender of participant	.111	.012
Low success rates for public health services? * Gender of participant	.045	.002
Lack of input from public health practitioners? * Gender of participant	.001	.000
Lack of support from public health practitioners? * Gender of participant	.155	.024
Difficulty in communicating with other PH providers? * Gender of participant	.063	.004
Lack of support from GPs? * Gender of participant	.115	.013
Insufficient funding from the government? * Gender of participant	.287	.082
Difficulty in fee collection? * Gender of participant	.107	.011
Time pressure and workload? * Gender of participant	.234	.055
Safety concerns among pharmacists? * Gender of participant	.019	.000
Safety concerns by GPs? * Gender of participant	.028	.001
Safety concerns of patients? * Gender of participant	.006	.000
Lack of patients' records? * Gender of participant	.124	.015

Lack of documentation of interventions? * Gender of participant	.099	.010
Physical design of community pharmacies? * Gender of participant	.019	.000
Misperception that counselling is not needed? * Gender of participant	.095	.009
Lack of instrumentation? * Gender of participant	.116	.014
Language barrier? * Gender of participant	.004	.000
Lack of understanding by the public? * Gender of participant	.047	.002
Lack of understanding by HC providers? * Gender of participant	.008	.000
How essential CPs provide PH services? * Gender of participant	.244	.060
The PH role of CPs is still underdeveloped? * Gender of participant	.150	.022
Pharmacies employing their own PH advisers? * Gender of participant	.088	.008
Devolve all work to PH practitioners? * Gender of participant	.168	.028
Pharmacists reaching out to public places? * Gender of participant	.100	.010
Community pharmacies developing into HLPs? * Gender of participant	.109	.012
Pharmacists developing their own expertise? * Gender of participant	.083	.007
Location * Gender of participant	.111	.012

Appendix 8a - Means Table by Age of Respondent

		Report									
Age of participant	Offering O-T-C advice?	Participating in local authority run scheme?	Collaborating in shared care scheme?	Is programme fully funded by local authority?	Increase PH content of undergraduate curriculum?	Offer dual MPharm (or even PharmD)/MPH degrees?	Pharmacy students training with other HC students?	Pharmacists working closely with HC practitioners?	Teach advanced communication techniques?	Adopt new technologies and the social media?	
20-29	Mean	1.0000	1.2593	1.6296	1.2609	3.7778	3.2963	4.0385	4.2963	4.1111	3.3704
	N	26	27	27	23	27	27	26	27	27	27
	Std. Deviation	.00000	.44658	.49210	.44898	.84732	1.06752	.77360	.82345	.93370	1.18153
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	4.0000
30-39	Mean	1.0000	1.3333	1.6667	1.2000	3.5556	3.1111	4.0000	4.3889	3.9444	3.0000
	N	18	18	18	15	18	18	18	18	18	18
	Std. Deviation	.00000	.48507	.48507	.41404	1.09664	1.18266	.90749	.50163	.72536	1.18818
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
40-49	Mean	1.0588	1.1765	1.7059	1.1667	3.6471	3.3529	3.7647	4.2353	4.0588	2.5882
	N	17	17	17	12	17	17	17	17	17	17
	Std. Deviation	.24254	.39295	.46967	.38925	.70189	1.05719	.90342	.43724	.74755	1.37199
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000
50-59	Mean	1.0000	1.2308	1.7692	1.0769	3.6250	2.6250	3.6000	3.6000	3.8125	3.1250
	N	16	13	13	13	16	16	15	15	16	16
	Std. Deviation	.00000	.43853	.43853	.27735	.80623	.95743	.98561	1.05560	.54391	1.02470
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000

	Mean	1.0000	1.0000	1.4286	1.0000	4.0000	3.2500	3.3750	4.3750	3.8571	3.2500
	N	8	8	7	8	8	8	8	8	7	8
60-69	Std. Deviation	.00000	.00000	.53452	.00000	.53452	1.03510	1.30247	.51755	.69007	1.48805
	Median	1.0000	1.0000	1.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	4.0000
	Mean	1.0000	1.5000	2.0000	1.0000	3.5000	3.0000	3.5000	4.0000	4.0000	3.5000
	N	2	2	1	2	2	2	2	2	2	2
70-79	Std. Deviation	.00000	.70711	.	.00000	.70711	.00000	.70711	.00000	.00000	.70711
	Median	1.0000	1.5000	2.0000	1.0000	3.5000	3.0000	3.5000	4.0000	4.0000	3.5000
	Mean	1.0115	1.2353	1.6627	1.1644	3.6932	3.1364	3.8256	4.1839	3.9885	3.0909
	N	87	85	83	73	88	88	86	87	87	88
Total	Std. Deviation	.10721	.42670	.47568	.37319	.83539	1.06330	.92281	.75527	.75474	1.21897
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000

Appendix 8b - Means Table by Age of Respondent contd.

Age of participant	Develop good adherence strategies for patients?	Enhancing role in antimicrobial resistance?	Enhance patients' self-managt capacities?	Enhance safe medication disposal methods?	Enhance the management of polypharmacy ?	Managing the medication needs of athletes?	Enhancing involvement in smoking cessation?	Providing students with advanced experience in PH?	Providing pharmacists with advanced experience in PH?	Remunerate pharmacists directly for PH services?	
20-29	Mean	4.1481	4.0370	4.2593	3.7407	4.2593	3.9630	3.8148	4.2222	4.2222	4.4444
	N	27	27	27	27	27	27	27	27	27	27
	Std. Deviation	.53376	.64935	.65590	1.28879	.90267	.80773	1.21012	.64051	.50637	.64051
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.0000
30-39	Mean	4.0556	3.7778	4.1667	3.7778	4.2222	3.5000	3.6111	3.8889	4.1111	4.3333
	N	18	18	18	18	18	18	18	18	18	18
	Std. Deviation	.53930	1.16597	.38348	.64676	.54832	.61835	1.03690	.58298	.58298	.84017
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	4.0000	4.0000	4.0000	4.5000
40-49	Mean	4.0588	4.1176	4.1765	3.8235	4.2941	3.5882	4.3529	4.1176	4.0588	4.2941
	N	17	17	17	17	17	17	17	17	17	17
	Std. Deviation	.42875	.60025	.52859	.63593	.58787	1.12132	.60634	.48507	.55572	.58787
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
50-59	Mean	3.7333	3.6250	3.9375	3.8750	3.8750	4.0667	4.1875	3.8000	3.8750	3.9375
	N	15	16	16	16	16	15	16	15	16	16
	Std. Deviation	.45774	.80623	.77190	1.08781	.88506	.70373	.54391	.94112	1.02470	.92871
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

60-69	Mean	4.1250	4.1250	4.5000	4.3750	4.3750	4.0000	4.3750	4.5000	4.3750	4.0000
	N	8	8	8	8	8	8	8	8	8	8
	Std. Deviation	.64087	.35355	.53452	.74402	.74402	.92582	.74402	.53452	.51755	1.30931
	Median	4.0000	4.0000	4.5000	4.5000	4.5000	4.0000	4.5000	4.5000	4.0000	4.0000
	Mean	4.0000	4.0000	4.0000	4.0000	4.0000	3.5000	4.0000	3.5000	4.0000	4.0000
70-79	N	2	2	2	2	2	2	2	2	2	2
	Std. Deviation	.00000	.00000	.00000	.00000	.00000	.70711	.00000	.70711	.00000	.00000
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.5000	4.0000	3.5000	4.0000	4.0000
	Mean	4.0345	3.9318	4.1818	3.8523	4.1932	3.8046	4.0000	4.0690	4.1136	4.2500
	N	87	88	88	88	88	87	88	87	88	88
Total	Std. Deviation	.51598	.78485	.59780	.96537	.75594	.84687	.94686	.67846	.65094	.80587
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

Appendix 8c - Means Table by Age of Respondent contd.

Age of participant	Insufficient training of pharmacists in PH?	Insufficient skill of pharmacists in PH?	Lack of professional autonomy for pharmacists?	Difficulties in recruiting patients?	Lack of demand for public health services?	High drop rates for public health services?	Low success rates for public health services?	Lack of input from public health practitioners?	Lack of support from public health practitioners?	Difficulty in communicating with other PH providers?	
20-29	Mean	3.6667	3.0370	3.7407	3.8889	2.6667	3.4815	3.0741	3.7778	3.6154	3.8077
	N	27	27	27	27	27	27	27	27	26	26
	Std. Deviation	.96077	1.22416	.98421	1.18754	1.24035	.93522	1.10683	.69798	1.02282	1.05903
	Median	4.0000	3.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	4.0000	4.0000
30-39	Mean	3.2778	3.0556	3.5000	3.3889	2.3889	3.6111	3.0000	3.4444	3.2222	3.3889
	N	18	18	18	18	18	18	18	18	18	18
	Std. Deviation	1.27443	1.10997	1.15045	1.19503	1.09216	.97853	1.02899	1.24722	1.39560	1.19503
	Median	4.0000	3.5000	4.0000	4.0000	2.5000	4.0000	3.0000	4.0000	3.5000	4.0000
40-49	Mean	3.5294	3.2353	3.7059	3.2941	2.0588	2.8824	1.8750	3.6471	3.5294	3.4706
	N	17	17	17	17	17	17	16	17	17	17
	Std. Deviation	1.23073	1.30045	1.21268	1.40378	1.34493	1.16632	.95743	1.22174	1.37467	1.28051
	Median	4.0000	4.0000	4.0000	4.0000	1.0000	3.0000	1.5000	4.0000	4.0000	4.0000
50-59	Mean	3.2500	2.8125	3.6250	3.3750	3.0000	3.3125	2.5000	3.6875	3.6000	3.5625
	N	16	16	16	16	16	16	16	16	15	16
	Std. Deviation	1.29099	1.51520	.95743	1.02470	1.15470	1.13835	1.41421	.47871	.50709	1.03078
	Median	4.0000	3.5000	4.0000	4.0000	3.0000	4.0000	2.5000	4.0000	4.0000	4.0000
60-69	Mean	3.3750	3.3750	3.8750	3.2500	2.3750	2.7500	2.2500	2.8750	3.3750	3.2500
	N	8	8	8	8	8	8	8	8	8	8

	Std. Deviation	1.50594	1.18773	1.24642	1.28174	1.06066	1.03510	1.28174	1.64208	1.50594	1.16496
	Median	4.0000	4.0000	4.0000	3.5000	2.5000	3.0000	2.0000	3.5000	4.0000	4.0000
	Mean	2.5000	2.0000	3.5000	3.5000	2.0000	3.0000	2.0000	4.0000	4.0000	4.0000
	N	2	2	2	2	2	2	2	2	2	2
70-79	Std. Deviation	2.12132	1.41421	.70711	.70711	1.41421	.00000	1.41421	.00000	.00000	.00000
	Median	2.5000	2.0000	3.5000	3.5000	2.0000	3.0000	2.0000	4.0000	4.0000	4.0000
	Mean	3.4318	3.0455	3.6705	3.5114	2.5114	3.2841	2.6322	3.5909	3.5000	3.5632
	N	88	88	88	88	88	88	87	88	86	87
Total	Std. Deviation	1.20149	1.25862	1.05832	1.20339	1.21290	1.04989	1.21152	1.02426	1.14532	1.11753
	Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	4.0000	4.0000

Appendix 8d - Means Table by Age of Respondent contd.

Age of participant	Lack of support from GPs?	Insufficient funding from the government?	Difficulty in fee collection?	Time pressure and workload?	Safety concerns among pharmacists?	Safety concerns by GPs?	Safety concerns of patients?	Lack of patients' records?	Lack of documentation of interventions?	Physical design of community pharmacies?	
	Mean	3.3704	3.8889	3.4815	4.2593	3.4444	2.9259	2.5926	4.0000	3.3333	3.4815
	N	27	27	27	27	27	27	27	27	27	27
20-29	Std. Deviation	1.39085	1.28103	1.28214	.90267	1.25064	1.38469	1.50024	1.03775	1.33012	1.39698
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	2.0000	4.0000	4.0000	4.0000
30-39	Mean	3.6111	3.8889	3.1667	4.6111	3.1111	2.6111	1.8889	4.2222	3.3333	2.4444

	N	18	18	18	18	18	18	18	18	18	18
	Std.	1.24328	1.23140	1.24853	.77754	1.32349	1.19503	.96338	.42779	.97014	1.54243
	Deviation										
	Median	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	2.0000
	Mean	3.6471	3.8824	3.2941	4.5294	3.4118	2.3529	2.1765	3.7059	3.1176	2.5294
40-49	N	17	17	17	17	17	17	17	17	17	17
	Std.	1.22174	1.26897	1.15999	1.00733	1.06412	1.45521	1.23669	1.31171	1.31731	1.32842
	Deviation										
	Median	4.0000	4.0000	3.0000	5.0000	4.0000	2.0000	2.0000	4.0000	4.0000	3.0000
	Mean	3.7500	4.5000	3.3750	4.4375	2.8125	2.7500	2.3750	3.6250	3.1333	2.6875
50-59	N	16	16	16	16	16	16	16	16	15	16
	Std.	1.06458	.63246	.88506	.51235	1.42449	1.34164	1.25831	.95743	1.24595	1.01448
	Deviation										
	Median	4.0000	5.0000	3.0000	4.0000	3.0000	3.0000	3.0000	4.0000	3.0000	3.0000
	Mean	4.0000	3.6250	2.7500	4.2500	3.1250	2.6250	1.7500	3.6250	3.7500	3.1250
60-69	N	8	8	8	8	8	8	8	8	8	8
	Std.	1.06904	1.59799	1.38873	.88641	1.24642	1.18773	.88641	1.50594	1.03510	1.45774
	Deviation										
	Median	4.0000	4.0000	3.0000	4.5000	3.0000	3.0000	1.5000	4.0000	4.0000	3.5000
	Mean	4.0000	4.0000	3.5000	3.5000	2.5000	2.5000	2.0000	4.0000	3.0000	2.0000
70-79	N	2	2	2	2	2	2	2	2	2	2
	Std.	.00000	.00000	.70711	.70711	2.12132	2.12132	1.41421	.00000	.00000	1.41421
	Deviation										
	Median	4.0000	4.0000	3.5000	3.5000	2.5000	2.5000	2.0000	4.0000	3.0000	2.0000
	Mean	3.6136	3.9773	3.2955	4.3977	3.2045	2.6818	2.2386	3.8864	3.2874	2.8750
Total	N	88	88	88	88	88	88	88	88	87	88

Std. Deviation	1.21704	1.19364	1.17600	.83789	1.26998	1.32652	1.25940	1.03315	1.19015	1.39632
Median	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000

Appendix 8e - Means Table by Age of Respondent contd.

Age of participant		Misperception that counselling is not needed?	Lack of instrumentation?	Language barrier?	Lack of understanding by the public?	Lack of understanding by HC providers?	How essential CPs provide PH services?	The PH role of CPs is still underdeveloped?	Pharmacies employing their own PH advisers?
20-29	Mean	3.1111	3.5185	2.7778	3.3462	3.5769	1.8889	1.1923	3.0000
	N	27	27	27	26	26	27	26	26
	Std. Deviation	1.47631	1.05139	1.45002	1.16421	1.10175	.97402	.40192	1.41421
	Median	4.0000	4.0000	3.0000	3.5000	4.0000	2.0000	1.0000	3.0000
30-39	Mean	2.6111	3.2778	1.9412	3.8889	3.5556	1.9444	1.1765	2.8333
	N	18	18	17	18	18	18	17	18
	Std. Deviation	1.33456	1.31978	1.08804	1.40958	1.58011	.99836	.39295	1.15045
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000
40-49	Mean	3.2353	3.1176	2.4118	3.9412	3.8235	1.8235	1.0625	2.6667
	N	17	17	17	17	17	17	16	15
	Std. Deviation	1.56243	1.36393	1.54349	.96635	.95101	1.28624	.25000	1.34519
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	1.0000	1.0000	3.0000
50-59	Mean	3.1875	3.1250	1.7500	4.0000	3.5333	2.2667	1.2667	2.5625
	N	16	16	16	15	15	15	15	16
	Std. Deviation	1.27639	1.08781	.93095	.53452	.91548	.88372	.45774	1.26326
	Median	4.0000	3.0000	1.0000	4.0000	4.0000	2.0000	1.0000	3.0000
60-69	Mean	3.1250	3.3750	2.3750	3.3750	3.4286	2.1250	1.1250	2.8750

	N	8	8	8	8	7	8	8	8
	Std. Deviation	1.64208	1.30247	1.06066	1.50594	1.39728	1.35620	.35355	1.72689
	Median	3.5000	4.0000	2.5000	4.0000	4.0000	1.5000	1.0000	3.0000
	Mean	2.0000	2.5000	1.0000	4.0000	4.0000	2.0000	1.0000	3.5000
70-79	N	2	2	2	2	2	2	2	2
	Std. Deviation	1.41421	2.12132	.00000	.00000	.00000	1.41421	.00000	.70711
	Median	2.0000	2.5000	1.0000	4.0000	4.0000	2.0000	1.0000	3.5000
	Mean	3.0227	3.2841	2.2759	3.7093	3.6118	1.9770	1.1667	2.8235
Total	N	88	88	87	86	85	87	84	85
	Std. Deviation	1.43019	1.20295	1.31794	1.13621	1.15567	1.05629	.37492	1.31996
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000

Appendix 8f - Means Table by Age of Respondent contd.

Report				
Age of participant		Community pharmacies developing into HLPs?	Pharmacists developing their own expertise?	Location
20-29	Mean	4.1538	4.3846	1.9615
	N	26	26	26
	Std. Deviation	.73170	.49614	.77360
	Median	4.0000	4.0000	2.0000
30-39	Mean	3.1667	3.9412	2.2941
	N	18	17	17
	Std. Deviation	1.24853	.74755	.77174
	Median	3.0000	4.0000	2.0000

40-49	Mean	3.9286	4.0667	2.1765
	N	14	15	17
	Std. Deviation	.91687	.96115	.72761
50-59	Median	4.0000	4.0000	2.0000
	Mean	3.5333	3.8125	2.0000
	N	15	16	16
60-69	Std. Deviation	.91548	.91059	.81650
	Median	4.0000	4.0000	2.0000
	Mean	4.5000	4.0000	1.5714
70-79	N	8	8	7
	Std. Deviation	.75593	1.06904	.97590
	Median	5.0000	4.0000	1.0000
Total	Mean	3.5000	4.0000	2.0000
	N	2	2	2
	Std. Deviation	.70711	.00000	1.41421
Total	Median	3.5000	4.0000	2.0000
	Mean	3.8072	4.0833	2.0471
	N	83	84	85
Total	Std. Deviation	1.00557	.79469	.80039
	Median	4.0000	4.0000	2.0000

Appendix 9 - Anova Table by Age of Respondent

ANOVA Table

			Sum of	df	Mean	F	Sig.
			Squares		Square		
Offering O-T-C advice? * Age of participant	Between Groups	(Combined)	.047	5	.009	.815	.543
	Within Groups		.941	81	.012		
	Total		.989	86			
Participating in local authority run scheme? * Age of participant	Between Groups	(Combined)	.831	5	.166	.907	.481
	Within Groups		14.463	79	.183		
	Total		15.294	84			
Collaborating in shared care scheme? * Age of participant	Between Groups	(Combined)	.707	5	.141	.610	.693
	Within Groups		17.848	77	.232		
	Total		18.554	82			
Is programme fully funded by local authority? * Age of participant	Between Groups	(Combined)	.603	5	.121	.857	.515
	Within Groups		9.425	67	.141		
	Total		10.027	72			
Increase PH content of undergraduate curriculum? * Age of participant	Between Groups	(Combined)	1.472	5	.294	.408	.842
	Within Groups		59.243	82	.722		
	Total		60.716	87			
Offer dual MPharm (or even PharmD)/MPH degrees? * Age of participant	Between Groups	(Combined)	5.824	5	1.165	1.03	.404
	Within Groups		92.540	82	1.129	2	
	Total		98.364	87			
Pharmacy students training with other HC students? * Age of participant	Between Groups	(Combined)	4.388	5	.878	1.03	.404
	Within Groups		67.995	80	.850	3	
	Total		72.384	85			

	Between Groups	(Combined)	6.616	5	1.323	2.52	.036
Pharmacists working closely with HC practitioners? * Age of participant	Within Groups		42.441	81	.524	5	
	Total		49.057	86			
	Between Groups	(Combined)	1.142	5	.228	.387	.857
Teach advanced communication techniques? * Age of participant	Within Groups		47.847	81	.591		
	Total		48.989	86			
	Between Groups	(Combined)	7.109	5	1.422	.954	.451
Adopt new technologies and the social media? * Age of participant	Within Groups		122.164	82	1.490		
	Total		129.273	87			
	Between Groups	(Combined)	1.795	5	.359	1.37	.241
Develop good adherence strategies for patients? * Age of participant	Within Groups		21.101	81	.261	8	
	Total		22.897	86			
	Between Groups	(Combined)	3.127	5	.625	1.01	.414
Enhancing role in antimicrobial resistance? * Age of participant	Within Groups		50.464	82	.615	6	
	Total		53.591	87			
	Between Groups	(Combined)	1.998	5	.400	1.12	.353
Enhance patients' self-manage capacities? * Age of participant	Within Groups		29.093	82	.355	6	
	Total		31.091	87			
	Between Groups	(Combined)	2.688	5	.538	.562	.729
Enhance safe medication disposal methods? * Age of participant	Within Groups		78.392	82	.956		
	Total		81.080	87			
	Between Groups	(Combined)	2.265	5	.453	.783	.565
Enhance the management of polypharmacy? * Age of participant	Within Groups		47.451	82	.579		
	Total		49.716	87			

	Between Groups	(Combined)	4.664	5	.933	1.32	.262
Managing the medication needs of athletes? * Age of participant	Within Groups		57.014	81	.704	5	
	Total		61.678	86			
	Between Groups	(Combined)	7.453	5	1.491	1.73	.136
Enhancing involvement in smoking cessation? * Age of participant	Within Groups		70.547	82	.860	3	
	Total		78.000	87			
	Between Groups	(Combined)	4.477	5	.895	2.06	.078
Providing students with advanced experience in PH? * Age of participant	Within Groups		35.109	81	.433	6	
	Total		39.586	86			
	Between Groups	(Combined)	1.853	5	.371	.868	.506
Providing pharmacists with advanced experience in PH? * Age of participant	Within Groups		35.011	82	.427		
	Total		36.864	87			
	Between Groups	(Combined)	3.366	5	.673	1.03	.400
Remunerate pharmacists directly for PH services? * Age of participant	Within Groups		53.134	82	.648	9	
	Total		56.500	87			
	Between Groups	(Combined)	4.370	5	.874	.591	.707
Insufficient training of pharmacists in PH? * Age of participant	Within Groups		121.221	82	1.478		
	Total		125.591	87			
	Between Groups	(Combined)	4.539	5	.908	.559	.731
Insufficient skill of pharmacists in PH? * Age of participant	Within Groups		133.279	82	1.625		
	Total		137.818	87			
	Between Groups	(Combined)	1.104	5	.221	.188	.966
Lack of professional autonomy for pharmacists? * Age of participant	Within Groups		96.340	82	1.175		
	Total		97.443	87			

	Between Groups	(Combined)	5.765	5	1.153	.786	.562
Difficulties in recruiting patients? * Age of participant	Within Groups		120.224	82	1.466		
	Total		125.989	87			
	Between Groups	(Combined)	8.895	5	1.779	1.22	.305
Lack of demand for public health services? * Age of participant	Within Groups		119.094	82	1.452	5	
	Total		127.989	87			
	Between Groups	(Combined)	8.177	5	1.635	1.52	.190
High drop rates for public health services? * Age of participant	Within Groups		87.721	82	1.070	9	
	Total		95.898	87			
	Between Groups	(Combined)	19.128	5	3.826	2.89	.019
Low success rates for public health services? * Age of participant	Within Groups		107.102	81	1.322	3	
	Total		126.230	86			
	Between Groups	(Combined)	5.967	5	1.193	1.14	.342
Lack of input from public health practitioners? * Age of participant	Within Groups		85.306	82	1.040	7	
	Total		91.273	87			
	Between Groups	(Combined)	2.525	5	.505	.371	.867
Lack of support from public health practitioners? * Age of participant	Within Groups		108.975	80	1.362		
	Total		111.500	85			
	Between Groups	(Combined)	3.413	5	.683	.532	.752
Difficulty in communicating with other PH providers? * Age of participant	Within Groups		103.989	81	1.284		
	Total		107.402	86			
	Between Groups	(Combined)	3.407	5	.681	.445	.815
Lack of support from GPs? * Age of participant	Within Groups		125.456	82	1.530		
	Total		128.864	87			

	Between Groups	(Combined)	5.870	5	1.174	.815	.542
Insufficient funding from the government? * Age of participant	Within Groups		118.084	82	1.440		
	Total		123.955	87			
	Between Groups	(Combined)	3.798	5	.760	.535	.750
Difficulty in fee collection? * Age of participant	Within Groups		116.520	82	1.421		
	Total		120.318	87			
	Between Groups	(Combined)	3.444	5	.689	.980	.435
Time pressure and workload? * Age of participant	Within Groups		57.636	82	.703		
	Total		61.080	87			
	Between Groups	(Combined)	5.944	5	1.189	.725	.606
Safety concerns among pharmacists? * Age of participant	Within Groups		134.375	82	1.639		
	Total		140.318	87			
	Between Groups	(Combined)	3.704	5	.741	.407	.843
Safety concerns by GPs? * Age of participant	Within Groups		149.387	82	1.822		
	Total		153.091	87			
	Between Groups	(Combined)	7.972	5	1.594	1.00	.420
Safety concerns of patients? * Age of participant	Within Groups		130.017	82	1.586	6	
	Total		137.989	87			
	Between Groups	(Combined)	4.598	5	.920	.854	.515
Lack of patients' records? * Age of participant	Within Groups		88.266	82	1.076		
	Total		92.864	87			
	Between Groups	(Combined)	2.818	5	.564	.384	.859
Lack of documentation of interventions? * Age of participant	Within Groups		118.998	81	1.469		
	Total		121.816	86			
	Between Groups	(Combined)	17.892	5	3.578	1.93	.098
Physical design of community pharmacies? * Age of participant	Within Groups		151.733	82	1.850	4	

	Total		169.625	87				
	Between Groups	(Combined)	6.639	5	1.328	.636	.673	
Misperception that counselling is not needed? * Age of participant	Within Groups		171.316	82	2.089			
	Total		177.955	87				
	Between Groups	(Combined)	3.656	5	.731	.491	.782	
Lack of instrumentation? * Age of participant	Within Groups		122.242	82	1.491			
	Total		125.898	87				
	Between Groups	(Combined)	16.779	5	3.356	2.05	.080	
Language barrier? * Age of participant	Within Groups		132.600	81	1.637		0	
	Total		149.379	86				
	Between Groups	(Combined)	7.254	5	1.451	1.13	.350	
Lack of understanding by the public? * Age of participant	Within Groups		102.479	80	1.281		3	
	Total		109.733	85				
	Between Groups	(Combined)	1.479	5	.296	.211	.957	
Lack of understanding by HC providers? * Age of participant	Within Groups		110.709	79	1.401			
	Total		112.188	84				
	Between Groups	(Combined)	2.064	5	.413	.356	.877	
How essential CPs provide PH services? * Age of participant	Within Groups		93.890	81	1.159			
	Total		95.954	86				
	Between Groups	(Combined)	.412	5	.082	.571	.722	
The PH role of CPs is still underdeveloped? * Age of participant	Within Groups		11.255	78	.144			
	Total		11.667	83				
	Between Groups	(Combined)	3.207	5	.641	.354	.878	
Pharmacies employing their own PH advisers? * Age of participant	Within Groups		143.146	79	1.812			
	Total		146.353	84				
Devolve all work to PH practitioners? * Age of participant	Between Groups	(Combined)	6.292	5	1.258	.977	.437	

	Within Groups		101.708	79	1.287		
	Total		108.000	84			
	Between Groups	(Combined)	5.657	5	1.131	.718	.612
Pharmacists reaching out to public places? * Age of participant	Within Groups		124.532	79	1.576		
	Total		130.188	84			
	Between Groups	(Combined)	15.869	5	3.174	3.64	.005
Community pharmacies developing into HLPs? * Age of participant	Within Groups		67.047	77	.871		
	Total		82.916	82			
	Between Groups	(Combined)	3.951	5	.790	1.27	.285
Pharmacists developing their own expertise? * Age of participant	Within Groups		48.466	78	.621		
	Total		52.417	83			
	Between Groups	(Combined)	3.136	5	.627	.978	.437
Location * Age of participant	Within Groups		50.676	79	.641		
	Total		53.812	84			

Appendix 10 - Measures of Association by Age of Respondent

Measures of Association

	Eta	Eta Squared
Offering O-T-C advice? * Age of participant	.219	.048
Participating in local authority run scheme? * Age of participant	.233	.054
Collaborating in shared care scheme? * Age of participant	.195	.038
Is programme fully funded by local authority? * Age of participant	.245	.060
Increase PH content of undergraduate curriculum? * Age of participant	.156	.024

Offer dual MPharm (or even PharmD)/MPH degrees? * Age of participant	.243	.059
Pharmacy students training with other HC students? * Age of participant	.246	.061
Pharmacists working closely with HC practitioners? * Age of participant	.367	.135
Teach advanced communication techniques? * Age of participant	.153	.023
Adopt new technologies and the social media? * Age of participant	.235	.055
Develop good adherence strategies for patients? * Age of participant	.280	.078
Enhancing role in antimicrobial resistance? * Age of participant	.242	.058
Enhance patients' self-managt capacities? * Age of participant	.253	.064
Enhance safe medication disposal methods? * Age of participant	.182	.033
Enhance the management of polypharmacy? * Age of participant	.213	.046
Managing the medication needs of athletes? * Age of participant	.275	.076
Enhancing involvement in smoking cessation? * Age of participant	.309	.096
Providing students with advanced experience in PH? * Age of participant	.336	.113
Providing pharmacists with advanced experience in PH? * Age of participant	.224	.050
Remunerate pharmacists directly for PH services? * Age of participant	.244	.060
Insufficient training of pharmacists in PH? * Age of participant	.187	.035
Insufficient skill of pharmacists in PH? * Age of participant	.181	.033
Lack of professional autonomy for pharmacists? * Age of participant	.106	.011
Difficulties in recruiting patients? * Age of participant	.214	.046
Lack of demand for public health services? * Age of participant	.264	.069
High drop rates for public health services? * Age of participant	.292	.085
Low success rates for public health services? * Age of participant	.389	.152

Lack of input from public health practitioners? * Age of participant	.256	.065
Lack of support from public health practitioners? * Age of participant	.150	.023
Difficulty in communicating with other PH providers? * Age of participant	.178	.032
Lack of support from GPs? * Age of participant	.163	.026
Insufficient funding from the government? * Age of participant	.218	.047
Difficulty in fee collection? * Age of participant	.178	.032
Time pressure and workload? * Age of participant	.237	.056
Safety concerns among pharmacists? * Age of participant	.206	.042
Safety concerns by GPs? * Age of participant	.156	.024
Safety concerns of patients? * Age of participant	.240	.058
Lack of patients' records? * Age of participant	.223	.050
Lack of documentation of interventions? * Age of participant	.152	.023
Physical design of community pharmacies? * Age of participant	.325	.105
Misperception that counselling is not needed? * Age of participant	.193	.037
Lack of instrumentation? * Age of participant	.170	.029
Language barrier? * Age of participant	.335	.112
Lack of understanding by the public? * Age of participant	.257	.066
Lack of understanding by HC providers? * Age of participant	.115	.013
How essential CPs provide PH services? * Age of participant	.147	.022
The PH role of CPs is still underdeveloped? * Age of participant	.188	.035
Pharmacies employing their own PH advisers? * Age of participant	.148	.022
Devolve all work to PH practitioners? * Age of participant	.241	.058
Pharmacists reaching out to public places? * Age of participant	.208	.043
Community pharmacies developing into HLPs? * Age of participant	.437	.191
Pharmacists developing their own expertise? * Age of participant	.275	.075
Location * Age of participant	.241	.058

Appendix 11a - Means Table by Year of Qualification

		Report									
Year of qualification		Offering O-T-C advice?	Participating in local authority run scheme?	Collaborating in shared care scheme?	Is programme fully funded by local authority?	Increase PH content of undergraduate curriculum?	Offer dual MPharm (or even PharmD)/MPH degrees?	Pharmacy students training with other HC students?	Pharmacists working closely with HC practitioners?	Teach advanced communication techniques?	Adopt new technologies and the social media?
2010-2014	Mean	1.0000	1.3077	1.6154	1.1667	3.6154	3.0769	3.7500	4.0769	3.8462	3.3077
	N	13	13	13	12	13	13	12	13	13	13
	Std. Deviation	.00000	.48038	.50637	.38925	.96077	1.11516	.96531	1.03775	1.14354	1.03155
2000-2009	Mean	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	Mean	1.0286	1.2778	1.6389	1.2414	3.6389	3.3056	4.0556	4.4167	4.1389	3.0556
	N	35	36	36	29	36	36	36	36	36	36
1990-1999	Std. Deviation	.16903	.45426	.48714	.43549	.93052	1.09073	.75383	.50000	.68255	1.28607
	Mean	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	Mean	1.0000	1.1818	1.6364	1.2222	3.8182	3.0909	3.4545	4.0909	4.1818	3.0000
1980-1989	N	11	11	11	9	11	11	11	11	11	11
	Std. Deviation	.00000	.40452	.50452	.44096	.60302	1.13618	1.29334	.53936	.40452	1.48324
	Mean	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	4.0000
1970-1979	Mean	1.0000	1.0909	1.7273	1.0000	3.6923	3.0000	3.8333	4.2500	3.7692	2.9231
	N	13	11	11	10	13	13	12	12	13	13
	Std. Deviation	.00000	.30151	.46710	.00000	.63043	.81650	.83485	.62158	.92681	1.32045
1970-1979	Mean	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	Mean	1.0000	1.2500	1.7273	1.0833	3.7692	2.8462	3.5385	3.6923	3.7500	3.2308
	N	13	12	11	12	13	13	13	13	12	13
1970-1979	Std. Deviation	.00000	.45227	.46710	.28868	.83205	1.21423	1.05003	1.10940	.45227	1.09193
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000

1960-1969	Mean	1.0000	1.0000		1.0000	3.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	N	1	1		1	1	1	1	1	1	1
	Std. Deviation	.	.		.	.	.	.	.	.	.
	Median	1.0000	1.0000		1.0000	3.0000	3.0000	4.0000	4.0000	4.0000	3.0000
Total	Mean	1.0116	1.2381	1.6585	1.1644	3.6782	3.1264	3.8235	4.1860	3.9884	3.0920
	N	86	84	82	73	87	87	85	86	86	87
	Std. Deviation	.10783	.42848	.47712	.37319	.82820	1.06536	.92809	.75944	.75917	1.22600
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000

Appendix 11b - Means Table by Year of Qualification contd.

		Report									
Year of qualification		Develop good adherence strategies for patients?	Enhancing role in antimicrobial resistance?	Enhance patients' self-managt capacities?	Enhance safe medication disposal methods?	Enhance the management of polypharmacy?	Managing the medication needs of athletes?	Enhancing involvement in smoking cessation?	Providing students with advanced experience in PH?	Providing pharmacists with advanced experience in PH?	Remunerate pharmacists directly for PH services?
2010-2014	Mean	3.9231	3.8462	4.0000	3.7692	4.3077	3.7692	3.6923	4.1538	4.0769	4.4615
	N	13	13	13	13	13	13	13	13	13	13
	Std. Deviation	.49355	.68874	.57735	1.01274	.63043	.83205	1.10940	.68874	.49355	.66023
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.0000
2000-2009	Mean	4.1667	4.0833	4.3056	3.7500	4.2500	3.7500	3.7778	4.0556	4.2222	4.4444
	N	36	36	36	36	36	36	36	36	36	36
	Std. Deviation	.56061	.80623	.52478	1.07902	.80623	.87423	1.12405	.62994	.54043	.60684
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.5000
1990-1999	Mean	4.0000	3.7273	4.0909	3.8182	4.1818	3.8182	4.3636	4.0909	4.0909	3.9091
	N	11	11	11	11	11	11	11	11	11	11

1980-1989	Std. Deviation	.44721	1.00905	.53936	.40452	.40452	.60302	.50452	.30151	.30151	1.04447
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	3.7500	3.8462	4.1538	3.9231	4.0000	3.7692	4.3077	4.1667	4.1538	4.3077
	N	12	13	13	13	13	13	13	12	13	13
1970-1979	Std. Deviation	.45227	.89872	.80064	1.18754	.91287	1.16575	.75107	.71774	.89872	.63043
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	4.0769	3.8462	4.1538	4.1538	4.1538	4.0000	4.3077	3.9231	3.8462	3.7692
	N	13	13	13	13	13	12	13	13	13	13
1960-1969	Std. Deviation	.49355	.55470	.68874	.80064	.89872	.73855	.48038	1.03775	.98710	1.16575
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	N	1	1	1	1	1	1	1	1	1	1
Total	Std. Deviation	.51900	.78936	.60094	.97084	.76003	.85157	.95235	.68240	.65460	.81009
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	N	86	87	87	87	87	86	87	86	87	87

Appendix 11c - Means Table by Year of Qualification contd.

		Report									
Year of qualification		Insufficient training of pharmacists in PH?	Insufficient skill of pharmacists in PH?	Lack of professional autonomy for pharmacists?	Difficulties in recruiting patients?	Lack of demand for public health services?	High drop rates for public health services?	Low success rates for public health services?	Lack of input from public health practitioners?	Lack of support from public health practitioners?	Difficulty in communicating with other PH providers?
2010-2014	Mean	3.6923	2.9231	3.1538	3.3077	2.6154	3.3846	2.9231	3.6154	3.2500	3.8462

	N	13	13	13	13	13	13	13	13	12	13
	Std. Deviation	.63043	1.25576	.89872	1.31559	1.12090	1.04391	.95407	.50637	.86603	.68874
	Median	4.0000	3.0000	3.0000	4.0000	3.0000	3.0000	3.0000	4.0000	3.0000	4.0000
	Mean	3.3889	3.1111	3.8611	3.8889	2.6111	3.5833	3.0286	3.6944	3.5556	3.5429
2000-2009	N	36	36	36	36	36	36	35	36	36	35
	Std. Deviation	1.27117	1.11555	1.01848	1.11555	1.22539	.93732	1.07062	1.06421	1.25230	1.29121
	Median	4.0000	3.0000	4.0000	4.0000	3.0000	4.0000	3.0000	4.0000	4.0000	4.0000
	Mean	3.6364	3.0909	3.4545	2.6364	2.2727	3.0909	1.8182	3.6364	3.3636	3.4545
1990-1999	N	11	11	11	11	11	11	11	11	11	11
	Std. Deviation	1.12006	1.37510	1.36848	1.36182	1.48936	1.13618	1.25045	1.43337	1.62928	1.12815
	Median	4.0000	4.0000	4.0000	3.0000	1.0000	3.0000	1.0000	4.0000	4.0000	4.0000
	Mean	3.6154	3.5385	4.0769	3.3846	2.4615	2.9231	2.9231	3.5385	3.5000	3.2308
1980-1989	N	13	13	13	13	13	13	13	13	12	13
	Std. Deviation	1.12090	1.33012	.49355	.96077	1.05003	1.18754	1.03775	.96742	.90453	1.30089
	Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	4.0000	4.0000
	Mean	3.0769	2.5385	3.3846	3.4615	2.6154	2.9231	1.9231	3.2308	3.6154	3.6923
1970-1979	N	13	13	13	13	13	13	13	13	13	13
	Std. Deviation	1.49786	1.39137	1.32530	1.19829	1.26085	1.11516	1.32045	1.09193	.96077	.85485
	Median	4.0000	3.0000	3.0000	4.0000	3.0000	3.0000	1.0000	4.0000	4.0000	4.0000
	Mean	1.0000	1.0000	4.0000	4.0000	1.0000	3.0000	1.0000	4.0000	4.0000	4.0000
1960-1969	N	1	1	1	1	1	1	1	1	1	1
	Std. Deviation	.	.	.	.	.	.	.	.	.	.
	Median	1.0000	1.0000	4.0000	4.0000	1.0000	3.0000	1.0000	4.0000	4.0000	4.0000
	Mean	3.4253	3.0345	3.6667	3.5057	2.5287	3.2874	2.6512	3.5862	3.4941	3.5581
Total	N	87	87	87	87	87	87	86	87	85	86
	Std. Deviation	1.20688	1.26167	1.06385	1.20920	1.20887	1.05553	1.20555	1.02924	1.15081	1.12307
	Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	4.0000	4.0000

Appendix 11d - Means Table by Year of Qualification contd.

Report

Year of qualification		Lack of support from GPs?	Insufficient funding from the government?	Difficulty in fee collection?	Time pressure and workload?	Safety concerns among pharmacists?	Safety concerns by GPs?	Safety concerns of patients?	Lack of patients' records?	Lack of documentation of interventions?	Physical design of community pharmacies?
2010-2014	Mean	3.6923	3.4615	3.2308	4.4615	3.0000	2.6923	2.4615	3.7692	3.6154	3.4615
	N	13	13	13	13	13	13	13	13	13	13
	Std. Deviation	1.10940	1.61325	1.42325	.66023	1.22474	1.25064	1.45002	.92681	.96077	1.05003
2000-2009	Median	4.0000	4.0000	4.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000
	Mean	3.4722	4.0556	3.4167	4.4444	3.4722	2.8056	2.2778	4.0833	3.1944	2.8889
	N	36	36	36	36	36	36	36	36	36	36
1990-1999	Std. Deviation	1.36248	1.14504	1.18019	.90851	1.27584	1.34843	1.32258	.93732	1.28329	1.61737
	Median	4.0000	4.0000	4.0000	5.0000	4.0000	3.0000	2.0000	4.0000	3.5000	3.0000
	Mean	3.5455	3.8182	3.3636	4.2727	3.2727	2.6364	2.2727	3.8182	3.0909	2.6364
1980-1989	N	11	11	11	11	11	11	11	11	11	11
	Std. Deviation	1.21356	.87386	1.12006	1.19087	1.10371	1.43337	1.19087	1.40130	1.22103	1.43337
	Median	3.0000	4.0000	4.0000	5.0000	4.0000	2.0000	2.0000	4.0000	4.0000	3.0000
1970-1979	Mean	3.9231	3.9231	2.8462	4.5385	3.1538	2.6154	2.0769	3.6923	3.6667	2.5385
	N	13	13	13	13	13	13	13	13	12	13
	Std. Deviation	1.18754	1.49786	.98710	.66023	.98710	1.32530	1.25576	1.10940	.77850	1.33012
1960-1969	Median	4.0000	5.0000	3.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000
	Mean	3.6154	4.4615	3.3846	4.3077	2.7692	2.6923	2.0769	3.6923	3.2308	2.9231
	N	13	13	13	13	13	13	13	13	13	13
1960-1969	Std. Deviation	1.12090	.66023	1.26085	.63043	1.58923	1.37747	1.11516	1.10940	1.36344	1.03775
	Median	4.0000	5.0000	4.0000	4.0000	3.0000	3.0000	2.0000	4.0000	3.0000	3.0000
1960-1969	Mean	4.0000	4.0000	3.0000	3.0000	1.0000	1.0000	1.0000	4.0000	3.0000	1.0000

	N	1	1	1	1	1	1	1	1	1	1
	Std. Deviation	.	.	.	.	.	.	.	.	.	.
	Median	4.0000	4.0000	3.0000	3.0000	1.0000	1.0000	1.0000	4.0000	3.0000	1.0000
	Mean	3.6092	3.9770	3.2874	4.4023	3.1954	2.7011	2.2299	3.8851	3.3140	2.8736
Total	N	87	87	87	87	87	87	87	87	86	87
	Std. Deviation	1.22338	1.20055	1.18034	.84165	1.27443	1.32169	1.26400	1.03907	1.17084	1.40435
	Median	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000

Appendix 11e - Means Table by Year of Qualification contd.

		Report									
Year of qualification		Misperception that counselling is not needed?	Lack of instrumentation?	Language barrier?	Lack of understanding by the public?	Lack of understanding by HC providers?	How essential CPs provide PH services?	The PH role of CPs is still underdeveloped?	Pharmacies employing their own PH advisers?	Devolve all work to PH practitioners?	Pharmacists reaching out to public places?
2010-2014	Mean	3.3077	3.4615	2.3077	3.1667	3.5385	2.0000	1.2308	2.9231	2.1538	3.4615
	N	13	13	13	12	13	13	13	13	13	13
	Std. Deviation	1.10940	.87706	1.03155	1.11464	.96742	1.00000	.43853	1.49786	1.28103	.96742
2000-2009	Median	4.0000	4.0000	3.0000	3.0000	4.0000	2.0000	1.0000	3.0000	2.0000	4.0000
	Mean	3.0556	3.3611	2.5714	3.7500	3.7143	1.9167	1.1765	2.9706	2.0294	3.0000
	N	36	36	35	36	35	36	34	34	34	34
1990-1999	Std. Deviation	1.56651	1.29069	1.48097	1.29560	1.31890	1.05221	.38695	1.19304	1.11424	1.34840
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	3.5000
	Mean	2.6364	3.0000	2.3636	3.9091	3.7000	1.7273	1.0909	2.3000	1.8000	3.8000
1990-1999	N	11	11	11	11	10	11	11	10	10	10
	Std. Deviation	1.50151	1.34164	1.50151	.83121	1.05935	1.10371	.30151	1.33749	1.03280	1.03280
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	1.0000	1.0000	2.0000	1.5000	4.0000

1980-1989	Mean	2.7692	3.1538	2.0769	3.5000	3.1667	2.4615	1.2727	3.3077	1.7692	3.0769
	N	13	13	13	12	12	13	11	13	13	13
	Std. Deviation	1.53590	1.21423	1.25576	1.24316	1.40346	1.19829	.46710	1.25064	.92681	1.44115
1970-1979	Mean	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000	1.0000	3.0000	1.0000	3.0000
	Mean	3.3846	3.3846	1.7692	4.0769	3.6923	2.0000	1.0769	2.3077	2.3077	3.0769
	N	13	13	13	13	13	12	13	13	13	13
1960-1969	Std. Deviation	1.19293	1.12090	.92681	.75955	.75107	.95346	.27735	1.37747	1.37747	1.18754
	Median	4.0000	4.0000	1.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	3.0000
	Mean	1.0000	1.0000	1.0000	4.0000	4.0000	1.0000	1.0000	4.0000	1.0000	4.0000
Total	N	1	1	1	1	1	1	1	1	1	1
	Std. Deviation	.	.	.	.	.	.	.	.	.	.
	Median	1.0000	1.0000	1.0000	4.0000	4.0000	1.0000	1.0000	4.0000	1.0000	4.0000
Total	Mean	3.0230	3.2759	2.2907	3.7059	3.6071	1.9884	1.1687	2.8452	2.0119	3.2024
	N	87	87	86	85	84	86	83	84	84	84
	Std. Deviation	1.43848	1.20743	1.31834	1.14251	1.16182	1.05712	.37674	1.31254	1.13535	1.24938
Total	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	4.0000

Appendix 11f - Means Table by Year of Qualification contd.

Report				
Year of qualification		Community pharmacies developing into HLPs?	Pharmacists developing their own expertise?	Location
2010-2014	Mean	4.0769	4.3077	2.0833
	N	13	13	12
	Std. Deviation	.49355	.48038	.79296

2000-2009	Median	4.0000	4.0000	2.0000
	Mean	3.7576	4.0909	2.0857
	N	33	33	35
	Std. Deviation	1.14647	.87905	.78108
1990-1999	Median	4.0000	4.0000	2.0000
	Mean	3.6000	4.2000	2.0909
	N	10	10	11
	Std. Deviation	1.26491	.42164	.83121
1980-1989	Median	4.0000	4.0000	2.0000
	Mean	3.7692	3.7692	2.1538
	N	13	13	13
	Std. Deviation	1.01274	1.16575	.89872
1970-1979	Median	4.0000	4.0000	2.0000
	Mean	3.8333	4.0769	1.8333
	N	12	13	12
	Std. Deviation	.93744	.64051	.83485
1960-1969	Median	4.0000	4.0000	1.0000
	Mean	4.0000	4.0000	1.0000
	N	1	1	1
	Std. Deviation	.	.	.
Total	Median	4.0000	4.0000	1.0000
	Mean	3.8049	4.0843	2.0476
	N	82	83	84
Total	Std. Deviation	1.01153	.79946	.80518
	Median	4.0000	4.0000	2.0000

Appendix 12 - Anova Table by Year of Qualification

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Offering O-T-C advice? * Year of qualification	Between Groups	(Combined)	.017	5	.003	.279	.923
	Within Groups		.971	80	.012		
	Total		.988	85			
Participating in local authority run scheme? * Year of qualification	Between Groups	(Combined)	.451	5	.090	.476	.793
	Within Groups		14.787	78	.190		
	Total		15.238	83			
Collaborating in shared care scheme? * Year of qualification	Between Groups	(Combined)	.147	4	.037	.155	.960
	Within Groups		18.292	77	.238		
	Total		18.439	81			
Is programme fully funded by local authority? * Year of qualification	Between Groups	(Combined)	.578	5	.116	.820	.540
	Within Groups		9.449	67	.141		
	Total		10.027	72			
Increase PH content of undergraduate curriculum? * Year of qualification	Between Groups	(Combined)	.893	5	.179	.249	.939
	Within Groups		58.096	81	.717		
	Total		58.989	86			
Offer dual MPharm (or even PharmD)/MPH degrees? * Year of qualification	Between Groups	(Combined)	2.446	5	.489	.416	.836
	Within Groups		95.163	81	1.175		
	Total		97.609	86			
Pharmacy students training with other HC students? * Year of qualification	Between Groups	(Combined)	4.589	5	.918	1.070	.383
	Within Groups		67.764	79	.858		
	Total		72.353	84			
Pharmacists working closely with HC practitioners? * Year of qualification	Between Groups	(Combined)	5.422	5	1.084	1.990	.089
	Within Groups		43.601	80	.545		

	Total		49.023	85			
	Between Groups	(Combined)	2.796	5	.559	.969	.442
Teach advanced communication techniques? * Year of qualification	Within Groups		46.192	80	.577		
	Total		48.988	85			
	Between Groups	(Combined)	1.375	5	.275	.174	.971
Adopt new technologies and the social media? * Year of qualification	Within Groups		127.889	81	1.579		
	Total		129.264	86			
	Between Groups	(Combined)	1.799	5	.360	1.365	.246
Develop good adherence strategies for patients? * Year of qualification	Within Groups		21.096	80	.264		
	Total		22.895	85			
	Between Groups	(Combined)	1.577	5	.315	.491	.782
Enhancing role in antimicrobial resistance? * Year of qualification	Within Groups		52.009	81	.642		
	Total		53.586	86			
	Between Groups	(Combined)	1.125	5	.225	.609	.693
Enhance patients' self-managt capacities? * Year of qualification	Within Groups		29.933	81	.370		
	Total		31.057	86			
	Between Groups	(Combined)	1.748	5	.350	.357	.876
Enhance safe medication disposal methods? * Year of qualification	Within Groups		79.309	81	.979		
	Total		81.057	86			
	Between Groups	(Combined)	.830	5	.166	.275	.925
Enhance the management of polypharmacy? * Year of qualification	Within Groups		48.848	81	.603		
	Total		49.678	86			
	Between Groups	(Combined)	.638	5	.128	.167	.974
Managing the medication needs of athletes? * Year of qualification	Within Groups		61.002	80	.763		
	Total		61.640	85			
	Between Groups	(Combined)	6.925	5	1.385	1.578	.176
Enhancing involvement in smoking cessation? * Year of qualification	Within Groups		71.075	81	.877		
	Total		78.000	86			

	Between Groups	(Combined)	.501	5	.100	.205	.959
Providing students with advanced experience in PH? * Year of qualification	Within Groups		39.080	80	.489		
	Total		39.581	85			
	Between Groups	(Combined)	1.412	5	.282	.645	.666
Providing pharmacists with advanced experience in PH? * Year of qualification	Within Groups		35.439	81	.438		
	Total		36.851	86			
	Between Groups	(Combined)	6.331	5	1.266	2.047	.081
Remunerate pharmacists directly for PH services? * Year of qualification	Within Groups		50.106	81	.619		
	Total		56.437	86			
	Between Groups	(Combined)	9.394	5	1.879	1.313	.267
Insufficient training of pharmacists in PH? * Year of qualification	Within Groups		115.870	81	1.430		
	Total		125.264	86			
	Between Groups	(Combined)	11.047	5	2.209	1.422	.225
Insufficient skill of pharmacists in PH? * Year of qualification	Within Groups		125.849	81	1.554		
	Total		136.897	86			
	Between Groups	(Combined)	8.608	5	1.722	1.572	.177
Lack of professional autonomy for pharmacists? * Year of qualification	Within Groups		88.725	81	1.095		
	Total		97.333	86			
	Between Groups	(Combined)	14.569	5	2.914	2.123	.071
Difficulties in recruiting patients? * Year of qualification	Within Groups		111.178	81	1.373		
	Total		125.747	86			
	Between Groups	(Combined)	3.556	5	.711	.472	.796
Lack of demand for public health services? * Year of qualification	Within Groups		122.122	81	1.508		
	Total		125.678	86			
	Between Groups	(Combined)	7.234	5	1.447	1.323	.263
High drop rates for public health services? * Year of qualification	Within Groups		88.582	81	1.094		
	Total		95.816	86			
	Between Groups	(Combined)	24.158	5	4.832	3.889	.003
Low success rates for public health services? * Year of qualification							

	Within Groups	99.377	80	1.242		
	Total	123.535	85			
	Between Groups (Combined)	2.304	5	.461	.420	.833
Lack of input from public health practitioners? * Year of qualification	Within Groups	88.800	81	1.096		
	Total	91.103	86			
	Between Groups (Combined)	1.486	5	.297	.214	.956
Lack of support from public health practitioners? * Year of qualification	Within Groups	109.761	79	1.389		
	Total	111.247	84			
	Between Groups (Combined)	3.027	5	.605	.465	.801
Difficulty in communicating with other PH providers? * Year of qualification	Within Groups	104.182	80	1.302		
	Total	107.209	85			
	Between Groups (Combined)	2.244	5	.449	.287	.919
Lack of support from GPs? * Year of qualification	Within Groups	126.469	81	1.561		
	Total	128.713	86			
	Between Groups (Combined)	7.044	5	1.409	.976	.438
Insufficient funding from the government? * Year of qualification	Within Groups	116.910	81	1.443		
	Total	123.954	86			
	Between Groups (Combined)	3.444	5	.689	.479	.791
Difficulty in fee collection? * Year of qualification	Within Groups	116.372	81	1.437		
	Total	119.816	86			
	Between Groups (Combined)	2.618	5	.524	.727	.605
Time pressure and workload? * Year of qualification	Within Groups	58.301	81	.720		
	Total	60.920	86			
	Between Groups (Combined)	10.524	5	2.105	1.320	.264
Safety concerns among pharmacists? * Year of qualification	Within Groups	129.154	81	1.594		
	Total	139.678	86			
	Between Groups (Combined)	3.430	5	.686	.379	.862
Safety concerns by GPs? * Year of qualification	Within Groups	146.800	81	1.812		

	Total		150.230	86			
	Between Groups	(Combined)	2.921	5	.584	.352	.880
Safety concerns of patients? * Year of qualification	Within Groups		134.481	81	1.660		
	Total		137.402	86			
	Between Groups	(Combined)	2.618	5	.524	.470	.798
Lack of patients' records? * Year of qualification	Within Groups		90.233	81	1.114		
	Total		92.851	86			
	Between Groups	(Combined)	3.924	5	.785	.558	.732
Lack of documentation of interventions? * Year of qualification	Within Groups		112.599	80	1.407		
	Total		116.523	85			
	Between Groups	(Combined)	10.124	5	2.025	1.028	.407
Physical design of community pharmacies? * Year of qualification	Within Groups		159.486	81	1.969		
	Total		169.609	86			
	Between Groups	(Combined)	9.366	5	1.873	.900	.485
Misperception that counselling is not needed? * Year of qualification	Within Groups		168.588	81	2.081		
	Total		177.954	86			
	Between Groups	(Combined)	7.074	5	1.415	.969	.442
Lack of instrumentation? * Year of qualification	Within Groups		118.306	81	1.461		
	Total		125.379	86			
	Between Groups	(Combined)	8.616	5	1.723	.991	.429
Language barrier? * Year of qualification	Within Groups		139.117	80	1.739		
	Total		147.733	85			
	Between Groups	(Combined)	6.398	5	1.280	.979	.436
Lack of understanding by the public? * Year of qualification	Within Groups		103.249	79	1.307		
	Total		109.647	84			
	Between Groups	(Combined)	3.126	5	.625	.448	.814
Lack of understanding by HC providers? * Year of qualification	Within Groups		108.910	78	1.396		
	Total		112.036	83			

	Between Groups	(Combined)	4.826	5	.965	.856	.514
How essential CPs provide PH services? * Year of qualification	Within Groups		90.163	80	1.127		
	Total		94.988	85			
	Between Groups	(Combined)	.376	5	.075	.514	.765
The PH role of CPs is still underdeveloped? * Year of qualification	Within Groups		11.263	77	.146		
	Total		11.639	82			
	Between Groups	(Combined)	11.456	5	2.291	1.359	.249
Pharmacies employing their own PH advisers? * Year of qualification	Within Groups		131.532	78	1.686		
	Total		142.988	83			
	Between Groups	(Combined)	3.648	5	.730	.551	.737
Devolve all work to PH practitioners? * Year of qualification	Within Groups		103.340	78	1.325		
	Total		106.988	83			
	Between Groups	(Combined)	6.883	5	1.377	.875	.502
Pharmacists reaching out to public places? * Year of qualification	Within Groups		122.677	78	1.573		
	Total		129.560	83			
	Between Groups	(Combined)	1.520	5	.304	.284	.921
Community pharmacies developing into HLPs? * Year of qualification	Within Groups		81.358	76	1.071		
	Total		82.878	81			
	Between Groups	(Combined)	2.082	5	.416	.637	.672
Pharmacists developing their own expertise? * Year of qualification	Within Groups		50.327	77	.654		
	Total		52.410	82			
	Between Groups	(Combined)	1.882	5	.376	.565	.726
Location * Year of qualification	Within Groups		51.928	78	.666		
	Total		53.810	83			

Appendix 13 - Measures of Association by Year of Qualification

Measures of Association

	Eta	Eta Squared
Offering O-T-C advice? * Year of qualification	.131	.017
Participating in local authority run scheme? * Year of qualification	.172	.030
Collaborating in shared care scheme? * Year of qualification	.089	.008
Is programme fully funded by local authority? * Year of qualification	.240	.058
Increase PH content of undergraduate curriculum? * Year of qualification	.123	.015
Offer dual MPharm (or even PharmD)/MPH degrees? * Year of qualification	.158	.025
Pharmacy students training with other HC students? * Year of qualification	.252	.063
Pharmacists working closely with HC practitioners? * Year of qualification	.333	.111
Teach advanced communication techniques? * Year of qualification	.239	.057
Adopt new technologies and the social media? * Year of qualification	.103	.011
Develop good adherence strategies for patients? * Year of qualification	.280	.079
Enhancing role in antimicrobial resistance? * Year of qualification	.172	.029
Enhance patients' self-managt capacities? * Year of qualification	.190	.036
Enhance safe medication disposal methods? * Year of qualification	.147	.022
Enhance the management of polypharmacy? * Year of qualification	.129	.017
Managing the medication needs of athletes? * Year of qualification	.102	.010
Enhancing involvement in smoking cessation? * Year of qualification	.298	.089
Providing students with advanced experience in PH? * Year of qualification	.113	.013

Providing pharmacists with advanced experience in PH? * Year of qualification	.196	.038
Remunerate pharmacists directly for PH services? * Year of qualification	.335	.112
Insufficient training of pharmacists in PH? * Year of qualification	.274	.075
Insufficient skill of pharmacists in PH? * Year of qualification	.284	.081
Lack of professional autonomy for pharmacists? * Year of qualification	.297	.088
Difficulties in recruiting patients? * Year of qualification	.340	.116
Lack of demand for public health services? * Year of qualification	.168	.028
High drop rates for public health services? * Year of qualification	.275	.075
Low success rates for public health services? * Year of qualification	.442	.196
Lack of input from public health practitioners? * Year of qualification	.159	.025
Lack of support from public health practitioners? * Year of qualification	.116	.013
Difficulty in communicating with other PH providers? * Year of qualification	.168	.028
Lack of support from GPs? * Year of qualification	.132	.017
Insufficient funding from the government? * Year of qualification	.238	.057
Difficulty in fee collection? * Year of qualification	.170	.029
Time pressure and workload? * Year of qualification	.207	.043
Safety concerns among pharmacists? * Year of qualification	.274	.075
Safety concerns by GPs? * Year of qualification	.151	.023
Safety concerns of patients? * Year of qualification	.146	.021
Lack of patients' records? * Year of qualification	.168	.028
Lack of documentation of interventions? * Year of qualification	.184	.034
Physical design of community pharmacies? * Year of qualification	.244	.060
Misperception that counselling is not needed? * Year of qualification	.229	.053

Lack of instrumentation? * Year of qualification	.238	.056
Language barrier? * Year of qualification	.241	.058
Lack of understanding by the public? * Year of qualification	.242	.058
Lack of understanding by HC providers? * Year of qualification	.167	.028
How essential CPs provide PH services? * Year of qualification	.225	.051
The PH role of CPs is still underdeveloped? * Year of qualification	.180	.032
Pharmacies employing their own PH advisers? * Year of qualification	.283	.080
Devolve all work to PH practitioners? * Year of qualification	.185	.034
Pharmacists reaching out to public places? * Year of qualification	.230	.053
Community pharmacies developing into HLPs? * Year of qualification	.135	.018
Pharmacists developing their own expertise? * Year of qualification	.199	.040
Location * Year of qualification	.187	.035

Appendix 14a - Means Table by Respondent's Role in Pharmacy

Respondent's role in pharmacy		Report									
		Offering O-T-C advice?	Participating in local authority run scheme?	Collaborating in shared care scheme?	Is programme fully funded by local authority?	Increase PH content of undergraduate curriculum?	Offer dual MPharm (or even PharmD)/MPH degrees?	Pharmacy students training with other HC students?	Pharmacists working closely with HC practitioners?	Teach advanced communication techniques?	Adopt new technologies and the social media?
Pharmacy Contractor	Mean	1.0000	1.0909	1.8000	1.1000	3.6923	2.8462	3.5833	3.8462	3.6923	3.0000
	N	13	11	10	10	13	13	12	13	13	13
	Std. Deviation	.00000	.30151	.42164	.31623	.75107	.80064	.79296	.68874	.75107	1.22474

Pharmacy Manager	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	Mean	1.0000	1.2708	1.5833	1.2093	3.6735	3.1633	3.7551	4.1875	4.0612	3.1837
	N	48	48	48	43	49	49	49	48	49	49
	Std. Deviation	.00000	.44909	.49822	.41163	.85117	1.12448	.96890	.86679	.80125	1.20197
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
Relief Pharmacist	Mean	1.0000	1.4000	2.0000	1.2500	3.6000	2.8000	4.0000	4.2000	4.0000	2.6000
	N	5	5	5	4	5	5	4	5	5	5
	Std. Deviation	.00000	.54772	.00000	.50000	.54772	1.09545	.00000	.44721	.70711	1.51658
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000
	Mean	1.0000	1.1667	1.8333	1.0000	3.8333	3.1667	3.8333	4.1667	4.1667	3.0000
Locum Pharmacist	N	6	6	6	4	6	6	6	6	6	6
	Std. Deviation	.00000	.40825	.40825	.00000	.75277	1.16905	1.47196	.40825	.75277	1.09545
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.5000	4.0000	4.0000	4.0000	3.0000
	Mean	1.1250	1.2500	1.5714	1.1667	3.7500	3.3750	4.2500	4.6250	4.0000	3.0000
	N	8	8	7	6	8	8	8	8	8	8
Pharmacist	Std. Deviation	.35355	.46291	.53452	.40825	.70711	.91613	.70711	.51755	.75593	1.30931
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	5.0000	4.0000	3.5000
	Mean	1.0000	1.1667	1.6667	1.0000	3.8333	3.5000	4.3333	4.3333	4.0000	3.5000
	N	6	6	6	5	6	6	6	6	5	6
	Std. Deviation	.00000	.40825	.51640	.00000	1.47196	1.37840	.51640	.51640	.00000	1.22474
Superintendent Pharmacist	Median	1.0000	1.0000	2.0000	1.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	1.0000	1.0000	2.0000	1.0000	3.0000	3.0000	3.0000	4.0000	3.0000	1.0000
	N	1	1	1	1	1	1	1	1	1	1
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	1.0000	1.0000	2.0000	1.0000	3.0000	3.0000	3.0000	4.0000	3.0000	1.0000
Pharmacy Contractor/Supt. Pharmacist	N	1	1	1	1	1	1	1	1	1	1

	Std.										
	Deviation										
	Median	1.0000	1.0000	2.0000	1.0000	3.0000	3.0000	3.0000	4.0000	3.0000	1.0000
	Mean	1.0115	1.2353	1.6627	1.1644	3.6932	3.1364	3.8256	4.1839	3.9885	3.0909
	N	87	85	83	73	88	88	86	87	87	88
Total	Std.	.10721	.42670	.47568	.37319	.83539	1.06330	.92281	.75527	.75474	1.21897
	Deviation										
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000	3.0000

Appendix 14b - Means Table by Respondent's Role in Pharmacy contd.

		Report									
Respondent's role in pharmacy		Develop good adherence strategies for patients?	Enhancing role in antimicrobial resistance?	Enhance patients' self-managt capacities?	Enhance safe medication disposal methods?	Enhance the management of polypharmacy ?	Managing the medication needs of athletes?	Enhancing involvement in smoking cessation?	Providing students with advanced experience in PH?	Providing pharmacists with advanced experience in PH?	Remunerate pharmacists directly for PH services?
Pharmacy Contractor	Mean	3.7500	4.0000	4.0769	3.6154	3.7692	3.8462	4.3846	4.0769	4.0000	4.2308
	N	12	13	13	13	13	13	13	13	13	13
	Std. Deviation	.45227	.40825	.49355	1.12090	.92681	.68874	.50637	.64051	.70711	.83205
Pharmacy Manager	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	4.0612	3.8367	4.2245	3.8367	4.2857	3.7083	3.8980	4.0625	4.1633	4.2653
	N	49	49	49	49	49	48	49	48	49	49
	Std. Deviation	.55558	.94311	.62133	.96495	.73598	.87418	1.02561	.59809	.55328	.75761

Relief Pharmacist	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	4.0000	4.0000	4.4000	3.8000	4.0000	3.4000	4.2000	4.2000	4.2000	4.4000
	N	5	5	5	5	5	5	5	5	5	5
	Std. Deviation	.70711	.70711	.54772	.83666	.70711	1.51658	.83666	.83666	.44721	.89443
Locum Pharmacist	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.0000
	Mean	4.0000	4.0000	4.0000	3.8333	4.3333	3.6667	4.0000	4.1667	4.0000	4.1667
	N	6	6	6	6	6	6	6	6	6	6
	Std. Deviation	.00000	.00000	.00000	.75277	.51640	.51640	.89443	.40825	.00000	.40825
Pharmacist	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
	Mean	4.1250	4.2500	4.2500	4.5000	4.3750	4.5000	4.1250	4.2500	4.5000	4.5000
	N	8	8	8	8	8	8	8	8	8	8
	Std. Deviation	.35355	.70711	.70711	.53452	.51755	.53452	.83452	.70711	.53452	.53452
Superintendent Pharmacist	Median	4.0000	4.0000	4.0000	4.5000	4.0000	4.5000	4.0000	4.0000	4.5000	4.5000
	Mean	4.3333	4.1667	4.1667	3.6667	4.3333	4.1667	3.6667	3.6667	3.6667	4.0000
	N	6	6	6	6	6	6	6	6	6	6
	Std. Deviation	.51640	.40825	.75277	1.36626	.81650	.40825	1.36626	1.36626	1.36626	1.54919
Pharmacy Contractor/Supt. Pharmacist	Median	4.0000	4.0000	4.0000	4.0000	4.5000	4.0000	4.0000	4.0000	4.0000	4.5000
	Mean	4.0000	3.0000	3.0000	4.0000	3.0000	3.0000	4.0000	4.0000	3.0000	3.0000
	N	1	1	1	1	1	1	1	1	1	1
	Std. Deviation	.	.	.	.	.	.	.	.	.	.
Total	Mean	4.0345	3.9318	4.1818	3.8523	4.1932	3.8046	4.0000	4.0690	4.1136	4.2500

N	87	88	88	88	88	87	88	87	88	88
Std. Deviation	.51598	.78485	.59780	.96537	.75594	.84687	.94686	.67846	.65094	.80587
Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

Appendix 14c - Means Table by Respondent's Role in Pharmacy contd.

		Report									
Respondent's role in pharmacy		Insufficient training of pharmacists in PH?	Insufficient skill of pharmacists in PH?	Lack of professional autonomy for pharmacists ?	Difficulties in recruiting patients?	Lack of demand for public health services?	High drop rates for public health services?	Low success rates for public health services?	Lack of input from public health practitioners ?	Lack of support from public health practitioners?	Difficulty in communicating with other PH providers?
Pharmacy Contractor	Mean	3.1538	2.6923	3.7692	3.2308	2.2308	2.9231	2.2308	3.4615	3.4615	3.6923
	N	13	13	13	13	13	13	13	13	13	13
	Std. Deviation	1.40512	1.37747	1.01274	1.09193	1.16575	.95407	1.16575	.87706	1.12660	.85485
	Median	4.0000	3.0000	4.0000	4.0000	2.0000	3.0000	2.0000	4.0000	4.0000	4.0000
Pharmacy Manager	Mean	3.3469	2.8980	3.6327	3.4286	2.6122	3.4082	2.7708	3.6939	3.4894	3.4694
	N	49	49	49	49	49	49	48	49	47	49
	Std. Deviation	1.23408	1.24574	1.09343	1.27475	1.33567	1.05906	1.25883	1.02478	1.24887	1.24335
	Median	4.0000	3.0000	4.0000	4.0000	3.0000	4.0000	3.0000	4.0000	4.0000	4.0000
Relief Pharmacist	Mean	3.8000	3.4000	3.6000	3.8000	2.4000	3.4000	2.8000	3.8000	3.2000	3.8000
	N	5	5	5	5	5	5	5	5	5	5

	Std.	.83666	1.51658	.54772	.83666	.89443	.54772	1.09545	.44721	.44721	.83666
	Deviation										
	Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	3.0000	4.0000
	Mean	3.8333	3.1667	4.1667	4.1667	2.3333	3.1667	1.8333	4.1667	4.0000	4.1667
	N	6	6	6	6	6	6	6	6	6	6
Locum Pharmacist	Std.	.40825	1.16905	.75277	.75277	1.21106	1.32916	.98319	.75277	.63246	.40825
	Deviation										
	Median	4.0000	3.5000	4.0000	4.0000	2.5000	3.0000	1.5000	4.0000	4.0000	4.0000
	Mean	3.6250	4.0000	4.0000	4.1250	3.0000	3.7500	3.0000	3.0000	3.3750	3.6250
	N	8	8	8	8	8	8	8	8	8	8
Pharmacist	Std.	1.18773	.53452	.75593	.83452	.75593	.88641	1.19523	1.41421	1.18773	1.18773
	Deviation										
	Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.5000	3.0000	3.0000	3.5000	4.0000
	Mean	3.8333	3.1667	2.8333	3.0000	2.1667	2.5000	2.5000	3.1667	3.5000	3.0000
	N	6	6	6	6	6	6	6	6	6	5
Superintendent Pharmacist	Std.	1.47196	1.47196	1.60208	1.67332	.98319	1.22474	1.22474	1.16905	1.37840	1.22474
	Deviation										
	Median	4.0000	3.5000	3.0000	3.5000	2.5000	3.0000	3.0000	3.5000	4.0000	3.0000
	Mean	3.0000	4.0000	4.0000	4.0000	1.0000	3.0000	3.0000	3.0000	4.0000	4.0000
	N	1	1	1	1	1	1	1	1	1	1
Pharmacy Contractor/Supt. Pharmacist	Std.	.	.	.	.	.	.	.	.	.	.
	Deviation										
	Median	3.0000	4.0000	4.0000	4.0000	1.0000	3.0000	3.0000	3.0000	4.0000	4.0000
	Mean	3.4318	3.0455	3.6705	3.5114	2.5114	3.2841	2.6322	3.5909	3.5000	3.5632
	N	88	88	88	88	88	88	87	88	86	87
Total	Std.	1.20149	1.25862	1.05832	1.20339	1.21290	1.04989	1.21152	1.02426	1.14532	1.11753
	Deviation										

Median	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000	4.0000	4.0000	4.0000
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Appendix 14d - Means Table by Respondent's Role in Pharmacy contd.

Respondent's role in pharmacy		Report									
		Lack of support from GPs?	Insufficient funding from the government ?	Difficulty in fee collection?	Time pressure and workload?	Safety concerns among pharmacists?	Safety concerns by GPs?	Safety concerns of patients?	Lack of patients' records?	Lack of documentation of interventions?	Physical design of community pharmacies?
Pharmacy Contractor	Mean	3.6923	4.3846	3.0769	4.3077	3.0000	3.0769	2.2308	3.6154	3.1538	2.3846
	N	13	13	13	13	13	13	13	13	13	13
	Std. Deviation	1.10940	.65044	.86232	.63043	1.22474	1.25576	1.01274	1.12090	.98710	1.12090
	Median	4.0000	4.0000	3.0000	4.0000	3.0000	3.0000	2.0000	4.0000	3.0000	3.0000
Pharmacy Manager	Mean	3.4286	3.9796	3.4082	4.4286	3.0204	2.4694	2.1020	3.8980	3.1667	2.9184
	N	49	49	49	49	49	49	49	49	48	49
	Std. Deviation	1.32288	1.18127	1.27342	.86603	1.29887	1.29264	1.26235	.98414	1.32622	1.39697
	Median	4.0000	4.0000	4.0000	5.0000	3.0000	2.0000	2.0000	4.0000	3.5000	3.0000
Relief Pharmacist	Mean	3.6000	2.8000	3.2000	4.6000	4.2000	2.2000	2.2000	3.2000	3.4000	2.6000
	N	5	5	5	5	5	5	5	5	5	5
	Std. Deviation	.89443	1.78885	.44721	.54772	.83666	1.09545	1.09545	1.30384	.54772	1.51658
	Median	3.0000	3.0000	3.0000	5.0000	4.0000	3.0000	3.0000	4.0000	3.0000	3.0000
Locum Pharmacist	Mean	3.6667	4.0000	3.3333	4.5000	3.5000	2.6667	2.5000	4.3333	3.0000	2.5000
	N	6	6	6	6	6	6	6	6	6	6

	Std.	.81650	.89443	1.21106	.54772	1.37840	1.50555	1.22474	.51640	1.09545	1.76068
	Deviation										
	Median	3.5000	4.0000	4.0000	4.5000	4.0000	3.0000	3.0000	4.0000	3.0000	2.0000
	Mean	4.0000	3.6250	3.0000	4.2500	4.1250	4.0000	3.2500	4.5000	4.1250	4.0000
	N	8	8	8	8	8	8	8	8	8	8
Pharmacist	Std.	1.41421	1.76777	1.06904	1.38873	.64087	.92582	1.58114	.75593	.64087	.75593
	Deviation										
	Median	4.5000	4.5000	3.0000	5.0000	4.0000	4.0000	3.5000	5.0000	4.0000	4.0000
	Mean	4.3333	4.5000	3.1667	4.1667	2.8333	2.5000	2.0000	3.6667	3.6667	3.0000
	N	6	6	6	6	6	6	6	6	6	6
Superintendent Pharmacist	Std.	.81650	.54772	1.72240	.75277	1.47196	1.37840	1.26491	1.50555	1.36626	1.67332
	Deviation										
	Median	4.5000	4.5000	4.0000	4.0000	3.5000	2.5000	1.5000	4.0000	4.0000	3.5000
	Mean	4.0000	4.0000	4.0000	5.0000	3.0000	1.0000	1.0000	4.0000	3.0000	1.0000
	N	1	1	1	1	1	1	1	1	1	1
Pharmacy Contractor/Supt. Pharmacist	Std.	.	.	.	.	.	.	.	.	.	.
	Deviation										
	Median	4.0000	4.0000	4.0000	5.0000	3.0000	1.0000	1.0000	4.0000	3.0000	1.0000
	Mean	3.6136	3.9773	3.2955	4.3977	3.2045	2.6818	2.2386	3.8864	3.2874	2.8750
	N	88	88	88	88	88	88	88	88	87	88
Total	Std.	1.21704	1.19364	1.17600	.83789	1.26998	1.32652	1.25940	1.03315	1.19015	1.39632
	Deviation										
	Median	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000	2.0000	4.0000	4.0000	3.0000

Appendix 14e - Means Table by Respondent's Role in Pharmacy contd.

Report

Respondent's role in pharmacy		Misperception that counselling is not needed?	Lack of instrumentation?	Language barrier?	Lack of understanding by the public?	Lack of understanding by HC providers?	How essential CPs provide PH services?	The PH role of CPs is still under-developed?	Pharmacies employing their own PH advisers?	Devolve all work to PH practitioners?	Pharmacists reaching out to public places?
Pharmacy Contractor	Mean	2.9231	3.0000	1.7692	4.0000	3.5833	2.0000	1.2500	2.8462	1.8462	3.3077
	N	13	13	13	12	12	13	12	13	13	13
	Std. Deviation	1.25576	1.15470	1.23517	.42640	.90034	1.08012	.45227	1.14354	.89872	.75107
	Median	3.0000	3.0000	1.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	3.0000
Pharmacy Manager	Mean	2.8367	3.4082	2.3750	3.6531	3.5000	1.8542	1.1875	2.8723	2.1277	3.2128
	N	49	49	48	49	48	48	48	47	47	47
	Std. Deviation	1.43392	1.11651	1.29853	1.18235	1.27162	.96733	.39444	1.37710	1.20897	1.28429
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	4.0000
Relief Pharmacist	Mean	3.0000	2.2000	1.8000	3.2000	3.5000	3.0000	1.4000	3.6000	2.2000	3.4000
	N	5	5	5	5	4	5	5	5	5	5
	Std. Deviation	1.87083	1.64317	1.09545	1.30384	.57735	1.00000	.54772	.89443	1.09545	1.34164
	Median	4.0000	1.0000	1.0000	4.0000	3.5000	3.0000	1.0000	3.0000	3.0000	4.0000
Locum Pharmacist	Mean	3.5000	3.5000	1.8333	4.4000	4.3333	2.1667	1.0000	2.0000	1.6667	3.5000
	N	6	6	6	5	6	6	6	6	6	6
	Std. Deviation	1.51658	1.37840	1.32916	.54772	.51640	1.47196	.00000	1.09545	1.03280	1.37840
	Median	3.5000	4.0000	1.0000	4.0000	4.0000	1.5000	1.0000	2.0000	1.0000	4.0000

Pharmacist	Mean	4.1250	3.8750	3.0000	3.8750	3.8750	1.6250	1.0000	3.8571	2.1429	3.2857
	N	8	8	8	8	8	8	7	7	7	7
	Std. Deviation	1.12599	.64087	1.30931	1.45774	1.45774	1.06066	.00000	.69007	1.57359	1.70434
	Median	4.5000	4.0000	3.0000	4.5000	4.5000	1.0000	1.0000	4.0000	1.0000	4.0000
Superintendent Pharmacist	Mean	3.1667	2.6667	2.6667	3.1667	3.6667	2.0000	1.0000	1.6667	1.5000	2.8333
	N	6	6	6	6	6	6	6	6	6	6
	Std. Deviation	1.32916	1.63299	1.63299	1.47196	1.03280	.89443	.00000	1.03280	.54772	1.16905
	Median	3.0000	2.5000	2.5000	3.5000	4.0000	2.0000	1.0000	1.0000	1.5000	3.0000
Pharmacy Contractor/Supt. Pharmacist	Mean	1.0000	4.0000	1.0000	4.0000	3.0000	4.0000		1.0000	1.0000	1.0000
	N	1	1	1	1	1	1		1	1	1
	Std. Deviation	.	.	.	.	.	.		.	.	.
	Median	1.0000	4.0000	1.0000	4.0000	3.0000	4.0000		1.0000	1.0000	1.0000
Total	Mean	3.0227	3.2841	2.2759	3.7093	3.6118	1.9770	1.1667	2.8235	2.0000	3.2118
	N	88	88	87	86	85	87	84	85	85	85
	Std. Deviation	1.43019	1.20295	1.31794	1.13621	1.15567	1.05629	.37492	1.31996	1.13389	1.24493
	Median	3.0000	4.0000	2.0000	4.0000	4.0000	2.0000	1.0000	3.0000	2.0000	4.0000

Appendix 14f - Means Table by Respondent's Role in Pharmacy contd.

Report

Respondent's role in pharmacy		Community pharmacies developing into HLPs?	Pharmacists developing their own expertise?	Location
Pharmacy Contractor	Mean	3.5385	4.0000	2.0000
	N	13	13	13
	Std. Deviation	.96742	.40825	.91287
	Median	4.0000	4.0000	2.0000
Pharmacy Manager	Mean	3.8043	4.0652	2.0833
	N	46	46	48
	Std. Deviation	1.12782	.90436	.76724
	Median	4.0000	4.0000	2.0000
Relief Pharmacist	Mean	3.8000	4.2000	1.8000
	N	5	5	5
	Std. Deviation	.83666	.44721	.83666
	Median	4.0000	4.0000	2.0000
Locum Pharmacist	Mean	3.6667	4.3333	2.3333
	N	6	6	6
	Std. Deviation	.51640	.51640	.81650
	Median	4.0000	4.0000	2.5000
Pharmacist	Mean	4.1667	4.0000	2.1250
	N	6	7	8
	Std. Deviation	.98319	1.00000	.83452
	Median	4.5000	4.0000	2.0000
Superintendent Pharmacist	Mean	4.3333	4.1667	1.2500

	N	6	6	4
	Std. Deviation	.51640	.98319	.50000
	Median	4.0000	4.5000	1.0000
	Mean	3.0000	4.0000	3.0000
Pharmacy Contractor/Supt. Pharmacist	N	1	1	1
	Std. Deviation	.	.	.
	Median	3.0000	4.0000	3.0000
	Mean	3.8072	4.0833	2.0471
Total	N	83	84	85
	Std. Deviation	1.00557	.79469	.80039
	Median	4.0000	4.0000	2.0000

Appendix 15 - Anova Table by Respondent's Role in Pharmacy

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Offering O-T-C advice? * Respondent's role in pharmacy	Between Groups	(Combined)	.114	6	.019	1.730	.125
	Within Groups		.875	80	.011		
	Total		.989	86			
Participating in local authority run scheme? * Respondent's role in pharmacy	Between Groups	(Combined)	.539	6	.090	.475	.825
	Within Groups		14.755	78	.189		
	Total		15.294	84			
Collaborating in shared care scheme? * Respondent's role in pharmacy	Between Groups	(Combined)	1.407	6	.234	1.039	.407
	Within Groups		17.148	76	.226		
	Total		18.554	82			
Is programme fully funded by local authority? * Respondent's role in pharmacy	Between Groups	(Combined)	.428	6	.071	.490	.813

	Within Groups		9.600	66	.145		
	Total		10.027	72			
Increase PH content of undergraduate curriculum? * Respondent's role in pharmacy	Between Groups	(Combined)	.805	6	.134	.181	.981
	Within Groups		59.911	81	.740		
	Total		60.716	87			
Offer dual MPharm (or even PharmD)/MPH degrees? * Respondent's role in pharmacy	Between Groups	(Combined)	2.969	6	.495	.420	.864
	Within Groups		95.395	81	1.178		
	Total		98.364	87			
Pharmacy students training with other HC students? * Respondent's role in pharmacy	Between Groups	(Combined)	4.739	6	.790	.922	.484
	Within Groups		67.645	79	.856		
	Total		72.384	85			
Pharmacists working closely with HC practitioners? * Respondent's role in pharmacy	Between Groups	(Combined)	3.211	6	.535	.934	.476
	Within Groups		45.846	80	.573		
	Total		49.057	86			
Teach advanced communication techniques? * Respondent's role in pharmacy	Between Groups	(Combined)	2.570	6	.428	.738	.620
	Within Groups		46.419	80	.580		
	Total		48.989	86			
Adopt new technologies and the social media? * Respondent's role in pharmacy	Between Groups	(Combined)	7.226	6	1.204	.799	.573
	Within Groups		122.047	81	1.507		
	Total		129.273	87			
Develop good adherence strategies for patients? * Respondent's role in pharmacy	Between Groups	(Combined)	1.622	6	.270	1.016	.421
	Within Groups		21.275	80	.266		
	Total		22.897	86			
Enhancing role in antimicrobial resistance? * Respondent's role in pharmacy	Between Groups	(Combined)	2.564	6	.427	.678	.668
	Within Groups		51.027	81	.630		
	Total		53.591	87			
Enhance patients' self-managt capacities? * Respondent's role in pharmacy	Between Groups	(Combined)	2.104	6	.351	.980	.444
	Within Groups		28.987	81	.358		

	Total		31.091	87			
	Between Groups	(Combined)	4.342	6	.724	.764	.600
Enhance safe medication disposal methods? * Respondent's role in pharmacy	Within Groups		76.737	81	.947		
	Total		81.080	87			
	Between Groups	(Combined)	4.867	6	.811	1.465	.201
Enhance the management of polypharmacy? * Respondent's role in pharmacy	Within Groups		44.849	81	.554		
	Total		49.716	87			
	Between Groups	(Combined)	6.703	6	1.117	1.626	.151
Managing the medication needs of athletes? * Respondent's role in pharmacy	Within Groups		54.976	80	.687		
	Total		61.678	86			
	Between Groups	(Combined)	3.425	6	.571	.620	.714
Enhancing involvement in smoking cessation? * Respondent's role in pharmacy	Within Groups		74.575	81	.921		
	Total		78.000	87			
	Between Groups	(Combined)	1.384	6	.231	.483	.819
Providing students with advanced experience in PH? * Respondent's role in pharmacy	Within Groups		38.202	80	.478		
	Total		39.586	86			
	Between Groups	(Combined)	4.036	6	.673	1.660	.142
Providing pharmacists with advanced experience in PH? * Respondent's role in pharmacy	Within Groups		32.827	81	.405		
	Total		36.864	87			
	Between Groups	(Combined)	2.608	6	.435	.653	.687
Remunerate pharmacists directly for PH services? * Respondent's role in pharmacy	Within Groups		53.892	81	.665		
	Total		56.500	87			
	Between Groups	(Combined)	4.455	6	.742	.496	.809
Insufficient training of pharmacists in PH? * Respondent's role in pharmacy	Within Groups		121.136	81	1.496		
	Total		125.591	87			
	Between Groups	(Combined)	11.692	6	1.949	1.252	.289
Insufficient skill of pharmacists in PH? * Respondent's role in pharmacy	Within Groups		126.126	81	1.557		
	Total		137.818	87			

	Between Groups	(Combined)	6.881	6	1.147	1.026	.415
Lack of professional autonomy for pharmacists? * Respondent's role in pharmacy	Within Groups		90.562	81	1.118		
	Total		97.443	87			
	Between Groups	(Combined)	9.173	6	1.529	1.060	.393
Difficulties in recruiting patients? * Respondent's role in pharmacy	Within Groups		116.816	81	1.442		
	Total		125.989	87			
	Between Groups	(Combined)	6.682	6	1.114	.744	.616
Lack of demand for public health services? * Respondent's role in pharmacy	Within Groups		121.307	81	1.498		
	Total		127.989	87			
	Between Groups	(Combined)	8.105	6	1.351	1.246	.292
High drop rates for public health services? * Respondent's role in pharmacy	Within Groups		87.793	81	1.084		
	Total		95.898	87			
	Between Groups	(Combined)	8.310	6	1.385	.940	.472
Low success rates for public health services? * Respondent's role in pharmacy	Within Groups		117.920	80	1.474		
	Total		126.230	86			
	Between Groups	(Combined)	7.167	6	1.195	1.150	.341
Lack of input from public health practitioners? * Respondent's role in pharmacy	Within Groups		84.106	81	1.038		
	Total		91.273	87			
	Between Groups	(Combined)	2.350	6	.392	.283	.943
Lack of support from public health practitioners? * Respondent's role in pharmacy	Within Groups		109.150	79	1.382		
	Total		111.500	85			
	Between Groups	(Combined)	4.921	6	.820	.640	.698
Difficulty in communicating with other PH providers? * Respondent's role in pharmacy	Within Groups		102.482	80	1.281		
	Total		107.402	86			
	Between Groups	(Combined)	6.228	6	1.038	.686	.662
Lack of support from GPs? * Respondent's role in pharmacy	Within Groups		122.636	81	1.514		
	Total		128.864	87			
	Between Groups	(Combined)	11.723	6	1.954	1.410	.221
Insufficient funding from the government? * Respondent's role in pharmacy							

	Within Groups		112.232	81	1.386		
	Total		123.955	87			
	Between Groups	(Combined)	2.592	6	.432	.297	.937
Difficulty in fee collection? * Respondent's role in pharmacy	Within Groups		117.726	81	1.453		
	Total		120.318	87			
	Between Groups	(Combined)	1.277	6	.213	.288	.941
Time pressure and workload? * Respondent's role in pharmacy	Within Groups		59.803	81	.738		
	Total		61.080	87			
	Between Groups	(Combined)	15.330	6	2.555	1.656	.143
Safety concerns among pharmacists? * Respondent's role in pharmacy	Within Groups		124.988	81	1.543		
	Total		140.318	87			
	Between Groups	(Combined)	22.330	6	3.722	2.305	.042
Safety concerns by GPs? * Respondent's role in pharmacy	Within Groups		130.760	81	1.614		
	Total		153.091	87			
	Between Groups	(Combined)	11.391	6	1.899	1.215	.307
Safety concerns of patients? * Respondent's role in pharmacy	Within Groups		126.597	81	1.563		
	Total		137.989	87			
	Between Groups	(Combined)	7.830	6	1.305	1.243	.293
Lack of patients' records? * Respondent's role in pharmacy	Within Groups		85.033	81	1.050		
	Total		92.864	87			
	Between Groups	(Combined)	8.049	6	1.341	.943	.469
Lack of documentation of interventions? * Respondent's role in pharmacy	Within Groups		113.767	80	1.422		
	Total		121.816	86			
	Between Groups	(Combined)	18.175	6	3.029	1.620	.152
Physical design of community pharmacies? * Respondent's role in pharmacy	Within Groups		151.450	81	1.870		
	Total		169.625	87			
	Between Groups	(Combined)	17.129	6	2.855	1.438	.210
Misperception that counselling is not needed? * Respondent's role in pharmacy	Within Groups		160.825	81	1.985		

	Total		177.955	87			
	Between Groups	(Combined)	13.553	6	2.259	1.629	.150
Lack of instrumentation? * Respondent's role in pharmacy	Within Groups		112.345	81	1.387		
	Total		125.898	87			
	Between Groups	(Combined)	12.855	6	2.142	1.255	.287
Language barrier? * Respondent's role in pharmacy	Within Groups		136.524	80	1.707		
	Total		149.379	86			
	Between Groups	(Combined)	6.922	6	1.154	.887	.509
Lack of understanding by the public? * Respondent's role in pharmacy	Within Groups		102.810	79	1.301		
	Total		109.733	85			
	Between Groups	(Combined)	4.730	6	.788	.572	.751
Lack of understanding by HC providers? * Respondent's role in pharmacy	Within Groups		107.458	78	1.378		
	Total		112.188	84			
	Between Groups	(Combined)	11.267	6	1.878	1.774	.115
How essential CPs provide PH services? * Respondent's role in pharmacy	Within Groups		84.688	80	1.059		
	Total		95.954	86			
	Between Groups	(Combined)	.904	5	.181	1.311	.268
The PH role of CPs is still underdeveloped? * Respondent's role in pharmacy	Within Groups		10.763	78	.138		
	Total		11.667	83			
	Between Groups	(Combined)	26.036	6	4.339	2.813	.016
Pharmacies employing their own PH advisers? * Respondent's role in pharmacy	Within Groups		120.317	78	1.543		
	Total		146.353	84			
	Between Groups	(Combined)	4.583	6	.764	.576	.748
Devolve all work to PH practitioners? * Respondent's role in pharmacy	Within Groups		103.417	78	1.326		
	Total		108.000	84			
	Between Groups	(Combined)	6.585	6	1.097	.693	.656
Pharmacists reaching out to public places? * Respondent's role in pharmacy	Within Groups		123.603	78	1.585		
	Total		130.188	84			

Community pharmacies developing into HLPs? * Respondent's role in pharmacy	Between Groups	(Combined)	4.146	6	.691	.667	.677
	Within Groups		78.770	76	1.036		
	Total		82.916	82			
Pharmacists developing their own expertise? * Respondent's role in pharmacy	Between Groups	(Combined)	.646	6	.108	.160	.986
	Within Groups		51.771	77	.672		
	Total		52.417	83			
Location * Respondent's role in pharmacy	Between Groups	(Combined)	4.387	6	.731	1.154	.340
	Within Groups		49.425	78	.634		
	Total		53.812	84			

Appendix 16 - Measures of Association by Respondent's Role in Pharmacy

Measures of Association

	Eta	Eta Squared
Offering O-T-C advice? * Respondent's role in pharmacy	.339	.115
Participating in local authority run scheme? * Respondent's role in pharmacy	.188	.035
Collaborating in shared care scheme? * Respondent's role in pharmacy	.275	.076
Is programme fully funded by local authority? * Respondent's role in pharmacy	.207	.043
Increase PH content of undergraduate curriculum? * Respondent's role in pharmacy	.115	.013
Offer dual MPharm (or even PharmD)/MPH degrees? * Respondent's role in pharmacy	.174	.030
Pharmacy students training with other HC students? * Respondent's role in pharmacy	.256	.065

Pharmacists working closely with HC practitioners? * Respondent's role in pharmacy	.256	.065
Teach advanced communication techniques? * Respondent's role in pharmacy	.229	.052
Adopt new technologies and the social media? * Respondent's role in pharmacy	.236	.056
Develop good adherence strategies for patients? * Respondent's role in pharmacy	.266	.071
Enhancing role in antimicrobial resistance? * Respondent's role in pharmacy	.219	.048
Enhance patients' self-managt capacities? * Respondent's role in pharmacy	.260	.068
Enhance safe medication disposal methods? * Respondent's role in pharmacy	.231	.054
Enhance the management of polypharmacy? * Respondent's role in pharmacy	.313	.098
Managing the medication needs of athletes? * Respondent's role in pharmacy	.330	.109
Enhancing involvement in smoking cessation? * Respondent's role in pharmacy	.210	.044
Providing students with advanced experience in PH? * Respondent's role in pharmacy	.187	.035
Providing pharmacists with advanced experience in PH? * Respondent's role in pharmacy	.331	.109
Remunerate pharmacists directly for PH services? * Respondent's role in pharmacy	.215	.046
Insufficient training of pharmacists in PH? * Respondent's role in pharmacy	.188	.035

Insufficient skill of pharmacists in PH? * Respondent's role in pharmacy	.291	.085
Lack of professional autonomy for pharmacists? * Respondent's role in pharmacy	.266	.071
Difficulties in recruiting patients? * Respondent's role in pharmacy	.270	.073
Lack of demand for public health services? * Respondent's role in pharmacy	.228	.052
High drop rates for public health services? * Respondent's role in pharmacy	.291	.085
Low success rates for public health services? * Respondent's role in pharmacy	.257	.066
Lack of input from public health practitioners? * Respondent's role in pharmacy	.280	.079
Lack of support from public health practitioners? * Respondent's role in pharmacy	.145	.021
Difficulty in communicating with other PH providers? * Respondent's role in pharmacy	.214	.046
Lack of support from GPs? * Respondent's role in pharmacy	.220	.048
Insufficient funding from the government? * Respondent's role in pharmacy	.308	.095
Difficulty in fee collection? * Respondent's role in pharmacy	.147	.022
Time pressure and workload? * Respondent's role in pharmacy	.145	.021
Safety concerns among pharmacists? * Respondent's role in pharmacy	.331	.109
Safety concerns by GPs? * Respondent's role in pharmacy	.382	.146
Safety concerns of patients? * Respondent's role in pharmacy	.287	.083
Lack of patients' records? * Respondent's role in pharmacy	.290	.084

Lack of documentation of interventions? * Respondent's role in pharmacy	.257	.066
Physical design of community pharmacies? * Respondent's role in pharmacy	.327	.107
Misperception that counselling is not needed? * Respondent's role in pharmacy	.310	.096
Lack of instrumentation? * Respondent's role in pharmacy	.328	.108
Language barrier? * Respondent's role in pharmacy	.293	.086
Lack of understanding by the public? * Respondent's role in pharmacy	.251	.063
Lack of understanding by HC providers? * Respondent's role in pharmacy	.205	.042
How essential CPs provide PH services? * Respondent's role in pharmacy	.343	.117
The PH role of CPs is still underdeveloped? * Respondent's role in pharmacy	.278	.078
Pharmacies employing their own PH advisers? * Respondent's role in pharmacy	.422	.178
Devolve all work to PH practitioners? * Respondent's role in pharmacy	.206	.042
Pharmacists reaching out to public places? * Respondent's role in pharmacy	.225	.051
Community pharmacies developing into HLPs? * Respondent's role in pharmacy	.224	.050
Pharmacists developing their own expertise? * Respondent's role in pharmacy	.111	.012
Location * Respondent's role in pharmacy	.286	.082

Appendix 17a - Means Table by Location

Means

Report

Location		Offering O-T-C advice?	Participating in local authority run scheme?	Collaborating in shared care scheme?	Is programme fully funded by local authority?	Increase PH content of undergraduate curriculum?	Offer dual MPharm (or even PharmD)/MPH degrees?	Pharmacy students training with other HC students?	Pharmacists working closely with HC practitioners ?	Teach advanced communication techniques?
Barnet	Mean	1.0000	1.1200	1.6522	1.0526	3.6800	3.4000	3.7600	4.2083	4.1667
	N	25	25	23	19	25	25	25	24	24
	Std. Deviation	.00000	.33166	.48698	.22942	.69041	.95743	1.05198	.65801	.56466
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000
Edinburgh	Mean	1.0333	1.0333	1.6000	1.1111	4.0000	3.1613	4.0645	4.2258	3.9032
	N	30	30	30	27	31	31	31	31	31
	Std. Deviation	.18257	.18257	.49827	.32026	.85635	1.12833	.77182	.80456	.94357
	Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000
Cardiff	Mean	1.0000	1.5556	1.8148	1.3333	3.4483	2.7586	3.6296	4.1034	3.8966
	N	29	27	27	24	29	29	27	29	29
	Std. Deviation	.00000	.50637	.39585	.48154	.73612	.98761	.96668	.81700	.67320
	Median	1.0000	2.0000	2.0000	1.0000	3.0000	3.0000	4.0000	4.0000	4.0000
Total	Mean	1.0119	1.2317	1.6875	1.1714	3.7176	3.0941	3.8313	4.1786	3.9762
	N	84	82	80	70	85	85	83	84	84

Std. Deviation	.10911	.42452	.46644	.37960	.79600	1.05361	.93469	.76301	.76009
Median	1.0000	1.0000	2.0000	1.0000	4.0000	3.0000	4.0000	4.0000	4.0000

Appendix 17b - Means Table by Location contd.

		Report								
Location		Adopt new technologies and the social media?	Develop good adherence strategies for patients?	Enhancing role in antimicrobial resistance?	Enhance patients' self-managt capacities?	Enhance safe medication disposal methods?	Enhance the management of polypharmacy?	Managing the medication needs of athletes?	Enhancing involvement in smoking cessation?	Providing students with advanced experience in PH?
Barnet	Mean	3.3600	4.0800	4.0000	4.2400	4.1600	4.1200	4.1200	4.1200	4.1667
	N	25	25	25	25	25	25	25	25	24
	Std. Deviation	1.15036	.40000	.70711	.66332	.98658	.78102	.60000	1.01325	.63702
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Edinburgh	Mean	2.6774	4.0323	4.0323	4.2258	3.7742	4.4516	3.6129	3.8710	4.1290
	N	31	31	31	31	31	31	31	31	31
	Std. Deviation	1.30095	.54674	.70635	.56034	1.08657	.85005	1.08558	1.17592	.88476
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	5.0000	4.0000	4.0000	4.0000
Cardiff	Mean	3.3103	3.9286	3.6897	4.0345	3.6552	3.9655	3.6786	4.0000	3.9310
	N	29	28	29	29	29	29	28	29	29
	Std. Deviation	1.07250	.53945	.89056	.56586	.81398	.56586	.66964	.59761	.45756
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

	Mean	3.0941	4.0119	3.9059	4.1647	3.8471	4.1882	3.7857	3.9882	4.0714
	N	85	84	85	85	85	85	84	85	84
Total	Std. Deviation	1.21129	.50286	.78108	.59456	.98205	.76367	.85124	.95735	.69048
	Median	3.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000

Appendix 17c - Means Table by Location contd.

		Report								
Location		Providing pharmacists with advanced experience in PH?	Remunerate pharmacists directly for PH services?	Insufficient training of pharmacists in PH?	Insufficient skill of pharmacists in PH?	Lack of professional autonomy for pharmacists?	Difficulties in recruiting patients?	Lack of demand for public health services?	High drop rates for public health services?	Low success rates for public health services?
Barnet	Mean	4.3200	4.2800	3.3600	2.7600	3.9600	3.5200	2.3600	3.0000	2.2500
	N	25	25	25	25	25	25	25	25	24
	Std. Deviation	.47610	1.02144	1.35031	1.33167	.97809	1.15902	1.18603	.91287	1.15156
	Median	4.0000	5.0000	4.0000	3.0000	4.0000	4.0000	2.0000	3.0000	2.0000
Edinburgh	Mean	4.1290	4.1935	3.3871	2.9677	3.5484	3.0968	2.2581	3.3548	2.7097
	N	31	31	31	31	31	31	31	31	31
	Std. Deviation	.84624	.70329	1.25638	1.32876	1.15004	1.53525	1.31574	1.33037	1.41877
	Median	4.0000	4.0000	4.0000	3.0000	4.0000	4.0000	2.0000	4.0000	3.0000
Cardiff	Mean	3.9655	4.2414	3.4828	3.4138	3.6552	3.9655	2.9310	3.4483	2.7931
	N	29	29	29	29	29	29	29	29	29

	Std. Deviation	.49877	.73946	1.08958	1.05279	.93640	.62580	1.06674	.82748	1.01346
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000
	Mean	4.1294	4.2353	3.4118	3.0588	3.7059	3.5176	2.5176	3.2824	2.6071
	N	85	85	85	85	85	85	85	85	84
Total	Std. Deviation	.65079	.81133	1.21786	1.25691	1.03307	1.22097	1.22097	1.06471	1.22246
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	3.0000	3.0000

Appendix 17d - Means Table by Location contd.

		Report								
Location		Lack of input from public health practitioners?	Lack of support from public health practitioners?	Difficulty in communicating with other PH providers?	Lack of support from GPs?	Insufficient funding from the government?	Difficulty in fee collection?	Time pressure and workload?	Safety concerns among pharmacists?	Safety concerns by GPs?
Barnet	Mean	3.5200	3.7500	3.3750	4.0800	4.2800	3.4000	4.2800	3.3600	3.0000
	N	25	24	24	25	25	25	25	25	25
	Std. Deviation	1.15902	1.22474	1.24455	1.18743	1.06145	.86603	.84261	1.15036	1.41421
	Median	4.0000	4.0000	4.0000	4.0000	5.0000	4.0000	4.0000	3.0000	3.0000
Edinburgh	Mean	3.6774	3.2667	3.5806	2.9677	3.7419	3.1613	4.4839	3.1935	2.3226
	N	31	30	31	31	31	31	31	31	31
	Std. Deviation	.90874	1.17248	1.25895	1.32876	1.29016	1.41649	.85131	1.37645	1.19407
	Median	4.0000	4.0000	4.0000	3.0000	4.0000	3.0000	5.0000	4.0000	2.0000
Cardiff	Mean	3.5862	3.5517	3.7241	3.8276	3.8966	3.2414	4.4483	3.0690	2.7931

	N	29	29	29	29	29	29	29	29	29
	Std. Deviation	1.08619	1.08845	.88223	.84806	1.20549	1.15434	.82748	1.33446	1.34641
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000
	Mean	3.6000	3.5060	3.5714	3.5882	3.9529	3.2588	4.4118	3.2000	2.6824
Total	N	85	83	84	85	85	85	85	85	85
	Std. Deviation	1.03740	1.16214	1.13313	1.22760	1.20422	1.17669	.83515	1.28915	1.32927
	Median	4.0000	4.0000	4.0000	4.0000	4.0000	3.0000	5.0000	3.0000	3.0000

Appendix 17e - Means Table by Location contd.

		Report								
Location		Safety concerns of patients?	Lack of patients' records?	Lack of documentation of interventions?	Physical design of community pharmacies?	Misperception that counselling is not needed?	Lack of instrumentation?	Language barrier?	Lack of understanding by the public?	Lack of understanding by HC providers?
Barnet	Mean	2.4400	3.5600	3.1667	2.5600	3.2800	2.9600	2.6000	3.6667	3.4545
	N	25	25	24	25	25	25	25	24	22
	Std. Deviation	1.32539	1.22746	1.16718	1.44568	1.48661	1.33791	1.41421	1.04950	1.26217
	Median	2.0000	4.0000	3.0000	3.0000	4.0000	3.0000	3.0000	4.0000	4.0000
Edinburgh	Mean	2.0000	3.8387	3.1935	3.0323	2.6774	3.3226	2.2903	3.6129	3.6129
	N	31	31	31	31	31	31	31	31	31
	Std. Deviation	1.15470	1.12833	1.37645	1.32876	1.51409	1.30095	1.29598	1.25638	1.17409
	Median	2.0000	4.0000	3.0000	3.0000	3.0000	4.0000	2.0000	4.0000	4.0000

Cardiff	Mean	2.3793	4.1724	3.4483	3.0000	3.1724	3.5517	1.9643	3.9286	3.6897
	N	29	29	29	29	29	29	28	28	29
	Std. Deviation	1.32055	.60172	1.05513	1.43925	1.33815	.82748	1.26146	.97861	1.10529
	Median	3.0000	4.0000	4.0000	3.0000	3.0000	4.0000	1.0000	4.0000	4.0000
Total	Mean	2.2588	3.8706	3.2738	2.8824	3.0235	3.2941	2.2738	3.7349	3.5976
	N	85	85	84	85	85	85	84	83	82
	Std. Deviation	1.26447	1.03266	1.20592	1.40078	1.45550	1.18345	1.32947	1.10525	1.16386
	Median	2.0000	4.0000	4.0000	3.0000	3.0000	4.0000	2.0000	4.0000	4.0000

Appendix 17f - Means Table by Location contd.

Report

Location	How essential CPs provide PH services?	The PH role of CPs is still underdeveloped?	Pharmacies employing their own PH advisers?	Devolve all work to PH practitioners?	Pharmacists reaching out to public places?	Community pharmacies developing into HLPs?	Pharmacists developing their own expertise?
Barnet	Mean	1.5200	1.2083	3.0000	2.0400	3.1600	4.0800
	N	25	24	25	25	25	25
	Std. Deviation	.71414	.41485	1.38444	1.17189	1.24766	1.07703
	Median	1.0000	1.0000	3.0000	2.0000	3.0000	4.0000
Edinburgh	Mean	1.8065	1.1667	2.7742	1.8710	3.3548	4.2000
	N	31	30	31	31	31	30

	Std. Deviation	.94585	.37905	1.33441	1.20394	1.33037	1.01483	.55086
	Median	2.0000	1.0000	3.0000	1.0000	4.0000	4.0000	4.0000
	Mean	2.6071	1.1481	2.7308	2.1538	3.1154	3.4400	3.9231
	N	28	27	26	26	26	25	26
Cardiff	Std. Deviation	1.16553	.36201	1.28243	1.08415	1.24344	1.08321	.68836
	Median	3.0000	1.0000	3.0000	2.5000	3.0000	3.0000	4.0000
	Mean	1.9881	1.1728	2.8293	2.0122	3.2195	3.7875	4.0741
	N	84	81	82	82	82	80	81
Total	Std. Deviation	1.05846	.38046	1.32222	1.14928	1.26710	1.01500	.78705
	Median	2.0000	1.0000	3.0000	2.0000	4.0000	4.0000	4.0000

Appendix 18 - Anova Table by Location

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Offering O-T-C advice? * Location	Between Groups	(Combined)	.021	2	.011	.898	.411
	Within Groups		.967	81	.012		
	Total		.988	83			
Participating in local authority run scheme? * Location	Between Groups	(Combined)	4.324	2	2.162	16.626	.000
	Within Groups		10.273	79	.130		
	Total		14.598	81			
Collaborating in shared care scheme? * Location	Between Groups	(Combined)	.696	2	.348	1.625	.204
	Within Groups		16.491	77	.214		

	Total		17.188	79			
	Between Groups	(Combined)	.995	2	.498	3.727	.029
Is programme fully funded by local authority? * Location	Within Groups		8.947	67	.134		
	Total		9.943	69			
	Between Groups	(Combined)	4.611	2	2.306	3.889	.024
Increase PH content of undergraduate curriculum? * Location	Within Groups		48.612	82	.593		
	Total		53.224	84			
	Between Groups	(Combined)	5.743	2	2.872	2.691	.074
Offer dual MPharm (or even PharmD)/MPH degrees? * Location	Within Groups		87.504	82	1.067		
	Total		93.247	84			
	Between Groups	(Combined)	2.911	2	1.456	1.694	.190
Pharmacy students training with other HC students? * Location	Within Groups		68.727	80	.859		
	Total		71.639	82			
	Between Groups	(Combined)	.254	2	.127	.214	.808
Pharmacists working closely with HC practitioners? * Location	Within Groups		48.067	81	.593		
	Total		48.321	83			
	Between Groups	(Combined)	1.220	2	.610	1.057	.352
Teach advanced communication techniques? * Location	Within Groups		46.733	81	.577		
	Total		47.952	83			
	Between Groups	(Combined)	8.506	2	4.253	3.039	.053
Adopt new technologies and the social media? * Location	Within Groups		114.741	82	1.399		
	Total		123.247	84			
	Between Groups	(Combined)	.323	2	.162	.633	.533
Develop good adherence strategies for patients? * Location	Within Groups		20.665	81	.255		
	Total		20.988	83			
	Between Groups	(Combined)	2.072	2	1.036	1.728	.184
Enhancing role in antimicrobial resistance? * Location	Within Groups		49.175	82	.600		
	Total		51.247	84			

	Between Groups	(Combined)	.749	2	.375	1.061	.351
Enhance patients' self-managt capacities? * Location	Within Groups		28.945	82	.353		
	Total		29.694	84			
	Between Groups	(Combined)	3.681	2	1.840	1.951	.149
Enhance safe medication disposal methods? * Location	Within Groups		77.331	82	.943		
	Total		81.012	84			
	Between Groups	(Combined)	3.705	2	1.853	3.355	.040
Enhance the management of polypharmacy? * Location	Within Groups		45.283	82	.552		
	Total		48.988	84			
	Between Groups	(Combined)	4.041	2	2.020	2.917	.060
Managing the medication needs of athletes? * Location	Within Groups		56.102	81	.693		
	Total		60.143	83			
	Between Groups	(Combined)	.864	2	.432	.466	.629
Enhancing involvement in smoking cessation? * Location	Within Groups		76.124	82	.928		
	Total		76.988	84			
	Between Groups	(Combined)	.892	2	.446	.934	.397
Providing students with advanced experience in PH? * Location	Within Groups		38.679	81	.478		
	Total		39.571	83			
	Between Groups	(Combined)	1.687	2	.844	2.041	.136
Providing pharmacists with advanced experience in PH? * Location	Within Groups		33.889	82	.413		
	Total		35.576	84			
	Between Groups	(Combined)	.105	2	.053	.078	.925
Remunerate pharmacists directly for PH services? * Location	Within Groups		55.189	82	.673		
	Total		55.294	84			
	Between Groups	(Combined)	.232	2	.116	.076	.926
Insufficient training of pharmacists in PH? * Location	Within Groups		124.356	82	1.517		
	Total		124.588	84			
	Between Groups	(Combined)	6.144	2	3.072	1.990	.143
Insufficient skill of pharmacists in PH? * Location							

	Within Groups	126.562	82	1.543		
	Total	132.706	84			
	Between Groups (Combined)	2.458	2	1.229	1.156	.320
Lack of professional autonomy for pharmacists? * Location	Within Groups	87.189	82	1.063		
	Total	89.647	84			
	Between Groups (Combined)	11.308	2	5.654	4.070	.021
Difficulties in recruiting patients? * Location	Within Groups	113.915	82	1.389		
	Total	125.224	84			
	Between Groups (Combined)	7.666	2	3.833	2.674	.075
Lack of demand for public health services? * Location	Within Groups	117.558	82	1.434		
	Total	125.224	84			
	Between Groups (Combined)	2.954	2	1.477	1.313	.275
High drop rates for public health services? * Location	Within Groups	92.269	82	1.125		
	Total	95.224	84			
	Between Groups (Combined)	4.390	2	2.195	1.486	.232
Low success rates for public health services? * Location	Within Groups	119.646	81	1.477		
	Total	124.036	83			
	Between Groups (Combined)	.351	2	.176	.160	.852
Lack of input from public health practitioners? * Location	Within Groups	90.049	82	1.098		
	Total	90.400	84			
	Between Groups (Combined)	3.208	2	1.604	1.193	.309
Lack of support from public health practitioners? * Location	Within Groups	107.539	80	1.344		
	Total	110.747	82			
	Between Groups (Combined)	1.605	2	.802	.619	.541
Difficulty in communicating with other PH providers? * Location	Within Groups	104.966	81	1.296		
	Total	106.571	83			
	Between Groups (Combined)	19.643	2	9.821	7.530	.001
Lack of support from GPs? * Location	Within Groups	106.946	82	1.304		

	Total		126.588	84			
	Between Groups	(Combined)	4.147	2	2.073	1.445	.242
Insufficient funding from the government? * Location	Within Groups		117.665	82	1.435		
	Total		121.812	84			
	Between Groups	(Combined)	.802	2	.401	.285	.753
Difficulty in fee collection? * Location	Within Groups		115.504	82	1.409		
	Total		116.306	84			
	Between Groups	(Combined)	.634	2	.317	.448	.640
Time pressure and workload? * Location	Within Groups		57.954	82	.707		
	Total		58.588	84			
	Between Groups	(Combined)	1.139	2	.570	.337	.715
Safety concerns among pharmacists? * Location	Within Groups		138.461	82	1.689		
	Total		139.600	84			
	Between Groups	(Combined)	6.891	2	3.445	1.996	.142
Safety concerns by GPs? * Location	Within Groups		141.533	82	1.726		
	Total		148.424	84			
	Between Groups	(Combined)	3.318	2	1.659	1.039	.359
Safety concerns of patients? * Location	Within Groups		130.988	82	1.597		
	Total		134.306	84			
	Between Groups	(Combined)	5.085	2	2.542	2.468	.091
Lack of patients' records? * Location	Within Groups		84.491	82	1.030		
	Total		89.576	84			
	Between Groups	(Combined)	1.358	2	.679	.461	.632
Lack of documentation of interventions? * Location	Within Groups		119.344	81	1.473		
	Total		120.702	83			
	Between Groups	(Combined)	3.696	2	1.848	.940	.395
Physical design of community pharmacies? * Location	Within Groups		161.128	82	1.965		
	Total		164.824	84			

	Between Groups	(Combined)	6.001	2	3.000	1.431	.245
Misperception that counselling is not needed? * Location	Within Groups		171.952	82	2.097		
	Total		177.953	84			
	Between Groups	(Combined)	4.740	2	2.370	1.721	.185
Lack of instrumentation? * Location	Within Groups		112.907	82	1.377		
	Total		117.647	84			
	Between Groups	(Combined)	5.351	2	2.675	1.533	.222
Language barrier? * Location	Within Groups		141.351	81	1.745		
	Total		146.702	83			
	Between Groups	(Combined)	1.623	2	.812	.659	.520
Lack of understanding by the public? * Location	Within Groups		98.545	80	1.232		
	Total		100.169	82			
	Between Groups	(Combined)	.703	2	.352	.255	.776
Lack of understanding by HC providers? * Location	Within Groups		109.016	79	1.380		
	Total		109.720	81			
	Between Groups	(Combined)	17.231	2	8.615	9.212	.000
How essential CPs provide PH services? * Location	Within Groups		75.757	81	.935		
	Total		92.988	83			
	Between Groups	(Combined)	.048	2	.024	.162	.851
The PH role of CPs is still underdeveloped? * Location	Within Groups		11.532	78	.148		
	Total		11.580	80			
	Between Groups	(Combined)	1.075	2	.538	.302	.740
Pharmacies employing their own PH advisers? * Location	Within Groups		140.535	79	1.779		
	Total		141.610	81			
	Between Groups	(Combined)	1.159	2	.580	.433	.650
Devolve all work to PH practitioners? * Location	Within Groups		105.828	79	1.340		
	Total		106.988	81			
	Between Groups	(Combined)	.938	2	.469	.287	.751
Pharmacists reaching out to public places? * Location							

	Within Groups		129.111	79	1.634		
	Total		130.049	81			
	Between Groups	(Combined)	7.361	2	3.680	3.828	.026
Community pharmacies developing into HLPs? * Location	Within Groups		74.027	77	.961		
	Total		81.388	79			
	Between Groups	(Combined)	1.069	2	.535	.860	.427
Pharmacists developing their own expertise? * Location	Within Groups		48.486	78	.622		
	Total		49.556	80			

Appendix 19 - Measures of Association by Location

Measures of Association

	Eta	Eta Squared
Offering O-T-C advice? * Location	.147	.022
Participating in local authority run scheme? * Location	.544	.296
Collaborating in shared care scheme? * Location	.201	.040
Is programme fully funded by local authority? * Location	.316	.100
Increase PH content of undergraduate curriculum? * Location	.294	.087
Offer dual MPharm (or even PharmD)/MPH degrees? * Location	.248	.062
Pharmacy students training with other HC students? * Location	.202	.041
Pharmacists working closely with HC practitioners? * Location	.073	.005
Teach advanced communication techniques? * Location	.159	.025
Adopt new technologies and the social media? * Location	.263	.069
Develop good adherence strategies for patients? * Location	.124	.015
Enhancing role in antimicrobial resistance? * Location	.201	.040
Enhance patients' self-managt capacities? * Location	.159	.025
Enhance safe medication disposal methods? * Location	.213	.045
Enhance the management of polypharmacy? * Location	.275	.076

Managing the medication needs of athletes? * Location	.259	.067
Enhancing involvement in smoking cessation? * Location	.106	.011
Providing students with advanced experience in PH? * Location	.150	.023
Providing pharmacists with advanced experience in PH? * Location	.218	.047
Remunerate pharmacists directly for PH services? * Location	.044	.002
Insufficient training of pharmacists in PH? * Location	.043	.002
Insufficient skill of pharmacists in PH? * Location	.215	.046
Lack of professional autonomy for pharmacists? * Location	.166	.027
Difficulties in recruiting patients? * Location	.301	.090
Lack of demand for public health services? * Location	.247	.061
High drop rates for public health services? * Location	.176	.031
Low success rates for public health services? * Location	.188	.035
Lack of input from public health practitioners? * Location	.062	.004
Lack of support from public health practitioners? * Location	.170	.029
Difficulty in communicating with other PH providers? * Location	.123	.015
Lack of support from GPs? * Location	.394	.155
Insufficient funding from the government? * Location	.185	.034
Difficulty in fee collection? * Location	.083	.007
Time pressure and workload? * Location	.104	.011
Safety concerns among pharmacists? * Location	.090	.008
Safety concerns by GPs? * Location	.215	.046
Safety concerns of patients? * Location	.157	.025
Lack of patients' records? * Location	.238	.057
Lack of documentation of interventions? * Location	.106	.011
Physical design of community pharmacies? * Location	.150	.022
Misperception that counselling is not needed? * Location	.184	.034
Lack of instrumentation? * Location	.201	.040
Language barrier? * Location	.191	.036

Lack of understanding by the public? * Location	.127	.016
Lack of understanding by HC providers? * Location	.080	.006
How essential CPs provide PH services? * Location	.430	.185
The PH role of CPs is still underdeveloped? * Location	.064	.004
Pharmacies employing their own PH advisers? * Location	.087	.008
Devolve all work to PH practitioners? * Location	.104	.011
Pharmacists reaching out to public places? * Location	.085	.007
Community pharmacies developing into HLPs? * Location	.301	.090
Pharmacists developing their own expertise? * Location	.147	.022

Appendix 20 – Test for Correlation

			Gender of participant	Age of participant	Year of qualification	Respondent's role in pharmacy	Location
Spearman's rho	Gender of participant	Correlation Coefficient	1.000	.061	-.030	.033	.107
		Sig. (2-tailed)		.569	.781	.762	.329
		N	88	88	87	88	85
	Age of participant	Correlation Coefficient	.061	1.000	.891**	-.201	-.055
		Sig. (2-tailed)	.569		.000	.061	.615
		N	88	88	87	88	85
	Year of qualification	Correlation Coefficient	-.030	.891**	1.000	-.218*	-.081
		Sig. (2-tailed)	.781	.000		.043	.466
		N	87	87	87	87	84

Respondent's role in pharmacy	Correlation Coefficient	.033	-.201	-.218*	1.000	-.022
	Sig. (2-tailed)	.762	.061	.043		.839
	N	88	88	87	88	85
Offering O-T-C advice?	Correlation Coefficient	.097	.040	-.057	.153	-.010
	Sig. (2-tailed)	.370	.715	.603	.156	.931
	N	87	87	86	87	84
Participating in local authority run scheme?	Correlation Coefficient	.139	-.104	-.119	.037	.423**
	Sig. (2-tailed)	.206	.343	.281	.737	.000
	N	85	85	84	85	82
Collaborating in shared care scheme?	Correlation Coefficient	-.128	.026	.078	.036	.148
	Sig. (2-tailed)	.249	.813	.485	.745	.189
	N	83	83	82	83	80
Is programme fully funded by local authority?	Correlation Coefficient	-.068	-.240*	-.152	-.060	.302*
	Sig. (2-tailed)	.568	.041	.198	.613	.011
	N	73	73	73	73	70
Increase PH content of undergraduate curriculum?	Correlation Coefficient	.023	-.043	.005	.033	-.142
	Sig. (2-tailed)	.833	.691	.964	.757	.196
	N	88	88	87	88	85
Offer dual MPharm (or even PharmD)/MPH degrees?	Correlation Coefficient	-.247*	-.151	-.118	.143	-.243*
	Sig. (2-tailed)	.020	.161	.277	.184	.025
	N	88	88	87	88	85
Pharmacy students training	Correlation Coefficient	-.109	-.261*	-.140	.235*	-.100

with other HC students?	Sig. (2-tailed)	.319	.015	.200	.029	.369
	N	86	86	85	86	83
Pharmacists working closely with HC practitioners?	Correlation Coefficient	-.107	-.221*	-.198	.202	-.051
	Sig. (2-tailed)	.325	.040	.068	.061	.647
	N	87	87	86	87	84
Teach advanced communication techniques?	Correlation Coefficient	-.004	-.168	-.140	.056	-.154
	Sig. (2-tailed)	.970	.119	.199	.604	.162
	N	87	87	86	87	84
Adopt new technologies and the social media?	Correlation Coefficient	-.159	-.072	-.032	-.004	.020
	Sig. (2-tailed)	.140	.503	.772	.969	.854
	N	88	88	87	88	85
Develop good adherence strategies for patients?	Correlation Coefficient	-.121	-.169	-.066	.199	-.121
	Sig. (2-tailed)	.263	.118	.544	.065	.274
	N	87	87	86	87	84
Enhancing role in antimicrobial resistance?	Correlation Coefficient	-.055	-.075	-.074	.067	-.144
	Sig. (2-tailed)	.611	.485	.496	.537	.188
	N	88	88	87	88	85
Enhance patients' self-managt capacities?	Correlation Coefficient	-.268*	-.061	.004	.003	-.150
	Sig. (2-tailed)	.012	.575	.969	.974	.172
	N	88	88	87	88	85
Enhance safe medication disposal methods?	Correlation Coefficient	-.187	.088	.127	.131	-.295**
	Sig. (2-tailed)	.081	.414	.241	.225	.006

	N	88	88	87	88	85
Enhance the management of polypharmacy?	Correlation Coefficient	-.077	-.114	-.101	.112	-.145
	Sig. (2-tailed)	.473	.291	.354	.299	.184
	N	88	88	87	88	85
Managing the medication needs of athletes?	Correlation Coefficient	-.125	.015	.079	.137	-.235*
	Sig. (2-tailed)	.247	.893	.471	.204	.032
	N	87	87	86	87	84
Enhancing involvement in smoking cessation?	Correlation Coefficient	-.111	.167	.243*	-.098	-.129
	Sig. (2-tailed)	.302	.119	.023	.365	.239
	N	88	88	87	88	85
Providing students with advanced experience in PH?	Correlation Coefficient	-.096	-.054	-.011	.039	-.169
	Sig. (2-tailed)	.374	.617	.919	.720	.124
	N	87	87	86	87	84
Providing pharmacists with advanced experience in PH?	Correlation Coefficient	.009	-.056	-.059	.040	-.249*
	Sig. (2-tailed)	.933	.603	.585	.713	.021
	N	88	88	87	88	85
Remunerate pharmacists directly for PH services?	Correlation Coefficient	-.091	-.209	-.242*	.000	-.078
	Sig. (2-tailed)	.400	.051	.024	.998	.477
	N	88	88	87	88	85
Insufficient training of pharmacists in PH?	Correlation Coefficient	-.131	-.091	-.068	.140	.002
	Sig. (2-tailed)	.224	.399	.530	.192	.984
	N	88	88	87	88	85

Insufficient skill of pharmacists in PH?	Correlation Coefficient	.143	.005	-.015	.230*	.211
	Sig. (2-tailed)	.183	.962	.893	.031	.052
	N	88	88	87	88	85
Lack of professional autonomy for pharmacists?	Correlation Coefficient	.107	.025	.099	-.030	-.121
	Sig. (2-tailed)	.321	.820	.360	.779	.269
	N	88	88	87	88	85
Difficulties in recruiting patients?	Correlation Coefficient	-.091	-.224*	-.107	.169	.132
	Sig. (2-tailed)	.400	.036	.322	.116	.229
	N	88	88	87	88	85
Lack of demand for public health services?	Correlation Coefficient	.137	-.022	-.055	.015	.190
	Sig. (2-tailed)	.204	.838	.615	.892	.081
	N	88	88	87	88	85
High drop rates for public health services?	Correlation Coefficient	.159	-.177	-.204	.017	.163
	Sig. (2-tailed)	.138	.098	.059	.876	.136
	N	88	88	87	88	85
Low success rates for public health services?	Correlation Coefficient	-.034	-.281**	-.278**	.039	.168
	Sig. (2-tailed)	.758	.008	.010	.722	.127
	N	87	87	86	87	84
Lack of input from public health practitioners?	Correlation Coefficient	.031	-.059	-.064	-.060	.023
	Sig. (2-tailed)	.774	.586	.554	.579	.835
	N	88	88	87	88	85
Lack of support from public	Correlation Coefficient	-.112	.016	.091	-.014	-.100

health practitioners?	Sig. (2-tailed)	.306	.884	.407	.901	.370
	N	86	86	85	86	83
Difficulty in communicating with other PH providers?	Correlation Coefficient	-.038	-.109	-.059	-.013	.087
	Sig. (2-tailed)	.730	.315	.591	.907	.429
	N	87	87	86	87	84
Lack of support from GPs?	Correlation Coefficient	-.121	.116	.031	.129	-.123
	Sig. (2-tailed)	.261	.283	.778	.230	.264
	N	88	88	87	88	85
Insufficient funding from the government?	Correlation Coefficient	-.269 [*]	.069	.126	-.082	-.145
	Sig. (2-tailed)	.011	.523	.244	.449	.184
	N	88	88	87	88	85
Difficulty in fee collection?	Correlation Coefficient	-.114	-.145	-.080	.034	-.040
	Sig. (2-tailed)	.290	.179	.459	.753	.714
	N	88	88	87	88	85
Time pressure and workload?	Correlation Coefficient	.201	-.026	-.102	.042	.085
	Sig. (2-tailed)	.060	.807	.347	.697	.442
	N	88	88	87	88	85
Safety concerns among pharmacists?	Correlation Coefficient	-.040	-.158	-.117	.198	-.073
	Sig. (2-tailed)	.710	.141	.279	.064	.509
	N	88	88	87	88	85
Safety concerns by GPs?	Correlation Coefficient	.029	-.083	-.052	.013	-.041
	Sig. (2-tailed)	.787	.441	.630	.908	.712

	N	88	88	87	88	85
Safety concerns of patients?	Correlation Coefficient	.021	-.111	-.101	.070	-.010
	Sig. (2-tailed)	.844	.304	.353	.515	.930
	N	88	88	87	88	85
Lack of patients' records?	Correlation Coefficient	.122	-.165	-.082	.148	.188
	Sig. (2-tailed)	.257	.125	.450	.170	.085
	N	88	88	87	88	85
Lack of documentation of interventions?	Correlation Coefficient	-.092	-.049	-.056	.164	.107
	Sig. (2-tailed)	.399	.649	.611	.128	.334
	N	87	87	86	87	84
Physical design of community pharmacies?	Correlation Coefficient	.014	-.208	-.173	.156	.125
	Sig. (2-tailed)	.897	.052	.110	.148	.256
	N	88	88	87	88	85
Misperception that counselling is not needed?	Correlation Coefficient	.117	.004	-.061	.152	-.038
	Sig. (2-tailed)	.277	.968	.578	.158	.733
	N	88	88	87	88	85
Lack of instrumentation?	Correlation Coefficient	.076	-.133	-.089	.059	.170
	Sig. (2-tailed)	.482	.218	.413	.584	.121
	N	88	88	87	88	85
Language barrier?	Correlation Coefficient	-.019	-.212*	-.188	.126	-.196
	Sig. (2-tailed)	.863	.049	.084	.246	.074
	N	87	87	86	87	84

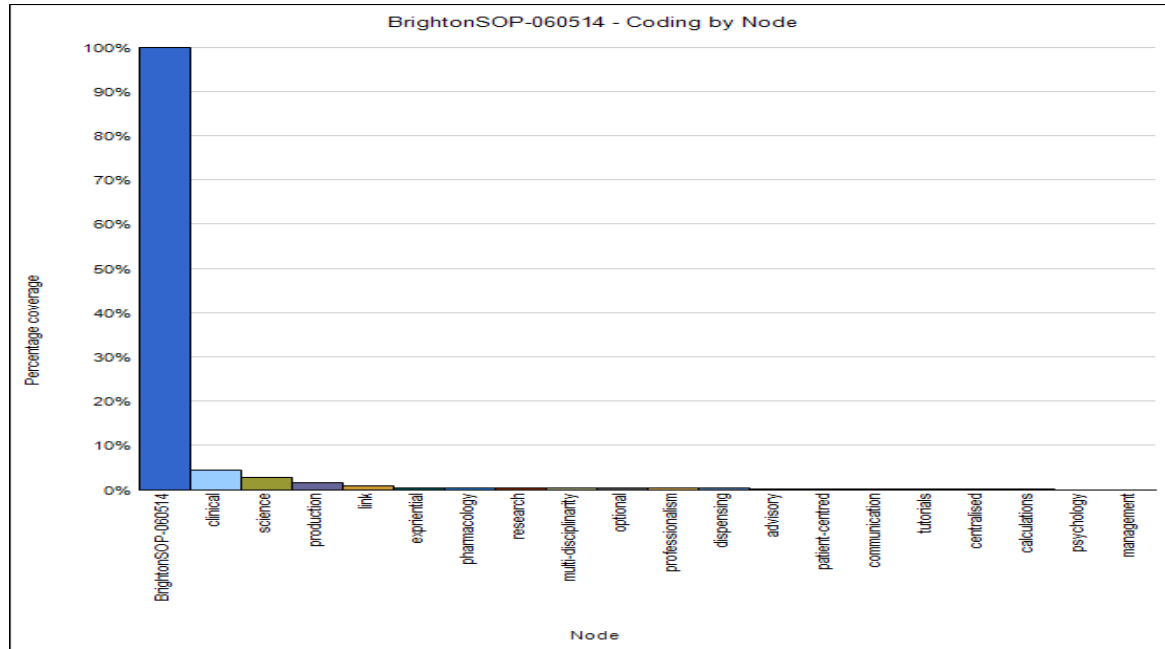
Lack of understanding by the public?	Correlation Coefficient	.059	.137	.155	-.020	.120
	Sig. (2-tailed)	.589	.207	.156	.858	.279
	N	86	86	85	86	83
Lack of understanding by HC providers?	Correlation Coefficient	.005	-.014	-.047	.095	.072
	Sig. (2-tailed)	.966	.900	.673	.386	.521
	N	85	85	84	85	82
How essential CPs provide PH services?	Correlation Coefficient	.216*	.075	.037	.062	.391**
	Sig. (2-tailed)	.045	.487	.732	.568	.000
	N	87	87	86	87	84
The PH role of CPs is still underdeveloped?	Correlation Coefficient	.150	-.033	-.088	-.177	-.062
	Sig. (2-tailed)	.174	.765	.428	.107	.581
	N	84	84	83	84	81
Pharmacies employing their own PH advisers?	Correlation Coefficient	-.069	-.073	-.078	-.073	-.074
	Sig. (2-tailed)	.532	.508	.478	.505	.508
	N	85	85	84	85	82
Devolve all work to PH practitioners?	Correlation Coefficient	-.171	-.038	-.038	-.078	.058
	Sig. (2-tailed)	.118	.729	.734	.475	.605
	N	85	85	84	85	82
Pharmacists reaching out to public places?	Correlation Coefficient	.123	.031	-.013	-.021	-.023
	Sig. (2-tailed)	.264	.781	.905	.850	.837
	N	85	85	84	85	82
Community pharmacies	Correlation Coefficient	-.126	-.065	-.069	.121	-.309**

developing into HLPs?	Sig. (2-tailed)	.257	.557	.540	.275	.005
	N	83	83	82	83	80
Pharmacists developing their own expertise?	Correlation Coefficient	-.055	-.210	-.134	.097	-.176
	Sig. (2-tailed)	.617	.055	.227	.378	.117
	N	84	84	83	84	81
Location	Correlation Coefficient	.107	-.055	-.081	-.022	1.000
	Sig. (2-tailed)	.329	.615	.466	.839	
	N	85	85	84	85	85

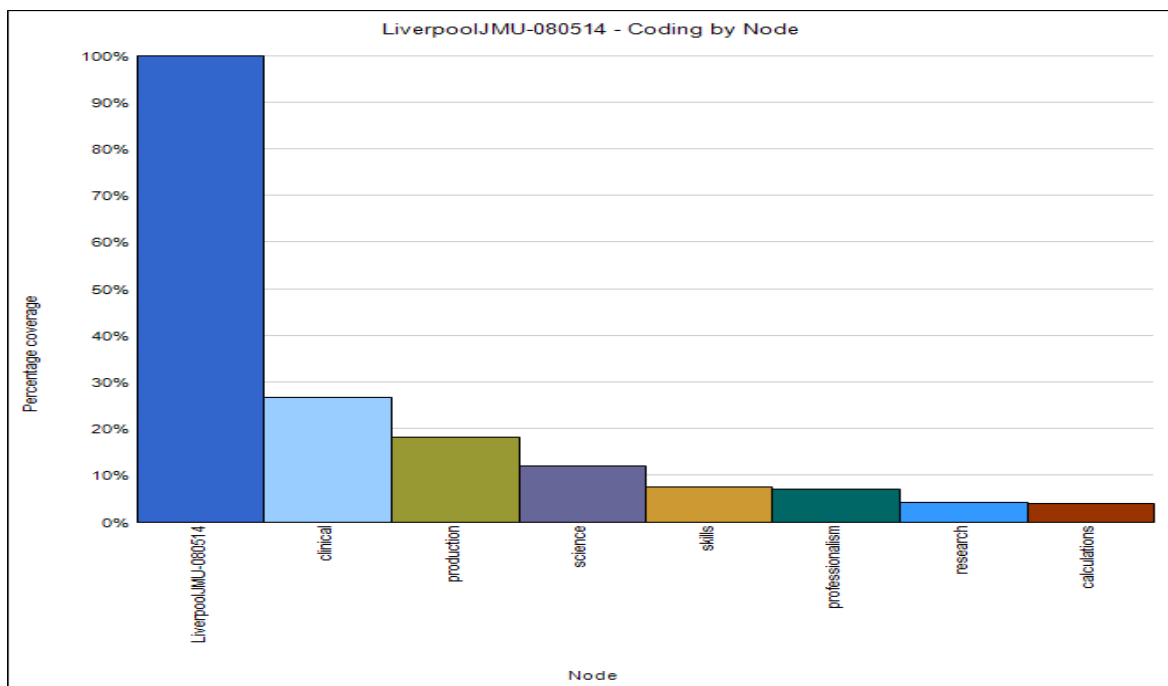
*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

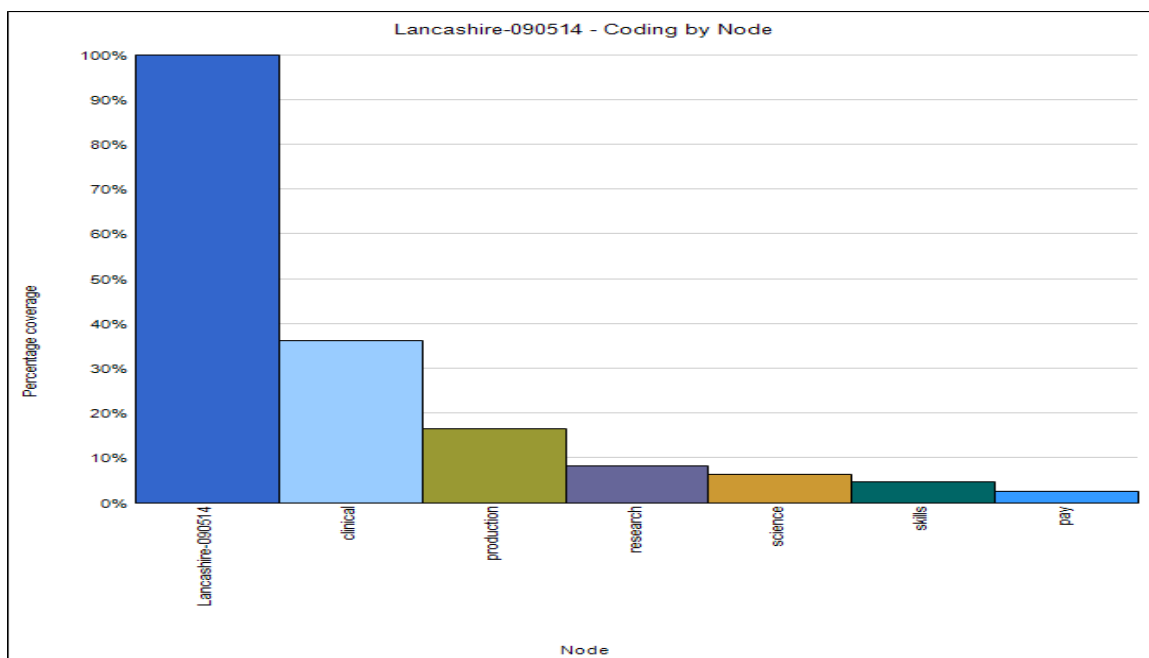
Appendix 21: Visualisation of the Curriculum of School of Pharmacy, University of Brighton



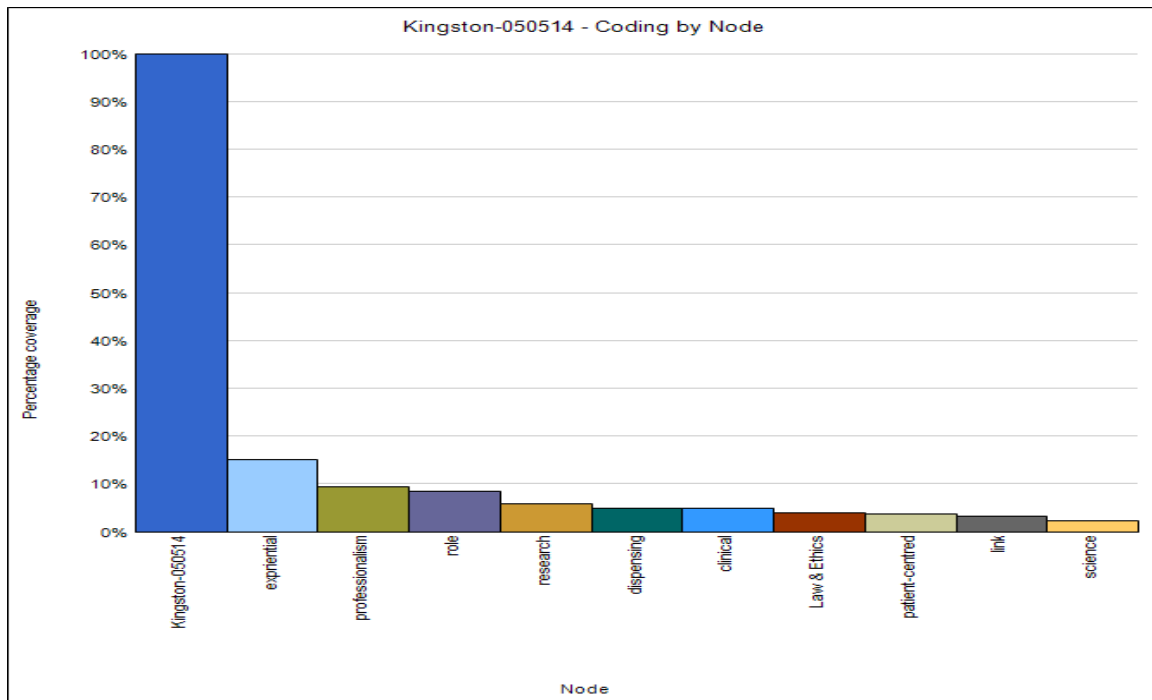
Appendix 22: Visualisation of the Curriculum of School of Pharmacy, Liverpool John Moores University



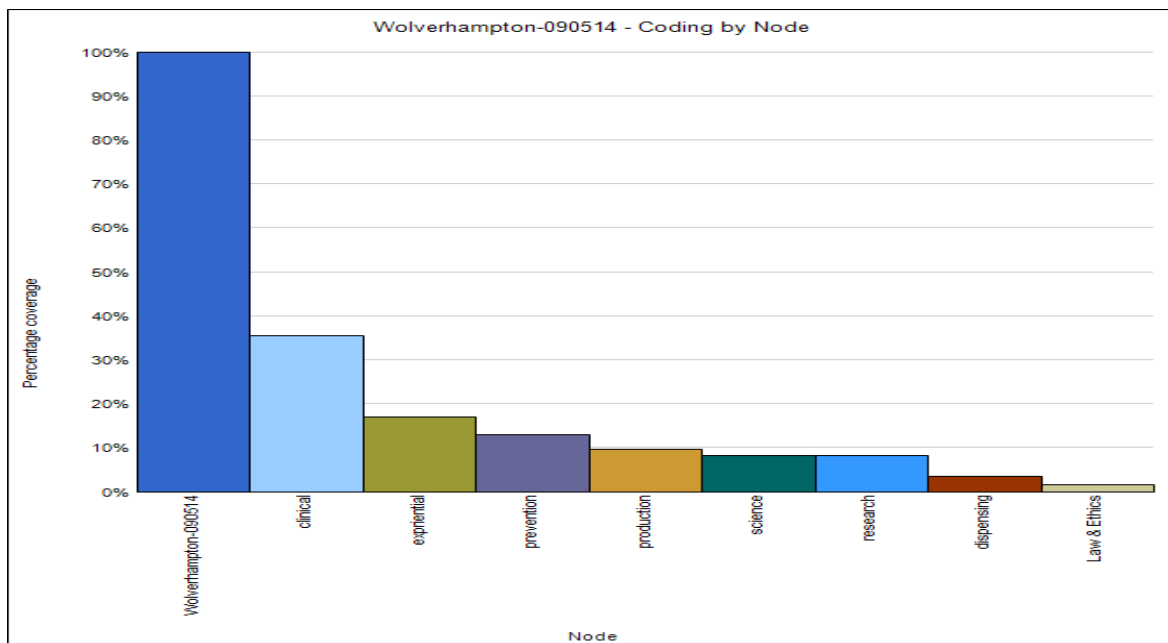
Appendix 23: Visualisation of the Curriculum of School of Pharmacy, University of Central Lancashire



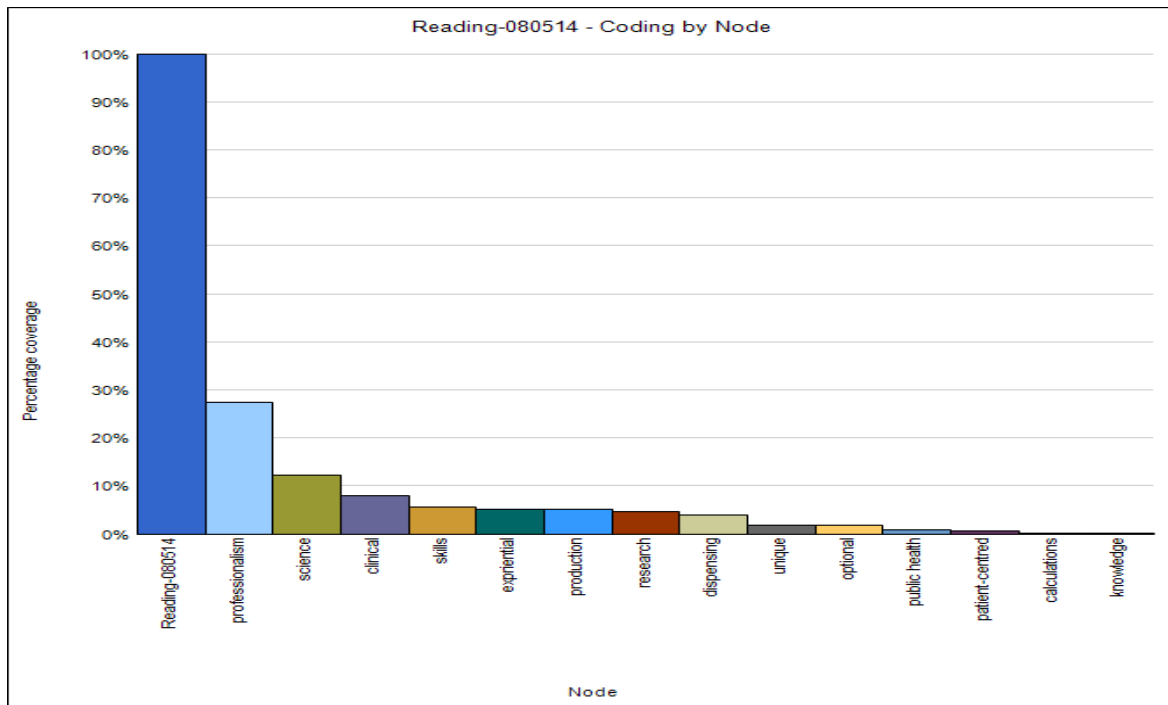
Appendix 24: Visualisation of the Curriculum of School of Pharmacy, Kingston University



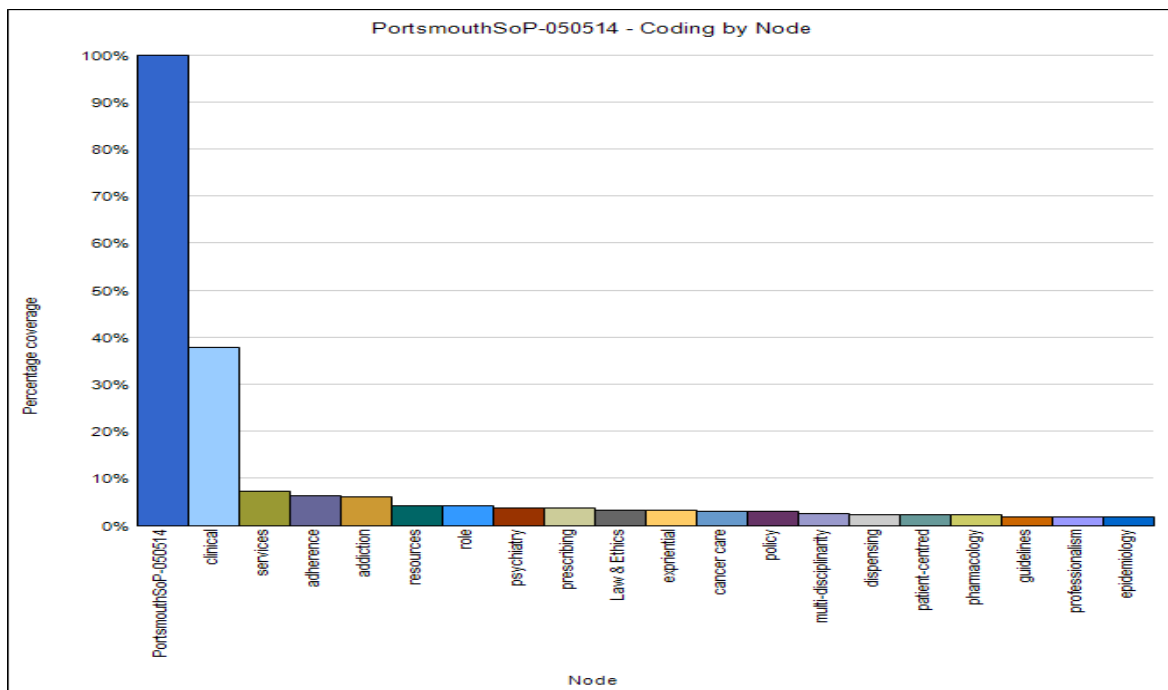
Appendix 25: Visualisation of the Curriculum of School of Pharmacy, University of Wolverhampton



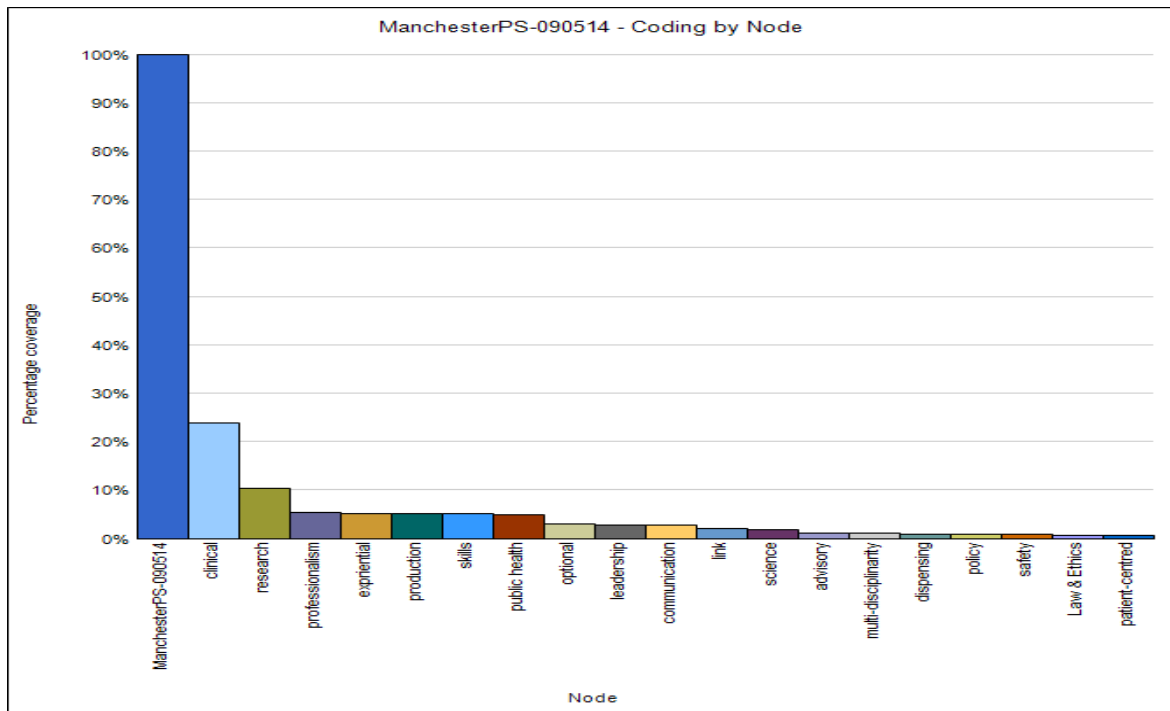
Appendix 26: Visualisation of the Curriculum of School of Pharmacy, University of Reading



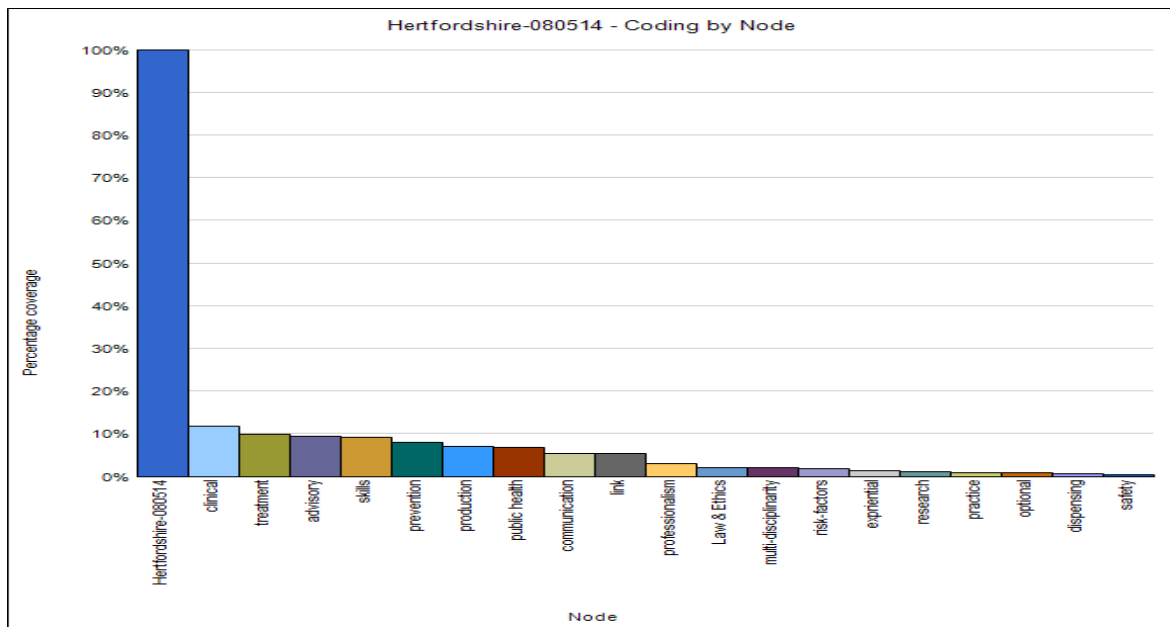
Appendix 27: Visualisation of the Curriculum of School of Pharmacy, University of Portsmouth



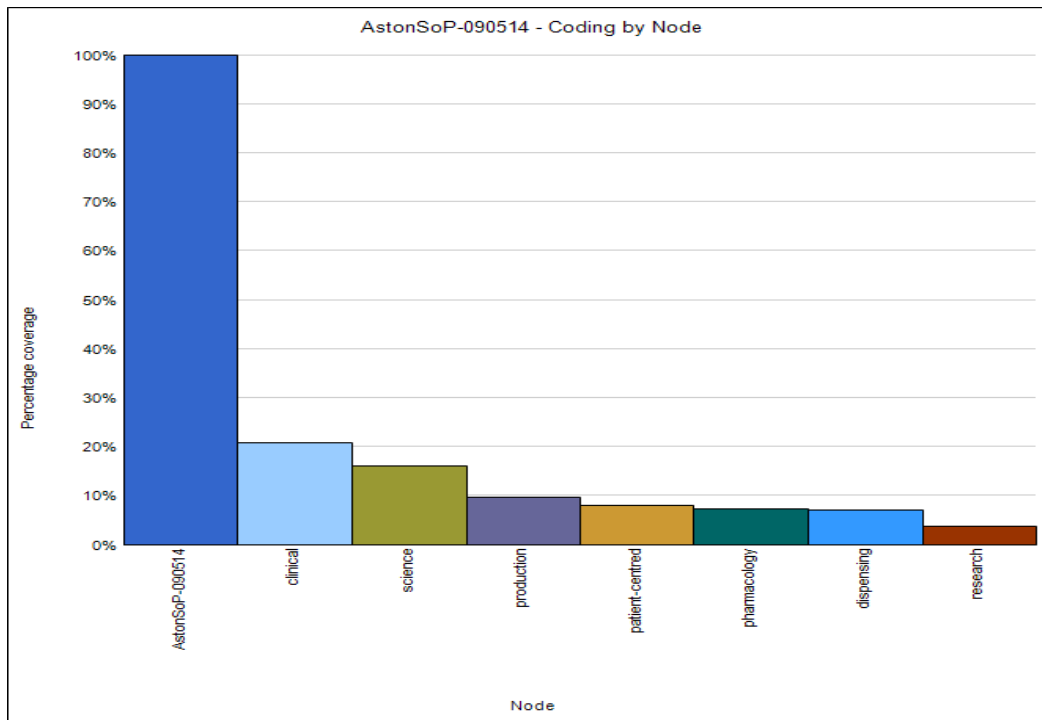
Appendix 28: Visualisation of the Curriculum of School of Pharmacy, University of Manchester



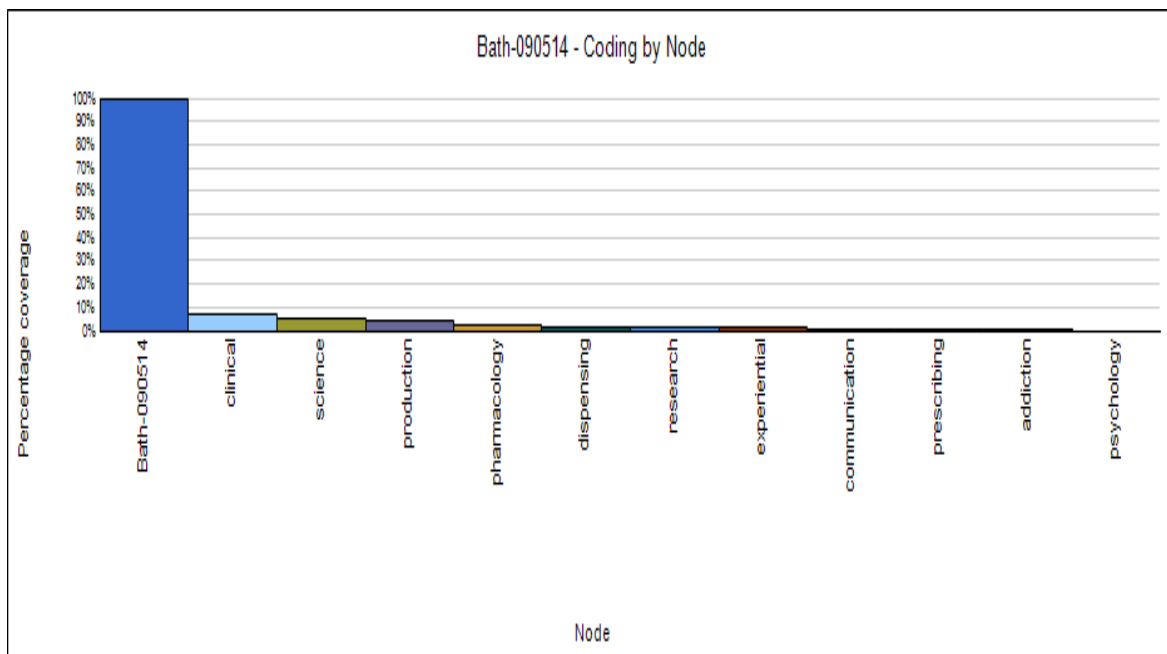
Appendix 29: Visualisation of the Curriculum of School of Pharmacy, University of Hertfordshire



Appendix 30: Visualisation of the Curriculum of School of Pharmacy, Aston University



Appendix 31: Visualisation of the Curriculum of School of Pharmacy, University of Bath



Appendix 32: Visualisation of the Curriculum of School of Pharmacy, University of Sunderland

