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THAI STAKEHOLDERS' PERCEPTIONS OF THE INTRODUCTION OF THE DOCTOR OF PHARMACY PROGRAMME

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DEDICATION

This thesis is dedicated to:

My dad and mum (อาป๊าสมศักดิ์ และแม่วิมล)

It is impossible to thank you adequately for everything you have done for me

My husband and my sons for their love and encouragement

My sister and brother-in-law for the continued support

My supervisors for their kindness and endless support

My wonderful friends for always being there for me

I would like to thank you to all of you, because without you this thesis would not exist. Thank you very much.

ABSTRACT

Global pharmacy education and pharmacy practice continue to face remarkable changes. Many countries are undergoing major transformations in the field of pharmacy education. In developing countries, there is an increasing trend towards adopting the PharmD degree. Thai pharmacy education has transitioned from having two entry-level degrees – a 5-year BPharm (with three main tracks: pharmaceutical care, pharmaceutical sciences, social and administrative pharmacy) and a traditional 6-year PharmD (pharmaceutical care) programme – to a single national 6-year PharmD programme or 'an all-PharmD programme' (including industry pharmacy and pharmaceutical care tracks).

Similar to other countries that have also been transitioning to 'an all-PharmD programme', there was limited evidence for the merit of the transition in Thailand. Although opinions and questions put forth on social media networks triggered debates about the need for the transition, there is a lack of an evidence-based and in-depth investigation about the reasons for this transition.

This thesis explores the experiences and perceptions held by stakeholders concerning the transition towards an all-PharmD programme in Thailand. The study used a mixed methods approach through a quantitative analysis of surveys (Phase 1 and Phase 2) and interviews with stakeholders who were involved in pharmacy education (Phase 3). Findings from the three phases and other resources were triangulated and validated (by comparing and confirming them) to provide a better picture of the transition of pharmacy education in Thailand.

Phase 1: A survey of the status of Thai pharmacy education.

This study aimed to explore the status of pharmacy education in Thailand by using a questionnaire survey. The surveys were distributed to the deans of all 19 faculties of pharmacy in Thailand. The response rate was 84% (n = 16). Characteristics of the Faculties of Pharmacy, the teaching staff, types of PharmD programme, the number of training sites and quality assurance mechanisms were reported.

The results showed that the Thai PharmD curriculum includes industrial pharmacy and clinical pharmacy tracks that differentiate it from the traditional US PharmD programme, which only focuses on patient care. There was a shortage of academic staff in the pharmaceutical care area and some faculties needed to better prepare for their training sites.

Phase 2: A survey of the pharmacists' perceptions towards the suitability of the PharmD graduates employed in hospital and community pharmacy settings and the competencies difference between the BPharm and the PharmD graduates.

This study aimed to explore Thai pharmacists' perceptions regarding the suitability of the PharmD graduates employed in hospital and community pharmacy settings, as well as the competency differences between the BPharm and PharmD graduates. A cross-sectional survey questionnaire was distributed to 180 hospital pharmacists and 200 community pharmacists during two conferences. The response rate was 55.6% among hospital pharmacists and 20% in the community pharmacists group. The findings highlighted that the PharmD graduates were suited for large hospital settings as they were well coordinated with the health care team. However, there were concerns regarding the suitability of the PharmD graduates for primary care settings, because of their lack of training in health promotion. Half of the respondents perceived PharmD graduates as having higher competencies in clinical activities and being more prepared to work than BPharm graduates. However, the other half of the respondents perceived the competencies of both pharmacy qualifications as being similar; PharmD graduates provide non-clinical activities similar to BPharm graduates, due to numerous barriers (e.g., high workload in dispensing services and the shortage of pharmacists) preventing PharmD pharmacists from providing direct pharmaceutical care services.

Phase 3: Thai stakeholder's perceptions of the introduction of the PharmD programme: a qualitative study.

This qualitative study aimed to understand the experiences and perceptions of stakeholders, regarding the transition to an all-PharmD programme in Thailand. Semi-structured interviews were conducted with 130 stakeholders (e.g., policy makers, educators, health care providers, patients, students, and parents). The data were audio recorded, transcribed verbatim and analysed using an inductive thematic analysis.

Three main themes were derived from the findings: 1) influences on the transition (e.g., the US-Thai consortium for the development of pharmacy education); 2) perceived benefits (e.g., improved pharmacy competencies from generalist to specialists); and 3) concerns (e.g., the higher cost of a longer period of study, and insufficient preceptors and training sites).

This PhD study carries important implications for both universities and policy makers. Faculties of pharmacy should consider a long-term plan to develop sufficient qualified academic staff and preceptors. Policy makers should prepare a strategic plan for the future workforce supply and requirements, increase the flexibility of the PharmD curriculum during its transition stage, and prepare a supportive and enabling system for PharmD graduates to provide advanced practice at their full potential. Close coordination between faculties, the Pharmacy Council of Thailand and pharmacy professional organisations is needed to ensure that pharmacy education provides the necessary competencies for graduates to offer a high level of needed pharmacy services. Further research focussing on the outcome, impact and efficiency of the PharmD programme is also needed.

To conclude, in this thesis, the issues surrounding the transition to an all-PharmD programme in Thailand were carefully investigated. This study reflects the influences and the requirements of the transition that it was initiated, in order to meet the need for higher levels of competency for the nation's pharmacists and is influenced by many factors. The stakeholders perceived benefits from the transition. They thought that the PharmD graduates will have higher competencies and be ready to work as pharmacists compared to graduates from the previous pharmacy curriculum. The findings also addressed the following issues concerning curriculum change: the higher costs of a longer period of study, the mismatch between the pharmacy graduates' competency and the job market's needs and the shortage of qualified preceptors.

PUBLICATIONS

Papers

1. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Claire Anderson. 2014. A survey of pharmacy education in Thailand. *Am J Pharm Educ,* 78(9): Article 161. **(Chapter 4.)**
2. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Claire Anderson. 2015. Hospital pharmacists' perceptions of the suitability of doctor of pharmacy graduates in hospital settings in Thailand. *BMC Med Educ,* 15(181): DOI 10.1186/s12909-015-0471-6. **(Chapter 5.)**
3. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Claire Anderson. 2015. Does a transition in education equate to a transition in practice? Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy programme. *BMC Med Educ,* 15(205): DOI 10.1186/s12909-015-0473-4. **(Chapter 6.)**

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Published abstracts

1. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Aporn Jaturapatarawong, Wiwan Worakunphanich, Mayuree Tangkiatkumjai, Claire Anderson. 2015. Survey of hospital pharmacists' perceptions of the PharmD programme to prepare the PharmD graduates to work in hospital settings. *Pharmacy Education*, 15(1): 211.
2. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Aporn Jaturapatarawong, Wiwan Worakunphanich, Mayuree Tangkiatkumjai, Claire Anderson. 2015. Survey of community pharmacists' perceptions of the PharmD programme to prepare the PharmD graduates to work in community pharmacy settings. *Pharmacy Education*, 15(1): 211.
3. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Aporn Jaturapatarawong, Wiwan Worakunphanich, Mayuree Tangkiatkumjai, Claire Anderson. 2015. Health care providers' perceptions of pharmaceutical care provided by PharmD graduates in hospital settings in Thailand. *Pharmacy Education*, 15(1): 212.
4. Teeraporn Chanakit, Bee Yean Low, Payom Wongpoowarak, Summana Moolasarn, Claire Anderson. 2015. Community pharmacy customers and health care providers' expectations of PharmD graduates' services in community settings in Thailand: a qualitative study. 2016. *Int J Pharm Prac,* 24(Supplement 1): 30.

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LIST OF ABBREVIATIONS

AACP	American Association of Colleges of Pharmacy
ACCP	American College of Clinical Pharmacy
ACE	American Council on Education
ACPE	Accreditation Council for Pharmacy Education, USA
APC	Australian Pharmacy Council
BPharm	Bachelor of Pharmacy
BS pharmacy	Bachelor of Science in Pharmacy
CP	Community pharmacists
CSMBS	The Civil Servant Medical Benefit Scheme, Thailand
Dr	Doctor
DDS	Doctor of Dental Surgery
DVM	Doctor of Veterinary Medicine
FDA	Food and Drug Administration
FIP	International Pharmaceutical Federation
FIP*Ed*	International Pharmaceutical Federation Education Development Team
GPhC	General Pharmaceutical Council, Great Britain
HIV/AIDS	Human immunodeficiency virus infection/acquired immunodeficiency syndrome
HP	Hospital pharmacists
IP-PD	Industrial Pharmacy-PharmD programme
MD	Doctor of Medicine
MDGs	Millennium Development Goals
MoPH	Ministry of Public Health, Thailand
MPharm	Master of Pharmacy
NHS	National Health Service, Thailand
NHSO	National Health Security Office, Thailand
PC-PD	Pharmaceutical Care-PharmD programme
OR	Odds Ratio
PBA	Pharmacy Board of Australia
PharmD	Doctor of Pharmacy
PhD	Doctor of Philosophy
PECT	The Pharmacy Education Consortium of Thailand
PCT	The Pharmacy Council of Thailand
PSc-BPharm	Pharmaceutical sciences track- BPharm programme
SAP	Social and Administrative Pharmacy
SSS	Social Security Scheme, Thailand
TQF	Thailand Qualifications Framework for Higher Education
UCS	Universal Coverage Scheme, Thailand
UNESCO	The United Nations Educational, Scientific and Cultural Organisation
UN	The United Nations
US/USA	The United States of America
WHO	The World Health Organization

GLOSSARY OF TERMS

Accreditation signifies that all processes about a pharmacy course have been reviewed for quality assurance purposes to ensure that the education or training meets the accreditation criteria. The accreditation process involves submission of a self-assessment document with documentary evidence, followed by an accreditation event attended by an accreditation team which concludes in a formal accreditation decision and may involve a site visit, meetings with academic staff and students, and viewing of teaching facilities (General Pharmaceutical Council, 2016b; The Pharmacy Education Committee of Thailand, 2013).

Clerkship/ internship refers to a programme or work integrated learning conducted by preceptors at practice settings (Australian Pharmacy Council, 2014)**.**

Direct patient care services describe the roles that involve a pharmacist's observation of the patient and contributions to the selection, modification, and monitoring of patient-specific drug therapy (Bright et al., 2010).

Dispensing services refers to the pharmacist's role in preparing, distributing, and dispensing medication products, including associated consultation, interacting with patients about selection and use of over-the-counter products and interactions with other healthcare providers during the dispensing process (Kreling et al., 2010).

Entry-level or first professional degree programme refers to the programmes that do not require entering students to have a prior degree in pharmacy (Association of Faculties of Pharmacy of Canada, 2010).

Experiential education refers to rotations or practical experiences in practice settings to add to the didactic course of pharmacy education (Yoo et al., 2014).

Millennium Development Goals (MDGs) refers to eight major public health and humanitarian goals declared by the United Nations, namely: i) eradicate extreme poverty and hunger; ii) achieve universal primary education; iii) promote gender equality; iv) reduce child mortality; v) improve maternal health; vi) combating HIV/AIDS, malaria, and other diseases; vii) ensure environmental sustainability; and viii) global partnership for development (Office of the National Economic and Social Development Board, 2010).

Pharmacy education refers to the design and capacity of education to develop the pharmacy workforce for a diversity of settings, varying levels of service provision and competence (e.g., pharmacist practitioners, pharmaceutical scientists) and scope of education (e.g., undergraduate, post-registration, continuing professional development) (Anderson et al., 2008). However, this thesis focuses on the undergraduate pharmacy education that aims to produce pharmacy graduates.

Pharmacy practice refers to a discipline within pharmacy that involves developing the professional roles of the pharmacist (Fatherlrahman et al., 2016).

Quality assurance is the systematic review, evaluation and monitoring of an educational programme (or programmes) to ensure that acceptable standards of education, research and scholarly activity, governance, management, operations, student services, resources and infrastructure are being maintained (Rouse and Meštrovic, 2014).

Regulation refers to rules or directives made and maintained by a recognised authority (Lovett et al., 2014)

Schools/Faculties of Pharmacy refer to the academic unit in a university with primary responsibility for delivering an accredited course. A “school” may be a school, faculty, department, division or others (General Pharmaceutical Council, 2011).

CHAPTER 1

THESIS INTRODUCTION

1.1 Introduction

Pharmacy education and pharmacy practice are facing remarkable changes following new scientific discoveries, evolving patients' needs and changing disease patterns. There is, in turn, increased demand and requirements for advanced pharmacy practice models and workforce competencies that cater for current and future practice needs. Therefore, many countries are introducing or undertaking major transformations in pharmacy education in order to prepare programmes that produce competent pharmacy graduates (Anderson et al., 2012a; Rouse and Meštrovic, 2014).

The World Health Organization (WHO), the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Pharmaceutical Federation Education Development Team (FIP*Ed*) are dedicated to improve global health. They are addressing workforce development to improve and change the education and training of pharmacists. They will lead and make an effort to come to a consensus among all leaders and regulators on how to best develop a competent pharmaceutical workforce through education. They all aim to improve global pharmacy education and have developed a "needs-based education model" (Anderson et al., 2012b; Rouse and Meštrovic, 2014). The model recommends that pharmacy education programmes should be designed to ensure that pharmacy graduates achieve required competencies, in order to deliver pharmacy services that meet the needs of national populations. Many developing countries have been transforming their pharmacy degree programmes to the level of Doctor of Pharmacy (PharmD) (Anderson and Futter, 2009; Babar et al., 2013; Jamshed et al., 2007). However, literature exploring the adoption of such programmes is limited.

The need for research

Thai pharmacy education has been changed from two pharmacy programmes (a 5-year BPharm and a 6-year PharmD pharmaceutical care programme) to a single 6-year PharmD programme, referred to in this study as **'an all-PharmD programme in Thailand'**.

The Pharmacy Council of Thailand (PCT) announced that the 6-year PharmD programme would be compulsory for pharmacy licensure, starting from 2014. The Council believed that such a programme would resolve the issue of curriculum overload for the high-credits in a 5-year BPharm programme, as well as providing the same standard of pharmacy professionalism (Matichon, 2007; The Royal Thai Government Gazette, 2008).

Similar to other countries that were also adopting 'an all-PharmD programme' approach, there was limited evidence for the merit of the transition to such a programme in Thailand. Although debates and questions have been put forward on social networks about the need for the transition to an all-PharmD programme in Thailand (ASTV Manager Online, 2009; PharmaCafe.com, 2008), there is a lack of in-depth investigation about the reasons for and the evidence base underpinning this transition (Pongcharoensuk and Prakongpan, 2012).

Pongcharoensuk and Prakongpan (2012) stated:

> *"The transition in the Thai pharmacy education in recent years has been done in a haphazard manner, without taking into consideration the many important contextual factors of the health care system as well as the constraints of all pharmacy schools in Thailand…Therefore, a lot of problems are expected and practical solutions are needed in the near future" (p.15).*

The transition of the pharmacy curriculum involves and affects many stakeholders, including both internal and external educational institutions at different levels (Anderson et al., 2011; Hoat et al., 2009; Kirschenbaum et al., 2006; MacCarrick, 2009; Rouse and Meštrovic, 2014). To date, there has been very little evidence of the experiences of stakeholders in this transition. Therefore, the purpose of this study was to explore the experiences and perceptions of Thai stakeholders regarding the introduction of an all-PharmD programme.

1.2 Structure of the thesis

This thesis is divided into seven chapters and Figure 1.1 below illustrates its structure. This chapter (**Chapter 1**) briefly describes the background to, and the need for, this study and the structure of this thesis.

Chapter 2 provides a review of the literature of the three main subject areas that inform the research, namely: i) global pharmacy education, ii) the transition to the entry-qualification from the BPharm to the PharmD degree and iii) pharmacy practice and education in Thailand.

Chapter 3 outlines the methodology and methods adopted for this study.

Chapter 4 presents the findings from "**Phase 1: A survey of the status of Thai pharmacy education"**.

Chapter 5 presents the findings from **"Phase 2: A survey of the pharmacists' perceptions towards the suitability of the PharmD graduates employed in hospital and community pharmacy settings"**.

Chapter 6 presents the findings from the interviews in **"Phase 3: Thai stakeholders' perceptions of the introduction of the Doctor of Pharmacy programme"**.

Chapter 7 discusses and integrates the key findings from the three phases of this study, and demonstrates how the findings relate to the wider literature. Finally, the implications of the findings for pharmacy faculties in Thailand, the national pharmacy policy, the strengths and the limitations of the study, as well as suggestions for future research, are all discussed. The researcher's reflections on the research are also presented.

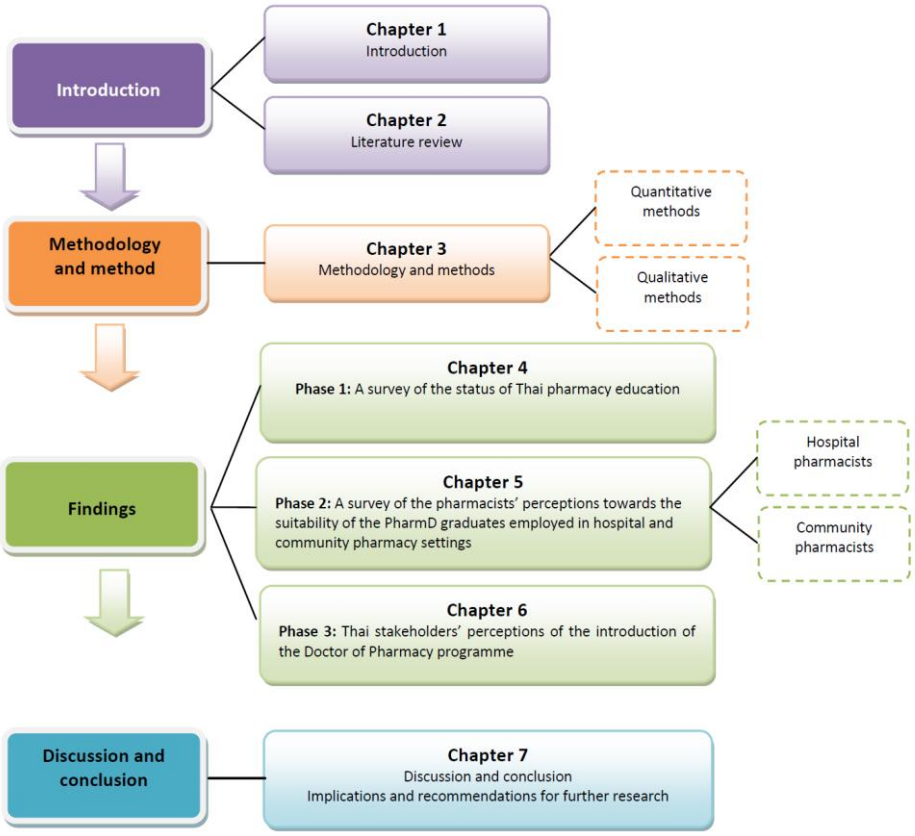

Figure 1.1 Structure of the thesis

CHAPTER 2

Literature review

2.1 Introduction

The purpose of this chapter is to review the literature relevant to the transition from the BPharm to the PharmD degree in Thailand. The literature search strategy to build the study background can be found in Appendix 1. In order to understand the context of pharmacy education, this chapter presents an overview of global pharmacy education, including the need-based education model, stakeholders' involvement in the quality of pharmacy education, the education systems in place to become a pharmacist in various countries and the transition from the BPharm to the PharmD programme in some countries. Details of the pharmacy practice, pharmacy education and transition to the 6-year PharmD programme in Thailand are presented. Gaps in the literature are identified. The literature map is presented in Figure 2.1.

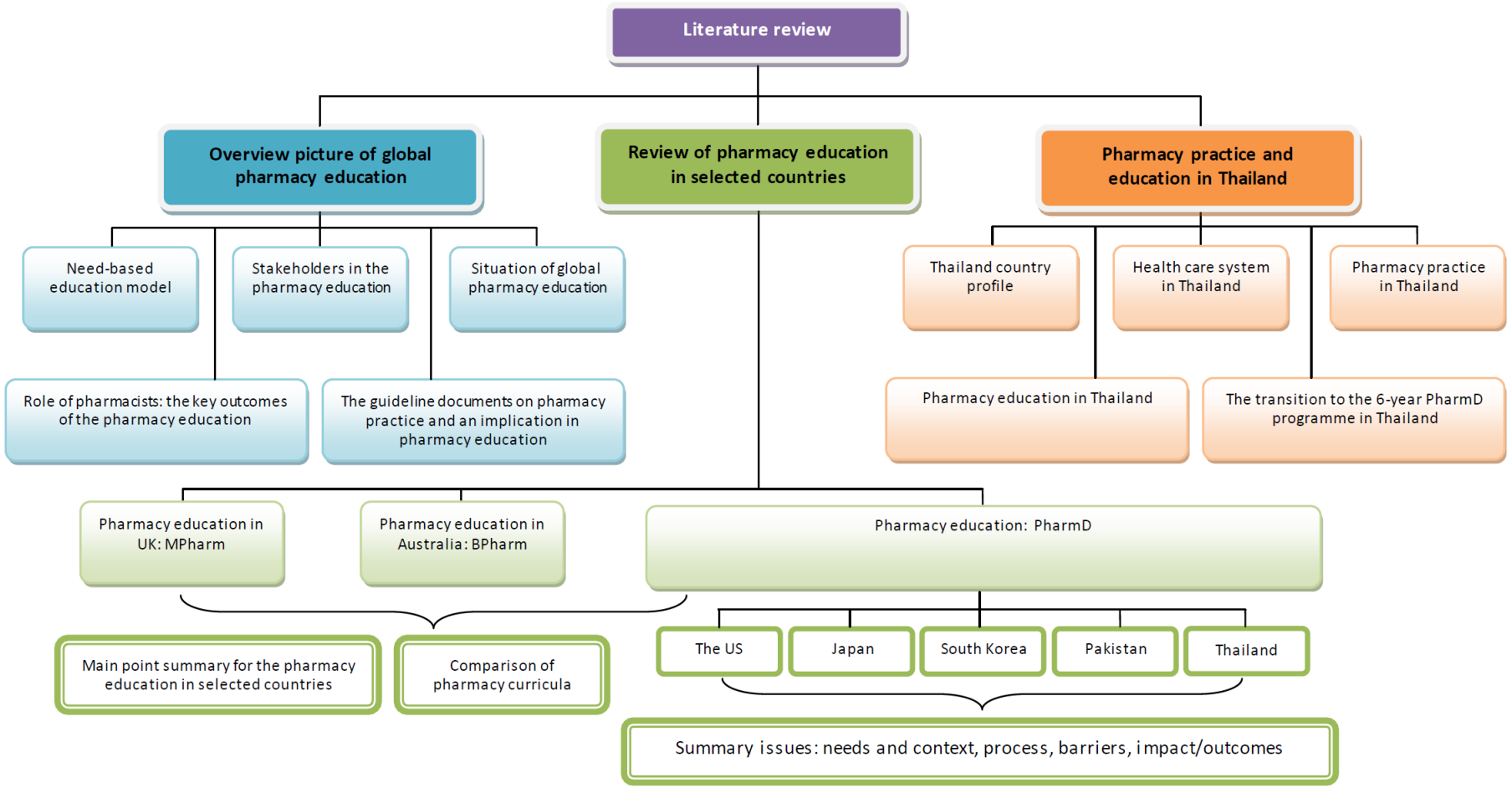

Figure 2.1 Literature review map of the transition from the BPharm to the PharmD programme

2.2 Overview of global pharmacy education

Global pharmacy education and pharmacy practice continue to face remarkable changes with new discoveries, technological advancement, evolving stakeholder needs, along with the requirement for pharmacists' advanced competencies for current and future practices within a wide range of opportunities embracing hospitals or community pharmacies, government agencies and/or the pharmaceutical industries. Therefore, many countries are introducing or undertaking major transformations in pharmacy education (Anderson et al., 2012b; Rouse and Meštrovic, 2014).

The curriculum is an important factor to shape career directions of future pharmacists (Anderson et al., 2012b; DiPiro, 2011; Rouse and Meštrovic, 2014). The requests for curriculum reform vary within different settings worldwide(Arakawa et al., 2013). For example, pharmacy educators in developed countries are preparing their students for pharmacy specialised area, such as personalised medicine; while developing countries are seeking to offer patient-oriented curricula and public health pharmacy (Anderson et al., 2012b; Hassali, 2011).

According to the trend of the roles and responsibilities of pharmacists that have moved from product-oriented to patient-oriented services, pharmacy education and training need further expansion and refinements; especially an introduction to inter-professional collaboration early in pharmacy education (Arakawa et al., 2013; Brazeau et al., 2009; FIP, 2015c; FIP, 2015b; WHO, 2010). However, there are many challenges to pharmacy education worldwide. For example, the limitation of the capacity and infrastructure in pharmacy education and training to produce pharmacy graduates (Anderson et al., 2008; Fielding et al., 2008; Lim et al., 2012), especially in the lower income countries that have relatively lower educational capacity and pharmacy graduate production (Anderson, 2013; Anderson et al., 2012a; Bates et al., 2013; FIP, 2012).

There is a requirement to ensure the quality of pharmacist capacity production through adequate and appropriate education and training to serve the needs of the individual patients and nations (Anderson et al., 2014a; Bates et al., 2013; Health Education England, 2016; Rouse and Meštrovic, 2014).

2.2.1 Need-based education model

The WHO, UNESCO and the FIP*Ed* all aim to improve global pharmacy education and have therefore developed a "needs-based education model" (Anderson et al., 2012b; Rouse and Meštrovic, 2014). The model stipulates that pharmacy education programmes must be designed to ensure that required competencies are achieved by all pharmacy graduates to deliver pharmacy services that meet the needs of national populations through thoughtful communication among all stakeholders (Anderson et al., 2012b; Anderson and Futter, 2009). Figure 2.2 showed the FIP Education Initiative's Needs-Based Education Model (Rouse and Meštrovic, 2014).

Figure 2.2 FIP Education Initiative's Needs-Based Education Model
Adapted with permission from FIP (Rouse and Meštrovic 2014, p.9)

Curriculum development is expected to meet a country's need, aligned with national priorities and global views (Babar et al., 2013). However, in most cases, one country's model of education cannot be adopted by another country without appropriate adaptation to suit local needs and contexts. Therefore, the curriculum content and structure will need to be modified to achieve the expected education outcomes and required competencies to meet the needs of a particular country (Rouse and Meštrovic, 2014).

2.2.2 Stakeholders' involvement in the quality of pharmacy education

Stakeholders are those who are affected by or can affect the achievement of an organisation's objectives (Freeman and McVea, 2001). Stakeholders' views in higher education are crucial and should be taken into consideration by the educators on an improving quality in higher education (Tang and Hussin, 2011).

Stakeholders are an important sector of the "needs-based model" because local stakeholders are the population who decides national needs (Hoat et al., 2009; Rouse and Meštrovic, 2014). For example, in Thailand regulatory bodies such as the government and the Pharmacy Council, are responsible for pharmacy practice. Such organisations have the duty to protect the wellbeing of the public by ensuring that the pharmacy workforce receives appropriate education and training to deliver a standard quality of services (Rouse and Meštrovic, 2014).

The stakeholders of pharmacy education can be categorised into two types: internal stakeholders and external stakeholders (FIP Academic Institutional Membership, 2016). Internal stakeholders are persons who take part in the everyday life of the pharmacy faculties: deans, academic staff, and students. External stakeholders are individuals that have an interest in pharmacy education despite the fact that they are not members of the pharmacy faculties: regulatory bodies, pharmacy experts, parents, health care providers, patients and all potential pharmacy users in the general population (Rouse and Meštrovic, 2014). The stakeholders involved in the quality assurance of pharmacy education are identified in Figure 2.3.

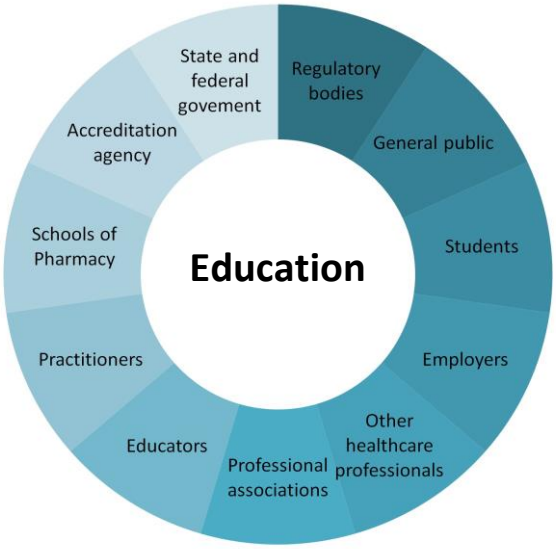

Figure 2.3 Stakeholders in the quality assurance of pharmacy education
Adapted with permission from FIP (Rouse and Meštrovic 2014, p.11)

Pharmacy education transformation involves and affects many stakeholders at different levels; many, if not all, with different roles and different expectations (Anderson et al., 2011; Hoat et al., 2009; Kirschenbaum et al., 2006; MacCarrick, 2009; Rouse and Meštrovic, 2014). Thus, collaboration with stakeholders from education, regulation, and practice areas is a key means to achieving sustainable solutions to the challenges surrounding pharmacy education transformation (Anderson et al., 2012a; Bader et al., 2016; Bates et al., 2013; FIP, 2015b; Rouse and Meštrovic, 2014).

2.2.3 The situation of global pharmacy education

The FIP 2013 Global Pharmacy Education Survey reported the pharmacy education and workforce data for 109 countries and territories representing around 175,000 graduating students per annum and 2,589 pharmacy and pharmaceutical educational institutions worldwide (Bates et al., 2013). The report highlighted significant information as presented Table 2.1 below.

Table 2.1 The information highlighted in the FIP 2013 Global Pharmacy Education report
Adapted with permission from FIP (Bates et al. 2013, p.11-23)

Topic	**Detail** (Bates et al., 2013)
Number of schools of pharmacy per country	The global average of schools/faculties per country is approximately 11. However, some countries have only a single national school/faculty (n=26, 27%) and 12 countries have no established pharmacy schools/faculties (e.g., Burundi, Tonga, Bhutan). However, some countries have very high number of schools/faculties (e.g., India 1,026; Brazil 417, US 129 Schools/Faculties).
Capacity and infrastructure	Capacity and infrastructure of pharmacy education varies between countries and WHO regions and generally correlates with population numbers and country level economic development indicators, e.g., those countries with lower economic indicators tend to have relatively lower educational capacity and pharmacist production.
Cost of pharmacy education	The cost of pharmacy education varies across countries and tends to correspond with national incomes and wealth and reflect national systems for higher education. The global sample mean of the direct student tuition fee in public universities is $ 3,128 (n=42).
Degree title and lengths of pharmacy course	There is variance in the degree title and course lengths. The majority of academic programme reported were Bachelor degree (n=30, 40.6%) with mode of 4 years length. The remaining degrees reported are Master (n=17, 23%) with mode of 5 years length, Bachelor & Master (n=8, 10.8%), PharmD (n=9, 12.2%) with mode of 6 years length, Bachelor & PharmD (n=8, 10.8%), Diploma & PharmD (n=1, 1.4%), Diploma & Bachelor & PharmD (n=1, 1.4%). This would suggest differences in content and education models between countries.
Quality assurance and accreditation system	The majority of respondents reported that they have quality assurance and accreditation within their countries. However, approximately 16% of the respondents had no accreditation mechanisms.

2.2.4 The role of the pharmacists: the key outcomes of the pharmacy education and training

The WHO, in the report of WHO consultative group (WHO, 1997) identified the roles of what they called the “seven star pharmacist". These roles were considered as the essential, minimum common expectations of pharmacists required by globally health care systems (FIP, 2000; Wiedenmayer et al., 2006) as shown in Table 2.2.

Table 2.2 The seven roles of the pharmacist (the seven star pharmacist)
Adapted with permission from WHO: ID 205004 (Wiedenmayer et al. 2006, p.16)

Role	**Function** (Wiedenmayer et al., 2006)
Caregiver	The pharmacist must provide caring service of the highest quality. They must be comfortable interacting with people whether the services are clinical, analytical, technological, or regulatory.
Decision maker	The appropriate, efficacious, and cost effective use of resources should be at the basis of the pharmacist’s work. To address this goal, the pharmacist requires the ability to evaluate, synthesise, and decide upon the proper action.
Communicator	The pharmacist is in a perfect position between physician and patient. They must knowledgeable and confident while interacting with other health professionals and the people
Leader	Whether the pharmacists find themselves as one of the health care team, but, the pharmacists is obligated to assume a leadership position in the overall well-being of the community. Leadership involves compassion, empathy, and the ability to make decisions, communicate, and manage effectively
Manager	The pharmacist must effectively manage resources, information, as well as being managed by others (e.g., employer, leader of a healthcare team).
Life-long learner	The pharmacy students cannot learn everything in school in order to practice as a pharmacist. The concepts and commitment to life-long learning must begin while attending school and must be supported through their pharmacy careers. Pharmacists should learn how to keep update their knowledge and skills.
Teacher	The pharmacist has responsibility to contribute to the education and training of future pharmacists. Participating as a teacher will offer an opportunity for the pharmacist to gain new knowledge and to improve their existing skills.

The roles of the pharmacist recommended by the WHO are recognised as the key outcomes of the basic pharmacy education and training of pharmacists (FIP/WHO, 2012; Wiedenmayer et al., 2006). Schools/Faculties of pharmacy should use the recommended roles to design their coursework and practice experiences (WHO, 1997) in order to produce the graduates who have competencies that meet those expected roles in both patient care and innovation in the pharmaceutical industry (Atkinson and Rombaut, 2010; The Secretary of State for Health by Command of Her Majesty, 2008; Wiedenmayer et al., 2006). However, the WHO in 2006 added function of “researcher” to the role of pharmacist. The pharmacist must be able to use the evidence base effectively and contribute to the evidence base in order to enhance on the rational use of medicines.

2.2.4 The guideline documents on pharmacy practice and pharmacy education

The WHO and FIP have provided important guidelines documents on pharmacy practice and pharmacy education (Basic Pharmaceutical Education Plan Working Group, 2014).

The objectives and brief details of the guideline documents are described in Table 2.3 below.

Table 2.3 The guideline documents on pharmacy practice and pharmacy education

Topic	Guideline document	Reference
Pharmacy practice	A practical handbook *"Developing pharmacy practice: a focus on patient care"* (2006): that aimed to guide pharmacy educators, pharmacy student and pharmacy practitioners to a new paradigm for pharmacy practice and to present a step by step approach to pharmaceutical care.	(Wiedenmayer et al., 2006)
	The *"Good Pharmacy Practice: Joint FIP/WHO Guidelines of GPP: Standards for quality of pharmacy services"* (2012): that aims to improve provide a description of ways in which pharmacists can improve access to health care, health promotion and the use of medicine.	(FIP/WHO, 2012)
Good Pharmacy Education Practice	The *"FIP Statement of Policy on Good Pharmacy Education Practice"* (2000) recommended that "Basic (first degree) education programmes should provide pharmacy students and graduates with a sound and balanced grounding in the natural, pharmaceutical and healthcare sciences that provide the essential foundation for pharmacy practice in a multi-professional healthcare delivery environment".	(FIP, 2000)
Quality assurance of pharmacy education	The 2nd edition of *"FIP Global Framework for Quality Assurance of Pharmacy Education"* (2014): this Framework is intended to address the foundation of a system of quality assurance for countries where no formal system exists or used as the self-assessment and continuous quality improvements of existing systems. This quality assurance framework provides five pillars of quality education, namely: context, structure, process, outcome, and impact of pharmacy education. Each pillar has its specific indicators for school to use as the self-assessment tool.	(Rouse and Meštrovic,2014)

Table 2.3 (continued)

Topic	Guideline document	Reference
Global competency Framework	-A *"Global Competency Framework (GbCF)"* (2012) for pharmacy profession: this framework is intended to support the evaluation and development of pharmacy competencies. -The scope of the framework encompasses foundation level practice and represents global consensus on the competencies of the outcomes of registration/ licensing levels of initial career education and training. -It provides a minimum set of behavioural competencies synthesised from competency documents of various countries that should be generally applicable for the pharmacy workforce worldwide. -The GbCF describes the four domains of competency as the following. 1) **Pharmaceutical public health competencies:** health promotion, medicine information and advice 2) **Pharmaceutical care competencies:** patient consultation and diagnosis, assessment of medicines, compounding, dispensing and monitor medicines 3) **Organisation and management competencies:** budget and reimbursement, human resource management, improvement of service, procurement, supply chain and management 4) **Professional/personal competencies:** communication skills, legal and regulatory practice	(FIP Education Initiatives, 2012).

2.3 Summary of issues related to the transition from the BPharm to a PharmD degree

There have been numerous of articles that discuss the transition from the BPharm to the PharmD programme in recent year (Babar et al., 2013). However, most of the evidence regarding this transition has been in commentaries and opinions (Ahmed and Hassali, 2008; Awaisu and Alsalimy, 2015; Babar et al., 2013; Ghilzai, 2008; Hadi, 2010; Jamshed, 2009; Jamshed et al., 2007; Khan et al., 2011). Very few systematic reviews or research about this transition have been undertaken (Boss and Lowther, 1993; Boyden, 2006).

The systematic review by Babar et al. (2013) explored the major patterns of dialogue about pharmacy education in the context of low-income and middle-income countries using document analysis. The reviewers found that the transition from the BPharm to the PharmD programme is a significant theme within the literature. The findings showed that there has been considerable debate around the need for the PharmD programme, but very little research has been done to investigate the issues involved. However, Babar et al. (2013) did not mention details of the transition process in the countries that had adopted PharmD programmes.

This review section was aimed to address this gap. The key publications demonstrating the opinions around issues of transition from the BPharm to the PharmD degree have been reviewed. There are four main issues that consistently emerged as follows:

1) Needs and context: that refers to the need for the transition in each country and context of the transition in each country

2) Process: that refers to the manner of enactment of the transition and process of implementing the transition

3) Barriers to the transition: that refers to factors that act as barriers to the implementation of the transition (Rudhumbu, 2015)

4) Impact/outcome: that refers to the impacts/outcomes of the transition for the stakeholders that are relevant to pharmacy education. It might be a short-term impact/outcome from the phenomenon of the transition or a long-term impact/outcome from the PharmD graduates in the real world.

These four issues are further discussed in this section. The key articles have been reviewed and presented in Appendix 2.

2.3.1 Needs and context

Many countries have adopted, or plan to adopt, a US style PharmD degree programme for their entry-level qualification (Anderson and Futter, 2009). This change, especially in developing countries, has received much criticism and debate from international audiences. The most repeated question within the literature was regarding "Why those countries transitioned from the BPharm to the PharmD degree?" (Babar et al., 2013; Hadi, 2010; Jamshed, 2009).

The common cited factors from various countries for reasons to follow the US education system are as follows:
1) The need to have a highly skilled clinical pharmacists to provide robust pharmaceutical care and to work with other health care teams (Anderson and Futter, 2009; Bright et al., 2010).
2) The need to improve patient outcomes and safety by decreasing medication-related problems (Anderson and Futter, 2009) and to improve economic outcomes (Ahmed and Hassali, 2008; Babar et al., 2013; Bright et al., 2010; Ghilzai, 2008; Mangasuli et al., 2008).
3) The need to incorporate new competencies into the pharmacy curricula of the transitioning countries (Bright et al., 2010).

It seems that the intention of the transition to the PharmD degree in many countries was to use pharmacy education as a way to guide the future of the profession, especially shifting to a more clinically oriented degree (Anderson and Futter, 2009; Bright et al., 2010). However, each country has its different needs and various pharmacists' roles in practice. It is vital that each country should look critically at its new pharmacy curriculum before deciding whether to adopt it, in order to be sure of the benefits they will get from the new curriculum.

On the other hand, Pakistan, South Korea and Thailand needed to expand their pharmacists' roles in clinical pharmacy, as well as meeting the high demand for pharmacists in the pharmaceutical industry. Therefore, their PharmD programmes are both clinically-oriented and pharmaceutical sciences-oriented (Ahmed and Hassali, 2008; Amir, 2011; General Pharmaceutical Council, 2011; Hadi and Hughes, 2009; Khan et al., 2011; Yoo et al., 2014).

Some scholars thought that the PharmD degree should be specifically for building a clinical pharmacist. It was suggested that the bachelor degree was still needed and should be continued as a basic degree programme, in order to develop pharmacists who have knowledge and skills to work in non-direct patient care areas like pharmaceutical industries and pharmacy marketing (Ahmed and Hassali, 2008; Amir, 2011; Hadi and Hughes, 2009).

In addition, the reason to move to the PharmD programme in Hungary was that the number of applicants to pharmacy courses had declined due to the changes in the pharmacy contract, which made careers in the pharmacy profession less financially attractive than before. Thus, the prospect of graduating with the title "doctor" would hopefully make pharmacy careers attractive again (Anderson and Futter, 2009).

Moreover, some countries have other intentions regarding the transition to the PharmD degree. For example, the transition to PharmD degree is one of the tools enabling a pharmacist from Pakistan or Bangladesh to be employed internationally in the US. Equally a doctoral level degree can be used as an instrument of professional power and status (Hadi and Hughes, 2009; Jamshed et al., 2007).

Anderson and Futter (2009) state "we wonder what evidence would be needed to be satisfied that the PharmD degree was the way to go for everyone?" (p.2). It is also interesting to determine if the countries that adopted the PharmD programme are truly interested in a pharmaceutical care model or only want their graduates to be qualified to enrol in the US system (Jamshed et al., 2007). On the contrary, Hadi (2010) suggested that it is acceptable to follow the US model. However, the 'following' country should ensure that the new programme is tailored to fit country's local needs, regardless of the programme's title. Additionally, the adopting country should ensure that the necessary resources and suitable career pathways for the new programme's graduates are available (Hadi, 2010).

Therefore, it is important to determine the aims or needs of the curriculum changes in the different countries. However, there are too few studies about the transition from the BPharm to the PharmD in many countries, including Thailand.

2.3.2 Process

The process of the transition from the BPharm to the PharmD has created similar situations among several countries as follows:

1) Debating about the transition

Not all organisations in each county were willing to support the PharmD as the sole entry-level degree. There were debates about the transition from the BPharm to the PharmD degree for a long period of time in order to establish a consensus at the national level (Bright et al., 2010; Francisco, 2003).

2) Mandating by the regulatory bodies

Each country had their regulatory bodies who mandated the PharmD programme as the entry-level pharmacy programme, by moving toward some sort of standardised credentialing methods (Bright et al., 2010; Francisco, 2003). For example, the curriculum must have been revised to fit the new PharmD programme in order to receive its accreditation or to produce pharmacy graduates who are eligible to sit for the licensure examination (Frankel et al., 2014; Kishi, 2001; Knapp, 2011).

3) Supportive regulations concerning the provision of pharmaceutical care in practice settings

To make changes in practice has been more complicated than the implementation of the pharmacy education degree programmes. Pharmaceutical care services will not be implemented or succeed only from pharmacists' individual efforts, but also need recognition from other health care providers, regulatory bodies and governments (Francisco, 2003; Watanabe et al., 2005a). In some countries, there are factors that support pharmacists to take up their new roles in direct patient care activities.

For example, in the US, the pharmaceutical care service called "Medication Therapy Management (MTM)", has been codified into law, and Medicare Part D[1] providers are required to offered MTM services to a specific subset of patients (Akaho et al., 2003; Bright et al., 2010; The Centers for Medicare & Medicaid Services, 2016). This situation differs from many developing countries, which have changed to the PharmD degree, that still have no supporting regulations (Madiha and Yang, 2014) and often no professional fee framework to reward pharmacists for making high-risk clinical decisions (Anderson and Futter, 2009).

However, most countries still have a 'grey area' gap between the clinical ability of pharmacists and their legal authority (Adams, 2015). Thus, professional regulatory bodies, education institutions, and governments should collaborate to consider adopting a clear definition of the pharmacy profession's scope of practice, in order to enable pharmacists to practice at the top of their clinical ability (Adams, 2015) (Figure 2.4).

Figure 2.4 Transition in pharmacy education might lead to changes in pharmacy practice if there are regulations that support pharmacists' roles
Adapted with permission from FIP (Rouse and Meštrovic 2014, p.11)

[1] The US citizens are covered by private insurance, which is often employer-paid. However, the government provided system covers citizens with limited incomes **(Medicaid)** or people who are 65 years or older, younger people with disabilities, and people with end-stage renal disease **(Medicare)**. Medicare has different parts to cover specific services: Medicare **Part A** (hospital insurance) covers inpatient hospital stay; **Part B** (Medical insurance) covers doctors' services, outpatient care; **Part C** (Advantage plans) cover all Part A, B, and D benefits, and **Part D** (prescription drug coverage) adds prescription drug coverage to Original Medicare. The Centers for Medicare and Medicaid Services (CMS) require each Medicare Part D law to establish a Medication Therapy Management (MTM) programme for targeted beneficiaries as part of its benefit. The MTM is a programme provided by pharmacists to optimise medicine therapy outcomes through improved medication use. (www.medicare.gov)

2.3.3 Barriers to the transition

The transition from bachelor degree to doctoral level, in most of countries raised concerns about education quality (Anderson et al., 2012b). Viewed through the prism of educational quality, the transition from the BPharm to the PharmD degree is seen to need more clinical courses and clerkships. Most developing countries may lack such crucial factors as experienced clinical academic staff, competent preceptors, collaboration with hospitals. Other challenges are likely to include insufficient infrastructure, and economic resources to provide adequate internships, all of which might affect the quality of pharmacists' education (Anderson and Futter, 2009; Hadi, 2010).

2.3.4 Impact/outcome

There is still insufficient information to develop a definite argument to support a relationship between success indicators and the introduction to the PharmD degree (Anderson and Futter, 2009; Hill, 1999). Anderson and Futter (2009) suggested that there should be a framework or a set of indicators to measure and monitor the impact of the PharmD degree.

The four issues of needs and context, process, barriers and impact/outcome, which were identified from the literature concerning the transition to an all-PharmD programme, are presented in Figure 2.5.

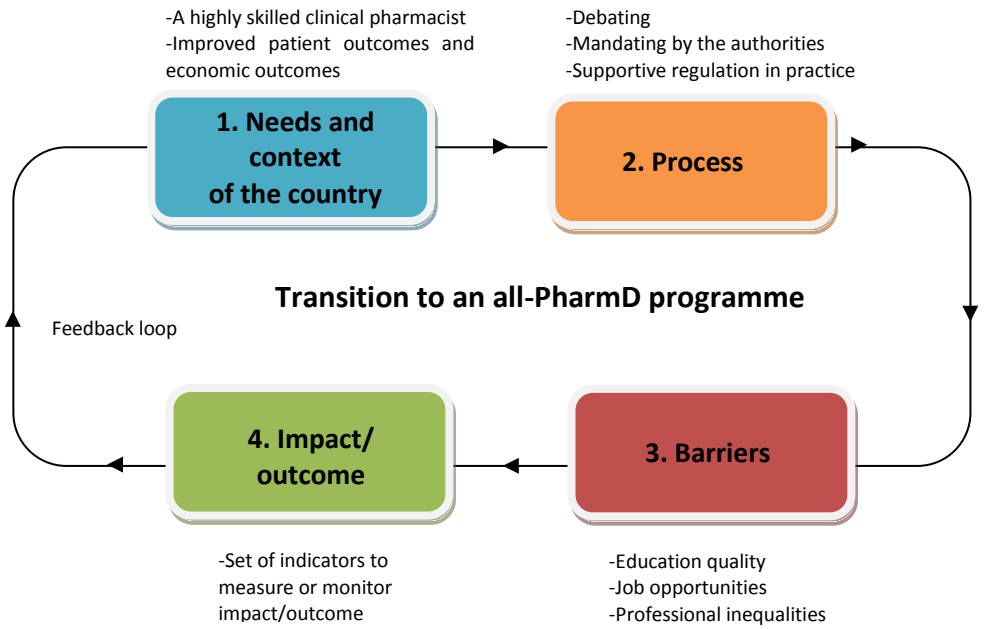

Figure 2.5 Four issues identified from the literature concerning the transition to an all-PharmD programme

Each country has their **different needs** due to the **different contexts** of health care systems that are related to the scope of pharmacy practice. The countries should consider their needs critically before they decide to adopt the PharmD programme, in order to increase and ensure the benefits they will get from the new programme.

Each country created a **different process** to handle the transition to an-all PharmD programme, but mostly had the process of school accreditation mandated by the appropriate regulatory bodies. The main **barrier** to the transition in most of countries is the issue of educational quality.

Finally, there still needs to be a framework or a set of indicators to measure and monitor **the impact/outcome** of the PharmD degree. This set of indicators should be used as a feedback loop to evaluate whether the transition balances the impacts/outcomes that meet the needs of the adopting country.

2.3.5 Studies reporting the transition from the BPharm to the PharmD degree

There are two studies regarding the transition from the BPharm to the entry-level PharmD degree in the US: Boyden (2006) and Boss and Lowther (1993). Both studies used qualitative case studies, which provided very useful details in specific schools. However, these two studies are case studies in the US and the findings might not be directly transferable to the situations in developing countries, due to significant differences in the countries' contexts (Koleba et al., 2006). The details, strengths, and weaknesses of the two studies are provided in Appendix 3.

1) Boyden (2006) investigated the changeover from the BPharm to the entry-level PharmD degree in pharmacy education. The interviews were conducted with 37 key participants at two schools of pharmacy: 1) the University of California, San Francisco (UCSF), which was the first institution to adopt the PharmD programme; 2) the Philadelphia College of Pharmacy that abandoned its successful post-BPharm PharmD degree programme and replaced it with a PharmD degree. The findings showed the factors that contributed to the motivation for an all-PharmD degree. These factors included the need for degree uniformity, to gain in prestige with the title of doctor, the requirement of more clinical exposure in the nation's pharmacy programmes. Specific beneficiaries included the opportunity to respond to the clinical needs of society, and the chance to raise the pharmacists' salaries. However, the PharmD degree would be costly if new clinical faculty and training sites needed to be acquired (Boyden, 2006).

2) Boss and Lowther (1993) aimed to identify the influences and factors concerning curriculum change in a small pharmacy college, which went through its major curriculum change to discontinue its BPharm programme. External influences created a need for the new PharmD curriculum; new accreditation standards made it necessary for all schools to offer the entry level PharmD degree. An internal influence was the lack of understanding among basic science staff about what the students needed to learn in pharmacy practice that tended to restrain attempts to focus on the new curriculum (Boss and Lowther, 1993).

2.4 Pharmacy education in selected countries

In this section, pharmacy education in certain selected countries that offer three types of pharmacy programmes will be reviewed. The countries to be considered are: 1) the UK that provides the MPharm; 2) Australia that provides the BPharm; 3) the USA and other countries that provide the PharmD programme.

2.4.1 Selected countries' basic information

All high-income countries (e.g., UK, Australia, USA, Japan and South Korea) have the number of pharmacists per 10,000 population ratio higher than the WHO recommendation (5 pharmacists per 10,000 population); Japan has the highest ratio, with 21 pharmacists per 10,000 population. The lower-income countries have lower ratios than the WHO's recommendations.

The most popular area of practice in the developed countries is the community pharmacy, due to the structure of their health care systems that need a high number of pharmacists in such pharmacies. On the other hand, the popular area of practice in Pakistan is the pharmaceutical industry, because of the successful pharmaceutical industry in Pakistan (Hassain and Jamshed, 2016). Thailand has the hospital pharmacy as the most popular area of practice, due to the public hospitals being the country's main healthcare facilities (Wibulpolprasert, 2010). The basic information regarding the pharmacy profession and pharmacy education in those selected countries is reviewed and presented in Table 2.4.

Table 2.4 Basic information, pharmacy workforce, and education and training in the UK, Australia and five countries that moved to an all-PharmD degree

Characteristics	UK (Association of Pharmacy Technicians UK, 2016; The Centre for Workforce Intelligence, 2013)	Australia (Marriott, 2011; Marriott et al., 2008; Moles and Stehlik, 2015; Pharmacy Board of Australia, 2016)	US (Lovett et al., 2014; Teeters et al., 2005; WHO, 2012)	Japan (Dolder et al., 2008; Inoue et al., 2015; Kanke, 2012; Kurosawa, 2011; National Institution for Academic Degrees and University Evaluation, 2014)	South Korea (Chun et al., 2009; Yoo et al., 2014)	Pakistan (Aslam and Ahmed, 2011; Bates et al., 2013; Hassain and Jamshed, 2016; Ibrahim et al., 2016)	Thailand (Ibrahim et al., 2016; Prapunwattana, 2012)
General aspects							
Region	Europe	Western Pacific	The Americas	East Asia	East Asia	Southern Asia	Southeast Asia
World Bank Classified countries incomes (FIP, 2015a)	High-income	High-income	High-income	High-income	High-income	Lower middle income	Upper middle income
Population (million)	61.3	22.3	273	128	49.8	176	67
GDP per capita (USD) (2013)	47,187	67,458	54,353	42,983	18,373	4,700	14,400
Life expectancy (years) (Robertson et al., 2014)	81.1	82	78.8	83.4	81.3	76.3	74.1
Number of licensed pharmacists (per 10,000 of population) (FIP, 2012; Sugibayashi, 2014)	50,664 (8)	26,434 (12)	249,642 (9)	276,517 (21)	53,492 (6.5)	12,000 (0.7)	28,272 (4.2) (current practice ~ 8,000; 1.2 pharmacist: 10,000 people)
Pharmacy technicians (FIP, 2012)	21,000	8,714	393,000	0	0	31,000	5,136
Pharmacy workforce by practice	**C[a] 71%**, H[b] 21%, I[c] 4% O[d] (e.g., primary care 7%, academic 3%, others 4%)	**C 63%,** H 18%, I 1.7% O %	**C 65%,** H 25%, O 10% (e.g., miscellaneous: patient cares sites 5%, others 5%)	**C 49.6%,** H 19.4%, I 11.9%, O 19.1% (e.g., drugs sales 6.1%, university 3.5%, others 9.6%)	**C 28.6%,** I 21%, H 18.3%, O 32.1%	**I 55%,** C 10%, H 10%, O 25% (e.g., sales and marketing 15%, regulatory affairs 5%, academia 5%)	**H 40%,** C 17%, I 10% O 33% (e.g., pharmacy marketing 22%, consumer protection 6%, education 5%
Community pharmacies (FIP, 2012)	12,891	5,167	37,539	71,970	20,633	80,000	11,592
Re-licensure required	Annual	Annual	Requirements vary by state	No renewal system in pharmacy license	N/A	N/A	Renewed every 5 years (required 100 unit of CE[e])

[a]C=Community pharmacy; [b]H=Hospital pharmacy; [c]I=Industrial pharmacy; [d]O=Other; [e]CE = Continuing education

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Table 2.4 (Continued)

Characteristics	UK	Australia	US	Japan	South Korea	Pakistan	Thailand
Pharmacy education							
No. of pharmacy institutions (Bates et al., 2013)	26	18	129	74	35	41	19
No. of pharmacy technicians institution (FIP, 2012)	N/A[a]	19	700	0	0	9	17
Pharmacy graduate per year (Bates et al., 2013)	2,800	1,755	12,719	9,912	1,372	4,000	1,680
Year that transition to an all-PharmD programme has been started	-	-	2000	2006	2009	2004	2010
Academic programme, length (years)	MPharm, 4-5	BPharm, 4	PharmD[b], 6[c], 4[d]	Bachelor, 6	Bachelor, 6	PharmD, 5	PharmD, 6
Practice training (Bates et al., 2013)	C[e],H[f],I[g] (pre-registration training 52 weeks)	C,H,O[h] (Internship 1,824 hours)	C,H,O (1,000-1,800 practice hours)	C, H (6 months)	N/A	C,H,I (12 months)	C, H, I, O (12 months)
National licensing exam	Required	Required	Required	Required	Required	Required	Required
The programme that bridge the academic gap between 4-and 6-year pharmacy programme	-	-	Non-traditional PharmD programme	The new curriculum-support training	Master degree programme in clinical pharmacy	N/A	Master degree programme in clinical pharmacy Residency training programme

[a]To become a pharmacy technician in UK, the individual needs to find employment as a pre-registration trainee pharmacy technician to receive on-the-job training from the employer, which will be combined with working towards a national qualification (Association of Pharmacy Technicians UK, 2016); [b]nearly half of students hold a bachelor or higher degrees; [c] for PharmD programme with no pre-pharmacy requirements for admission; [d] for PharmD programme that requires at least 2-years of specific pre-professional (undergraduate) coursework prior to 4-academic year of professional study; [e] C=Community pharmacy, [f]H=Hospital pharmacy, [g]I=Industrial pharmacy, [h]O=Other

2.4.2 Education systems to become a pharmacist

The international educational systems show the different degree awards that might cause confusion. However, it seems they are similar in course length and that most are approximately 6 years if pre-entry standards and internships are included (Anderson and Futter, 2009; Babar et al., 2013; General Pharmaceutical Council, 2011; Kim and Ghimire, 2013; Marriott, 2011; Sripanidkulchai, 2008; Sripanidkulchai, 2012) (see Table 2.5).

All countries have the similar education systems to cater for those who wish to become a pharmacist: the students enter from secondary school except for the US and Korea where entry is after a minimum 2 years at university, followed by a 4 year pharmacy course with one year training experience and then a licensure examination (Kim and Ghimire, 2013; Sripanidkulchai, 2008; Sripanidkulchai, 2012).

The challenges in pharmacy education in the UK and Australia are similar; being informed by the debate over the relative content weighing of science and practice within the courses. The US has the policy that all pharmacists who are involved with direct patient care will, by 2020, be obliged to complete a residency prior to entering practice. This move requires increasing the need for qualified preceptors. All countries require registration assessment of new pharmacists or their national licensure.

Table 2.5 Education systems to become a pharmacist in the UK, Australia and the five countries that transition from the BPharm to PharmD programme
Adapted with permission from Sripanidkulchai 2012 (General Pharmaceutical Council, 2011; Kim and Ghimire, 2013; Sripanidkulchai, 2008; Sripanidkulchai, 2012)

Approximate age	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Approximate grade	1	2	3	4	5	6	7	8	9	10	11	12								
UK (4-year MPharm, 5-year MPharm)	Primary school						Secondary school					Sixth form college	4-year MPharm					Pre-registration training (52 weeks)	Registration assessment, health, character and identity checks, registration as a pharmacist	
													5-year MPharm, including intercalated blocks of pre-registration							
Australia (4-year BPharm, 2-year MPharm)	Primary school						High school						4-year BPharm				Internship	National registration		
													3-year Bachelor			MPharm		Internship	National registration	
US (6-year PharmD)	Primary school						Secondary school						2-year prerequisites or obtaining a transferable bachelors' degree pharmacy	4-year School of Pharmacy, including clerkship 1,000-1,800 practice hours -IPPE[d] 300 hours during first 3 years of course -APPE[e] 36 weeks in the fourth year					State Board exam	
Japan (6-year BPharm)	Primary school						Junior High school			High school			6-year BPharm, including 6 months internship (5 weeks practice of school + 10 weeks hospital + 10 weeks community pharmacy in the fifth year and the sixth year) (Prior to start outside practice: students have to take common exam at school (CBT[a]+OSCE[b]) in the fourth year)						National Board exam	
Korea (2+4 Pharmacy programme)	Primary school						Junior High school			High school			2-year Pre-pharmacy + PEET[c]	4-year School of Pharmacy, including clerkship in the final year -IPPE[d] 2 credits (70 hours) -APPE[f] 1 years (33 weeks/1330 hours for 28 credits)					National Board exam	
Pakistan (5-year PharmD)	Primary school					Secondary school (lower level G6-8)			Secondary school (upper level G9-12)				5-year PharmD (There is no clarity regarding pharmacy practice experience)							
Thailand (6-year PharmD)	Primary school						High school						6-year PharmD, including 2,000 practice hours -IPPE[d] 400 hours during the fourth year -APPE[e] 1,600 hours during the fifth and the sixth year						Licensure exam	

[a]CBT = Computer based testing-for knowledge; [b]OSCE (Objective Structured Clinical ability Examination)-for professional skills; [c]PEET= Pharmacy Education Eligibility Test;
[d]IPPE=Introductory Pharmacy Practice Experience; [e]APPE = Advanced Pharmacy Practice Experience

2.4.3 Pharmacy practice

Pharmacists in the UK, Australia, and the US can be given the authority to be supplementary or independent prescribers that depend on the countries regulations; while pharmacists in Japan, South Korea, Pakistan, and Thailand have prescribing authority for 'Pharmacist Only Medicines' and the over-the counter medicines for the symptomatic treatment of minor conditions (see Table 2.6).

Pharmacists in all countries provide clinical pharmacy services but at different levels of implementation; for example, pharmacists in developed countries have many supporting systems for the implementation of pharmaceutical care practice. On the other hand, in developing countries pharmaceutical care implementation still encounters a number of challenges, including the absence of a recognized reimbursement system and insufficient numbers of competent pharmacists (Murtaza et al., 2015). In addition, clinical pharmacy in developing countries is developed as an isolated unit and not usually related to health care systems (Jamshed et al., 2007).

Pharmacists in all countries are able to work in the pharmaceutical industry. In the UK, the pharmaceutical industry requires the qualified person (QP) on a manufacturer's authorisation. QP is a technical term used in the European Union pharmaceutical regulation. A QP is typically a licensed pharmacist, biologist, or chemist (Royal Pharmaceutical Society, 2016).

Table 2.6 The scope of practice of pharmacists in the UK, Australia and the five countries that transition from the BPharm to the PharmD programme
Adapted from Watanabe et al. 2005

Content of activities (Watanabe et al., 2005a; WHO, 1997)	**UK** (Hall, 2013; Royal Pharmaceutical Society, 2016)	**Australia** (Hoti et al., 2011; Moles and Stehlik, 2015; Pharmaceutical Society of Australia, 2010; The Pharmacy Guild of Australia, 2016)	**US** (National Governors Association, 2015; The Council on Credentialing in Pharmacy, 2009)	**Japan** (Watanabe et al., 2005a; Yamada and Nabeshima, 2015)	**South Korea** (Chun et al., 2009; Hwang and Young, 2015)	**Pakistan** (Khan, 2011; Murtaza et al., 2015)	**Thailand** (The Association of Hospital Pharmacy (Thailand), 2013)
1. Prescribing authority							
Prescribing authority	✓[a]	✓[b]	✓[c] or X	X	X	X	X
Prescribing authority for "Pharmacist Only Medicines" and the over-the counter medicines for the symptomatic treatment of minor conditions	✓	✓	✓or X	N/A	✓	✓	✓
2. Dispensing activities[d]							
Reviewing incoming prescription	✓	✓	✓	✓	✓	✓	✓
Dispensing/ Inspecting dispensing	✓	✓	✓	✓	✓	✓	✓
Preparing IV products	✓	✓	✓	✓	✓	✓	✓
Drug distribution	✓	✓	✓	✓	✓	✓	✓
Inventory management	✓	✓	✓	✓	✓	✓	✓
3. Clinical activities							
Clinical-oriented activities (e.g., MTM[e], ward round, pharmacist-managed clinic for patient counselling, drug information services)	✓	✓	✓ or X	✓	✓	✓	✓
4. Pharmaceutical industrial (WHO, 1997)							
Manufacture and quality assurance	QP[f]	✓	✓	✓	✓	✓	✓
Research and development	✓	✓	✓	✓	✓	✓	✓
Regulatory affairs	QP	✓	✓	✓	✓	✓	✓
Clinical trials and post-marketing surveillance	QP	N/A	✓	✓	✓	✓	✓
Sales and marketing	QP	N/A	✓	✓	✓	✓	✓

✓ = Yes; X = non; [a] In the UK, the trained pharmacists can be a supplementary prescriber (can prescribe an medicine that has been agreed with medical prescriber and specific in a clinical management plan (CMP) or independent prescriber (can prescribe most drugs without needing a CMP). Trained pharmacists can prescript 1) Non-controlled drugs: any medicine provided it is not black listed (The blacklist refers to a range of medicines, e.g., hypnotics and anxiolytics, that cannot prescribed by brand name) 2) Controlled drugs: Schedule 2,3,4,5-are not able to prescribe diamorphine, dipipanone, cocaine for treating addiction but may prescribe these items for treating organic disease or injury;

[b] Protocol Driven Pharmacist Prescribing (PDPP) is a type of dependent prescribing in which the management for the medication aspects of patient care is delegated by an independent prescriber to a pharmacist according to pre-defined protocols (e.g., in asthma, diabetes); [c] In the US, the extent of the authority is highly variable in different states; [d] In most countries have pharmacy technicians and pharmacy assistants to provide supply roles. [e]MTM = Medication Therapy Management; [f]QP=Qualified person.

2.4.4 Comparison of pharmacy curricula

Marriott (2011) reviewed the international course content by examining the MPharm curricula of the University of Manchester, UK; the PharmD curricula of the University of Colorado, USA; the BPharm curricula of the Monash University, Melbourne, Australia)(Marriott, 2011).

The review shows that the PharmD programme in the US leans toward professional practice and therapeutics (Marriott, 2011). The comparison of international pharmacy curricula in Figure 2.6 was adapted from Marriott (2011) by adding the pharmacy curricula from South Korea, Pakistan and Thailand (Choi, 2011; Higher Education Commission, 2004; Madiha and Yang, 2014; Marriott, 2011; The Pharmacy Council of Thailand, 2012b).

In Pakistan, South Korea and Thailand, where graduates' destinations lean towards the pharmaceutical industry, their programmes have to include the pharmaceutical sciences content as well as the clinical content. The 5-year PharmD programme in Pakistan has the highest content in the pharmaceutical sciences (Higher Education Commission, 2004).

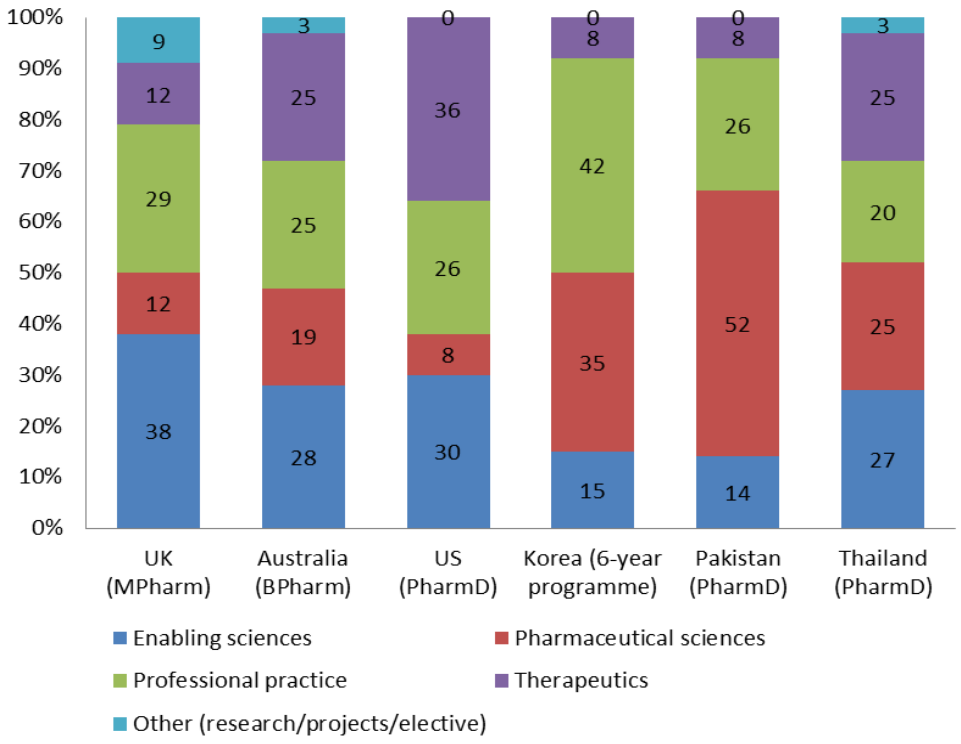


Figure 2.6 Comparison of international pharmacy curricula
Adapted with permission from Marriott 2011, p.23

2.4.5 Pharmacy education in the UK: the MPharm programme

The schools of pharmacy in the UK provide a master's programme that awards the Master of Pharmacy (MPharm) degree (Sosabowski and Gard, 2008). To register as a pharmacist, the General Pharmaceutical Council (GPhC) accredited a mandatory 4-year MPharm degree, to be followed by a year of pre-registration training. The one exception is a 5-year MPharm degree integrating the pre-registration year, where the 12-month pre-registration placement was replaced by two six-month placements at the beginning of year four and the end of year five (General Pharmaceutical Council, 2011). All candidates are then required to successfully complete the GPhC examination and registration assessment (General Pharmaceutical Council, 2016d; Hall, 2013; The Centre for Workforce Intelligence, 2013).

The 5-year integrated MPharm degree was first proposed in 2011 in the discussion paper 'Modernising Pharmacy Careers' (MPC)(Guile and Ahamed, 2011). The GPhC was convinced by the argument that the MPharm degree and pre-registration training should be brought together. The main driver for a national five-year programme is the opportunity to improve the quality of pharmacy graduates by giving schools of pharmacy more control over the quality of their students' placement experiences. However, this change also raises concerns; in particular regarding the issue of access to, and the supply of, qualified preceptors and additional costs for students (Torjesen, 2016).

In 2016, there are 26 fully accredited schools of pharmacy in the UK (General Pharmaceutical Council, 2016b). Pharmacy degree programmes in the UK must be accredited every 6 years. Each school admits an average of 150 students each year (Sosabowski and Gard, 2008). The cost of the tuition fee is typically £9,000 (approximately $13,000) per year.

2.4.5.1 The pharmacy curriculum in Great Britain

The MPharm course gives pharmacy graduates an integrated and interdisciplinary view of the scientific of medicines and links this to the practice and ethics of the pharmacy profession. It includes knowledge and professionals skills needed to become a pharmacist. The standards for the accreditation of MPharm courses can be found in *"Future pharmacists Standards for the initial education and training of pharmacists"* (General Pharmaceutical Council, 2011).

The structure of pharmacy programmes in Great Britain can vary from university to university. For example, the structure of pharmacy programme the University of Nottingham is modular. Within each module, the course provides integrated teaching across therapeutic themes or disease states. Within each module, the student will study elements of the following areas: i) pharmacology and therapeutics; ii) biology and physiology; iii) pharmaceutics; iv) chemistry (e.g., physical chemistry and analysis, synthesis and chemical mechanisms, pharmacokinetics and natural products); v) professionalism and leadership; vi) pharmacy practice (The School of Pharmacy: University of Nottingham, 2016). On the other hand, the core material of course structure of MPharm at the University of Manchester is divided into five key areas (i) the medicine; ii) the pharmacist; iii) the patient; iv) the public and v) integrated professional practice). For example, course unit for year 1 is including with i) the medicine: introduction to medicines; ii) the pharmacist: introduction to professional practice; iii) the patient: introduction to human biology; iv) the public: public health microbiology; v) integrated professional practice for year 1. The content of the first three years is common to all students and then will have opportunity for specialisation in the fourth year. (The University of Manchester, 2017)

2.4.5.2 Challenges for pharmacy education in Great Britain

1) There are concerns about the increased number of schools of pharmacy and increased number of graduates that could be unemployed. This might cause a long-term outcome that fewer students will apply for pharmacy programmes, as they could well fail to find employment after graduation. Then the number and quality of applicants could fall (Martini, 2014; Sosabowski and Gard, 2008; The Centre for Workforce Intelligence, 2013).

2) The requirement to introduce more therapeutics into courses to provide for the new role of prescribing must be faced. Similarly, the debate over the relative weighting of science and practice within the course needs to be resolved (Global Knowledge Exchange Network on Health Care, 2009; Hall, 2013; Sosabowski and Gard, 2008).

2.4.6 Pharmacy education in the Australia: the BPharm programme

The pharmacy programme must be accredited by the Australian Pharmacy Council (APC) and approved by the Pharmacy Board of Australia (PBA) (Australian Pharmacy Council, 2014). Programmes eligible for accreditation are those offered at bachelor or master degree level, which provide a programme of study for the initial education and training of pharmacy students. The Bachelor of Pharmacy is a 4-year undergraduate degree. The Master of Pharmacy is a 3-year full-time graduate (Australian Pharmacy Council, 2014).

After completion of BPharm or Master's degree programmes, graduates must complete a 12 months internship that was previously referred to a pre-registration training. This experience occurs in hospital or community pharmacy settings under the supervision of a Pharmacy Board approved pharmacist. Thus, the overall programme for entry to registration is 5 years (a 4-year bachelor's degree plus a 1-year internship) (Marriott et al., 2008).

Upon completion of the internship, graduates must pass a series of exams, administered by the pharmacy boards, involving an oral exam, a law and ethics exam, and a competency assessment test, in order to become a registered pharmacist. Pharmacists are required to renew their registration annually (Pharmacy Board of Australia, 2014).

2.4.6.1 The Australia pharmacy curriculum

The Australian Pharmacy Council (APC) for Accreditation of Pharmacy courses in Australia provides an *"Indicative Pharmacy Curriculum for Australia"*, which indicates all topics that are required to be included in a curriculum (Australian Pharmacy Council, 2014). Length of placements varies between schools (Marriott, 2011).

2.4.6.2 Challenges in the Australia pharmacy education

1) Pharmacy practice in Australia has been moving from a dispensing role into a medication management role. The pharmacy education curriculum has been changed to address these new practice directions by placing an emphasis on teaching patient care skills; particularly communication and patient assessment.

The increased emphasis on clinical areas has led to a reconsideration of the extent of basic sciences in the pharmacy curriculum. A strong education in the basic sciences is still important and required to ensure that pharmacists will able to understand the chemistry and pharmacology of new drugs. However, the basic sciences content included in their courses must be relevant to the needs of the practicing pharmacist of the future (Marriott et al., 2008).

2) A shortage of qualified academic staff in both pharmacy practice and drug delivery disciplines, due to the number of schools of pharmacy in Australia increasing from 6 to 16 in a decade (Marriott et al., 2008). In terms of the availability and financial attraction of pharmacy positions, an academic career seems less attractive, compare to community or hospital settings. A solution to maintaining academic faculty levels will need to be found and may include moving toward a model of clinical teachers similar to that used in medical education (Beardsley et al., 2008; Marriott et al., 2008).

2.4.7 The PharmD programme: the US, Japan, South Korea, Pakistan

The Doctor of Pharmacy (PharmD) is a professional doctorate degree, also known as a clinical doctorate; a term only used in the health professions: the Doctor of Medicine (MD) and Doctor of Dental Science (DDS) (Pierce and Peyton, 1999). It is the entry level, or first-professional, degree for pharmacy programmes in the US (Lovett et al., 2014).
The professional doctorate degree emphasises practice competencies, which is different from an academic doctorate, such as Doctor of Philosophy (PhD) that focuses on knowledge or original research production (Pierce and Peyton, 1999).

The United States is the first western country that has moved to a universal acceptance of the 6-year PharmD degree as the sole credential for the professional pharmacy programme; the PharmD programme focuses mainly on clinical pharmacy (Francisco, 2003). There is an increasing trend in countries such as South Korea, Pakistan, Thailand towards the PharmD degree education (Anderson and Futter, 2009; Babar et al., 2013). The list of countries that transitioned from the BPharm to the PharmD degree, as their entry-level qualification, is presented in Table 2.7.

Other countries that provide the PharmD combined with other programmes are as follows:
1) Bachelor and PharmD: Afghanistan, Canada, Taiwan, Ghana, Jordan, Qatar, Saudi Arabia
2) Diploma and PharmD: France, India (Bates et al., 2013).

Table 2.7 List of countries that provide their entry-level qualification as a PharmD degree by regions
(Bates et al., 2013; Koleba et al., 2006)

Regions	Countries	Number of countries
The Americas	US, Canada (plan to offer an all-PharmD in 2020)	2
Europe	Hungary, Italy	2
Asia	Japan, South Korea, Pakistan, Thailand	4
Africa	Benin, Cameroon, Republic of Congo, Senegal, Tunisia	5
Australia	N/A	0
Total		**13**

In this section, the transition from the BPharm to the PharmD programme in the US, Japan, South Korea and Pakistan has been reviewed. The transition from the BPharm to the PharmD or similar programme in those four countries has been accomplished. Canada is one country that is still in the transition process of adopting an all-PharmD programme. However, other countries including Benin, Cameroon, Republic of Congo, Senegal and Tunisia have changed their entry-level qualification to the PharmD degree but had insufficient publications available or had research reported in a language other than English were not selected for inclusion in this review.

2.4.7.1 The United States of America

2.4.7.1.1 Need for the change

The US pharmacy profession decided to move to an all-PharmD programme over 20 years ago, in an effort to enhance pharmacists' competencies and reflect growth in the knowledge base of the profession. The principal supporting argument was that the Bachelor in Pharmacy programme could not adequately prepare pharmacists to provide appropriate pharmaceutical care services (Gans, 1990; Pierce and Peyton, 1999). There was a need to incorporate new competencies into the pharmacy curriculum and a need to provide robust pharmaceutical care, together with the potential for improved economic outcomes (Bright et al., 2010).

An improved professional image and increased prospects for career opportunities were offered as reasons to change by supporters of the change (Kreling et al., 2010). Bright et al. (2010) mentioned that the transition to the PharmD degree was the way to shape the future of the profession.

2.4.7.1.2 Process of the transition to the PharmD degree

The origin of the debate over whether to offer the entry level PharmD as the sole professional degree began back in 1948, when the American Council on Education (ACE) recommended that the professional pharmacy curriculum should be a 6-year programme. In the 1950s, the PharmD programme was started at the University of Southern California (USC) and the University of California, San Francisco (UCSF) (Bright et al., 2010).

In 1972, the American Association of Colleges of Pharmacy (AACP) recommended the formation of a "Commission on Pharmacy" to study the scope of pharmacy services in health care and the educational requirements needed to train pharmacists in order to provide the clinical pharmacy services. John S Millis, the President of the National Fund for Medical Education, chaired the commission. The Millis Commission's report (1975), *"Pharmacists for the future"* contained recommendations for pharmacy practice and education. From this report, many educators believed that it was the time to adopt the PharmD degree as the sole degree leading to licensure (Francisco, 2003).

In 1989, 56% of US pharmacy schools still only offered the bachelor degree, 14% offered the PharmD degree and 30% offered both degrees. The AACP President William Miller appointed a task force, which was termed *"the AACP Commission of Implement Change in Pharmaceutical Education",* to develop recommendations to guide pharmacy education to meet the demands of the profession, the health care system and the society (American Association of Colleges of Pharmacy, 1992; Francisco, 2003). From its third background paper, the commission concluded that the curriculum needed more time than was available in the bachelor degree to educate pharmacy practitioners of the future adequately. It was important to expand the curriculum and use a single title "Doctor of Pharmacy" for the provision of pharmaceutical care (Elenbass and Worthen, 2009).

In 1989, the Accreditation Council for Pharmacy Education (ACPE), the body that sets educational standards and accredits colleges of pharmacy (Carter, 2016), stated that its intent was to accredit only PharmD degree programmes as the entry-level degree into the pharmacy profession; suggesting the year 2000 as a probable target date (Francisco, 2003).

This declaration drove much discourse among educators who were doubtful of obtaining adequate resources to add another year into the curricula. Concern was also expressed over the practitioners: in particular fearful that bachelor practitioners would be disenfranchised if pharmacy schools produced only PharmD graduates (Francisco, 2003).

Debates about the PharmD as the entry-level degree have continued for approximately 40 years (Knapp, 2011) but the issue was finally resolved in July 1992, at the annual meeting of the AACP (Francisco, 2003). The delegates voted overwhelmingly to endorse the PharmD degree as the sole degree leading into the practice of pharmacy (Francisco, 2003). In 1997 with the publication of Standards 2000, the ACPE put in place the requirement that all pharmacy schools develop a plan for transitioning from two degrees to one degree by July 1, 2000 (Bright et al., 2010). Then, all schools and colleges of pharmacy revised their curricula in order to receive accreditation.

2.4.7.1.2.1 Enablers

1) Leadership: The close association between the AACP and ACPE played a vital role in the strength of the AACP's suggestions. The AACP influenced the ACPE to revise accreditation standards for all school of pharmacy to include the PharmD degree and the educational elements necessary for providing pharmaceutical care (Boss and Lowther, 1993; Carter, 2016).

2) Evidence of support: Between 1986-1991, many articles focused on the important of preparing pharmacists for the changing of the pharmacy profession by shifting towards a more comprehensive patient-focused care (Boss and Lowther, 1993; Hepler, 1990) and other factors that stimulated a need for change in pharmacy education, particularly the rising cost of health care (Boss and Lowther, 1993; Bright et al., 2010; Gans, 1990; Marcellus, 1995).

There were also a number of studies regarding measuring the effect of the PharmD graduates in practice, compared to the Bachelor of Science in Pharmacy programmes (the degree will be referred to as the BPharm in this thesis). The conclusions that might be drawn from these studies were as follows: job activities and professional satisfaction of BPharm and the entry-level PharmD graduates were not significantly different (Barnett and Matthews, 1992; Hill, 1999).

However, most of the studies were limited in their methodology due to such issues as low response rates and imbalanced representation by degrees (Hill, 1999; Koleba et al., 2006). Furthermore, many papers had been published at least ten years ago.
So, transferability of these studies should be considered carefully due to significant differences in environment and conditions, such as health care systems, education systems, and levels of acceptance of the pharmacy profession (Koleba et al., 2006).

3) Perceived benefits: Some stakeholders perceived that the PharmD programme would increase the prestige of the school and the school would get a bigger budget and more academic staff (Knapp, 2011).

2.4.7.1.2.2 Barriers

Transition to the PharmD has not been without controversy (Bright et al., 2010; Francisco, 2003). The barriers that have been mentioned are as the follows:

1) Lengthening the education programme for a year would cost money. Tuition fee would increase, student debt would rise, and the state would have to contribute more funding to support the programme. The longer and more costly programme would drive away applicants; student quality would therefore decline (Knapp, 2011).

2) There would be a lack of competent preceptors (Scheckelhoff et al., 2008).

3) The new standard would produce overqualified pharmacy graduates, especially in community pharmacies, that mainly involved dispensing activities (Knapp, 2011; Kreling et al., 2010).

2.4.7.1.3 The US PharmD curriculum

Compared to the BPharm, the PharmD curriculum was extended by one year that included additional pharmacotherapy and patient care coursework, plus expanded experiential learning with specified activities emphasising clinical skills; for example, counselling patients or advising other health professionals on drug use issues (Kreling et al., 2010; Lovett et al., 2014).

Typically, the PharmD programmes in schools of pharmacy last 4 years. The first year in the school of pharmacy consists mainly of foundation courses: communication, biochemistry, anatomy, and introduction to pharmacy (Lovett et al., 2014). In year 2 and 3, the course work will focus on the practice-related topics such as pharmaceutics, pharmacokinetics, medicinal chemistry, pharmacology, and therapeutics (Lovett et al., 2014). Year 4 is typically clerkship-type instruction in a practice setting. The clerkships in year 4 are called Advanced Pharmacy Practice Experiences (APPEs), which involve structure training in a specific practice setting, including hospital, nursing home or ambulatory care clinic (Lovett et al., 2014; Patton et al., 2010).

There are four major domains in the educational outcomes: i) patient-centred care; ii) health system management; iii) health and wellness and iv) promotion of population-based care (Accreditation Council for Pharmacy Education, 2015; Center for the Advancement of Pharmaceutical Education Advisory Panel on Education Outcomes, 2004; Islam et al., 2016; Nemire and Meyer, 2006).

Challenges in the US pharmacy education

Even though the transition from the BPharm to PharmD programme in the US has been accomplished, the American College of Clinical Pharmacy (ACCP) and the American Society of Health-System Pharmacists (ASHP) thought that the pharmacy education should be better. Both organisations share a common vision that all pharmacists who are involved with direct patient care will be required to complete a residency prior to entering practice by 2020 (Engels et al., 2015). They thought that the current curricula were not addressing medical advances and discoveries; for example, the emergence of HIV/AIDS, as well as new developments in biotechnology and immunology (Bright et al., 2010).

Some barriers were mentioned concerning the cost of creating residency positions and the need for qualified preceptors. However, solutions to overcome these barriers were proposed; for example, developing preceptor training programmes, standardising teaching certificates and encouraging smaller community hospitals to develop residency programmes (Bright et al., 2010; Engels et al., 2015).

2.4.7.2 Japan

2.4.7.2.1 Need for the change

The curriculum change was made to address the strong demand for highly competent pharmacists to deliver pharmaceutical care for the health care teams (Kurosawa, 2011). In order to enable pharmacists to deliver the effective and high quality of pharmacy services for these changing roles, it was considered necessary to adopt the 6-year programme (Watanabe et al., 2005a).

2.4.7.2.2 Process of the transition to the PharmD degree

For Japanese pharmacy education to change to a 6-year programme was proposed by the Japan Pharmaceutical Association (JPA) in 1973. However, the change was not implemented until 2003, when the Council for Pharmaceutical Education approved the transition (Dolder et al., 2008).

In 2006, the pharmacy education system in Japan was in transition from the traditional 4-year programme into two programmes, namely: a traditional 4-year programme and a new 6-year Bachelor of Pharmacy programme, which is similar to the PharmD programme (Dolder et al., 2008; Kurosawa, 2011). The traditional 4-year programme emphasised pharmaceutical sciences due to the career decisions of graduates; approximately 80% of Japanese pharmacy graduates enter the pharmaceutical industry (Watanabe et al., 2005a).

The 4-year BPharm graduates are not able to obtain a national pharmacy license (Kanke, 2012). The 6-year programme is mandatory for registration for the licensure examination and is related to the accreditation system (Inoue, 2007). Thus, only the graduates from the new 6-year programme are able to obtain a national pharmacy license (Kurosawa, 2011).

2.4.7.2.2.1 Enablers

There is a prescription law that separates prescribing and dispensing in Japan (Bungyo) (Akaho et al., 2003; Inoue et al., 2015). This law allows opportunities for pharmacists to provide pharmaceutical care activities within the scope of the prescription law (Watanabe et al., 2005b; Watanabe et al., 2005a).

2.4.7.2.2.2 Barriers

The transition to the 6-year programme in Japan has also had many challenges. Those challenges include insufficient numbers of academic staff in the clinical pharmacy area; lack of experienced preceptors; barriers to providing clinical pharmacy activities due to a high volume of prescriptions; and other health care professionals still having doubts about the role of pharmacists (Watanabe et al., 2005a).

2.4.7.2.3 The PharmD curriculum

The 6-year programme provides students with more pharmaceutical care, pharmacy practice, and pharmacotherapy courses. It includes 2.5 month rotations in hospital and community pharmacy settings, which are longer than the 4-year programme that included only 2-4 week hospital pharmacy rotation (Watanabe et al., 2005a).

2.4.7.3 South Korea

2.4.7.3.1 Need for the change

The curriculum change in the Republic of Korea (South Korea) was made to address the significant change in pharmacy practice, since a new prescription law was enacted in 2000 (Kim and Ghimire, 2013). The new law completely separates the prescribing and dispensing functions between physicians and pharmacists. After the new law, physicians may no longer dispense medications to their patients and pharmacists may no longer make diagnoses on their own or sell prescription drugs without a prescription. These conditions were aimed to address certain public health issues; in particular high rates of drug misuse and overuse (Cho, 2002). However, pharmacists' compliance with their new roles has been suboptimal. This result is because of the 4-year BPharm programme had mainly focused on the pharmaceutical sciences and most graduates had inadequate preparation to equip them to provide clinical services (Kim and Ghimire, 2013).

2.4.7.3.2 Process of the transition to the PharmD degree

In order to cope with the scope of Korean pharmacy practice and align with the global trend toward 6-year pharmacy programmes, the Ministry of Education and Human Resources Development of Korea reorganised the pharmacy programme in 2005 (Kim and Ghimire, 2013; Yoo et al., 2014). The transition from the 4-year programme to the 6-year programme was fully implemented in 2009 (Yoo et al., 2014).

2.4.7.3.2.1 Enablers

According to the new situation regarding prescription, Korean pharmacists are required to perform drug use evaluation and medication counselling for a patient prior to dispensing (Kim and Ghimire, 2013).

2.4.7.3.2.1 Barriers

There is the need to build infrastructure for the pharmacy practice experiences such as networking with training sites and preceptors. There is also a need to develop facilities and resources; in particular funds, manpower and knowledge (Choi, 2011).

2.4.7.3.3 The PharmD curriculum

The previous 4-year pharmacy programme was expanded to the 6-year (2+4) programme (Kim and Ghimire, 2013). The 6-year programme increased the courses in clinical pharmacy and the training period (Kim and Ghimire, 2013; Yoo et al., 2014). The new curriculum includes a 2-year pre-pharmacy course and 4 years of pharmacy with practice experience.

After the 2-year pre-pharmacy course, students have to pass the Pharmacy Education Eligibility Test (PEET), organised by the Korean Association of Pharmacy Education (KAPE) before beginning the 4-year programme (Yoo et al., 2014). The PEET examination includes subject such as biology, chemistry, physics, and mathematics. Students also have to submit an internationally authorised English test: for example, the Test of English as a Foreign Language (TOEFL) (Kim and Ghimire, 2013; Korean Pharmaceutical Association, 2016).

The new programme includes pharmacy practice experiences (training) that are divided into 2 phases: i) Phase 1 (IPPE) (70 hours), where students are exposed to pharmacy practice environments within the college under supervision of preceptors and ii) Phase 2 (APPE) (1,330 hours) that provides students with in-depth courses and professional experiences (Kim and Ghimire, 2013; Yoo et al., 2014).

2.4.7.4 Pakistan

2.4.7.4.1 Need for the change

There were two main motivations for the transition to a PharmD programme in Pakistan (Khan, 2011). The first motivation was to provide a way for future graduates to practice in the US (Hadi and Hughes, 2009; Khan, 2011); second was to develop the new curriculum to prepare the future pharmacist to have the capacity to work in various careers in Pakistan, especially in the patient care area (Khan, 2011; The Pakistan Pharmacy Council, 2013).

2.4.7.4.2 Process of the transition to the PharmD degree

In 2004, the Higher Education Commission (HEC) of Pakistan upgraded the 4-year BPharm to the 5-year PharmD programme in order to standardise the Pakistani pharmacy educational system, according to international education and practice needs (Khan, 2011; Madiha and Yang, 2014). It had been announced that the 5-year PharmD was the essential condition for a university's PharmD accreditation, and a requirement for a pharmacist to practice in Pakistan (Khan, 2011).

2.4.7.4.2.1 Enablers

Many Pakistani universities countered deficiencies by sharing knowledge, skills and updates in clinical pharmacy with other universities (e.g., Universiti Sains Malaysia in Malaysia).
In addition, the government hired a broad range of pharmacists in major public hospitals in order to establish and provide pharmaceutical services and to serve as training sites for the PharmD graduates in the future (Hadi and Hughes, 2009).

2.4.7.4.2.2 Barriers

1) There were concerns about an inadequate number of experienced and qualified academic staff in the pharmacy practice area, lack of practice based-settings, as well as the insufficient clinical content and practice training in the PharmD programme (Jamshed, 2009; Jamshed et al., 2007; Khan, 2011; Madiha and Yang, 2014), all of which may lead to low quality of education and low student satisfaction and performance (Amir, 2011).

2) There are many challenges for PharmD graduates in practice; for example, lack of an acceptance by other health professionals (Ghayur, 2008; Khan, 2011; Madiha and Yang, 2014), the dispenser in pharmacies and hospitals performing the pharmacists' jobs (Khan, 2011); lack of the public awareness of the pharmacists' roles (Khan, 2011), and a severe pharmacy workforce shortage (Anderson and Futter, 2009; FIP, 2015a).

2.4.7.4.3 The 5-year PharmD curriculum

The 5-year PharmD programme had increased content and practice in pharmaceutical care and the clinical pharmacy clerkship. However, there were reports that the clinical and social aspects of pharmacy; in particular patient counselling, research methods and evidence-based medicines, as well as other major areas (e.g., pharmacogenomics, pharmacoeconomics, pharmacoepidemiology, public health pharmacy and drug policy) were not included in the new curriculum (Hassain and Jamshed, 2016; Khan et al., 2015; Khan, 2011).

In this section, the transition from the BPharm to the PharmD programme in the US, Japan, South Korea, and Pakistan have been discussed. Key points summarising the transition from the BPharm to the PharmD degree or the similar programmes are described in Table 2.8, highlighting the need for the transition, process and barriers of the transition in those selected countries including Thailand (see details in section 2.5.5).

Table 2.8 Key points summarising the transition from the BPharm to the PharmD degree or similar programmes in term of need and process in five selected countries

	US (Bright et al., 2010; Carter, 2016; Dolder et al., 2008; Kreling et al., 2010; Scheckelhoff et al., 2008)	**Japan** (Dolder et al., 2008; Inoue, 2007; Kurosawa, 2011; Watanabe et al., 2005a)	**South Korea** (Choi, 2011; Chun et al., 2009; Kim and Ghimire, 2013; Yoo et al., 2014)	**Pakistan** (Hadi, 2010; Hadi and Hughes, 2009; Khan, 2011; Madiha and Yang, 2014; The Pakistan Pharmacy Council, 2013)	**Thailand** (Pongcharoensuk and Prakongpan, 2012; The Pharmacy Council of Thailand, 2008)
Need					
Need for the transition	To have a highly skilled clinical pharmacist to provide the pharmaceutical care and work with health care teams	To cope with the regulations that changes in the scope of pharmacy practice in their countries	-To cope with the regulations that changes in the scope of pharmacy practice in their countries -To align with the global trend toward 6-year programme	-To standardise the Pakistani pharmacy educational system according to international education and local practice needs -To enable the graduates to work abroad (e.g., US, Gulf region)	The policy makers believed that the 6-year PharmD will produce pharmacy graduates who had knowledge and skills needed by the job market.
Context					
Previous programme	The 5-year Bachelor	The 4-year BPharm	The 4-year BPharm	The 4-year BPharm	The 5-year BPharm
New programme	The 6-year PharmD (PC[a])	The 6-year BPharm (PC[a])	The 6-year programme (PC[a], IP[b])	The 5-year PharmD (PC[a], IP[b])	The 6-year PharmD (PC[a], IP[b])
The different between the previous and the 6-year curriculum	PharmD curricula were extended by one year that includes additional pharmacotherapy and patient care coursework plus expanded experiential learning	The new 6-year BPharm programme focused on patient care and had longer rotations in hospital and community pharmacy settings.	The new programme increases the number of required courses in clinical pharmacy and training period.	Increase knowledge and practice in pharmaceutical care and the clinical pharmacy clerkship in the 4th and 5th year.	The 6-year PharmD increased practice hours from 500 hours in BPharm to 2,000 practice hours in PharmD.
Process of transition					
Process	In 1997, the ACPE[c] decreed that they would no longer accredit BPharm programmes in 2000 and all schools of pharmacy had to convert to the PharmD as the sole professional degree.	Proposed by the JPA[d] in 1973 and approved by the Council for Pharmaceutical Education in 2003.	The Ministry of Education and Human Resources Development of Korea reorganised the pharmacy programme in 2005. The new programme was fully implemented in 2009.	In 2004, the HEC[e] of Pakistan upgraded the 4-year BPharm to the 5-year PharmD programme in 2004.	Proposed by the PECT[f] and it was mandated by the PCT[g] for pharmacy licenses in 2008. All schools moved to the 6-year programme in 2010.
External drivers (e.g., regulations supporting in the new role of pharmacists)	The MTM[h] has been codified into law, and Medicare Part D providers are required to offer MTM services to patients.	Pharmacists have the opportunities to provide pharmaceutical care activities within the scope of the prescription law.	Pharmacists have the opportunities to provide pharmaceutical care activities within the scope of the prescription law.	N/A	N/A
Perceived barriers	Difficulties to provide adequate numbers of hospital-based preceptors due to the lack of competence preceptors	Inadequate number of academic staff in clinical pharmacy and qualified preceptors.	There is need to build infrastructure for pharmacy practice experiences.	1. Limitations in pharmacy education 2. Limitation of pharmacists' roles in clinical settings	Lack of long-term strategies for reasonable implementation

[a]PC = Pharmaceutical care; [b]IP = Industrial pharmacy; [c] ACPE = Accreditation Council on Pharmaceutical Education; [d]JPA = the Japan Pharmaceutical Association;
[e]Higher Education Commission (HEC); [f]PECT = Pharmacy Education Consortium of Thailand; [g]PCT = Pharmacy Council of Thailand; [h]MTM= Medication Therapy Management

2.5 Pharmacy practice and education in Thailand

2.5.1 Thailand country profile and health statistics

Thailand is located in Southeast Asia; it covers an area of approximately 541,000 km^2, divided into 77 provinces with a population of 67 million; 96% are Thais, 51% are females and 44% live in the municipal areas (Department of Provincial Administration: Ministry of Interior, 2011; National Statistical Office, 2011). See Figure 2.7 for its geographical location and neighbours in South-East Asia. Most of Thai people are Buddhists (93%), followed by Muslims (5.4%), Christians (0.9%) and others (Wibulpolprasert, 2010). Thai is the nation's official language. Life expectancy at birth is 71 for males and 78 for females (Bureau of Policy and Strategy: Office of the Permanent Secretary, 2013).

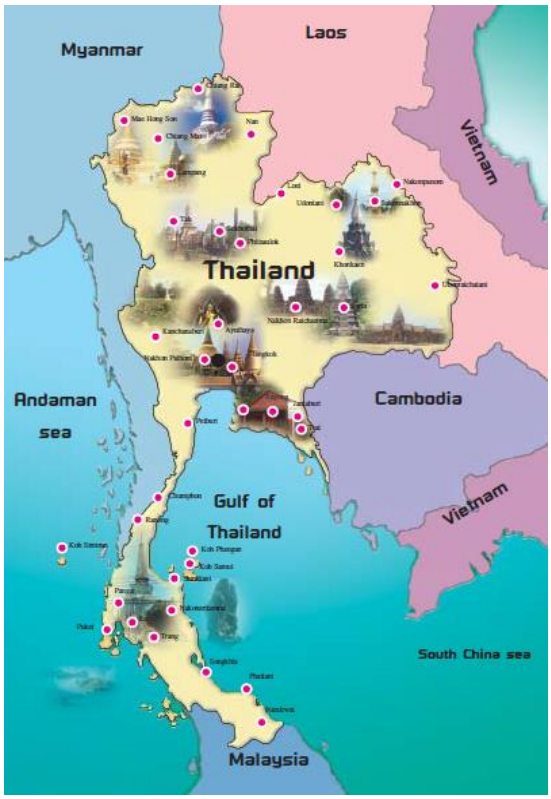


Figure 2.7 Map of Thailand
Taken from Thailand Health Profile 2008-2010 (Wibulpolprasert, 2010)

Thailand has met several millennium development goals (MDGs) such as poverty and hunger reduction, universal primary education, gender equality, fighting against HIV/AIDS, and providing access to clean drinking water and sanitation. However, Thailand still needs to achieve sustainable development and to address targets on child mortality and maternal health (Office of the National Economic and Social Development Board, 2010; United Nations, 2012). Cancer, accidents, heart disease, hypertension and cerebrovascular disease were the leading causes of death in 2008-2012 (Bureau of Policy and Strategy: Office of the Permanent Secretary, 2013).

2.5.2 Health care systems in Thailand

Public and private providers deliver health care services in Thailand (Sakunphanit, 2015). The majority of the health care service system is public sector, largely under the Ministry of Public Health (MoPH) (Chaiyakunapruk et al., 2016; Sirirak, 2010). The Thai health system provides four comprehensive care packages to the population, ranging from community health care to special care (Sirirak, 2010).

1) Community health care services: these provide health promotion, prevention, and long-term care. They are delivered at home by the non-formal health workforce, which is made up of trained village health volunteers and health care providers, who are the primary care workers and nurses.

2) Primary health care services: this service is provided at health centres by health workforce members such as nurses and public health officers; some pharmacists are posted in selected health centres. Doctors and healthcare teams, including pharmacists, are made available at urban health centres; mobile clinics are provided to rural health centres once or twice a month. Private clinics also included in this service.

3) Secondary care services: these services are provided at community hospitals in rural areas, as well as in general hospitals and private hospitals in urban areas that mainly target curative and rehabilitative care at the individual level, and serve as referral hospitals for primary care facilities. Doctors and healthcare teams are responsible for providing care.

4) Tertiary care services: these services are located in cities that include general hospitals, regional hospitals, medical school hospitals, and large private hospitals. The services are mainly provided in curative care, particularly in medical specialty services (Sirirak, 2010). Thailand has three main public health insurance schemes: i) the Civil Servant Medical Benefit Scheme (CSMBS), covering 5 million (8%) civil servants, public employees and their dependents; it is funded by a general tax; ii) the Social Security Scheme (SSS) covers 9 million (17%) private employees, and temporary public employees. It is funded via contributions from employees, employers and the government; iii) Universal Coverage Scheme (UCS) covers 47 million (75%) Thai nationals who are not covered under other schemes. It is funded by general taxes and operated by the National Health Security Office (NHSO). However, private health insurance is also available for personal options (Chaiyakunapruk et al., 2016).

2.5.3 Pharmacy practice in Thailand

In 2012, there were approximately 28,000 registered pharmacists in Thailand. However, a survey conducted by the Human Resources for Health Research and Development Office and a health resources survey conducted by the Bureau of Policy and Strategy, found that there were approximately 8,000 pharmacists working at health care facilities. Therefore, the pharmacist to population ratio is 1:7,810 (Steering Committee on Formulation of 11th National Health Development Plan, 2012). The pharmacist to population ratio is lower than the Thai government's strategic plan in 2004 (1:5,000) and also lower than the WHO's criterion of 1:2,000 (Azhar et al., 2009). Therefore, the Thai pharmacy workforce is still critically insufficient.

Thai pharmacists are required to become involved in all aspects of the pharmaceutical supply chain, from the pharmaceutical industry to monitoring patient outcomes (Pongcharoensuk and Prakongpan, 2012). The sectors in which Thai pharmacists work are categorised as hospitals (40%), pharmacy marketing (22%), community pharmacies (17%), the pharmaceutical industry (10%), consumer protection (6%) and education (5%) (Prapunwattana, 2012).

In the following section, the two main pharmacy practice area will be reviewed, these being: i) pharmaceutical care involving hospital pharmacy and community pharmacies, and ii) industrial pharmacy. These are the two main tracks in a 6-year PharmD programme in Thailand.

2.5.3.1 Pharmaceutical care area

2.5.3.1.1 Hospital pharmacy

Hospital pharmacists form a major part of the pharmacy workforce in Thailand (Prapunwattana, 2012). Thai hospital pharmacists have major roles in:

1) Drug dispensing
2) Drug purchasing and inventory control
3) Patient oriented services (e.g., drug use decision-making, selection of drug products)
4) Health consumer protection (Koster et al., 2014; Rattanachotphanit et al., 2008).

The Thai hospital pharmacists' qualifications surveyed by the Association of Hospital Pharmacy (Thailand) (Thai HP) in 2009, showed that the majority of hospital pharmacists (72%) held the 5-year BPharm degree; only 7% had the traditional 6-year PharmD, and the remaining 21% were postgraduates with master's degree, doctor of philosophy degree, or board-certified specialists (Wongpoowarak et al., 2013). However, up to now there has been no research about the suitability of the PharmD graduates employed in hospital settings in Thailand.

Before 1990, the pharmacy services were mainly involved in drug dispensing and distribution. After adopting the concept of pharmaceutical care, Thai hospital pharmacists began to integrate their clinical pharmacy activities into their pharmacy care practice, particularly by participating in ward rounds (Chaiyakunapruk et al., 2016; Pitaknitinun and Jongsirilerd, 2008) (see Figure 2.8).

Figure 2.8 The Thai clinical pharmacist working in medical ward
Location: North Eastern, Thailand, date taken: 10/08/2013

Thai hospital pharmacists have become an essential part of the health care team. The model for providing pharmaceutical care has expanded to all hospital levels. A number of specialities have been developed and recognised nationwide. The success of hospital pharmacy practice might be because of the strong hospital pharmacy organisation, together with an active quality assurance system. In addition, strong support from the academic sector also has a great emphasis on patient-oriented education and the development of the PharmD programme, which provides an advanced role for pharmacists in Thailand (Chaiyakunapruk et al., 2016).

There are both similarities and differences in the hospital pharmacists' roles in Thailand and in the UK. Hospital pharmacists in both countries are involved in the same activities: for example, dispensing, providing drug information and the manufacturing of sterile medicines. However, Thai hospital pharmacies services have a high workload on dispensing prescriptions for outpatient services, while in the UK community pharmacists take on much of this role. This role difference might be because Thai community pharmacies are not included in the country's health care system. The UK hospitals' pharmacists regularly perform a clinical role and visit patients on the wards, as they work with health teams (Hall, 2013).

However, the provision of pharmaceutical care in Thailand is voluntary, and therefore it has not been incorporated into routine pharmacy practice in Thai hospitals (Ngorsuraches and Li, 2006).

The majority of the professional standards governing hospital pharmacy services in Thailand and the UK are similar; particularly in the areas of safe and effective use of medicines, providing quality patient care, leadership, and management. However, in the UK, workforce planning is required for reviewing, developing, supporting, and funding a pharmacy workforce and workforce development; matters which fail to get a mention in the Thai professional standards. The comparison features of hospital pharmacy in Thailand and the UK are presented in Table 2.9.

Table 2.9 Comparison of hospital pharmacy in Thailand and the United Kingdom

Factor	Thailand	United Kingdom
Overview		
Medical insurance system	The Thai health care system has three parts; CSMBS, SSS, UCS	Under the government-managed National Health Service (NHS) which is financed by taxes. All people can received medical services free of charge (Department of Health, 2000).
Hospital pharmacy practices		
Professional standards for hospital pharmacy services	Professional standards for hospital pharmacy declared by the Association of Hospital Pharmacy (Thailand) in cooperation with the Division of Provincial Hospital (Pramyothin, 2013) for hospital pharmacies to accomplish are as follows; 1. Leadership and practice management 2. Drug information and education 3. Optimising medication therapy 4. Medication distribution and control 5. Facilities, equipment and information resources 6. Research (Chaiyakunapruk et al., 2016)	Professional standards for hospital pharmacy services: optimising patient outcomes from medicines by the Royal Pharmaceutical Society (Royal Pharmaceutical Society, 2014). **Domain 1:** Patient experience (e.g., putting patients first, episode of care, integrated transfer of care) **Domain 2:** Safe & effective use of medicines (e.g., effective use of medicines, supply of medicines) **Domain 3:** Delivering the service (e.g., leadership, government and financial management, workforce)
Hospital pharmacy workforce -Pharmacists -Pharmacy technicians	5,591 pharmacists and 4,569 pharmacy technicians (Pagaiya and Hongtong, 2011)	7,500 pharmacists (Stephens, 2011) and 21,000 pharmacy technicians (Inoue et al., 2015)
Hospital pharmacy services	-Drug dispensing, drug purchasing and inventory control, patient care services (e.g., ward rounding, medical reconciliation), health consumer protection, pharmaceuticals preparation, drug information service -Specialise: e.g., cardiology, nephrology, infectious disease, paediatrics, geriatrics, oncology	-Supply, clinical services (e.g., ward rounding), provision of information, pharmaceuticals preparation (e.g., sterile medicines, intravenous nutrition, radiopharmaceuticals) -Specialise: e.g., haematology, cardiology, nephrology, infectious disease, paediatrics, geriatrics, medicine information service (Hall, 2013)

2.5.3.1.2 Community pharmacy area

Thai community pharmacies are one of the major health facilities where people can access medicines and health related products (Chan and Ching, 2005; Technical working group for analysis of the Thai drug system, 2002; Wibulpolprasert, 2010). The National Statistical Institute reported that approximately 25% of Thai people use the community pharmacy as the primary care provider in 2006 (National Statistical Office, 2006).

There are three types of Thai community pharmacies:

1) Modern community pharmacies (see Figure 2.9), which must have a pharmacist on duty during business hours

2) Non-pharmacist drugstores, which are an old-fashioned form of pharmacies, operated by a businessperson without a registered pharmacist and that sell only household remedies and ready-packed medicines. This type of drugstore will shortly fade out as permission to operate these businesses have been withdrawn.

3) Traditional drugstores, which are required by law to have an expert in traditional medicines (Chan and Ching, 2005; Food and Drug Administration of Thailand, 2011; Saramunee et al., 2011).

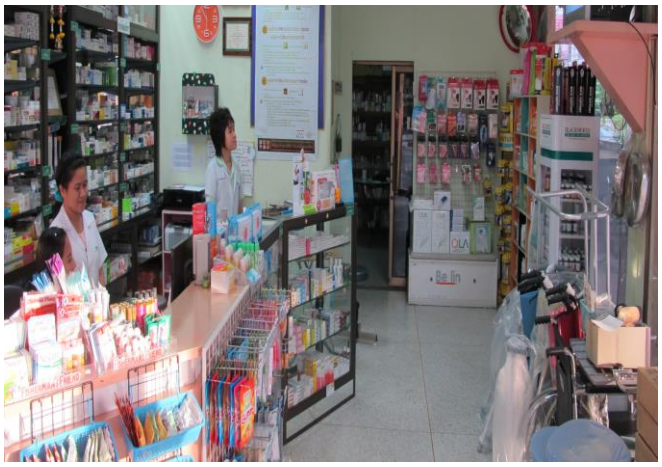


Figure 2.9 The modern community pharmacy in Thailand
Location: North Eastern, Thailand, date taken: 11/08/2013

All drug stores are regulated by the Food and Drug Administration of Thailand (Thai FDA), under the Ministry of Public Health (MoPH). Modern medicines are divided into four major groups;

1) Household remedies: common medicines for minor ailments that can be purchased from supermarkets and petrol stations without the supervision of a pharmacist (e.g., paracetamol 500 mg, 10 tablets per strip).

2) Ready-packed medicines: these can be sold, without prescription, by pharmacists, nurses and other medical professionals (e.g., Paracetamol 500 mg, 100 tablets per container).

3) Dangerous medicines: that can be bought without prescription in a drugstore staffed by a pharmacist, such as antibiotics, oral contraceptives, anti-hypertensive drugs

4) Specially controlled medicines: which can obtained with a valid prescription in a drugstore staffed by a pharmacist; for example steroid tablets (Chan and Ching, 2005; Saramunee et al., 2011; The Constituent Assembly in the capacity of the National Assembly, 1967)

Self-medication is a common practice among Thai people. They can access medicine via private clinics and community pharmacies. They can purchase the dangerous medicines from community pharmacies. In addition, some drugs that need to be dispensed by the pharmacists are illegally available in grocery shops in the rural villages (Chaiyakunapruk et al., 2016).

In 2015, there are 360 community pharmacies, accredited by the Thai FDA, participating in the National Health Security Office (NHSO)'s primary care project (Lochid-amnuay et al., 2009). These accredited community pharmacies are able to provide four primary care services:

1) Screen people for diabetes mellitus and hypertension and refer those who are at risk to a community hospital for further evaluation

2) Provide medicine management, such as prevention and management of drug related problems

3) Provide smoking cessation services

4) Provide health information and benefit of health insurance schemes (Ploylearmsang et al., 2013).

Participating in the community pharmacy in the NHSO's primary care project is starting to upgrade community pharmacy to be an excellent first line health care service setting. Pharmacy faculties should prepare the PharmD graduates for their expected roles, especially in the primary care services.

There are some similarities and differences between community pharmacies in Thailand compared in England (Inoue et al., 2015; Royal Pharmaceutical Society of Great Britain, 2009; Saramunee et al., 2011; The Centre for Workforce Intelligence, 2013; The Pharmacy Council of Thailand, 2013c) (see Table 2.10).

Community pharmacists in both countries have provided health prevention and health promotion services; for example screening for chronic diseases and smoking cessation services (Nimpitakpong et al., 2010; Peletidi et al., 2016; Ploylearmsang et al., 2013). However, the UK community pharmacists have a wider scope of practice compared to those in Thailand, particularly the authority to prescribe (Hall, 2013), to carry out a medication use review (Latif et al., 2013), providing flu vaccination services (Anderson and Thornley, 2014; Anderson and Thornley, 2016). These extended services have been accepted by the national funding bodies across the UK; whilst such services are at the beginning phase in Thailand.

Table 2.10 Comparison of community pharmacies in Thailand and England

Factor	Thailand	England
Number of community pharmacies	17,398 (33% pharmacies are located in Bangkok (1 pharmacy:2,116 population); 67% are located in regional (1 pharmacy:7,500 population) (National Statistical Office, 2011)	11,495 (Prescribing and Primary Care team: Health and Social Care Information Centre, 2013)
Number of community pharmacies per 1000,000 population	26.60	22 (Prescribing and Primary Care team: Health and Social Care Information Centre, 2013)
Proportion of community pharmacy	97% Independent, 3% Chain store	61% Chain store, 39% Independent
Drug regulation	Drug Act, B.E. 2510 (1967) describes four types of drug available in Thailand; 1. Household remedies 2. Ready-packed medicines 3. Dangerous medicines 4. Specially controlled medicines (The Constituent Assembly in the capacity of the National Assembly, 1967).	The Medicines Act 1968 describes three types of drug as available in England: 1. Prescription-only medicines (POM) dispensed according to a doctor's prescription. 2. Pharmacy-only medicines (P) sold under the supervision of a pharmacist. 3. General sales list (GSL) or the "over the counter" medicines are medicines that can be purchased from general stores, supermarket, petrol stations without the supervision of a pharmacist (Boyle, 2011).
Community pharmacy regulation	Bureau of Drug Control, Thai FDA regulation compulsory	Three national organisations that have key functions for community pharmacy are as follows; 1. The General Pharmaceutical Council (GPhC) registration compulsory 2. The Royal Pharmaceutical Society (RPS) acts as the professional leadership body 3. The Pharmaceutical Services Negotiating Committee (PSNC) is the representative body for community pharmacies in England (The NHS Confederation (Employers) Company Ltd, 2013)
Funding	Almost 100% medicines and other sales (Most of community pharmacies have not yet been connected to the national health system. They are independently and privately run.)	-80% NHS services: prescription dispensing plus commissioned public health services, 20% medicines and other sales (Boyle, 2011; Smith et al., 2013).
Services	**1. Conventional services** (e.g., Providing services in common ailments, referring for the potential serious problems) **2. Role as subcontractor with the public hospitals or private clinics** -Dispensing the prescribed medications and refilling the prescription and DRPs management **3. Pharmaceutical care** (e.g., patient assessment, medication monitoring) (Kittipibul et al., 2006), medication therapy management (MTM), family pharmacy service (Yotsombut et al., 2012) **4. Primary care services** (e.g., screening for diabetes mellitus and hypertension, provide health information and benefit of health insurance schemes (Ploylearmsang et al., 2013; Yotsombut et al., 2012)	NHS services provided by community pharmacies (three-tiered model) **1. Essential** (distribute by all pharmacies): prescription dispensing, disposal of unwanted medicines, promotion of healthy lifestyles **2. Advanced** (distribute by 86% of pharmacies): Medicines use review (MUR), the New Medicines Service (NMS). These two services are commissioned as part of the national pharmacy contract which community pharmacies can be reimbursed for supporting patients in their medicines uses (Smith et al., 2013). **3. Enhanced** (varied distributed): public health service, cardiovascular screening, smoking cessation, provision of free emergency hormonal contraception.
Health promotion services[a]	Screening for diabetes mellitus and hypertension, weight management, nutrition and physical activity, sexual health services, smoking cessation services, home care, depression screening and advisory service (Inoue et al., 2015; Phimarn et al., 2015)	Smoking cessation support, hypertension/diabetes screening, asthma screening, weight management, screening risky alcohol use, emergency contraception, immunization, home care (Anderson, 2000; Anderson and Thornley, 2014; Anscombe et al., 2012)
Standard guideline	Standard of Accredited Pharmacy (2001) by the Pharmacy Council of Thailand (Pramyothin, 2013)	Professional Standards for Public Health Practice for Pharmacy (The Royal Pharmaceutical Society, 2013)

[a]Most are not accredited for additional services

2.5.3.2 Industrial pharmacy

Thailand's generic drugs industry comprises of 167 companies, of which 157 conform to a Good Manufacturing Practice (GMP) standard (The Office of Industrial Economics, 2013). The Thai pharmaceutical industry mainly focuses on formulating drug products from imported active ingredients and the manufacturing of generic products (Chan and Ching, 2005). Thailand has quite a good potential for research and development on generic drugs, in terms of drug formulation that is not using advanced or complicated technology. Thailand had rarely developed new drugs due to the high cost of investment and high level of research required to do so (The Office of Industrial Economics, 2013).

There are three categorises of drug manufacturers in Thailand:
1) Multinational corporations that manufacture active ingredients and pharmaceutical formulations
2) Thai-owned companies that mainly focuses on producing pharmaceutical formulations
3) The Government Pharmaceutical Organisation (GPO) that primarily prepare pharmaceutical formulations for public hospitals (Chan and Ching, 2005).

The pharmacists who work in industry are mainly involved in product and quality control. Their main duty is to look after the medical products to ensure that the products comply with the requirements, and do not place patient at risk due to inadequate safety, quality or efficacy (Chantaraskul, 2014).

The Thai pharmaceutical industry has been confronted with various changed situations, as can be seen in the continuous growth of pharmaceutical imports, severe competition in major export markets, manufacturers needing to comply with the Pharmaceutical Inspection Cooperation Scheme (PIC/S) GMP standards. The Thai pharmaceutical industry lacks a number of experts in research and developments; a deficit that also applies to the sub-strength pharmacy workforce in Thailand's pharmaceutical industries (The Office of Industrial Economics, 2013).

There are some similarities and differences between the pharmaceutical industries in Thailand compared with the UK. The majority of the pharmaceutical companies in Thailand have mainly focused on the production of the generic medicines, which are medicines that are no longer covered by a patent and can there be made and sold more cheaply by other companies. In addition, a small number of drug companies in Thailand have research and development capacities.

On the other hand, the UK has both companies that have invested heavily in developing new medicine, as well as companies that limit their production to generic medicines (Hall, 2013). Therefore, the industrial pharmacists in UK have more opportunity to work in various activities than do those in Thailand. UK pharmacists become involved in research and development of new medicines, working alongside physicians and nurses during the clinical trial stage of developing a new medicine.

In addition, pharmacists in the UK and Thailand are able to work as a representative of a pharmaceutical company or pharmacy marketing area. Marketing includes activities such as advertising, visiting prescribers and provide those prescribers with information about the company's medicines being promoted (Hall, 2013).

2.5.4 Pharmacy education in Thailand

2.5.4.1 Pharmacy degree

The first pharmacy school in Thailand was founded in 1914. It offered a 3-year programme and expanded to a 4-year programme in 1941, and then to a 5-year BPharm programme in 1957 (Kapol et al., 2008; Pongcharoensuk and Prakongpan, 2012; Pramyothin, 2013; Sumpradit et al., 2014). The PharmD programme was originally offered as a 2-year post-bachelor programme, and then transitioned to an entry-level 6-year PharmD programme: announced in 1995 and implemented in 1997 (Chaiyakunapruk et al., 2016). The first of the Thai PharmD programmes was launched at Naresuan University (Pongcharoensuk and Prakongpan, 2012).

For the BPharm graduates who would like to study in the PharmD programme, the Faculty of Pharmaceutical Sciences, Naresuan University and Chulalongkorn University provided a 2-year post-BPharm PharmD programme (Thomas et al., 2011). Later, the post-BPharm PharmD programme was stopped due to there being no BPharm pharmacists interested in this programme. The BPharm pharmacists thought that this PharmD degree was equivalent to the undergraduate degree and would not provide benefit for them in terms of career advancement. However, there are the post-graduate programmes such as master's degree programme in clinical pharmacy or the Board Certified in Pharmacotherapy, which would help the Thai BPharm pharmacists to obtain further clinical pharmacy knowledge and skills.

The BPharm programme was no longer offered after 2010, due to the mandate of the Pharmacy Council of Thailand (PCT) that the 6-year PharmD programme would be eligible for the pharmacy licensure examination (Sumpradit et al., 2014; The Royal Thai Government Gazette, 2008). From 2010, all faculties offered only the PharmD programme, hence it is called an "all-PharmD" programme. The period and offered pharmacy degree in Thailand are presented in the Table 2.11.

At present, there are 19 faculties of pharmacy, based in 14 public and 5 private universities, which are accredited by the PTC to offer only the PharmD degrees (Table 2.12). Figure 2.10 presents the picture of one of the faculties of pharmacy in Thailand.

Table 2.11 The period and duration of offered pharmacy degrees in Thailand
(Chaiyakunapruk et al., 2016; Pongcharoensuk and Prakongpan, 2012; The Royal Thai Government Gazette, 2016)

Period	Offered degree	Duration (year)
1914-1934	Certification in Pharmacy Compounding	3
1935-1936	Certification in Pharmacy	3
1937-1940	Associate degree in Pharmacy	3
1940-1956	Bachelor of Sciences (BSc) or Bachelor of Pharmacy (BPharm)	4
1957-2010	Bachelor of Sciences (BSc) or Bachelor of Pharmacy (BPharm)	5
1999-2010	Doctor of Pharmacy (PharmD) (the 1995-announced PharmD)	6
2010-2016	Doctor of Pharmacy (PharmD) (the 2008-announced PharmD) or an "all-PharmD"	6
2017	Doctor of Pharmacy (PharmD) (the 2016-announced PharmD)	6

Table 2.12 List of faculties of pharmacy in Thailand
(Chaiyakunapruk et al., 2016; Pongcharoensuk and Prakongpan, 2012)

University	Year founded	Type of ownership
1. Faculty of Pharmaceutical Sciences, Chulalongkorn University	1913	Public
2. Faculty of Pharmacy, Chiangmai University	1966	Public
3. Faculty of Pharmacy, Mahidol Univeristy	1968	Public
4. Faculty of Pharmaceutical Sciences, Prince of Songkla University	1980	Public
5. Faculty of Pharmaceutical Sciences, Khon Kaen University	1983	Public
6. Faculty of Pharmacy, Silpakorn University	1985	Public
7. Faculty of Pharmacy, Rangsit University	1987	Private
8. Faculty of Pharmaceutical Sciences, Huachiew Chalermprakiet University	1993	Private
9. Faculty of Pharmaceutical Sciences, Naresuan University	1994	Public
10. Faculty of Pharmaceutical Sciences, Ubon Ratchathani University	1994	Public
11. Faculty of Pharmacy, Srinakharinwirot University	1996	Public
12. Faculty of Pharmacy, Mahasarakham University	1999	Public
13. Facuty of Pharmacy, Siam University	2006	Private
14. Faculty of Pharmacy, Payap University	2006	Private
15. School of Pharmacy, Walailak University	2007	Public
16. School o f Pharmacy, Eastern Asia Univeristy	2008	Private
17. Faculty of Pharmaceutical Sciences, Burapha University	2009	Public
18. School of Pharmaceutical Sciences, University of Phayao	2010	Public
19. Faculty of Pharmacy, Thammasat University	2012	Public

Figure 2.10 Faculty of Pharmaceutical Sciences in Thailand
Location: North Eastern, Thailand, date taken: 21/08/2013

There are many postgraduate programmes offered in Thailand: i) Masters and PhD degrees by numerous Faculties of Pharmacy; ii) the diploma degree for the Board Certification Pharmacotherapy Training Programme, which is a 4-year programme for training pharmacy residencies in specialised areas such as internal medicine, paediatrics, oncology (Srisopa et al., 2012). The programme is provided by the College of Pharmacotherapy of Thailand (CPhT). Another diploma degree provided by the College of Pharmaceutical and Health Consumer Protection of Thailand (CPHCP) aims to develop individuals who are expert pharmacist in health consumer protection (Pramyothin, 2013).

2.5.4.2 Entry qualification and educational cost

There were two paths of admission to pharmacy programmes: through direct admission or the central admission system. The details of entry qualification are presented in Chapter 4. The expenditure for one full time student at a faculty of pharmacy was approximately 140,000 baht per year (£2,700 or $4,100) for a public university (Clungsombat, 2005) and approximately 300,000 baht per year (£6,051 or $8,500) for a private university (Rangsit University, 2016).

2.5.4.3 Pharmacy licensure examination

Since 2003, the PTC has decreed that all pharmacy graduates must take a licensure examination in order to ensure and standardise the quality of pharmacists from different faculties. The licensure examination is divided into 2 examinations, which are the multiple choice questions (MCQ) and Objective Structured Pharmaceutical Examination (OSPE) (Kanke et al., 2012). All pharmacy qualifications in Thailand give the pharmacy graduates the same license to work across all sectors. However, the PCT will require pharmacy students who enter their study programme in 2017, to take two examinations for licensure. The first examination is at the end of the 4th year to test their core competencies and the second one at the end of their 6th year to determine their competencies in specialised areas (Pongcharoensuk and Prakongpan, 2012).

2.5.4.4 Number of pharmacy students and graduates

Approximately 2,500 new students are enrolled each year and approximately 2,000 graduate (Pramyothin, 2013). The number of the Thai BPharm and PharmD graduates from 1995-2015 (Chanakit et al., 2015a) is presented in Figure 2.11. Approximately 20% of students dropped out. However, there is no data available regarding the dropout of pharmacy students in Thailand. There were some possible reasons for dropping out as follows; i) capability in passing the examination or getting low grade point average; ii) some of them leave pharmacy for medicine or dentistry or other academic pursuits.

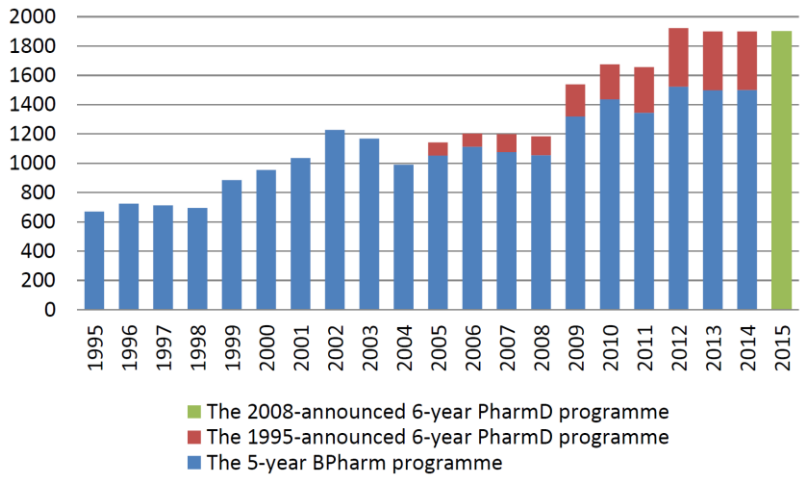


Figure 2.11 Number of BPharm graduates, 1995-announced and 2008-announced PharmD graduates during 1995-2012

Adapted with permission from Chanakit et al. 2015b, p.3

In 2013, the total number of the Thai PharmD graduates was only 1,600 or 8% of the total pharmacy graduates in Thailand (Prapunwattana, 2012; Tassaneeyakul et al., 2013; Wongpoowarak, 2013a). During 2005-2014, there were PharmD graduates from the 1995-announced PharmD in pharmaceutical care. The first class of the PharmD graduates from the 6-year PharmD programme, announced in 2008, graduated in 2015.

2.5.4.5 The number of Thai pharmacy academic staff and the first year student in 2013

The numbers of pharmacy academic staff, and of first year pharmacy students, from 19 university faculties for the year 2013, are presented in Table 2.13. The number of academic staff in the pharmaceutical care track was 429 (38%), which is lower than the 474 (42%) academic staff in the pharmaceutical sciences track. The first year pharmacy students are divided into three tracks. The tracks that had the highest number of PharmD students is the pharmaceutical care track, which totalled 1,199 students or 58% of all first year pharmacy students (Tassaneeyakul et al., 2013).

Table 2.13 The number of academic staff and the number of the first year pharmacy students in 2013 from 19 university faculties
Adapted from Tassaneeyakul et al. 2013

	Number (%) in each special track				Total
	Basic science	Pharmaceutical care (PC)	Pharmaceutical science or industrial pharmacy (IP)	Social and administrative pharmacy (SAP)	
Academic staff	80 (7%)	429 (38%)	474 (42%)	146 (13%)	1129 (100%)
The first year pharmacy students	N/A	1199 (58%)	797 (38%)	80 (4%)	2076 (100%)

2.5.4.6 Thai pharmacy curriculum structure

2.5.4.6.1 The differences between the pharmacy programmes in the past and present

Thai pharmacy education has changed from the 5-year BPharm degree, with its three main tracks of pharmaceutical care, pharmaceutical sciences, and Social and Administrative pharmacy, and a concurrent traditional 6-year PharmD pharmaceutical care programme, to "a single national 6-year PharmD programme" or "an all-PharmD programme" which includes industry pharmacy and pharmaceutical care tracks (The Pharmacy Council of Thailand, 2012b; Wongpoowarak, 2002) (see Figure 2.12).

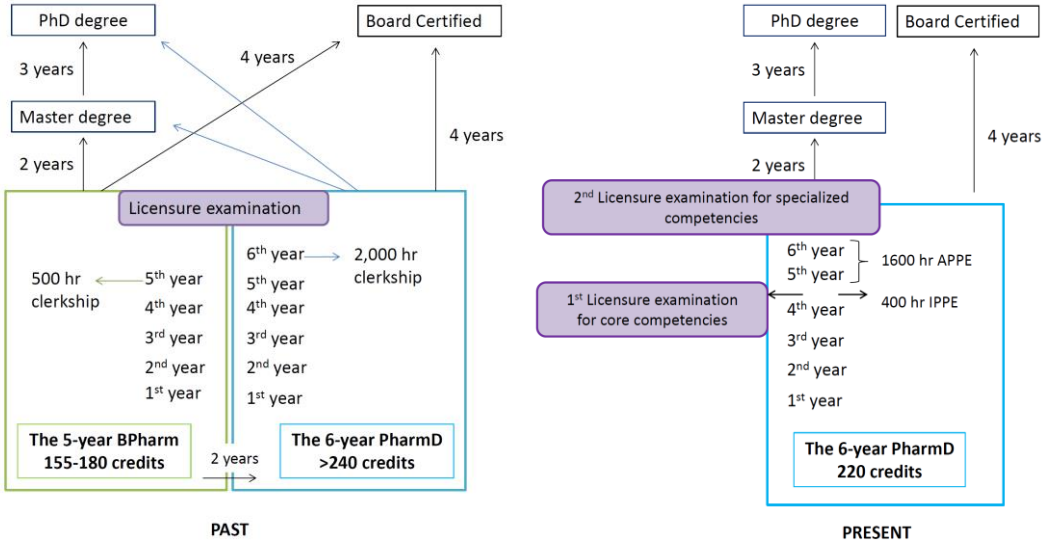


Figure 2.12 The pharmacy education in Thailand in the past (1997-2010) and the present
Adapted with permission from Wongpoowarak, 2002 (Tassaneeyakul et al., 2013; Wongpoowarak, 2002) (note: Two exams will be started for the PharmD students who enter in 2017)

The 6-year PharmD programme, announced in 2008, emphasised patient care by providing a higher number of credits in the pharmacy courses on patient care (30%), compared to the 25% in pharmaceutical sciences (The Pharmacy Council of Thailand, 2012a). However, later, the 2012, 2013 and 2015 announced 6-year PharmD programme course structures were divided into two main tracks: the pharmaceutical care PharmD programme (PC-PD) and the industrial pharmacy PharmD programme (IP-PD), which provide the number of credit in patient care (25%) equivalent to pharmaceutical sciences (25%) (see Table 2.14) (Chanakit et al., 2014; Sumpradit et al., 2014).

Table 2.14 Differences among the curriculum structures of the 5-year BPharm, the 2008 Announced 6-year PharmD programme and the 2012 Announced 6-year PharmD programme

(Sanguansermsri et al., 1998; The Pharmacy Council of Thailand, 2008; The Pharmacy Council of Thailand, 2012b; The Royal Thai Government Gazette, 2005; The Royal Thai Government Gazette, 2008)

	Before 2008: BPharm and PharmD programme		**From 2008: all-PharmD programme**			
	The 5-year BPharm[a]	The 1995 Announced 6-year PharmD	The 2008 Announced 6-year PharmD[b]	The 2012 Announced 6-year PharmD[b]	The 2013 Announced 6-year PharmD[b]	The 2015 Announced 6-year PharmD[b]
Characteristics	To fulfil general pharmacist with elective courses of interest (e.g., Clinical pharmacy, Pharmaceutical technology)	Focused in pharmaceutical care	Focused in pharmaceutical care	Divided into 2 main tracks: PC-PD[c], IP-PD[d]	Divided into 2 main tracks: PC-PD[c], IP-PD[d]	Divided into 2 main tracks: PC-PD[c], IP-PD[d]
Curriculum structure Credits (minimum)						
1. General education[e]	30-57	≥30	30	30	30	30
2. Pharmacy courses	126-155	180	144	144	144	184
2.1 Basic sciences[f]	27-71	65	30	30	30	30
2.2 Professional courses[g]	79-103	105	114	114	114	114 and clerkship 34 credits
-Pharmaceutical care	37-52	65-99	≥ 42 credits (or 30% of pharmacy course)	≥ 30 credits (or 25% of pharmacy course)	≥ 30 credits (or 25% of pharmacy course)	≥ 30 credits (or 25% of pharmacy course)
-Pharmaceutical sciences	32-57	34-50	≥ 35 credits (25%)	≥ 30 credits (25%)	≥ 30 credits (25%)	≥ 30 credits (25%)
-Social pharmacy	5-19	10-33	≥ 14 credits (10%)	≥ 15 credits (12%)	≥ 15 credits (12%)	≥ 15 credits (12%)
-Specialty professional / track	6-36	18-23	N/A	≥ 45 credits (37%)	≥ 15 credits	≥ 15 credits
2.3 Professional practice	500 hours	≥30 credits	2,000 hours[h] **-Clerkship in core competencies:** 400 hours **-Clerkship in specialised area:** 1,600 hours	2,000 hours[h] **Clerkship in core competencies:** 400 hours (≥6 credits) **-Clerkship in specialised area:** 1,600 hours (≥28 credits)	2,000 hours[h] **-Clerkship in core competencies:** 400 hours (≥6 credits) **-Clerkship in specialised area:** 1,600 hours (≥28 credits)	2,000 hours[h] **-Clerkship in core competencies:** 400 hours (≥6 credits) **-Clerkship in specialised area:** 1,600 hours (≥28 credits) In 3 tracks (PC, IP, SAP)
3. Free elective courses	3-6	≥10	6	6	6	6
Total credits required	150-188	≥240	220	220	220	220

[a] The 5-year BPharm and structure follows curriculum standard for higher education; [b] The 2008 Announced 6-year PharmD curriculum and the 2012 Announced 6-year PharmD curriculum structure follows Thailand Qualification Framework (TQF) for certification of Doctor of Pharmacy degree and the Pharmacy Council of Thailand; [c] Pharmaceutical care PharmD (PC-PD) programme; [d] Industrial pharmacy PharmD (IP-PD) or pharmaceutical sciences programme; [e] General education e.g., computers, humanities, language and communication, sciences, mathematics, statistics; [f] Basic sciences (e.g., anatomy, biochemistry, microbiology, physiology); [g] Professional courses (e.g., pharmaceutical technology, pharmacotherapy, pharmacy administration, pharmacy orientation, forensic pharmacy, senior project); [h] One professional practice credit represents between 45 and 60 hours of practice training

2.5.4.6.2 The structure guideline of the new PharmD curriculum

Year 1 content will cover general education topics: computers, humanities, language and communication, sciences and mathematics, statistics. Year 2 content will cover basic sciences: anatomy, biochemistry, microbiology and physiology, together with some professional courses. Year 3 and 4 content will cover professional pharmacy courses including: pharmaceutical technology, pharmacotherapy, pharmacy administration, pharmacy orientation and forensic pharmacy. In the last two years, the pharmacy students can select their specialties. During year 5 and 6 content will cover professional practice courses and will consist of specialised clerkships (The Pharmacy Council of Thailand, 2012a), as shown in Figure 2.13.

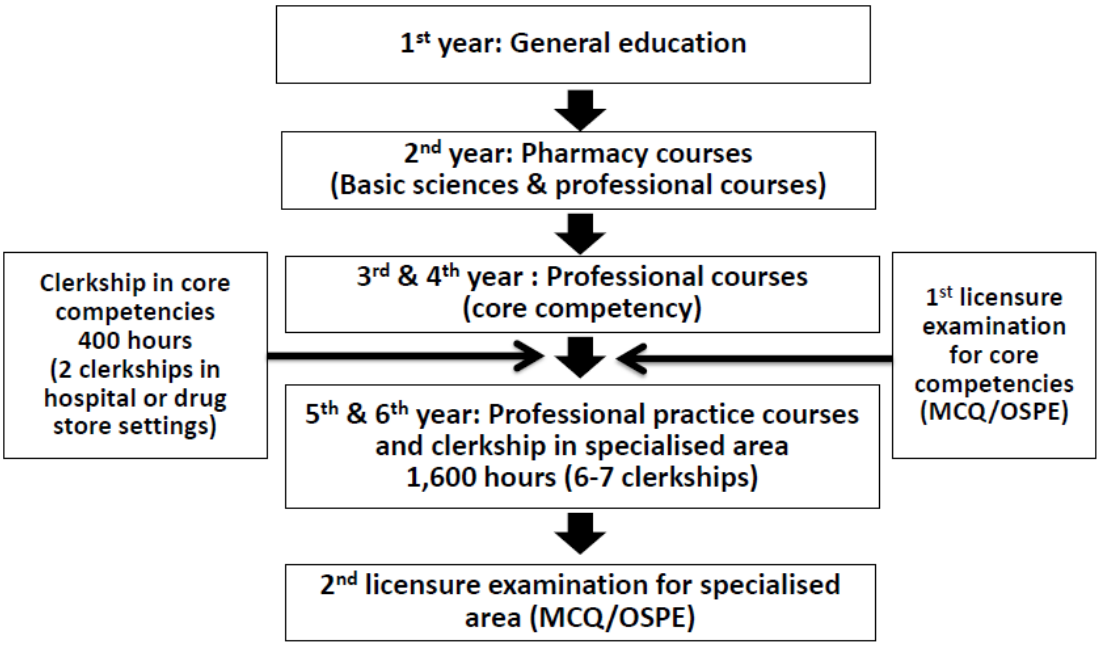


Figure 2.13 Structure guideline of a 6-year PharmD curriculum in Thailand
Taken with permission from Chanakit et al., 2014, p.10

2.5.4.6.3 The clerkship structure of the new PharmD programme

Students will have the first 400 hours of their clerkship at the end of the fourth year. These practical experiences in the areas of hospital pharmacy and community pharmacy are compulsory for all pharmacy students; equivalent to the IPPE in the US. The use of the remaining 1,600 hours professional practice time, equivalent to APPE, will depend on each individual's interest in pharmaceutical care, industrial pharmacy or SAP (Chanakit et al., 2014; The Pharmacy Council of Thailand, 2012a). The clerkship structure of the PharmD programme for each special track is presented in Table 2.15.

Table 2.15 Clerkship structure of the PharmD programme for each special track
Taken with permission from Chanakit et al., 2014, p.11

Year	Number of rotations	Pharmaceutical care track		Industrial pharmacy track	Social pharmacy Track
4th	2	Clerkship in core competencies: 2 clerkships in hospital and community settings of at least 400 hours			
5th - 6th	Professional practice clerkship in specialised areas: 1600 hours (6-7 clerkships)				
		Hospital pharmacy	**Community pharmacy**		
	2-3	Advanced hospital pharmacy clerkship (specialised area)	Advanced community pharmacy clerkship (specialised area)	Advanced pharmaceutical sciences clerkship (drug production, regulation and registration, research and development, Thai traditional pharmacy	Advanced social and consumer protection, pharmacy marketing
	1	Medication system management	Consumer protection clerkship		
	1	Acute care/ Medicine	Acute care/ medicine		
	1	Ambulatory Clerkship	Ambulatory clerkship	Quality assurance or quality control clerkship	Consumer protection clerkship
	1	Community pharmacy/ primary care clerkship	Community pharmacy/ primary care clerkship	Drug production	Community pharmacy/ primary care clerkship

2.5.4.7 Thai pharmacy competency guidelines

Competency refers to a quality or characteristic of a person related to effective performance, which is made up of many things, such as knowledge, skills, and attitudes (Mills et al., 2004).

The PCT established the 2002 Thai Pharmacy Competency Standards, which were used as a foundation for the pharmacy curricula and licensure examination and as guidelines for the standard practice of Thai pharmacists. Thai pharmacy graduates, from both the BPharm and the PharmD programmes, must take the same pharmacy licensure examination based on these competency standards; the exam covers eight domains relating to all aspects of Thai pharmacy practices (Kapol et al., 2008).

In 2012, the PCT developed "Core Competency Standards (2012)" for PharmD students who started their programme in 2015, as well as for all those who follow, which contained seven core competency domains. The PCT also developed the specialised competencies for the two main tracks: i) the functional competency standards in pharmaceutical care, containing 9 domains and ii) the functional competency standards in industrial pharmacy, containing four domains (The Pharmacy Council of Thailand, 2011; The Pharmacy Council of Thailand, 2012c; The Pharmacy Council of Thailand, 2013a; The Pharmacy Council of Thailand., 2002)(see Table 2.16).

Therefore, the pharmacy students who started their pharmacy education in, and after 2017 will have two licensure examinations; the first examination is for core competencies at the end of their 4th year and the second examination is for specialised areas at the end of their 6th year.

Table 2.16 Differences between the 2002 competency standard guidelines and the 2012 competency standard guidelines

(The Pharmacy Council of Thailand, 2002; The Pharmacy Council of Thailand, 2011; The Pharmacy Council of Thailand, 2012c; The Pharmacy Council of Thailand, 2013a)

	The 2002 competency standards		**The 2012 competency standard**
For student who study in these programmes	The 5-year BPharm programme	The 2008 announced 6-year PharmD programme	The 2012 announced 6-year PharmD programme
Competency-oriented content in programme (Patient-:Product-:SAP-oriented content)	35%:49%:16%	44%:33%:23%	40%:40%:20%
Competency standard guidelines of the Pharmacy Council of Thailand	**-The competency standards (2002)** contained the following 8 domains; 1. Pharmaceutical manufacturing process and quality assurance 2. Management of pharmacy resources 3. Preparation of pharmaceutical products 4. Delivery of primary health care and health promotion 5. Contribution to the optimum use of medicines 6. Provision of medicine management 7. Provision of medicine information 8. Legal practice		-There are three Thai pharmacy competency guidelines (e.g., core competency guidelines, functional competency standards for pharmaceutical care and industrial pharmacy). **-The core competency standards** (2012) contained the following 7 domains; 1. Professional ethics and morals 2. Working with team and system management 3. Information technology skills, communication skills and providing education on medicine usage. 4. Pharmaceutical products, herbal medicinal products, pharmaceutical chemical products and quality control 5. Drug procurement and extemporaneous preparation to patients 6. Pharmaceutical care and herbal use 7. Health system and health care system **-A functional competency standard in pharmaceutical care** (2011) contained the following 9 domains; 1. Integrate knowledge in pharmaceutical manufacturing and quality assurance process in pharmaceutical care services 2. Provide drug selection and drug procurement of pharmaceutical products to serve individual patient and community appropriately 3. Prepare appropriate pharmaceutical products for individual customer 4. Provide advice or conduct activities for individual and community health promotion 5. Understand the pharmacy professional-related laws 6. Provide pharmaceutical care services for individual patient and community as a part of health care team 7. Manage medication system and provide medication risk management for patient safety with health care team 8. Manage medicine system quality assurance to maintain the effectiveness and safety of patient care 9. Provide evidence-based, accurate, current, and reliable medicines and health-related product information to individual patient, community and health care providers **-A functional competency standard in industrial pharmacy** (2014) contained the following 4 domains; 1. Research and development 2. Quality assurance and quality control 3. Manufacturing 4. Regulatory affairs and product registration

2.5.5 The transition to the 6-year PharmD programme in Thailand

The 5-year BPharm programme was the primary degree offered in Thailand. It was divided into three tracks: i) pharmaceutical sciences, ii) pharmaceutical care and iii) social and administrative pharmacy, for students to achieve more professional specialisation (Chanakit et al., 2014; Pongcharoensuk and Prakongpan, 2012; Sumpradit et al., 2014). However, the new pharmacy graduates and employers felt that the graduates still had inadequate training and were not able to work instantly upon graduation (Matichon, 2007; The Royal Thai Government Gazette, 2008).

In 1989, the concept of clinical pharmacy was introduced in Thailand and made a greater demand of pharmacists in patient care areas (Sumpradit et al., 2014). This demand was supported by the the US-Thai Consortium for the Development of Pharmacy Education in Thailand (Kapol et al., 2008). Thai pharmacy educators and pharmacy practitioners participated in this collaboration, in order to develop the skills in clinical pharmacy that were needed. This might have been one of the motivations for pharmacy educators to develop the PharmD programme.

The first 6-year PharmD programme, announced in 1995, that focused on patient care was developed at the Faculty of Pharmaceutical Sciences, Naresuan University in 1999 (Pongcharoensuk and Prakongpan, 2012; Sanguansermsri et al., 1998). This programme aimed to increase the potential of students to fulfil the needs of society, particularly relating to higher competency in patient care.

An all 6-year PharmD policy was first proposed by the Pharmacy Education Consortium of Thailand (PECT), also known as the Council of the Deans (Keokitichai, 2014) in 1993; the initiative was also raised at the First National Pharmaceutical Education Forum in 1994 (Pramyothin et al., 1999; The Royal Thai Government Gazette, 2008).

Pharmacy education in Thailand began to change rapidly when the Pharmacy Council of Thailand announced in 2008 that all faculties must offer only a 6-year PharmD programme by the year 2014 (Sumpradit et al., 2014; The Pharmacy Council of Thailand, 2008; The Royal Thai Government Gazette, 2008). Thai policy makers believed that the 6-year PharmD programme would resolve the issue of curriculum overload for the 5-year BPharm programme, which had a very high number of credits, and would provide the same standards for the pharmacy profession in Thailand (Matichon, 2007; The Royal Thai Government Gazette, 2008).

These reasons were similar to the recommendation to discontinue the BPharm programme in the US (Marcellus, 1995). Unfortunately, the Thai authorities gave the same status to the PharmD as to the Bachelor degree (Richards, 2012). However, later, the government awarded the progression, promotion and salary of PharmD graduates similar to a master's degree.

Eleven universities offered a 5-year BPharm programme and one university offered a PharmD programme in 1999. There was a gradual implementation of more PharmD programmes, until finally the 5-year BPharm programme was not offered after 2010 (Pramyothin et al., 1999; Sripanidkulchai, 2008; Wongpoowarak, 2013a). At this point all faculties have offered only the 6-year PharmD programme, as shown in Table 2.17.
In addition, the details of the histories of all 6-year PharmD programmes in Thailand (Zhang, 2014) are shown in Figure 2.14.

Table 2.17 The number of faculties/schools and degree programme offerings
(Pramyothin et al., 1999; Sripanidkulchai, 2008a; Wongpoowarak, 2013a)

Degree programme offerings	Number of Faculties			
	1999	2008	2010	2016
Only BPharm	11	8 (KKU[a], MU[b], UBU[c], HCU[d], RU[e], PU[f], WU[g], EU[h])	0	0
BPharm and PharmD	0	5 (PSU[i], CMU[j], SU[k], SWU[l], CU[m])	0	0
Only PharmD	1 (NU[n])	3 (NU[n], MSU[o], SmU[p])	18	19
Total pharmacy faculties/schools	**12**	**16**	**18**	**19**

[a]KKU = Faculty of Pharmaceutical Sciences, Khon Kaen University;[b]MU = Faculty of Pharmacy, Mahidol Univeristy
[c]UBU = Faculty of Pharmaceutical Sciencs, Ubon Ratchathani University;[d]HCU = Faculty of Pharmaceutical Sciences, Huachiew Chalermprakiet University;[e]RU = Faculty of Pharmacyy, Rangsit University;[f]PU = Faculty of Pharmacy, Payap University
[g]WU = School of Pharmacy, Walailak University;[h]EU= School o fPharmacy, Eastern Asia Univeristy
[i]PSU = Faculty of Pharmaceutical Sciences, Prince of Songkla University; [j]CMU = Faculty of Pharmacy, Chiangmai University;
[k]SU = Faculty of Pharmacy, Silpakorn University; [l]SWU = Faculty of Pharmacy, Srinakharinwirot University
[m]CU = Faculty of Pharmaceutical Sciences, Chulalongkorn University; [n]NU =Faculty of Pharmaceutical Sciences, Naresuan University; [o]MSU = Mahasarakham University; [p]SmU = Faculty of Pharmacy, Siam University

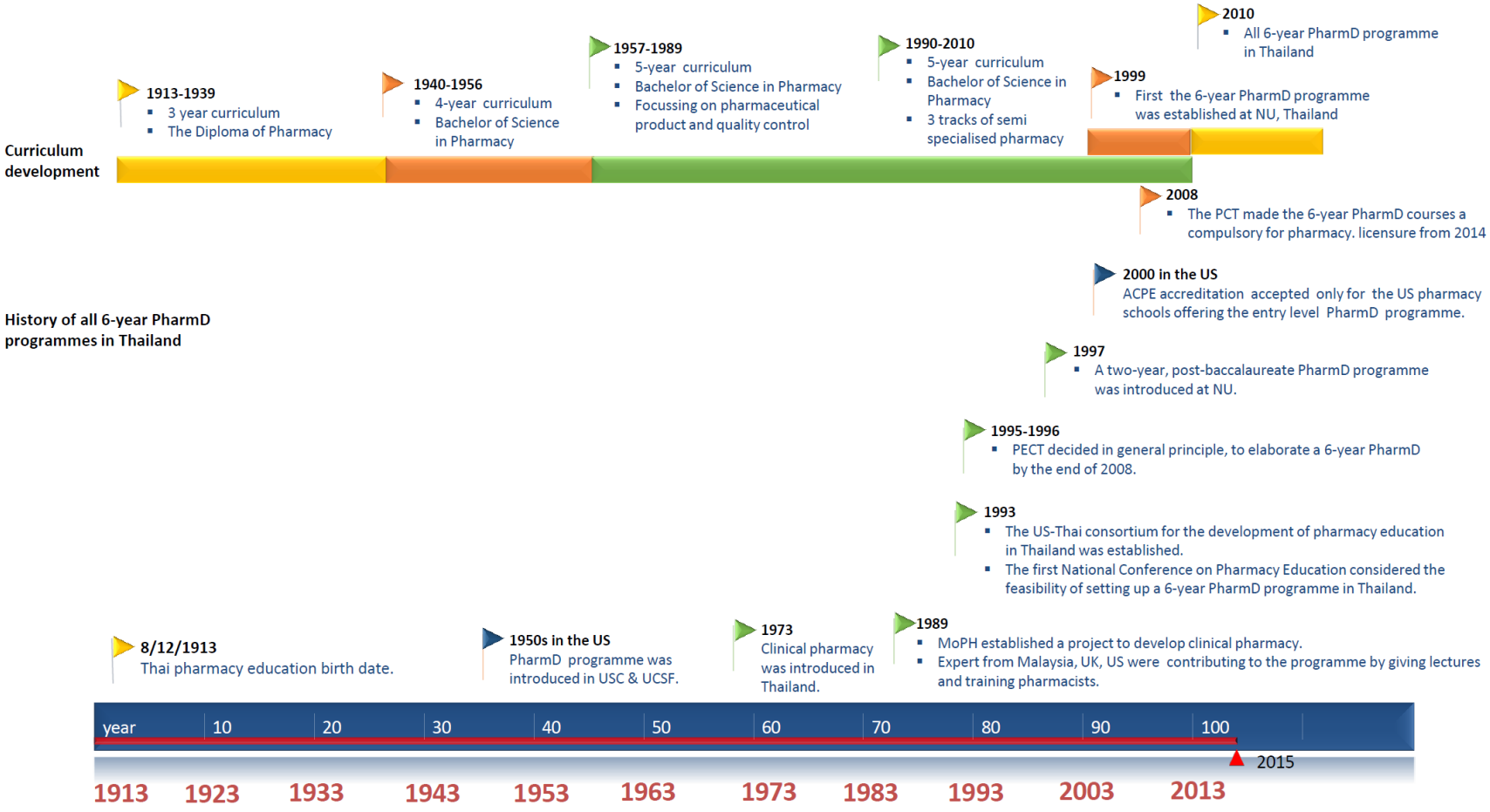


Figure 2.14 The history of all 6-year PharmD programme in Thailand

Taken with permission from Chanakit et al. 2015a

2.5.5.1 Studies reporting the stakeholders' opinions regarding the issues of transition to an all-PharmD programme in Thailand

Stakeholders play an important part in the "needs-based model", developed from FIP*Ed*'s Global Quality Assurance Framework, due to local stakeholders being the population who decide local or national needs (Hoat et al., 2009; Rouse and Meštrovic, 2014). For example, the regulatory bodies, such as government and the Pharmacy Council, are responsible for pharmacy practice. They have the duty to protect the wellbeing of the public by ensuring that the pharmacy workforce receives appropriate education and training to deliver the standard quality of services (Rouse and Meštrovic, 2014).

Curriculum change involves and affects many stakeholders, including both internal and external educational institutions, with their different levels, different roles and also different expectations (Anderson et al., 2011; Hoat et al., 2009; Kirschenbaum et al., 2006; MacCarrick, 2009; Rouse and Meštrovic, 2014). It is worth exploring the stakeholders' experiences of this transition. Stakeholders should be involved in pharmacy practice and the quality assurance of pharmacy education. However, there was little information about the stakeholders' perceptions and experiences about the transition to an all PharmD programme.

Three studies which investigated the opinions of some stakeholders groups, regarding the issues of transition to an all-PharmD programme in Thailand, were found during the data collection in Thailand (see Table 2.18). These three documents in Thai language were a government report (Pramyothin et al., 1999), collated conference papers (Wongpoowarak, 2013a), and a collection of publicly accessible published documents (Chaichalermpong et al., 2009), supported by personal communications.

1) Pramyothin et al. (1999) found that most experts from the hospital and consumer protection areas agreed with and supported a 6-year programme with special tracks, but experts from community pharmacy and industry preferred a 5-year programme with special tracks (Pramyothin et al., 1999).

2) Wongpoowarak et al. (2013) also carried out a survey of stakeholders' opinions regarding changing to a 6-year programme in 2001. The findings showed that most of the pharmacy graduates and employers felt that a 6-year PharmD was needed for both pharmaceutical care and pharmaceutical sciences tracks, while academic staff had mixed views regarding the duration of pharmacy programme in pharmaceutical sciences: 15% supported 4 years; 63% supported 5 years and 22% were for 6 years (Wongpoowarak, 2013a).

From these two studies cited immediately above, it might be concluded that the majority of stakeholders agreed with the transition to the 6-year PharmD programme in the pharmaceutical care track. This preference might have been because supporters were able to see the growth trend in the pharmaceutical care area; in particular, the increased clinical pharmacy activities in hospital pharmacy practice.

After an "all-PharmD programme" policy was launched by the PCT in 2008, there were many debates conducted on social networks about the transition. In particular was the issue of whether the change had been planned in pharmacy education but had not been planned in health care system (ASTV Manager Online, 2009; PharmaCafe.com, 2008).

3) Chaichalermpong et al. (2009) carried out a survey of pharmacists regarding curriculum changes. The results found most of the respondents did not agree that a 6-year programme would decrease the pharmacy curriculum workload or improve the status of pharmacists equal to other 6-year programmes, as in medicine and dentistry. The majority of the respondents thought that the pharmacy curriculum should include both 5- and 6-year programmes, and approximately 20% of respondents thought that there should be only 6-year programmes (ASTV Manager Online, 2009; PharmaCafe.com, 2008).

However, there is a limited number of qualitative studies that explore the stakeholders' perceptions regarding the transition to an all PharmD programme in Thailand (Chaichalermpong et al., 2009).

Table 2.18 Studies reporting the opinions of some stakeholder groups regarding the issues of transition to an all-PharmD programme in Thailand (n=3)

Authors, Titles	Aims, Methods	Key findings	Strengths	Limitations
Pramyothin, et al. (1999) Strategies and guideline for pharmacy education management in next two decade (Pramyothin et al., 1999)	**Aims:** To identified strategies and guideline for pharmacy education management in next two decade **Methods:** A mixed methods approach was used; 1) An academic staff survey 2) A pharmacy experts' interviews	**1. An academic staff survey:** -A cross-sectional survey questionnaire was distributed to dean, deputy dean, and head of division/department of 12 faculties of pharmacy (10 public and 2 private universities). -97 responses were included in the data analysis (response rate 81%). Approximately half of respondents (54%) agreed that the overall of pharmacy curriculum in 1999 was appropriate. They suggested that there should increase practice experiences. In case of curriculum change to 6 year, majority of respondents agree of the transition, which the 6-year curriculum should be increased credits in the Specialty professional and the practice training. There were 2 respondent disagree with the transition to the 6-year programme. **2. A pharmacy experts' interviews:** - Semi-structured interviews were conducted with 51 pharmacy experts (e.g., 20 hospital pharmacists, 10 community pharmacists, 11 industrial pharmacists, 7 pharmacists in consumer protection and 3 marketing pharmacists). -Most experts from hospitals and consumer protection areas agreed with a 6-year programme with special tracks, but experts from community pharmacy and industrial preferred a 5-year programme with special tracks.	This study is the first study that has employed a mixed methods approach to identify the perceptions of the stakeholders regarding the curriculum change to the PharmD programme in Thailand.	-The author did not mention the issues of data saturation and the ethical approval.
Wongpoowarak, et al. (2001) Employers and pharmacy graduates' perceptions regarding the pharmacy curriculum changing to a 6 year programme at the Faculty of Pharmaceutical Sciences, Prince of Songkla University	**Aims:** To explored employers and pharmacy graduates' perceptions regarding the curriculum reform **Methods:** Cross-sectional surveys	-276 responses (156 employers, 91 pharmacy graduates and 29 academic staff of Faculty of Pharmaceutical Sciences, Prince of Songkla University) were included in this study. -The employers (e.g., who work at second and tertiary hospital 20%, primary care hospital 63%, others 17%) perceived that the 6-year programme in pharmaceutical care and the 6-year programme in pharmaceutical sciences are appropriate 74% and 56.4%, respectively. -The BPharm graduates (e.g., graduates from the clinical track 34%; Social pharmacy 29%, pharmaceutical sciences 37%) perceived that the 6-year programme in pharmaceutical care and the 6-year programme in pharmaceutical sciences are appropriate 89% and 69.7%, respectively. -The academic staff thought that the pharmacy programme in pharmaceutical sciences should be 4-year programme, 5-year programme and 6-year programme respectively, 15%, 63%, and 22%.	This is the first survey that has reported the stakeholders' perceptions regarding the curriculum change to the PharmD programme in Thailand.	-The author did not mention about the ethical approval. -Generalisability: Case study design might represent only of the specific institutions with the same characteristics.

Table 2.18 (Continued)

Authors, Titles	Aims, Methods	Key findings	Strengths	Limitations
Chaichalermpong et al. (2009) Pharmacists survey regarding the Pharmacy Council of Thailand (PCT) regulation 2008 in relation to the duration of the pharmacy degree programme (Chaichalermpong et al., 2009)	**Aims:** To explored Thai pharmacist's perceptions regarding the PCT regulation 2008 in relation to the duration of the pharmacy degree programme **Methods:** Cross-sectional surveys	A survey questionnaire was randomly sent to pharmacists who were members of PCT who graduated in year 1975, 1980, 1985, 1990 and to academic staff in faculties of pharmacy and snowball sampling; a total of 827 via postal mail and 1,450 via email. 636 pharmacists participated in this study. The results found that the majority of the respondents did not agree that a 6-year programme will stop, or necessarily decrease, the pharmacy curriculum workload (76.2%) or improve the status of pharmacists equal to other 6-year programmes (e.g., medicine, dentistry) (66.5%). Most of respondents agreed that the pharmacy curriculum should be producing generalists (75.2%), while the specialists should be studying in higher education. Additionally, the 70% of respondent thought that pharmacy curriculum should include both the 5-year and 20% of respondent thought that it should be all 6-year programme (ASTV Manager Online, 2009; PharmaCafe.com, 2008).	This is the first survey that contained the most participants regarding the curriculum change to the PharmD programme in Thailand.	-There had insufficient details about sampling strategy (e.g., the reason of a random sample that was limited to the pharmacists licensed from 1975-1990). -The academic staff may be over-represented (36.8%), while others may be under represented (e.g., student 0.3%, industry pharmacy 3.5%). -There might have the non-response bias. -The author did not mention about the ethical approval.

2.5.5.2 Study reporting Thai PharmD graduates' skills and professional competencies

Sitaruno et al. (2013) reported on the satisfaction regarding the skills of Thai traditional PharmD graduates in providing pharmaceutical care. The data were based on the opinions of the graduates themselves, employers, colleagues, and patients. The majority of the participants were satisfied with competencies in pharmaceutical care of the PharmD graduates as the graduates exhibited high responsibility towards their work and excellent self-learning competencies (Sitaruno et al., 2013).

Sumpradit et al. (2014) described self-reported professional competency by comparing pharmaceutical care track-BPharm (PC-BPharm) and pharmaceutical sciences track-BPharm (PSc-BPharm) and the traditional 1995 6-year PharmD graduates enrolled in the public service programme. The PharmD graduates reported the highest competency in acute care, medication reconciliation and primary care services, whereas PSc-BPharm graduates reported more competence in consumer health protection than PharmD and PC-BPharm graduates (Sumpradit et al., 2014).

Suwannaprom, et al. (2014) reported that the graduates from the new PharmD programmes (PC-PD and IP-PD graduates) had high confidence in their expected specialised competency domains. The graduates from the new 6-year PharmD programmes rated their competencies in professional ethics and moral domain higher than the 5-year BPharm graduates did. The 6-year PharmD graduates also reported higher confidence that they can apply their competencies in practice (Suwannaprom et al., 2015). The key findings of these studies have been summarised in Table 2.19.

To conclude from these studies, graduates in the pharmaceutical care track PharmD perceived that they have higher competencies in pharmaceutical care than the BPharm graduates. However, there have been no studies regarding objectively measured competency such as pharmacy licensure examination scores, actual professional competency, professional performance or professional suitability for employment in workplace settings.

Table 2.19 Studies reporting the self-assessment professional competency among pharmacy graduates (n=3)

Authors, Titles	Aims, Methods	Key findings	Strengths	Limitations
Sitaruno, et al. (2013) Satisfaction toward the Doctor of Pharmacy (PharmD) graduates and PharmD program: perspective of graduates, employers, colleagues, and patients (Sitaruno et al., 2013)	**Aims:** To study attitude of Prince of Songkla University (PSU) PharmD graduates toward the PharmD curriculum and the satisfaction toward the skills in providing pharmaceutical care from the graduate themselves, employers, colleagues and patients. **Methods:** A cross-sectional survey	-63 graduates were included in the data analysis (response rate 52.5%), 33 employers, 67 colleagues, 36 patients -The majority of PharmD graduates were working in hospital (54%) and 18 graduates were responsible for providing pharmaceutical care services. -The PharmD graudates were confident to work as a pharmacist professional. -The characteristics of PharmD graduates that the employers rated most satisfying were high responsibility and self-learning competencies, whereas their colleagues were satisfied with all characteristics of PharmD graduates (e.g., communication skills, leadership, service mind, and self-confidence).	This is the first study that has reported the stakeholders' perceptions regarding the satisfaction toward the PharmD graduates.	-The author did not mention about the ethical approval. -Generalisability: small sample size; the survey had been send to the PharmD graduates from one faculty. -Selection bias: the survey was distributed to the employee by the PharmD graduates themselves.
Sumpradit, et al. (2014) Comparison of self-reported professional competency across pharmacy education programs: a survey of Thai pharmacy graduates enrolled in the public service program (Sumpradit et al., 2014)	**Aims:** To compare the perception of professional competency among new pharmacy graduates from the three different pharmacy programmes available in 2013 who enrolled in the public service programme. **Methods:** -A cross-sectional survey using a self-administered, structured, close-ended questionnaire -Data collection was conducted during Thailand's annual health professional meeting on April 2013 for workplace selection of pharmacy graduates.	-266 pharmacy graduates responded to the questionnaire (response rate 49.6%) -There were 93 PharmD, 87 PC-BPharm and 86 PSci-BPharm graduates. -The PharmD graduates reported highest competency in acute care services, medication reconciliation services, and primary care services. -Psci-BPharm graduates reported more competence in consumer health protection and herbal and alternative medicines than PC-BPharm.	This is the first study that has investigated the perceptions of professional competency of pharmacy graduates from three different pharmacy programmes: PharmD, Pc-BPharm, Psci-BPharm.	-The sampling frame: the respondents did not represent all pharmacy graduates in 2013. Only graduates who were enrolled in the public service programme provided an eligible sample. -Self-reported might serve as a proxy measure but not the actual professional performance.
Suwannaprom, et al. (2015) Self-assessment professional competency and perceptions towards pharmacy profession among pharmacy graduates 2014 (Suwannaprom et al., 2015)	**Aims:** To measure self-assessment professional competencies **Methods:** - A cross-sectional survey using a self-administered, structured, close-ended questionnaire -All pharmacy graduates in the academic year 2014 entered the National Objective Structured Practical Examination in March 2015 at all 12 examination centres received the self-completed questionnaire. -Respondents were asked to rank their confidence in performing a variety of tasks corresponding to Thai pharmacy competencies on a 5-point Likert-type scale.	-1,744 graduates completed questionnaires (response rate 90%). Majority of the respondents were the 6-year PharmD graduates (72.8%) while 27.2% were the BPharm graduates. Pharmaceutical care track was dominant (61%) compared to Pharmaceutical sciences (PSC) (31%) and Social and administrative pharmacy (SAP) tracks (7%). -Graduates rated their competencies highest in professional ethics and moral domain followed by pharmaceutical care and system management domains. -The pharmacy graduates in PC- and PSC-tracks reported the confidence in their expected specialised competency domains. The confidence was unclear among the SAP graduates. These findings can serve as evidences supporting the transition to all 6-year PharmD programme with specialty tracks in PC and PSC.	-This is the first national survey study that has reported the self-assessment professional competency and perceptions towards pharmacy profession among the first cohort PharmD graduates.	-The perceived competency might serve as a proxy measure but not the actual performance of the pharmacy graduates.

2.6 Gaps in the literature

Although, there are many articles that mentioned the transition from the BPharm to the PharmD programme, most of the information is in commentaries, opinions, and review articles; there have very few research articles. From the literature review, two main gaps concerning the transition from the BPharm to the PharmD programme in the literature were identified. The two 'gaps' are set out below:

1) Needs: Despite the stakeholders being the important sector in the "needs-based model", who play a vital role in deciding local needs, there was insufficient research about the stakeholders' perceptions regarding the need and worth of adopting the PharmD programme as the single pharmacy degree in developing countries, including Thailand.

2) Impact/outcome: There has been only a limited amount of research that has explored the impact/outcome of the PharmD pharmacists on the health care system, even in the US. It is important to monitor patients' outcomes, economic outcomes and public perceptions, in order to validate the claim that the need for an all-PharmD programme truly existed.

2.7 Summary

In this chapter, a picture of global pharmacy education has been presented that continues to face challenges in producing pharmacy graduates in order to meet stakeholders' requirements. This demand is made more difficult in developing countries where there is a lack of resources, expertise, and infrastructure. The transition to an all-PharmD programme in selected countries, that all aim to produce the competent pharmacy graduates to meet the need of their countries, has been described.

However, a big gap in terms of the insufficient capacity in pharmacy education, as highlighted by a lack of the academic staff and other resources has been reported. Other areas of concern are pharmacy practice, particularly a lack of a suitable pharmacy workforce and insufficient supportive policy and regulations.

There were few studies directed towards the stakeholders' perceptions about the transition in pharmacy education in Thailand . Consequently, there was a need for research that explored the stakeholders' perceptions regarding the transition from the BPharm and the PharmD to an all-PharmD in Thailand. In addition, there has been no previous national survey research into the status of pharmacy education for the PharmD programme in Thailand. There has been no study concerning the professional suitability of graduates for employment in the pharmacy practice settings and no analysis of the competency differences between BPharm and PharmD graduates.

Detailed below are the aims and objectives of this current research initiative. The following chapter describes the methodology and the method for this study.

2.8 Aims and objectives of the study

According to the literature review and the gaps in the Thai pharmacy education, five initial research questions (RQ) are offered:

RQ 1) What was the status of pharmacy education in Thailand?
RQ 2) How do the pharmacists perceive the suitability of the *previous* PharmD graduates who were employed in pharmacy practice settings?
RQ 3) How do the pharmacists perceive any competency differences between the BPharm and the PharmD graduates?
RQ 4) Why does Thai pharmacy education need the transition to an all-PharmD programme?
RQ 5) How do Thai stakeholders perceive the transition/ the introduction of PharmD programme in Thai pharmacy education?

The overall aim of this study is to explore the stakeholders' perceptions regarding "the transition to an all-PharmD in Thailand". The research questions, research objectives and three main research initiatives that addressed the study aims and objectives are presented in Table 2.20 and Figure 2.15.

Table 2.20 Research questions, research objectives, and the three research initiatives that addressed the objectives of the study

Research questions	Objectives	Studies	Chapter
RQ 1) What was the status of pharmacy education in Thailand?	1) To explore the status of pharmacy education in Thailand	**Phase 1:** A survey of the status of Thai pharmacy education	Chapter 4
RQ 2) How do the pharmacists perceive the suitability of the previous PharmD graduates who were employed in pharmacy practice settings? **RQ 3)** How do the pharmacists perceive any competency differences between the BPharm and the PharmD graduates?	2) To explore the perceptions of pharmacists regarding the suitability of PharmD graduates who were employed in practice settings 3) To explore the competency different between the BPharm and the PharmD graduates	**Phase 2:** A survey of the pharmacists' perceptions towards the suitability of the PharmD graduates who were employed in hospital and community pharmacy settings and the competency differences between BPharm and PharmD graduates	Chapter 5
RQ 4) Why does Thai pharmacy education need the transition to an all-PharmD programme? **RQ 5)** How do Thai stakeholders perceive the transition/ the introduction of PharmD programme in Thai pharmacy education?	4) To explore the Thai stakeholders' perceptions about the need and other experiences about the transition of the entry-level pharmacy qualification from the BPharm and the PharmD to an all-PharmD in Thailand	**Phase 3:** Thai stakeholders' perceptions of the introduction of the Doctor of Pharmacy programme	Chapter 6

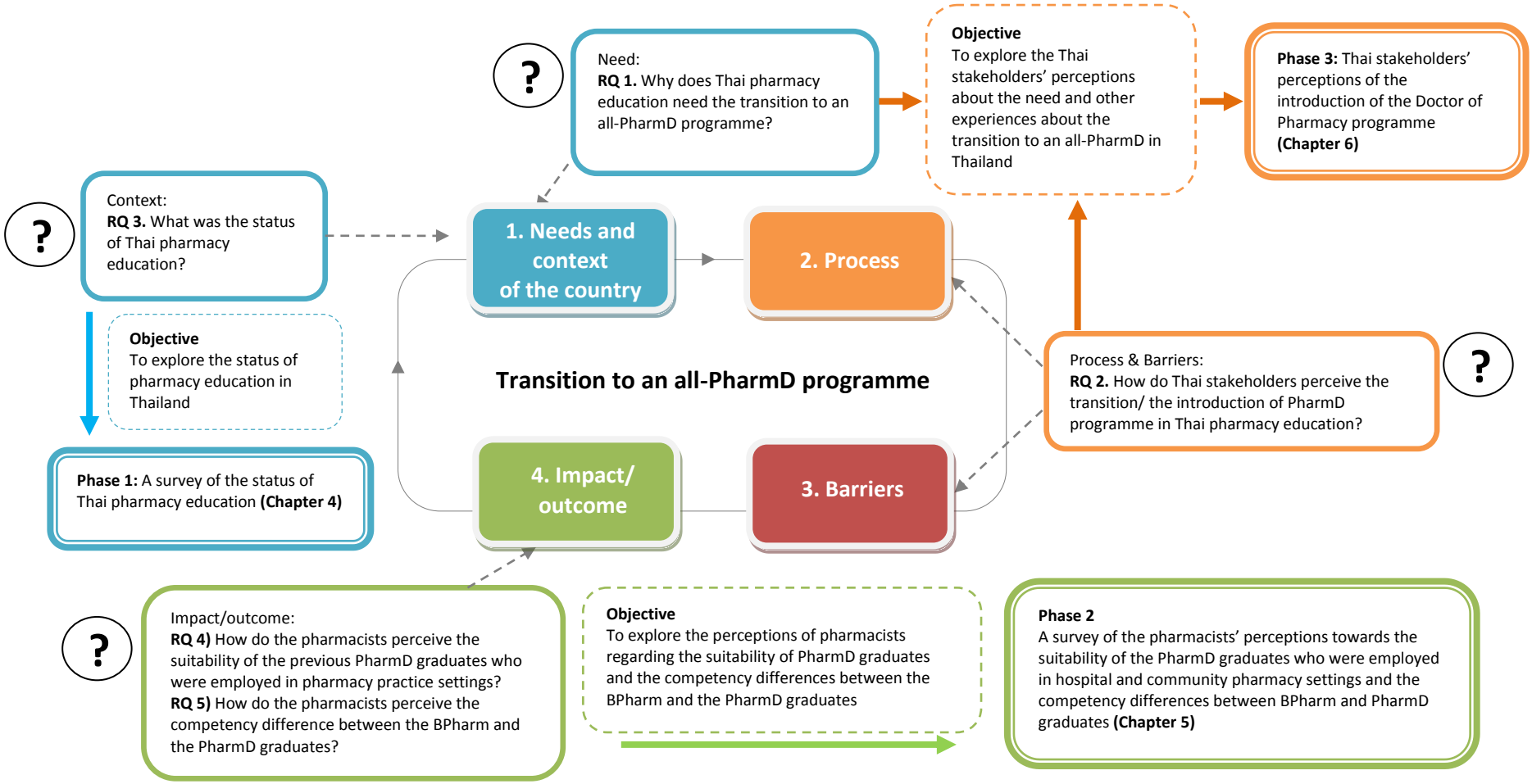


Figure 2.15 Research questions, objectives and the three studies contributed to address the objectives of the study

CHAPTER 3:

Methodology and study methods

3.1 Introduction

This chapter describes the methodological approach adopted for this study by briefly outlining the worldviews underpinning this research topic. A rationale for using a mixed methods approach is provided, as are details of the quantitative and qualitative methods that were chosen, and how validity and reliability can be assessed. Finally, the ethical approval details are presented.

3.2 Philosophy and worldviews

All research has a philosophical foundation and researchers should be aware of assumptions they make about gaining knowledge during their study. Researchers should identify the assumptions that they bring to research. A paradigm or worldview is a set of ideas, beliefs and values of a community of specialists. There are four common paradigms or worldviews, postpositivist, constructivist, participatory and pragmatist, which are different from the concepts of *ontology* (the nature of reality), *epistemology* (how we gain knowledge of what we know), *methodology* (the principle that drives the selection of research methods), and *methods* (the tools or processes that are used in research) (Creswell, 2014; Creswell and Clark, 2011).

Postpositivism is typically associated with quantitative approaches in which postpositivists tend to view realty as singular; researchers reject or fail to reject hypothesis. On the other hand, constructivism is often associated with qualitative approaches where the constructivist views reality as multiple realities; as when researchers provide a range of quotes to illustrate participants' perspectives. Participatory worldviews are influenced by the political reality constructed by participants and the observer. A pragmatism worldview is focused on the research problem and uses any approaches available to understand the problem of interest, rather than focusing on the specific research methods. The pragmatists look for the truth that is practically useful and whatever works at the time. The pragmatists are typically associated with the mixed methods approach (Creswell, 2014; Creswell and Clark, 2011; Peterson and Gencel, 2013).

3.3 Mixed methods research

Mixed methods research is an approach in which the researcher collects, analyses and mixes both quantitative and qualitative data in a single study or a multiphase study. The researcher is likely to base knowledge claims gathered from mixed methods research on their pragmatic problem-centred worldview, which frees the researcher to combine both quantitative and qualitative approaches to best understand research problem (s) (Creswell, 2014; Creswell and Clark, 2011; Johnson et al., 2007).

Multiple worldviews can be used in mixed methods research. For example, if a study begins with a quantitative method, such as a survey, the researcher is using a postpositivist worldview. Then, if the study moves to employ qualitative methods, such as interviews, to explain the results from the survey the worldview shifts to a constructivist perspective. Thus, a researcher's perception is that worldviews relate to types of designs that are able and open to change during a study. Researchers need to honour and write about their worldviews. Mixed methods research is a methodology and method for conducting research that involves collecting, analysing and integrating both quantitative and qualitative research in a longitudinal programme of inquiry. Such a mixed information gathering approach aims to provide a better understanding of a research problem than either research approach alone (Creswell and Clark, 2011).

However, mixed methods research takes time to gather data from either quantitative and/or qualitative sources, and takes resources to support data collection and data analysis. There are some challenges in using a mixed method design, such as the effort and knowledge required to conduct both quantitative and qualitative research.

The mixed methods approach is practical because researchers are able to use options from a range of methods to answer their research questions. The approach is useful because researchers may be required to solve problems combining numbers and words, as well as inductive and deductive thinking. Mixed methods research gains strength from both quantitative and qualitative research and helps answer questions that cannot be answered by quantitative or qualitative study alone (Creswell and Clark, 2011).

The most common approach to mixed methods is the convergent model (Creswell and Clark, 2011). It was initially conceptualised as a "triangulation" design, where quantitative and qualitative methods are used and the results are triangulated. It also embraces both the differing strengths and weaknesses of quantitative methods, including large sample size and potential for generalisation with those of qualitative methods, such as small sample size and in-depth investigation (Creswell and Clark, 2011; Patton, 2002). The convergent design procedures are outlined as follows:

1) Quantitative data and qualitative data were collected and analysed separately using the techniques traditionally associated with each data type.

2) The researcher identifies content, compares and triangulates the quantitative and qualitative findings and looks for consistencies, inconsistencies and contradictions.

3) The researcher interprets to what extent and in what ways results from both quantitative and qualitative findings related to each other, in order to produce a more complete understanding regarding the topic of interest (Creswell and Clark, 2011).

3.4 Choice of methodology

The literature review in Chapter 2 highlighted a lack of data, therefore suggesting the need to conduct further research to gather basic information concerning the subject of Thai pharmacy education. Areas of concern include the characteristics of pharmacy faculties, academic programmes, and the pharmacy education workforce; as well as the need for data on the perceptions of Thai pharmacists regarding the suitability of PharmD graduates employed in practice settings. There was also a need to gather further evidence on stakeholders' perceptions regarding the transition of pharmacy education in Thailand.

In response to the need to develop an understanding about the transition of pharmacy education in Thailand, the pragmatic worldview and a mixed methods approach are well suited to deal with the research questions in this study, because such an approach enables the researcher to adopt a variety of methods and types of data to best answer the research questions (Creswell, 2013; Creswell and Clark, 2011; Johnson et al., 2007).

The philosophical assumptions in this study are presented in Table 3.1.

Table 3.1 The philosophical assumptions in this study

(Creswell, 2013; Creswell and Clark, 2011)

	Worldview element	**Characteristics**	**Implications**
Ontology (the nature of reality)	Pragmatism	Singular and multiple reality	1. Facts are facts for the quantitative aspects 2. Researcher reports different perspectives as themes develop in the findings and provide quotes to illustrate different perspectives
Epistemology (how to find reality)	Practicality	Collect data by "what works" to address research question	1. Researchers objectively collect data on instruments 2. Researcher relies on quotes as evidence from the participant
Methodology (The principle that drive a selection of the research method)	Mixed method	Combining	Researchers collect both quantitative and qualitative data and combine them.
Method (The tools/processes employed in the research)	Quantitative Qualitative	1. Quantitative research is an approach in which the investigators often use numbers in the presentation of analyses (Bryman, 2012). 2. Qualitative research is based on how the social world is understood, interpreted, and experienced. Therefore, the reality cannot be measured directly. The reality exists as perceived by people and by the investigators and is collected in a real life setting (Gray, 2009).	Quantitative: surveys Qualitative: interviews

Quantitative and qualitative data were collected and analysed separately and findings from the quantitative and qualitative strands were brought together during the final step of the research, by comparing or integrating the findings in a discussion (Creswell and Clark, 2011; Creswell et al., 2011; Patton, 2002).

The quantitative study model was used to explore the situation of Thai pharmacy education and to explore the perceptions of Thai pharmacists regarding the suitability of PharmD graduates' performances when employed in practice settings. The differences in the perceived competencies between BPharm and PharmD graduates were investigated by using a cross-sectional survey. The qualitative approach, using an in-depth interview, was chosen to explore stakeholders' perceptions regarding the transition of pharmacy education in Thailand.

The reason for collecting both quantitative and qualitative findings is to obtain a better understanding of the transition of pharmacy education by comparing and integrating data collected through different methods including data triangulation thereby combining the strength of each research strand (Creswell and Clark, 2011; Creswell et al., 2011; Johnson et al., 2007; Patton, 2002).

The triangulation design of this study is presented in Figure 3.1. The triangulation approach was used in this study, in order to validate the findings regarding the status of the pharmacy education, by using:

1) Multi-methods- quantitative survey and qualitative interviews

2) Various data sources including results from surveys, interviews, and documents such as government publications, minutes of meetings and unpublished reports.

The findings from these three study initiatives were triangulated by confirming, comparing, complementing, and contrasting in order to provide strong findings, conclusions, and recommendations.

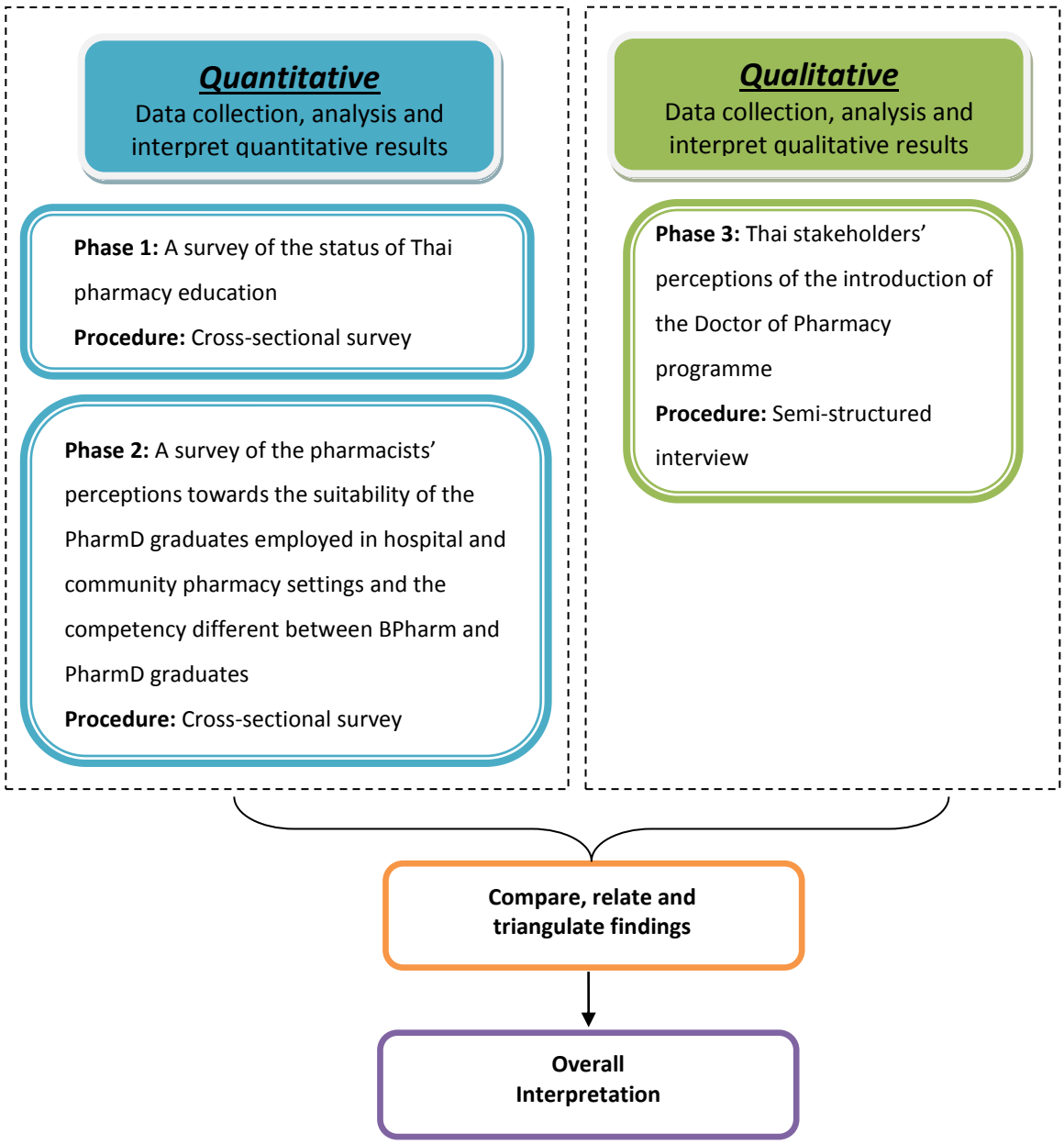


Figure 3.1 Diagram illustrating the design of this study

3.4.1 Quantitative research methods

Quantitative research draws on the paradigm that the goal of knowledge is to be able to describe the phenomena that people experience, which can be objectively observed and measured. Quantitative research is an approach in which the investigators often use numbers in the presentation of analyses; the approach is typically highly structured so that the researchers are able to examine the precise issues that are focused on in the study. Quantitative researchers often want their findings to be generalisable to the relevant population and so such researchers are often involved in large-scale investigations of social trends and connections between variables (Bryman, 2012; Cleland et al., 2012). However, quantitative research has some limitations, for example, its limitation on exploring and gathering data in depth.

There are two main approaches to quantitative study design: descriptive and experimental. Descriptive studies are used to describe characteristics of a population that normally answers the "what" question. Experimental research tests whether the independent variable controlled by the researcher affects a dependent variable, the variable that being measured for change (Cleland et al., 2012).

3.4.1.1 Cross-sectional study

In cross-sectional studies data are collected at one time point or over a short period. The purpose of cross-sectional study is descriptive and it often uses a survey approach. It usually has no hypothesis but the aim is to describe a population with respect to an outcome of interest (Levin, 2006). The cross-sectional survey has advantages in that it is useful for understanding a broad-base of knowledge and interests; is inexpensive to employ and takes a short time to conduct; it is therefore suitable a study that has time and resources limitations. However, cross-sectional studies have limitation as the situations/findings might be different at different periods of data gathering (Gray, 2009).

3.4.1.2 Surveys

A survey is a detailed and quantified description of a population; it is also the most popular approach in social research and in the educational research (Denscombe, 2007; Gray, 2009). It should take a wide coverage of views at a specific point in time (Denscombe, 2007) and it is often used in cross-sectional studies.

A descriptive survey is designed to measure the characteristics of a particular population to determine people's perceptions. Surveys can use closed-ended questions that tend to be easier to answer, or open-ended questions that aim to explore perceptions or a combination of question types in some depth (Bryman, 2012; Gray, 2009).

There are two categories of survey questionnaire, administered as follows:
1) Self-administered or self-completion; examples being postal questionnaires, or delivery and collection questionnaire (Gray, 2009). For a self-completion questionnaire, the respondents complete the questions themselves (Bryman, 2012).

2) Interviewer administered questionnaires for use in a structured interview or telephone questionnaire.

The choice of questionnaire is dependent on the purpose of the survey, types of questions that the researcher intends to ask and available resources such as time and funding (Gray, 2009). There are advantages to self-completion questionnaire, as compared to structured interviews: they are cheaper and quicker to administer, there is no interviewer to affect the answers that people give, there is no interviewer variability and such a format is convenient for respondents. On the other hand, the self-completion questionnaire has disadvantages as compared to the structured interview: there is no one present to help respondents, so they cannot be prompted and cannot be probed to elaborate upon an answer. The researcher must ensure that the questionnaire is easy to complete but cannot be sure whether the right person completed the questionnaire; it is difficult to ask a lot of questions and they typically have a low response rate (Bryman, 2012).

3.4.1.3 Asking questions: closed or open questions

One of the most important considerations for the survey researchers is whether to ask a question in a closed or open format. A closed question is presented with a set of fixed-choice alternatives from which the respondents have to choose an answer; in an open question the respondents can reply in their own terms.

Closed questions have the advantages that they are easy for respondents to complete and the availability of answers might help to clarify the meaning of questions for respondents to process their answer. However, they have disadvantages is that it might possible that the respondents' answers might not be covered by the fixed answers that have been provided. So, the questionnaire should have a possible response category of "Other" to allow respondents to answer what they mean (Bryman, 2012).

Open questions have advantages that they are useful for exploring new areas about which the researcher has limited knowledge. However, open questions have the following disadvantages:
1) They need greater effort from respondents; therefore respondents might not want to write extensively, which may give rise to the low response rates.

2) They are time-consuming for the researcher to code the answers. In quantitative research the coding process has two main steps; categorised the unstructured open-ended answers and assign numbers to the categorises that have been created in order to allow the categories to be processed quantitatively (Bryman, 2012).

3.4.1.4 Justification for using the questionnaire survey approach

In the Phase 1 study, the questionnaires were sent to the respondents by post (postal questionnaire) and after the completion of the questionnaire, they were asked to return by post to the researcher. The use of a self-completion questionnaire in Phase 1 is appropriate for the following reasons:
1) The population of this study was all 19 deans of faculties of pharmacy in Thailand, which are located all over the country. Therefore, postal self-completion questionnaires are appropriate to handle a wide geographically distribution (Gray, 2009).

2) The questionnaire for this study is a long questionnaire. It has questions about details of the faculty, requesting a list of academic programmes offered, qualifications of academic staff and number of students enrolled. The survey took about three hours to complete because information was required from various faculty members. Therefore, self-completion questionnaires were more convenient for the respondents because they could complete the questionnaire when they wanted to, and at a speed that was convenient (Bryman, 2012).

In the Phase 2 study, a cross-sectional survey was chosen to collect the data regarding the perceptions of Thai hospital pharmacists and community pharmacists due to it being appropriate for understanding a snapshot of the outcomes, which are the pharmacists' perceptions, and the pharmacists' characteristics associated with the outcome at a given point in time. The respondents in the Phase 2 study were recruited using convenience sampling at a conference organised by the hospital pharmacy association and the community pharmacy associations; this was a practical way to approach large numbers of pharmacists at the same time. This convenience sampling has the advantages of saving time and cost. However, it may be biased and unrepresentative of the population (Anderson, 2010; Lohr, 2008). The questionnaires were administered by a research assistant (WW)[2] she handed out questionnaires to the conference attendees and collected the questionnaires after the attendees have completed them (Bryman, 2012).

This delivery and collection of questionnaires had advantages over postal questionnaires in that there was some direct contact with the potential respondents, which might serve to increase the number of people who complete the questionnaires. However, like all questionnaires, the response rate depends on how interested the respondents are in the survey. Another disadvantage of this approach is the time and effort needed for delivering and collecting the questionnaires (Gray, 2009).

Delivery and collection of questionnaires was appropriate to use in Phase 2 because of the following reasons.

1) There is no up-to-date database representing the numbers, addresses and workplaces of the Thai hospital-based pharmacists (Ngorsuraches and Li, 2006; Prapunwattana, 2012). Therefore, the most practical way to approach this group of pharmacists at the same time was to contact them at their conference. Questionnaires were distributed to the conference attendees in the conferences locations. They were quick to administer and respondents promptly returned the questionnaires at the conferences (Gray, 2009).

2) Self-completion questionnaires are cheaper to administer, compared to the time and cost of travel for interviews (Bryman, 2012).

[2] WW= Wiwan Worakunphanich, WW is a pharmacist at Thai Traditional Medicine Research Institute, Bangkok, Thailand

This study used convenience sampling from the pharmacy conference, because it was possible to contact a large group of pharmacists, thereby saving the researcher both time and cost. However, the disadvantage of convenience sampling is the findings from the samples might not be able to transfer to the population.

In addition, other details of the survey studies for **Phase 1** and **Phase 2** are described and presented in Chapter 4 and Chapter 5.

3.4.2 Qualitative research methods

Qualitative research is based on how the social world is understood, interpreted, and experienced. Therefore, the reality cannot be measured directly. Reality exists as perceived by people, including the investigators, and is collected in a real life setting. Such data not only provides a snapshot of events but also shows "how" and "why" things happen (Gray, 2009).

Qualitative research can provide meaning and understanding and is ideally suited to explore an area that has been little researched (Harvey et al., 2015; Hinton et al., 2012). Such a research model can also provide useful information to understand the story behind the observed results and people' perceptions (Creswell, 2014).

There was a very little information concerning the rationale for adopting the PharmD curriculum as the single pharmacy degree in Thailand. Therefore, qualitative method is well suited to the study of this issue because it allows the capture of the experiences and perceptions of stakeholders about the needs for the curriculum change and other perspectives related to the impact of the curriculum change.

There are various forms of data collection methods in qualitative study; for example, interviews, focus groups, and observations. The selected the method will dependent on the research questions, the time and resources available, and accessibility and feasibility to data collection from potential participants (Accreditation Council for Pharmacy Education, 2015). The applications, strengths, and weaknesses of the different data collection methods in qualitative research are summarised in Table 3.2. However, this study focuses only on interview methods, which were used in this study.

Table 3.2 The nature of data, study population, strengths and weaknesses of the different data collection methods in qualitative research

	Individual Interview	**Focus group interviews**	**Observations**
Nature of data (Accreditation Council for Pharmacy Education, 2015)	-For exploring issues in depth and detail -To understand personal experience -To understand complex issues (e.g., motivations, decision, impacts, outcomes) -To explore private subjects, sensitive issues	-For debate, creative thinking and solutions -To explore social context and display how people talk about an issue -Rely on the researcher's focus and the group's interaction	-For understanding what actually happens rather that the explanations given -To observe the perceived naturally occurring behaviour in the topic
Study population (Accreditation Council for Pharmacy Education, 2015)	-For participants who are geographically disperse, highly diverse or seems to be less able to travel	-For participants who geographically clustered, there is some shared background to the topic	-For participants who had visible action that can be observed
Strengths (Bryman, 2012; D'Amato and Dean, 2011; Edwards and Holland, 2013)	1. Provide more detail and in depth 2. Suitable for issues that are not sensible or feasible to observation 2. Suitable for issues that need reconstruction of events (e.g. by asking participants to think back over how a series of events unfolded in relation to a present situation) 3. Allow access to a wider range of people and situations 4. Suitable for issues that would raise ethical concerns if the study use the observation methods	1. Allow the exploration of attitudes regarding specific behaviours that would not be readily provided in individual interviews 2. It is a free-flowing naturalistic conversation of the participants and they respond to each other in real time 3. Group interaction can provide understandings and synergy into participants' opinions and experiences, thus it increase quantity and quality of information	1. Provide better understanding of reality through prolonged interaction in a natural environment of social settings 2. Have ability to observe behaviour rather than rely on what participant said 3. Suitable for some issue that difficult to interviews (e.g., social worlds that might sensitive to outsiders)
Weaknesses (Boyce and Neale, 2006; Bryman, 2012; Edwards and Holland, 2013)	1. Time consuming 2. Interviewer required appropriate trained in interviewing techniques 3. Due to the small of sample are chosen and random sampling methods are not use, the generalisation might not able to made 4. Can be influence by the researcher	1. Participants need adequate expressive language and social skills to participate in the groups 2. Some participants may dominated by other participants 3. Moderators require skills in managing group dynamics (e.g., gather information from all of the participants)	1. Can be intrusive in people's life (e.g., people's time, the rhythms of work lives) 2. Quality of the observation depend on the skill of the observer 3. Observer characteristics (e.g., gender, ethnicity, social class) may affect observation

3.4.2.1 Interviews

Interviews are one of the qualitative approaches that provide a means of trying to understand people's perspectives on subjects that cannot be observed directly (Patton, 2002).

The common characteristics of interviews are:
1) They involve an interactional exchange of dialogue between two or more participants, face-to-face or by other methods.
2) A researcher has topics or issues that he/she wishes to cover but with a flexible structure.
3) Meaning and understandings are created by both the interviewer and the interviewee (Edwards and Holland, 2013; Kvale and Brinkmann, 2009).

Interviews range from structured to semi-structured to unstructured interviews.
The structured interview is more usual in quantitative surveys involving a sequence of questions, asked in the same way of all participants, with little flexibility for or by the researcher. Semi-structured and unstructured interview formats are used by qualitative researchers and provide an increasing level of flexibility and lack of structure (Edwards and Holland, 2013).

In the semi-structured interview, a researcher has a list of questions, referred to as the interview guide. However, there is no requirement to present the questions in a certain order; which questions to ask and how to ask it, is flexible and depends on the interviewee's response and the progress of the interview itself (Edwards and Holland, 2013).

A semi-structured interview provides more space for interviewees to answer but still retains some structure for comparison across interviewees. In the unstructured interview, a researcher has in mind the topic of study, but this format, has more flexibility that allows the interviewee to talk from their own perspective, but with the interviewer keeping the respondent pointed 'in the right direction' towards the research topic (Edwards and Holland, 2013).

3.4.2.2 Justification for using an interview with individuals

This study aimed to explore stakeholders' thoughts and their perceptions in depth about what happened and why in the transition to an all-PharmD programme, including both the earlier and later stages. Thus, an interview with individuals was selected for this study, due to it allowing the provision of rich data from participants' experiences, providing a comfortable environment for the interviewees and being most likely to provide the desired depth of information (Lewis and Nicholls, 2014). In addition, focus group discussions were rejected as they are more difficult to arrange for the busy stakeholders, such as policy makers, deans, academic staff, and doctors (Stokes and Bergin, 2006).

It was considered of importance, due to some topics potentially being sensitive and which might affect other people, to obscure interviewees' identities, provide confidentiality and minimise the influence of others on an individual's response (Stokes and Bergin, 2006).

3.4.2.3 Sampling

In the study, probability sampling technique typically has been selected. It means that each unit in the population has a known probability of being selected. On the other hand, a qualitative study typically uses non-probability methods for selecting the sample. It means that a sample has not been selected using a random sampling method but the sample is selected based on the specific characteristics within the sampled population. The rigour of a sample in a qualitative study is those sampled are relevant to the research questions that are being posed. However, such a research sample is not intended to be statistically representative (Bryman, 2012; Lewis and Nicholls, 2014). In Phase 3 qualitative study, non-probability sampling was used due to its ability to represent the main characteristics of each group of the stakeholders in pharmacy education, together with their appropriate selection criteria.

The main sampling approaches employed in qualitative research are explained as follows:
1) Purposive sampling: The sample units are chosen by using specific criteria; such as individuals have particular characteristics such as socio-demographic characteristics, specific experiences, behaviours or roles that will enable detailed exploration of the research question. Members of a sample are chosen by using criteria to meet two aims: 1) to ensure that all key informants are of relevance to the research questions and 2) to ensure that the sample units have enough diversity (Lewis and Nicholls, 2014).

2) Theoretical sampling: The researcher selects an initial sample, analyses the data, and selects a further sample. The data collection is continued until the researcher reaches a point of "data saturation"; the moment when no new theme or issue would be obtained from expanding the further sample (Accreditation Council for Pharmacy Education, 2015). The theoretical sample is appropriate for exploratory studies in areas that are difficult to identify in advance as possessing the characteristics that are need in the sample. The choice will be be influenced by the nature of the research population and its complexity. Time and resources are the pragmatic factors that also play an important part in the decision to continue data collection (Accreditation Council for Pharmacy Education, 2015).

3) Convenience sampling: This approach is based on who is available. The advantages of convenience sampling are that the approach is cheap and quick. However, it has limitations regarding the validity of the findings that might be strengthened through a more systematic approaches (Accreditation Council for Pharmacy Education, 2015).

4) Snowball sampling: It is a sampling approach where the researcher initially samples a small group whose members are relevant to the research questions. These participants suggest other participants who have the experience or characteristics relevant to the study, and those suggest others, and so on (Bryman, 2012).

3.4.2.4 Sample sizes

Many qualitative researchers commented about the number of interview to conduct that "it depends" (Lewis and Nicholls, 2014, p.117). Some issues that will help to determine the sample size are presented below.

1) Heterogeneity of the population: if the population related to the topic is known to be very diverse, it is likely to increase the required sample size (Lewis and Nicholls, 2014).

2) Type of research approach: for example, narrative research might need to sample just two or three individuals, while a general qualitative sample is usually under 50. If much larger than 50, the quality of data collection and analysis can be difficult to manage (Lewis and Nicholls, 2014).

3) The budget and resources available in terms of data collection and analysis (Lewis and Nicholls, 2014).

4) It is important that sample size should not be too small, in order to ensure that the sample will be rich in terms of the characteristics and diversity within the population (Lewis and Nicholls, 2014).

5) A sufficient sample size has been reached when the same stories are emerging from the interviewees, this is often called 'data saturation' (Boyce and Neale, 2006).

3.4.2.5 Justification for selected sampling methods

This study adopted different sampling methods. It began with purposive sampling by using selection criteria for selected stakeholders who were relevant to pharmacy education. The sample was purposive, designed to ensure that participants at different stages in the curriculum change were included during fieldwork. The participants were among those involved in the earlier stages; some participants were involved in later stages of the change, and some were involved in both earlier and later stages of the change. For example, the interview guide for policy makers had questions focused on the events in the earlier stage of the transition to an all-PharmD programme while users were asked about their perceptions on the situation in year 2013, when there were no graduates from the new PharmD programme. The researcher used snowball sampling to further sample, especially in hard to reach populations, including policy makers, pharmacy experts, and health care providers who have had the experience to work with PharmD graduate (Bryman, 2012). This study also used convenience sampling for some stakeholder groups (e.g., students and public). Then the researcher considered to expand or not to expand the sample further, based on the common sense of the researcher about the data saturation; whether the data collected was able to provide a reasonable answer to the research questions. In addition, justification for the selection of stakeholders, inclusion criteria, and recruitment processes are explained in more detail in Chapter 6.

3.5 Validity and reliability

3.5.1 Validity and reliability: quantitative perspectives

3.5.1.1 Validity

Validity refers to the issue of whether an indicator that is developed to measure a concept really measures that concept (Bryman, 2012). To ensure validity, a research instrument must measure what it was intended to measure (Gray, 2009). At the basic level, different types of validity can be define as follows: measurement validity, internal validity and external validity (Creswell and Clark, 2011; Gray, 2009).

3.5.1.1.1 Measurement validity

Writers on measurement validity suggested a number of ways of appraising measurement validity: face validity, content validity and construct validity (Bryman, 2012). Two methods of measurement validity used in this study are outlined below.

3.5.1.1.1.1 Face validity

Gray stated that "Sometimes face validity may be sufficient, that is, the extent to which an instrument *looks* as though it will measure what it is intended to measure" (Gray, 2009, pp. 299-300). Face validity may be established by asking other experts in a field whether the measure seems to reflect the concept concerned (Bryman, 2012).

3.5.1.1.1.2 Content validity

This concept refers to how judges assess whether the items or questions are representative of possible items (Creswell and Clark, 2011). Bernhardt stated that "If the content of a questionnaire matches a situation that is being studied, then the questionnaire has content validity" (Bernhardt, 2016, p.3). This type of validity was used in the questionnaire development process, regarding the measuring perceptions in education research (Artino et al., 2014; Bernhardt, 2016). An important component in test development is providing evidence that the items created are measuring the content they are supposed to measure (Pierce and Peyton, 1999). An evaluation of the match between items and objectives is the most important assessment during the content validation process (Pierce and Peyton, 1999). An Item-Objective Congruence (IOC) index evaluation is a process by which content experts rate individual items based on the degree to which they measure specific objectives listed by the test developer.

The IOC has been used in content validity tests in some educational studies (Pierce and Peyton, 1999; Sovajassatakul et al., 2011; Tungsujarittam and Intrasai, 2014). A content expert will evaluate each item by giving the item a rating of -1 (clearly not measuring), 0 (degree to which the content area is unclear) or 1 (for clearly measuring) for each objective (Pierce and Peyton, 1999).

3.5.1.1.2 Internal validity

Internal validity relates to the extent to which the investigator can conclude that there is a cause and effect relationship among variables. It might be when researchers are trying to link a cause with an effect. Therefore, it might not be relevant to most descriptive studies, such as surveys that simply report findings. Internal validity is relevant for assessing interventions because it is required to be able to conclude that the programme of interest made a difference (Stoiber and DeSmet, 2009).

3.5.1.1.3 External validity

External validity refers to the confidence of the researcher to generalise the findings to other persons in other places and at other times (Creswell and Clark, 2011; Dumont, 2008). Regarding validity in surveys, external validity is usually of highest concern in survey design (Creswell and Clark, 2011). In this study, a self-administered questionnaire was distributed to pharmacists at their 2013 conference. It could be that only enthusiastic participants answered and completed the questionnaires. Therefore, the non-respondent bias might makes it difficult to generalise the findings to the broader population, as the participants in the survey might represent only one kind of person in the potential research population (Dumont et al., 2015).

3.5.1.2 Reliability

Reliability refers to the consistency of a measure of a concept. If a test is considered reliable, one would expect an individual to obtain similar results on separate occasions (Dumont, 2008). Reliability is categorised as internal consistency reliability and test-retest reliability (Dumont, 2008; Stoiber and DeSmet, 2009). Internal consistency reliability involves assessing consistency of performance across test items on a single test. It is done by administering a test to a group of people then using statistical techniques to estimate the reliability of the test. Internal consistency reliability is an indirect method of calculating reliability but is practical and cost-effective, while the test-retest method provides a direct assessment (Dumont, 2008).

The test-retest reliability assesses the consistency of a measurement across the time. Test-retest reliability is important in surveys when the survey is based on a repeated cross-sectional design; that is when a survey is conducted at two or more different points in time (Dumont, 2008).

3.5.1.3 Justification for validity and reliability in quantitative study (Phase 1 and Phase 2 surveys)

3.5.1.3.1 Validity and reliability used in Phase 1 survey

3.5.1.3.1.1 Validity checking: face validity.

In Phase 1, the FIP global pharmacy education survey was chosen to collect data on the status of Thai pharmacy education, because it was well suited to this study as it consisted of questions regarding status of pharmacy education and was validated. The original English version of the FIP global pharmacy education survey was translated into the Thai language, detailed information of which can be seen in Chapter 4. The adapted version of the questionnaire was tested for face validity through discussion with academic supervisors (CA, BY) and PW, a Thai pharmacy education expert and a policy maker of the Pharmacy Council of Thailand.

3.5.1.3.1.2 Reliability checking: the pilot test for the clarity of the questionnaire.

Reliability refers to the consistency of the questions' results. Consistency is defined as the ability of the respondents to understand the meaning of the questions. If questions are poorly worded or confusing, that might diminish questionnaire reliability (Haskell, 2009).
A pilot study was used to test the clarity of the questionnaire, the understanding of the questions, to determine what resources were needed to answer the survey questions and to identify any practical problems. The pilot study volunteer was a dean of one of the faculties of pharmaceutical sciences in Thailand. The Dean was asked to identify any difficult or confusing items. The Dean also suggested that the researcher should provide the definition of full time academic staff and the definition of the opportunities for teaching staff to attain formal qualifications in education/teaching and learning. The Dean's responses and the time taken to complete each part of the survey were noted. Therefore, questionnaire reliability was ensured by testing for the clarity and understanding of the questionnaire in the pilot study. The pilot study's results were included in the main findings.

3.5.1.3.2 Validity and reliability used in Phase 2: The pharmacists' perceptions survey

3.5.1.3.2.1 Validity checking: the content validity.

In Phase 2 of this study: the pharmacists' perceptions survey, the content validity of two survey questionnaires was verified by pharmacy experts, as explained in Chapter 5, by using an Item-Objective Congruence (IOC) index score greater than 0.5 (Phongrat, 1997) to confirm the content validity of the questionnaire.

Table 3.3 showed the list of items and objective(s) that each item was intended to measure. This list was distributed to three content experts. Each expert would rate each item on each of the objectives.

Table 3.3 One content expert's ratings for two items measuring each objective

Items	Objectives	Experts' opinion			
		-1 (clearly not measuring)	0 (unclear)	1 (clearly measuring)	Suggestions
1. Do you think PharmD graduates are suitable to be employed at your workplace setting?	Outcome of the PharmD programme			1	
2. Do you think there are any differences in pharmacy competency between the 5-year BPharm and the 6-year PharmD graduates?	Performance of PharmD graduates			1	

After the experts complete an evaluation of the items, the ratings are combined to provide indexes of IOC measures for each item on each objective. The range of the index score for each item is -1 to 1, where a value of -1 means that all experts agree that the item is not measuring the objective and a value of 1 means that all experts agree that the item is clearly measuring that objective (Pierce and Peyton, 1999).

In Table 3.4, there are two items, two objectives, and ratings provided from three content experts. The index value of 1 for item 1 indicates that all experts agreed that the item is clearly measuring objective 1. The cutoff accepted value might be a minimum of 0.5 (Phongrat, 1997).

Table 3.4 The Index of Item-Objective Congruence (IOC) values and the judges' average ratings for each objective

Items	Objectives	Experts' opinion			
		Expert 1	Expert 2	Expert 3	Average IOC
1. Do you think PharmD graduates are suitable for employment at your workplace setting?	Outcome of the PharmD programme	1	1	1	1
2. Do you think there are any differences in pharmacy competency between the 5-year BPharm and the 6-year PharmD graduates?	Performance of PharmD graduates	1	1	1	1

3.5.1.3.2.2 Reliability checking: the internal consistency reliability.

The questionnaire included two types of questions: i) closed-ended questions using dichotomous answers (yes/no) and ii) open-ended questions that aimed to explore the meaning of the responses. The internal consistency reliability was ensured by used the Cronbach's alpha test. Cronbach's alpha is a commonly used test of internal reliability which can be used for both binary-type and large-scale data (Boss and Lowther, 1993). A computed alpha coefficient will vary between 1 (perfect internal reliability) and 0 (no internal reliability). An acceptable level of internal reliability is typically is 0.80 (Bryman, 2012).

3.5.2 Validity and reliability: qualitative perspective

There are some common criticisms reflecting concerns about the validity and reliability of qualitative research findings. Such concerns include a lack of transparency in the analytical procedure, the generalisability of findings from a small and non-random sample, bias of the researcher, the validity and reliability of main instrument (Bureau of Policy and Strategy, 2010; Merriam, 2009; Murphy and Yielder, 2010). The explanation of validity and reliability from a qualitative perspective needs to be based on the worldview of qualitative research, where reality is constructed, multidimensional and ever-changing (Merriam, 1995; Patton, 2002), and where there is no a single, absolute reality waiting to be observed and measured (Merriam, 1995). Therefore, researchers offer their interpretations of someone else's interpretation of reality (Merriam, 1995).

Unlike quantitative research, which uses statistical approaches for establishing the validity and reliability of research findings, qualitative research has different strategies to ensure the rigour of the findings (Murphy and Yielder, 2010).

In a qualitative study, validity refers to the findings provided by the researcher and the participants, that are accurate and can be trusted (Creswell and Clark, 2011; Lincoln and Guba, 1985); an alternative term, credibility, is sometime used (Engels et al., 2015).

Reliability or dependability relate to the consistency within the employed procedures designed to ensure that data collection is undertaken in a consistent manner (Long and Johnson, 2000) and that the research findings are consistent (Murphy and Yielder, 2010).

There are those who believe that qualitative research is dynamic and therefore that studies can never be repeated. They argue that, in the first place, there is no single reality to be captured, thus replication is not a realistic goal to follow. This is not to question the existence of the phenomenon itself, but rather to acknowledge that other factors may exist and will affect a potential for replication. Therefore, the replication of research findings would be achieved if another study uses the similar methods in similar conditions. Therefore, it is important to provide a clear description of methods or an audit trail indicating how the study was designed and conducted, as well as how data were interpreted (Engels et al., 2015).

Merriam (1995) used the term “trustworthiness” to describe the rigour of qualitative research. Lincoln and Guba (1985) offer “trustworthiness criteria” for representing rigour in qualitative research, compared to the quantitative terms, as presents in Table 3.5. Advantages and limitations of strategies for enhancing the rigour of qualitative study are summarised in Table 3.6.

It should be noted that the central part of all trustworthiness criteria is the researcher’s reflexivity. The details of the researcher’s reflections on the research are presented in Chapter 6 (p. 203) and Chapter 7 (pp.278-280). Researchers have to discuss their own roles in, and influences upon, the research and provide clear audit trails of documents to support their research findings (Lincoln and Guba, 1985; Murphy and Yielder, 2010).

Table 3.5 Comparison of terminology regarding validity and reliability in quantitative and qualitative perspectives and strategies that used to enhance rigour in qualitative study

Quantitative terms (Murphy and Yielder, 2010)	**Qualitative terms** (trustworthiness criteria) (Bureau of Policy and Strategy, 2010; Merriam, 1995; Murphy and Yielder, 2010)	**Strategies used to enhance rigour in qualitative study** (Bureau of Policy and Strategy, 2010; Creswell and Clark, 2011; Long and Johnson, 2000; Merriam, 1995; Murphy and Yielder, 2010)
Internal validity	**Credibility or truth value** -Represent the accurate of findings that fit or acceptable between respondents' views and the researchers' interpretation of them -It is recognised that there are several realities exist and a researcher viewpoints and experiences may influenced the findings (Bureau of Policy and Strategy, 2010).	1. Respondent validation or member checking 2. Prolong engagement in the setting 3. Triangulation 4. Peer examination 5. Reflexivity and reflection on own perspectives
External validity or **generalisability**	**Transferability or applicability** -Application of findings to other contexts or settings -In qualitative research, which has individual subjective meaning or unique experience, thus it should be case-to-case transfer, not generalisation to the broader population (Murphy and Yielder, 2010).	1. Provide thick description about the settings and the participant characteristics (Murphy and Yielder, 2010).
Reliability	**Dependability or consistency or confirmability** -The findings can be confirmed if another study use the similar methods or condition under the qualitative views. -In qualitative study, consistency also means that the findings of a study are consistent within the data collected.	1. Triangulation 2. Peer examination 3. Clear audit trail of documents (e.g., raw data, analysis notes, process and personal notes) (Murphy and Yielder, 2010) 4. Inter-coder agreement

Table 3.6 Advantages and limitations of strategies for enhancing the rigour of qualitative study

Strategies	Advantages	Limitations
1. Respondent validation/member checking -The researcher takes major themes of the finding back to key participants in the study and ask them whether the findings are an accurate reflection of their experiences (Creswell and Clark, 2011; Engels et al., 2015).	-Lincoln and Guba (1985) suggested that member checking is the most important technique for validation. It involves taking the findings back to the research participants to check the completeness of coverage of the subject of the phenomenon and to confirm their meaning or researchers' interpretations (Engels et al., 2015).	-Respondent validation is normally conducted by a researcher. It might be increase strength if the check process by a third party rather the researcher (Long and Johnson, 2000; Murphy and Yielder, 2010).
2. Prolong engagement -The researchers present in the setting under investigation for a significant period of time.	-Builds trust and allows the researcher to engage themselves into the local culture (Long and Johnson, 2000). -Able to gain an adequate understanding in the situation (Shenton, 2004)	-It might deter the researcher from cooperating, if too many demand are made on staff, gatekeepers responsible for allowing the researcher access to the organisation (Lincoln and Guba, 1985; Shenton, 2004).
3. Audit of the decision trail -This approach aims to declare of the decision trail in both a physical audit trail (e.g., details of all sources of data, collection techniques, methodology decisions) and an intellectual audit tail (e.g., how a researcher is thinking, assumptions made, decisions taken, meanings interpreted, and influences on the researcher) (Long and Johnson, 2000)	-It increases research transparency. -It is a useful approach for novice researchers to encourage a self-questioning and reflective attitude regarding the research process (Long and Johnson, 2000).	-The researcher needs to maintain a log of all research activities, document all data collection and analysis process throughout the study. -Rarely implemented in practice.
4. Triangulation -Triangulation means the use of different sources of information to confirm and improve the clarity of the findings by involve the use of several data sources (interviews, documents), comparing data generated by different methods (e.g., quantitative, qualitative), or from diversity of informants (Engels et al., 2015; Murphy and Yielder, 2010; Shenton, 2004)	-To overcome a weakness or bias of a single research approach -The diversity of informants, several organisations (site triangulation) provide a better, more stable view of reality (Shenton, 2004).	-Energy and time consuming (Hruschka et al., 2004).
5. Inter-coder agreement (simple methods) -Inter-coder reliability assesses the degree to which coding of text by multiple coders are similar (Hruschka et al., 2004)	-It is a systematic coding process that provide more reliable compared with a process where coder used his or her own individual methods and interpretations (Hruschka et al., 2004).	-Energy and time consuming (Hruschka et al., 2004).
6. Peer debriefing -To discuss the findings at intervals with supervisors or knowledgeable colleagues, presenting or publishing preliminary findings or national conference attendance (Murphy and Yielder, 2010).	-Opportunity to engage and answer critical questions.	-Energy and time consuming (Hruschka et al., 2004). -A researcher should report how the debriefer is chosen, the nature of the debriefing (e.g., frequency, duration, content, effect on research and outcomes) (Barber and Bellin, 2009)
7. Reflexivity and reflection on own perspectives -A researcher reflect their own views, beliefs and experiences, and how the researcher constructs knowledge from the research process (e.g. statement of researcher's experiences, assumptions, biases)(Long and Johnson, 2000; Shenton, 2004) **-Reflection** is an in-depth consideration of events outside of oneself. Reflection involves these questions: who, what, how, when, where and why. **-Reflexivity** is finding strategies to question our own attitudes, thought process, to understand our roles in relation to others.	-Flood state that "Without some degree of reflexivity any research is blind and without purpose" (Flood, 1999). -Reflexivity is normally used in qualitative research and has been accepted as a method where researcher can validate their research practices (Lambert et al., 2010).	-It is challenge to researcher to decide how best to exploit the reflexive potential of their research (e.g., difficult to publish due to the limitation of their subjective analysis by academic journal) -Researchers' apparent openness and attention to multiple dynamics can disguise the partial nature of their findings (Finlay, 2002).

3.5.2.1 Justification for validity and reliability in qualitative perspective

In qualitative study, there is more of a focus on validity rather than reliability, to ensure that the findings are accurate, can be trusted and are credible (Creswell and Clark, 2011). However, both qualitative validation and reliability are important to establish.

In the qualitative phase, the researcher used triangulation, member checking, inter-coder agreement and, audit trails to enhance the rigour of the study. Table 3.7 illustrates the approaches to enhance rigour of this qualitative study during the interview process, data management, and data analysis.

Table 3.7 The approaches to enhance rigour of the qualitative phase in this study

(Alozaibi, 2011; Creswell, 2014)

Process	Approaches	Details
Data collection	The interview guide	The interview guide was developed based on both the research questions and a literature review. The interview guide was reviewed and approved by a senior qualitative researcher (CA) and academic supervisors (CA, BL). Thai academic advisors of Faculties of Pharmacy (PW, SM) also reviewed the interview guide for the appropriateness in Thai context. The interview guide was used in the semi-structure interview process to ensure that the same basic information is obtained from interviews. However, the interview guide was flexible and able to improve for the new ideas identified during the data collection.
	The creditability of the researcher	The researcher attended many qualitative research-training courses (e.g., qualitative research methods, individual and group interviews and analysing qualitative interviews) and practiced the interviews with experience qualitative researchers (e.g., academic members and nurses). From the trainings and experiences, the researcher gained confidence enough to conduct the interviews, data collection, and analysis in qualitative research. The researcher had the strict adherence with the ethical requirement (e.g., concerning about confidentiality, consequences and the researchers' role) and scientific quality of research (e.g., maintain the distance between being researcher, pharmacy profession and personal friendship) to provide a full and unbiased investigation of the phenomena as much as possible.
	The pilot study	The pilot study was undertaken to test the interview process and the interview schedule. The pilot study allowed TC to get familiar with the research environment, enhance interview skill, and refine the interview strategy for the different groups of stakeholder.
	Triangulation	Triangulated data were collected from different type of stakeholder categories via interviews across four different regions to check and establish validity include all types of stakeholders who involved in the quality assurance of pharmacy education according to the FIP definition and also include sub-groups of each stakeholder category to further maximise sample variation (Creswell, 2013; Guion, 2002; Hinton et al., 2015; Illing JC et al., 2013).
Data management	Audit trails	The audit trail is an essential part of rigorous qualitative study that will able to track how the data were analysed and how themes were generated through interviews and interpreted to assess the trustworthiness of the research (Guba, 1981). This qualitative study provided details of method in Chapter 6.
	Transcription	To enhance reliability of transcription, ten Thai transcriptions were randomly checked twice for accuracy with the audio recordings by TC and one Thai pharmacist (Lee et al., 2013). To enhance validity of transcription, transcripts were sent back to 10 requested interviewees for them to check and confirm for correctness (Corden and Sainsbury, 2006; Creswell, 2013; Hinton et al., 2012).
	Translation	Meaning-based translation from Thai to English was performed by TC and had forward- blind backward translations process (Larson, 1998) to check the correctness of the translation. This process was performed to validate the translations and ensure no loss of conceptual equivalence had taken place (Squires, 2009).
Data analysis	Triangulation	In order to validate the information from interviews, the interviews have been triangulated with the analysis of peer-reviewed publications, meeting minutes, unpublished report, and pharmacy professional association reports (Boyden, 2006). The findings and data from different sources (Creswell, 2013; Guion, 2002; Illing JC et al., 2013) (e.g., government document) were compared and contrasted; facts provided by the participants were confirmed.
	Peer debriefing	Emerged themes were regularly discussed with the academic supervisors during supervision meetings that provided new perspectives of the data and added credibility to the findings. The preliminary findings were presented at national and international conference and some were also published.
	Member checking	In order to validate the interpretation of researchers, this study took the preliminary analyses consisting of major themes back to six key participants, who willing to share their views of the analyses (Creswell, 2013) and ask them whether the findings are accurately reflected their experiences.
	The inter-coder agreement	To establish the reliability, this study used the inter-coder agreement process with the simple agreement method. A draft code book was developed. It was aimed at determining the agreement of the coding. TC and CA independently coded two transcripts using a codebook and comparing codes. They considered the agreement of coding for these passages to be more than 80% of coding (Creswell, 2013).
	Reflexivity	The researcher is the main instrument for obtaining knowledge in qualitative research (Patton, 2002). Therefore, the researcher reported her personal and professional information that might have affected data collection, data analysis, interpretation, and reflexivity in Chapter 7.

3.6 Ethical approval and funding

3.6.1 Ethical approval

This study was granted ethical approval from the Faculty of Sciences, University of Nottingham in April 2013 (An email regarding the ethical approval from the Faculty of Sciences, University of Nottingham), the Research Ethics Committee of Ubon Ratchathani University (26 July 2013) and the Research Ethics Committee of Buddhachinaraj Hospital (No.88/56, 26 September 2013). Approval letters for this study are presented in Appendix 4.

3.6.2 Funding

The Royal Thai Government funded this PhD study.

3.7 Summary

In this chapter, a detailed description of the methodological approaches used in this study has been provided. A pragmatism worldview and a mixed methods approach were employed as appropriate ways to answer the research questions in this study. The justification for using quantitative and qualitative methods is discussed, demonstrating the appropriate choice for using each of the data gathering methods used in the study. The validity and reliability of this study were discussed. The following three chapters will present the findings of this research.

CHAPTER 4:

Phase 1: A survey of the status of pharmacy education in Thailand

4.1 Introduction

This chapter presents the results of the Phase 1 of this research: a survey the status of the pharmacy education in Thailand. The International Pharmaceutical Federation and the World Health Organization's (FIP-WHO) Global Survey of Pharmacy Schools was used as an information source and tool for this study. The survey instrument was distributed to the deans of all 19 of the faculties of pharmacy in Thailand.

4.1.1 Justification for considering the survey of the status of the pharmacy education in Thailand

Pharmacy education in Thailand has undergone a significant transition, as described in Chapter 2. To this researcher's knowledge there has been no previous national survey into the status of pharmacy education for the PharmD programme in Thailand. Therefore, the objective of this study was to explore the status of pharmacy education in Thailand in 2013. The findings from this study were used to triangulate with the qualitative study in **Chapter 6**.

4.2 Objectives

To explore the status of pharmacy education in Thailand; in particular addressing the characteristic of faculties of pharmacy, academic programmes, pharmacy education workforce and standards of quality assurance.

4.3 Methods

4.3.1 Study design

The objective of the study was addressed using a cross-sectional survey.

A. Justification for using the FIP global pharmacy education survey

The FIP global pharmacy education survey was chosen to collect data on the status of Thai pharmacy education because it well suited to this study, as it consists of questions regarding the status of pharmacy education and was validated (see Appendix 5).

The original FIP global pharmacy education survey was developed in collaboration with the FIP Collaborating Centre at the University College, London; the School of Pharmacy at the University of Nottingham, and the FIP*Ed* and WHO Human Resources for Health staff (Anderson et al., 2014a; Bates et al., 2013). This global survey aimed to collect the educational backgrounds of pharmacy students prior to registration as licensed pharmacists and pharmacy educators, as well as to assess the quality assurance accreditation mechanisms. The findings were used to identify workforce shortages and opportunities for collaboration, as well as providing evidence-based information needed for policy development.

Respondents included FIP member organisations, contacts at individual universities, and contacts in associations from 109 countries and territories. The FIP*Ed* survey was conducted in English and also Arabic, Chinese, French, Japanese, Portuguese, and Spanish, between January 2012 and April 2013. The results represented 175,000 pharmacy students and 2,500 educational institutions and are available in the 2013 FIP*Ed* Global Education Report (Anderson et al., 2014a; Bates et al., 2013).

B. Development of the questionnaire

The FIP*Ed* gave permission to use the FIP global pharmacy education survey in this study. Translations and cross-cultural adaptations to Thai language were allowed. The original English version of the FIP global pharmacy education survey was translated into the Thai language, and then adapted with some added questions, in order to be specific to Thai pharmacy education. The different types of Thai compulsory clerkships/placements were added in the question about the ownership of training sites; some questions relating to such issues as language use in pharmacy programmes, the accreditation bodies, and the process of registration of the licensed pharmacists, that were common in Thai context, were omitted in order to save time for the respondents.

-Forward-backward translation

The details of forward-backward translation (Chen and Boore, 2010; Feng-bin et al., 2014; Lopez et al., 2008; Nes et al., 2010) are as follows: the questionnaire was forward translated into a Thai language version by two bilingual Thai translators (TC, NK[3]), using a symmetrical translation approach; the translation was then checked by another bilingual pharmacy academic in Thailand (PW[4]). Agreement on the veracity of the forward-translated version was reached by all translators using two criteria: i) clarity and ease of understanding of the translation ii) conceptual equivalence.

The questionnaire was then processed 100% blind-backward translation from Thai into English by the bilingual Thai-English speaker (WN[5]). The backward translation (English) was reviewed for conceptual equivalence with the forward translation (Thai version). Researchers confirmed Thai and English language consistency. Two English versions (original and backward translation with adaptation questionnaires) were considered and approved by a FIP*Ed* expert (CA), who was in the team who developed the original version. A consensus among researchers was reached on the final translation.

-Face validity and pilot study

The adapted version of the questionnaire was tested for face validity through discussion with academic supervisors (CA, BL) and PW, a Thai pharmacy education expert and a policy maker of the Pharmacy Council of Thailand (PCT). The pilot study tested for the clarity of the questionnaire and the understanding of the questions. Using a volunteer dean from one of faculties of pharmaceutical sciences in Thailand, the pilot study was also used to determine what resources were needed to answer the survey questions and to identify any practical problems. The Dean was asked to identify any difficult or confusing items. The Dean's responses and the time taken to complete each part of the survey were noted; the translation was then revised as needed. The pilot study's results were included in the main results.

[3] NK = Dr.Nonglek Kunwaradisai; NK is an Assistant professor at the Faculty of Pharmaceutical Sciences, Ubon Ratchathani University, Thailand, who obtained her PhD degree from the University of Bradford, United Kingdom in 2002.
[4] PW = Dr.Payom Wongpoowarak; PW is an Associate Professor at the Faculty of Faculty of Pharmaceutical Sciences, Prince of Songkla University, Thailand who obtained her PhD degree from the University of Cardiff, United Kingdom in 1999.
[5] WN = Dr.Wipapan Ngampramuan; WN was an interpreter of the Royal Thai Police Headquarter, a lecturer of English at Department of English, Faculty of Liberal Arts, Mahidol University and obtained her PhD degree from the University of Nottingham in 2016.

-Details of the survey

The survey was divided into 2 parts (see Appendix 6: Thai version of FIP-WHO global survey of pharmacy school).

Part 1 covered details of the faculty or school, such as a list of academic programmes offered, types and qualifications of teaching staff, number of students who enrolled, left the programme, or graduated between 2009 and 2012, maximum capacity for new admissions, requirements for admission, and descriptions of sites for student training.

Part 2 covered quality assurance and included questions regarding quality assurance mechanisms and processes, and continuing education for graduated professionals.
The researchers also asked for the related documents each school used to fill up the survey. Respondents were typically the dean or the deputy dean for academic affairs. The survey took about 3 hours to complete because information was required from various faculty members: academic staff, quality assurance staff, and clerkship staff who arrange the rotations.

4.3.2 Population and sample

All deans of the 19 universities (Figure 4.1) that provided pharmacy programmes were contacted by conventional or electronic mail and were requested to complete the survey.

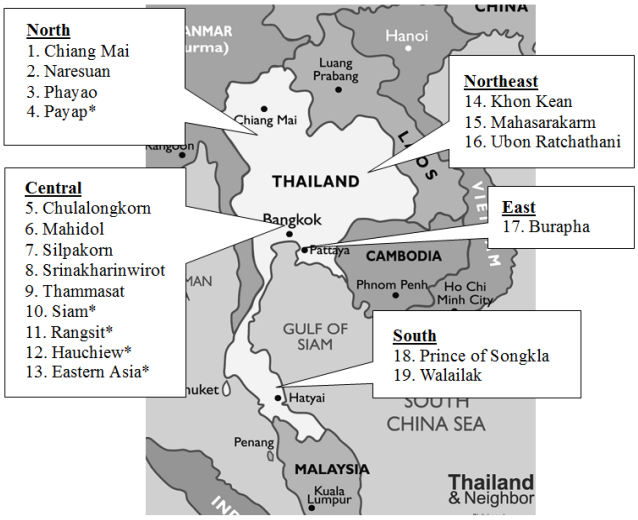


Figure 4.1 The nineteen universities providing pharmacy education in Thailand (14 public universities, *5 private universities)

4.3.3 Data collection

Data were collected from April to July 2013. A cover letter, survey instrument, and self-addressed stamped return envelope were mailed to the 19 Deans of Faculties of Pharmacy. Six weeks later, a follow-up e-mail and new cover letter were sent to those who had not responded to the initial mailing. To increase the response rate, the survey instrument was sent three times and respondents were offered 1,000 baht or approximately £20 (exchange rate on May 2013; £1 = 46.06 Thai baht) as an incentive. The incentive amount was based on rate of overtime compensation suggested by the Ministry of Finance.

4.3.4 Data analysis

To ensure the accuracy of the information in this study, respondents were asked to include documents relevant to pharmacy education and the academic programmes they described in the survey. This data included quality assurance reports, self-assessment reports, curriculum, list of academic staff and students, research, and article references (see Appendix 7 for details of the documentation).

The survey data were compared to these documents, as well as with other publicly accessible documents. The data analysis was based on the best available validated data checked by the researcher (Bates et al., 2013). Data were entered into Microsoft Excel (version 2007) and percentages were calculated. Respondents were asked about any missing data; percentages of missing data, and possible reasons for missing data, were presented.

4.3.5 Ethical approval

The Faculty of Sciences, University of Nottingham, United Kingdom, granted ethical approval for this phase of the study on the 29th April 2013 (see Appendix 4).

4.4 Results

4.4.1 Faculty characteristics

The response rate was 84.2%: 16 of the 19 deans responded. Those three non-respondents were one public university and two private universities due to the limitation of coordinating staff and difficulty to access the information. Table 4.1 summarises the characteristics of the sixteen faculties of pharmacy whose deans responded to this survey. Most faculties were located in the central part of Thailand. More than half of the colleges have been in existence for less than 20 years.

There are two paths of admission to pharmacy programmes: through direct admission or the central admission system. The direct admission process, through which candidates could apply to the university directly, might recruit about 60% of student capacity for new admissions. The criteria include cumulative Grade Point Average (CGPA)[6], total General Aptitude Test (GAT)[7] scores, Professional Aptitude Test (PAT)[8] scores, a physical examination, and a colour blindness test. The other path to entry was through the central university admission system, managed by the Commission on Higher Education, which recruits students to about 40% capacity for new admissions. The criteria are the same as for the direct admission system, but also include the Ordinary National Educational Test (O-NET)[9].

[6] CGPA is assessed from grade 10 to 12 with a total of 6 semesters.

[7] GAT assesses English skills in speaking, vocabulary, structure and writing.

[8] PAT assesses skills in maths, science, engineering, architecture, teachers' aptitude, art aptitude, and aptitude in foreign languages.

[9] O-NET is a test for assessing knowledge and proficiency of grades 6,9 and 12 students in line with stands of learning covering the following major subjects areas: Thai language, math, sciences, social sciences culture and religion, English language, art, career and technology. The National Institute of Education Testing Service is responsible for conduction the ONET exam. The admission committee considers the test scores when reviewing applications; GPAC 20%, O-NET 30%, GAT 10% and PAT 40%.

Table 4.1 Characteristics of the Faculties of Pharmacy surveyed (n=16)

Characteristics	No. (%)
Regional location within Thailand	
North	4 (25.0)
Northeast	3 (18.8)
Central	7 (43.8)
East	1 (6.3)
South	1 (6.3)
Year in existence (range)	
1-20 years (1-19)	9 (56.3)
21-40 years (21-33)	4 (25.0)
>40 years (45-100)	3 (18.7)
Ownership	
Ministry of Higher Education	13 (81.3)
Private	3 (18.7)
Maximum capacity for new admissions to the first year	
1-100	7 (43.8)
101-200	9 (56.3)
Admission	
Both direct and central admission with interview	11 (68.8)
Direct admission with interview	2 (12.5)
Central admission with interview	3 (18.7)
Opportunities for teaching staff to attain formal qualifications in education/teaching and learning	
Yes	16 (100)
No	0 (0)

4.4.2 Type of degrees offered

All faculties have offered only the 6-year PharmD programme in 2012. Table 4.2 provides the number of the type of degrees offered. However, the PharmD programme in Thailand, with its two main tracks relating to pharmaceutical care and industrial pharmacy, differs from the PharmD model in the USA.

Table 4.2 Degrees offered in academic year 2013 in 16 pharmacy faculties

Degrees offered	No. (%)
Degree offered in 2013	
5-year programme (bachelor of pharmacy, BPharm)	0 (0)
6-year programme (doctor of pharmacy, PharmD)[a]	
- PharmD (pharmaceutical care only)[b]	5 (29.4)
- PharmD (with special track)[c]	8 (47.1)
- PharmD (separate programme)[d]	3 (17.6)
- PharmD (international programme)[e]	1 (5.9)
Master's degree (length 2 years)	
Yes	5 (31.2)
No	11 (68.8)
PhD (length: 4 years)	
Yes	8 (50.0)
No	8 (50.0)
Graduate diploma (length: 1 year)	
Yes	1 (6.2)
No	15 (93.8)

[a] One university has 2 types of the 6-year programme.

[b] **PharmD (pharmaceutical care programme only)**

[c] **PharmD with 2 to 4 specialised tracks** chosen in the fourth year (e.g., industrial pharmacy—an official name used by the Pharmacy Council of Thailand instead of pharmaceutical sciences, pharmaceutical care, primary pharmacy and consumer health protection, pharmaceutical and health informatics)

[d] **PharmD separate programme**, for which course of study is chosen during the admissions process (e.g., industrial pharmacy, which include 4 parts: research and development, quality assurance and quality control, manufacturing and regulatory affairs, and product registration and PharmD pharmaceutical care)

[e] **PharmD international programme,** applicants for which might have been students coming from international schools in Thailand or from schools in foreign countries. This programme was taught in English but had the same setting, resources, and curriculum as the Thai language programme and was managed in conjunction with a PharmD programme taught in Thai.

4.4.3 Teaching staff

The data from year 2009-2012 were requested. Characteristics of the teaching staff from the faculties of pharmacy surveyed are shown in Table 4.3. The majority (90%) of the teaching staff were full-time employed Thai nationals. More than half of the total staff was female. Approximately 60% of all teaching staff held a doctoral degree. Less than 2% of staff completed a residency. Regarding the work balance among academic staff, an average of 60% focused on teaching activities, 20% focused on research, and less than 20% concurrently focused on patient care services in real practice settings , such as taking part in clinical ward rounds and pharmacy counselling clinics.

Table 4.3 Characteristics of teaching staff from the faculties of pharmacy surveyed (n=15, missing data=1)

Characteristics	Frequency (%)			
	2009	2010	2011	2012
Employment status				
Full time	790 (90.2)	801 (96.3)	840 (96.9)	866 (97.0)
Part time	86 (9.8)	31 (3.7)	27 (3.1)	27 (3.0)
Gender				
Male	488 (55.7)	415 (49.9)	427 (49.3)	369 (41.3)
Female	388 (44.3)	417 (50.1)	440 (50.7)	524 (58.7)
Nationality				
Local	865 (98.7)	827 (99.4)	861 (99.3)	886 (99.2)
Foreigners	11 (1.3)	5 (0.6)	6 (0.7)	7 (0.8)
Academic qualification				
PhD	491 (56.1)	515 (61.9)	537 (61.9)	553 (61.9)
Residency[a]	12 (1.3)	12 (1.4)	14 (1.6)	14 (1.6)
Others (e.g., BPharm, MPharm, MSc)	373 (42.6)	305 (36.7)	316 (36.5)	326 (36.5)
Number of full time staff who spend >50% of their time on each of the following areas (n=8, missing=8[b])				
Teaching	259 (76.2)	274 (69.4)	294 (62.8)	321 (65.2)
Research	62 (18.2)	83 (21.0)	115 (24.6)	95 (19.3)
Patient care service	19 (5.6)	38 (9.6)	59 (12.6)	76 (15.5)
Preceptor at clerkship site employed by other health services (n=10, missing data = 6)	677	778	657	816

[a] Residency is a post-graduate training. Upon completion of a pharmacy degree, graduates can pursue further training with a clinical focus, known as residency programmes (www.accp.com/stunet/compass/residency.aspx)..

[b]From 8 sets of missing data, 4 faculties responded that they could not place their staff into the 3 categories described in the questionnaire: teaching activities, research, and patient care services.
It should be noted that Thai universities/institutions have 4 primary missions to perform as follows:
i) Teaching and learning aim to provide knowledge and skills to students to achieve success in their lives;
ii) Research among academic staff is encouraged to support the country's development;
iii) Providing academic services aims to provide various kinds of academic services to the community and encourage community development;
iv) Preservation of art and culture aims to promote, conserve and maintain the traditions and values of Thai culture.

One university revealed that the teaching staff all had equivalent responsibilities for each of these 4 main tasks.

4.4.4 Students

The data from year 2009-2012 were requested. However, there were difficulties in accessing the information about student enrolment, drop-out and graduation by gender. Therefore, the respondents provided the 2012 data, which was the most recent information at that time. The number of first-year PharmD students enrolled but left before graduation in 2012 is shown in Table 4.4. Sixteen students from 10 universities left before graduation and the number of pharmacy graduates in 2012 from 11 universities was 1,113. An overview of student enrolment, drop-out and graduation rates in 2009-2011 was not provided by faculties due to faculties not having electronic databases that categorised the number of students by gender. However, faculties provided data for their latest year (2012) for this survey.

Table 4.4 Overview of student enrolment, drop-out and graduation rates in 2012

	No. (%)
Number of first-year students enrolled (PharmD programme)	
(n=15, missing data=1)	
Male	359 (29.2)
Female	872 (70.8)
Total	**1,231**
Number of first-year students who left academic program (PharmD program) before graduation[a]	
(n=10, missing data=6, number of first-year students from 10 faculties =819)	
Male	7 (0.9)
Female	9 (1.1)
Total	**16 (2.0)**
Number of graduated students	
(n=11, missing=5)	
BPharm graduated students	
Male	167 (23.7)
Female	537 (76.3)
Total	704
PharmD graduated students	
Male	93 (22.7)
Female	316 (77.3)
Total	409
Total graduated students	**1,113**

[a] The drop-out rate in this study was low (2.0%) due to it representing only the numbers of the first-year students who left the academic programme in 2012. Therefore, it was lower than the drop-out rate that was represented in Chapter 2, p.63.

4.4.5 Curriculum

All 6-year pharmacy courses in Thailand complied with the core pharmacy course structure guidelines, as recommended by the Pharmacy Council of Thailand, with not less than 140 credit hours for professional content. During the first 4 years, the curriculum provides students with core competencies for professional practice. In the last 2 years, pharmacy students selected their specialties. During the fifth year, students have course work and the sixth year consists of specialised clerkships similar to various American pharmacy practice experiences.

Clerkship experiences needed to total at least 2,000 practice hours. Students had the first 400-hour clerkship at the end of their fourth year. These practice experiences in the areas of hospital pharmacies and community pharmacies were compulsory for all pharmacy students. The remaining professional practice time depended on each individual's interest which could be hospital, community, research and development, manufacturing or regulation. The details of the 6-year pharmacy course were explained in Chapter 2. The proportions of student credit hours in PharmD programmes are as follows: dedicated to theory 51.5%, to practice 46.7%, and research 1.8% (see Table 4.5).

Table 4.5 Proportion of student credit hours in theory, practice, and research in PharmD Programmes
(n=13, missing data=3)

	Number of credits			
	Theory*	**Practice***	**Research***	**Total**
Mean ± SD (%)	118 ± 26.2 (51.5)	107 ± 28.7 (46.7)	4 ± 0.63 (1.8)	228 ± 4.8 (100)
Range	53-156	70-180	3-5	222-238

*Theory (e.g., lectures), practice (e.g., clinical facilities, laboratories, hospitals, community pharmacies), research (e.g., thesis project)

4.4.6 Training sites

Student training sites were run by both the faculties and by external entities (Figure 4.2).

The medication system clerkship was at the time a new clerkship involving conceptual framework of hospital accreditation, observation of policy, and management decision making, which was mandated by the Pharmacy Council of Thailand. This clerkship was only for the students who studied the pharmaceutical care track; therefore, some faculties do not offer it.

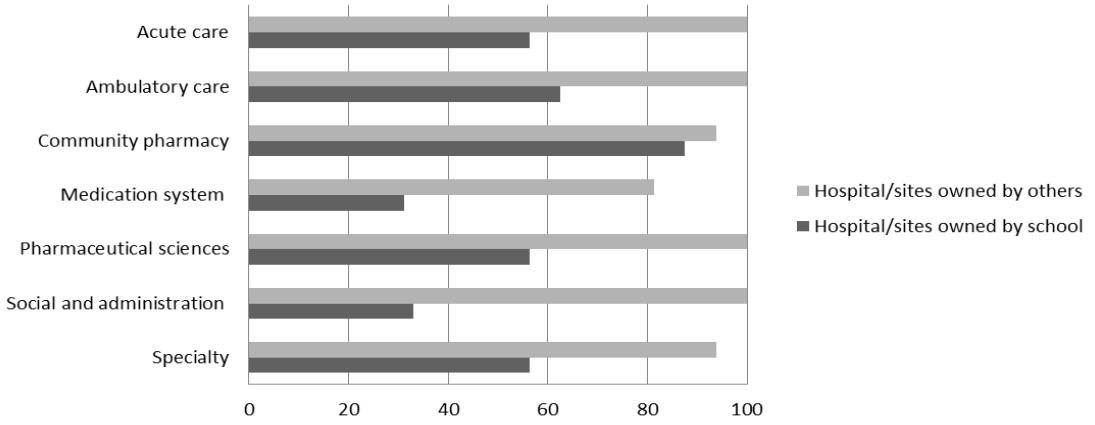


Figure 4.2 Ownership of training sites (n=16)

Regarding the issue of how well prepared the training sites were, a majority of faculties (62.5%) perceived that they had enough preceptor sites in term of quantity and quality of training; on the other hand 37.5% of the pharmacy faculties said they needed more preparation for taking on the students (Table 4.6).

Table 4.6 How prepared were the training sites of the 16 faculties

Readiness of training sites	Number of faculties (%)
Enough in both number and quality of training site	10 (62.5)
Need more preparation	
-Not enough training sites but qualify	2 (12.5)
-Enough but some training sites do not qualify	2 (12.5)
-Not enough and some training sites do not qualify	2 (12.5)

4.4.7 Quality assurance mechanisms

The quality assurance system had 2 components, internal and external. Internal quality assurance (IQA)[10] was the responsibility of each educational institution and followed the policy of Office of the Higher Education Commission (under the Ministry of Education). Assessment and evaluation occurred once a year.

The Office of the National Education Standards and Quality Assessment (ONESQA), a public organisation not associated with the Ministry of Education, oversees external quality assurance (EQA)[11]. Inspections are conducted every 3-5 years. Ten colleges underwent EQA every 3-5 years (62%) and 6 faculties experienced EQA every year (38%) (see Table 4.7).

[10] **IQA system** was developed based on "*the Higher Education Education Standards" published in the announcement of the Ministry of Education* that focuses on self-assessment (input) and process. The framework of IQA consists of 9 aspects of quality component: 1) philosophies, commitment and objectives; 2) teaching and learning; 3) student development activities; 4) research; 5) academic services; 6) preservation of art and culture, 7) administration and management, 8) finance and budgeting, 9) IQA system and mechanism.

[11] **EQA system** focuses on educational achievements (outputs and outcomes). The indicators consists of 6 standards which are: 1) quality graduates; 2) research and innovation; 3) academic service; 4) cultural preservation; 5) institutional management and development, 6) IQA (Sattayawaksakul et al. 2013)

Table 4.7 Quality assurance mechanisms and processes

Quality assurance system	Number of faculties (%)
Internal quality assurance	
Once a year	14 (87.5)
More than once a year	2 (12.5)
External quality assurance	
Once a year	6 (37.5)
Once every 3 years	2 (12.5)
Once every 5 years	6 (37.5)
Once every 3-5 years	2 (12.5)
Accredited by the Pharmacy Council of Thailand	16 (100)

Under the Pharmacy Education Committee of the Pharmacy Council of Thailand, a quality assurance system was developed for the accreditation of pharmacy graduates in each pharmacy faculty via two main processes:

1) Curriculum accreditation and institution accreditation and

2) Pharmacy licensure examination

Accreditation aimed to ensure that graduates were of high quality. The frequency of institutional accreditation by the Pharmacy Council was once every 5 years for established schools and once a year for new schools. New faculties of pharmacy changed their accreditation to once every 5 years as an established school when 50% of their graduates passed the licensure examination for 3 consecutive years. All faculties were accredited by the Pharmacy Council of Thailand (n=16, 100%).

4.5 Discussion

4.5.1 Comparison of the PharmD programme in Thailand with programmes in other countries

This study showed that all faculties offered a 6-year PharmD programme in 2012. The PharmD programme in Thailand, with its two main tracks relating to pharmaceutical care, and industrial pharmacy, differs from the PharmD model in the USA. The USA model offers a patient-focused curriculum (Bradberry et al., 2007; Nemire and Meyer, 2006; New et al., 2012). The Thai model also differs from programmes in India, Jordan, and Japan, which only offer a PharmD in pharmaceutical care (Al-Wazaify et al., 2006; Basak and Sathyanarayana, 2010; Dolder et al., 2008). The Thai PharmD curriculum is, however, similar to that of countries such as Pakistan and South Korea; both of which offer a clinical PharmD and a pharmaceutical sciences PharmD (Khan, 2010; Kim and Ghimire, 2013).

4.5.2 Comparison of the qualification of educators in Thailand and qualifications of educators in other countries

The percentage of Thai academic staff, who focused on patient care service with real practice settings in 2012, was only 15.5%. It was relatively low when compared with the percentage of US pharmacy faculty members in the pharmacy practice discipline (52%) (Beardsley et al., 2008). In addition, the number of academic staff who completed a residency programme was extremely low at less than 2%.

The new PharmD programme in Thailand is more clinically oriented, as compared to the BPharm programme, thus more academic staff in the clinical pharmacy area are needed; especially academic staff who were trained in the pharmacotherapy residency programme. The reason for this need is the residents are highly competent to provide pharmaceutical care and could be the people to bridge the gap between education and real clinical practice. They are in the position to be role models for students, pharmacists, and preceptors regarding the clinical pharmacists' role in the real world (American Association of Colleges of Pharmacy, 2015).

Policy makers might consider:

1) Increasing number of academic staff who hold a pharmacotherapy residency degree;

2) Encouraging the existing academic staff to make more time to provide patient care services within real practice settings to enhance their knowledge and skills and to use their experiences to teach the PharmD students;

3) Increasing the number of teacher practitioners who are employed to work at the practice settings, in order to provide pharmacy services to the hospitals, as well as supervising the PharmD students being trained at the practice sites. Policy makers should also provide a clear career structure, incentives or reward system for the teacher practitioners working at the training sites, as these academic staff have different responsibilities, career paths and opportunities for advancement (WHO, 2013).

4.5.3 The production of pharmacy students and the country's requirements

In 2013, from all 19 faculties, approximately 1,700-2,000 students were studying PharmD degrees (Wongpoowarak, 2013b). However, there has been no information to confirm that this number is appropriate for the requirements of the Thai pharmacy workforce.

The projections of future workforce requirements and pharmacy graduate production plans, should be frequently updated to give a clear picture of the situation and requirements for the pharmacy workforce in every sector (Bates et al., 2013; Payanantana et al., 2013).

The attrition rate of 0.6% from Thai pharmacy education in 2012 was lower than other countries. However, an understanding of attrition rates is important because it allows policy makers to estimate the number of new pharmacists that can be expected to join the register each year (Hassell et al., 2007)

4.5.4 Quality assurance

All faculties have an internal and external quality assurance system, as well as accreditation from the Pharmacy Council of Thailand. The accreditation criteria help control faculty admission capacity and prepare the faculty facilities to ensure the accepted quality of Thai pharmacy education (Sattayawaksakul, 2013; The Pharmacy Council of Thailand, 2014; Wongpoowarak, 2013b).

4.5.5 Preparation of preceptors and training sites

The new PharmD programme requires 2,000 hours of practice training, a four-fold increase as compared to BPharm programme. Therefore, qualified preceptors and expert training sites will be one of the key success factors for the PharmD programmes. However, 37.5% of faculties reported that they needed more preparation for the training sites and pharmacy preceptors for their PharmD students.

The reasons for concerns regarding the quantity and quality of preceptors and training sites include: the high routine workloads of the preceptors, lack of time/money/management staff, training sites requiring standardisation and demands imposed by quality assurance issues (Chanakit et al., 2015b; Dolder et al., 2008; Payakachat et al., 2011; WHO, 2013).

The Pharmacy Council and Thai pharmacy faculties might need to consider reviewing the challenges of preparing training sites during the significant transition in Thai pharmacy education; particularly the need for more preceptors Practice-based facilities, faculty-preceptor relationships and other support systems are required for the sustainable development of trained preceptors (Chanakit et al., 2015b).

4.5.6 Future study

Participants commented that it was very difficult to access the requested information. They needed a significantly longer time (3 days to 7 days) to collect information rather than the 3-6 hours anticipated by this researcher. Many personnel were involved in the process of data collection from various sources as follow:

- “students and curriculum information” from the academic affairs division;
- “academic staff information” from the administration and planning division;
- “preceptors and training sites information” from the professional development division;

as well as from various forms of material data files, including computers and faculty annual report.

This difficulty in retrieving education information revealed that effective education management information systems are needed to manage and provide basic statistical information, as well as supporting future decisions at both institutional and national levels.

Many countries also face this education information problem (Moses, 2001). The tool of an efficient education management information system should be considered as a national level priority and developed to support future decisions in a timely manner. For future study, it is necessary every 3-5 years to collect education information, such as is presented in this study, to provide considerable detail of Thai pharmacy education, in order to establish a country level database, and also for benchmarking with global pharmacy education.

A significant transition requires cooperation between faculties of pharmacy, the Pharmacy Council, government, and those pharmacists already in the workforce, to strengthen pharmacy education. Issues that need to be addressed include academic and institutional capacity, quality of the curriculum, curriculum validation and competencies of pharmacy graduates (Anderson et al., 2009). Training also demands attention, particularly the areas of training site accreditation and preceptor development.

4.6 Strengths and weaknesses of this phase 1 study

4.6.1 Strengths

This cross-sectional survey is the first faculty survey that provides a picture of the 2013 status of curricula, teaching staff, and students in pharmacy education in Thailand.

The survey research that was intended to involve all schools of pharmacy was expected to have a response rate of ≥ 70-80% (Fincham, 2008; Fincham and Draugalis, 2013). This study had a very satisfactory response rate (84.2%). The findings also had a low rate of missing data in some characteristics categories, such as:

- characteristics of the faculties of pharmacy surveyed (n=16, no missing data),
- degrees offered in academic year 2013 (n=16, no missing data),
- characteristics of teaching staff (n=15, missing data 1 of 16, 6.25%),
- proportion of student credits (n= 13, missing data 3 of 16, 18.75%).

Thus, this finding might validly represent those characteristics in Thai pharmacy faculties.

4.6.2 Weaknesses

There was a high rate of missing data in some categories, for example,

- number of first-year students who left PharmD programme before graduation (n=10, missing data 6 of 16, 37.5%),
- number of graduate students (n=11, missing data 5 of 16, 31.25%) which showed only 1,113 graduated students.

However, the report of the Pharmacy Council of Thailand showed the total of 1,980 pharmacy graduates from all 19 universities (Tassaneeyakul et al., 2013). This difference in total might be due to the explanation of some respondents that they could not provide the number of graduated students divided by gender. Therefore, they did not provide that information in the survey. Therefore, those missing data should be given careful consideration because they can impact the interpretation of the findings.

4.7 Conclusion

The Thai PharmD curriculum, which differs from the US PharmD curriculum, was adapted with the aim to meet the country's needs and so includes industrial pharmacy as well as clinical tracks. However, data on pharmacy education in Thailand needs to be regularly collected, monitored, and evaluated. A long-term strategy should be put in place to ensure the quantity and quality of pharmacy graduates emerging from the new PharmD programme.

CHAPTER 5:

Phase 2: A survey of hospital pharmacists' and community pharmacists' perceptions of the suitability of the performance of PharmD graduates for the Thai health system and the competency differences between BPharm and PharmD graduates

5.1 Introduction

Chapter 5 (Phase 2 study) presents and discusses hospital pharmacists and community pharmacists' perceptions regarding the professional suitability of PharmD graduates employed in hospitals and community pharmacies, as well as the competency differences between the BPharm and the PharmD graduates.

5.1.1 Justification for considering the survey of the pharmacists' perceptions

Scope of the study

At the time of this thesis began (2013), there were no PharmD graduates from the new PharmD programme; there had only been PharmD graduates from the traditional 6-year PharmD programme, announced in 1995, which focused only on patient care. These PharmD graduates are mainly working in the hospitals and community pharmacies (Sitaruno et al., 2013). Therefore, phase 2 of this research is focused on the perceptions of the pharmacists, in the hospitals and community pharmacies, regarding the traditional PharmD graduates who are employed in those settings.

Background

The goal of the pharmacy curriculum is to produce pharmacists who have competencies that are necessary to achieve pharmacy educational outcomes that meet the needs of the country's health care system (American Association of Colleges of Pharmacy, 2016a). Pharmacy educational outcomes shall include performance on national licensure exams, pharmacy graduates' performance or competencies in practice, and programme satisfaction by the employers, users or graduates (Accreditation Council for Pharmacy Education, 2016). It would seem that only two studies have been undertaken that relate to the outcomes of the traditional PharmD programme in Thailand: Sitaruno et al. (2013) and Sumpradit et al. (2014) (see Chapter 2, section 2.5.5.2).

However, there are no studies regarding the professional suitability of the traditional PharmD graduates for employment in pharmacy practice settings in the patient care area. Therefore, this study explored the perceptions of Thai pharmacists regarding the 'fit for purpose' suitability of the traditional PharmD graduates employed in hospitals and community pharmacies, as well as exploring the pharmacists' perceptions of the competency differences between BPharm and PharmD graduates.

5.2 Objectives

1. To explore the perceptions of Thai hospital pharmacists regarding the suitability of the traditional PharmD graduates employed in hospital settings in Thailand and their perceptions of the competency differences between BPharm and PharmD graduates.

2. To explore the perceptions of Thai community pharmacists regarding the suitability of the traditional PharmD graduates employed in community pharmacy settings in Thailand and their perceptions of the competency differences between BPharm and PharmD graduates.

5.3 Methods

5.3.1 Study design

The objectives of the study were addressed using a cross-sectional survey. The diagram of this survey study is presented in Figure 5.1.

5.3.1.1 Justification for using the cross-sectional survey

A cross-sectional study design can be employed to describe a population with respect to an outcome at a specific time point (Levin, 2006). A cross-sectional survey was chosen to collect the data about the perceptions of Thai hospital pharmacists and community pharmacists because it is appropriate for understanding the snapshot of the outcome, which are perceptions, and the pharmacists' characteristics associated with the outcome at a given point in time.

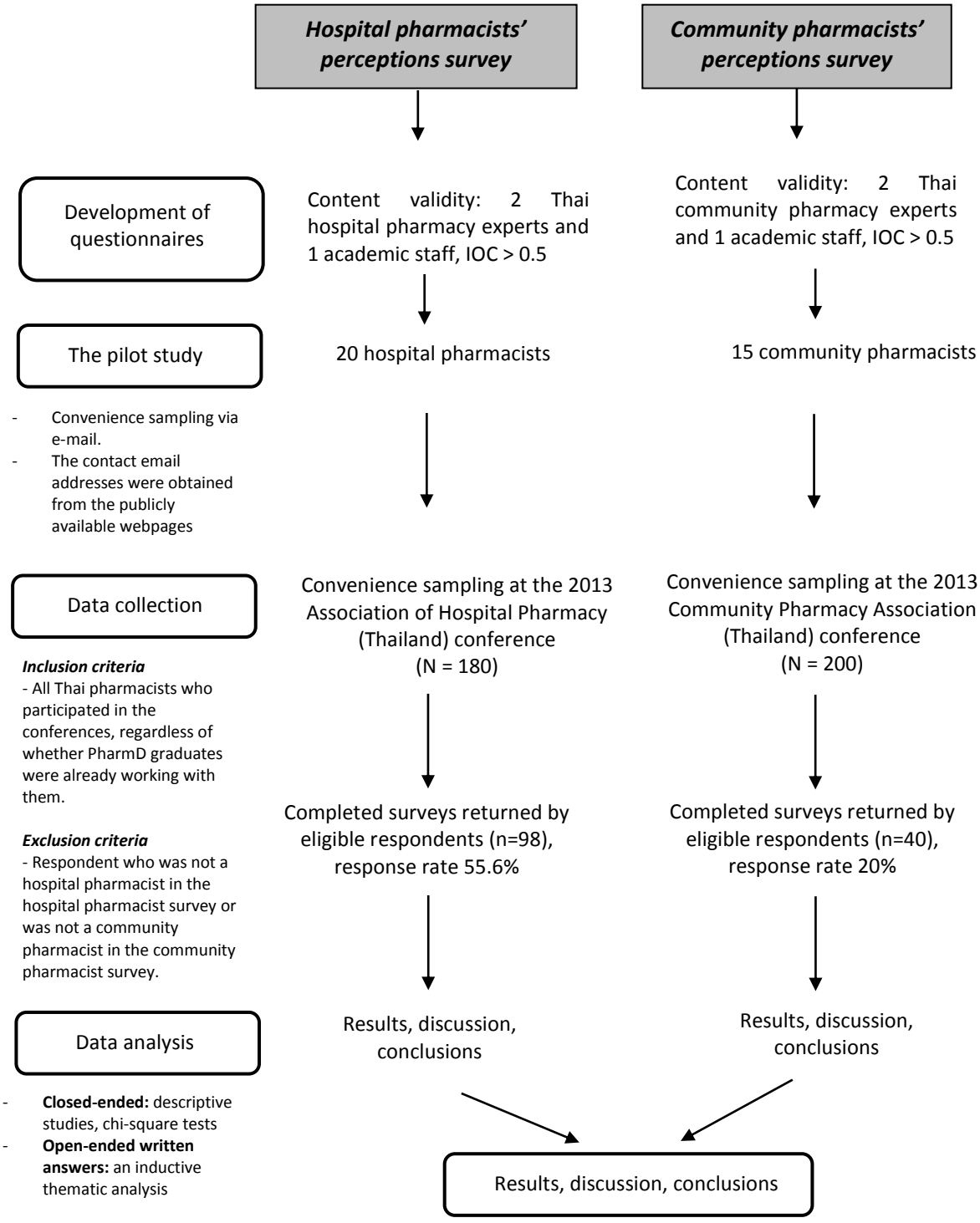


Figure 5.1 Phase 2: diagram of the survey study

(Note: All processes of the survey study in the hospital and community pharmacists' perceptions survey were the same. However, the differences between those two surveys was shown as follows; i) the response rate in the pilot study in community pharmacists was lower than the hospital pharmacist due to the limitation to access the contact email addresses from the the publicly available webpages ii) the response rate in community pharmacists' survey was lower than the hospital pharmacists survey.)

5.3.2 Study samples

5.3.2.1 Sample size calculation

Even there was the report of the number of pharmacist in each sector (Prapunwattana, 2012). However, when the researcher asked for the updated information from the Pharmacy Council of Thailand, the president confirmed that there was no updated information available for the researcher to use to send the questionnaires. Therefore, from the most available information that the researcher retrieved, the researcher would have liked to use this information to calculate the sample size.

Sample size determination were calculated by using a formula proposed by Yamane (1967) as shown below:

$$n = N / (1+Ne^2)$$ (Yamane, 1967)

where: n is the sample size ; N is the population size ; e is the deviation of sampling (0.05).

Hospital pharmacist, N = 7,146: $n= 7146/ (1+ (7146*0.05^2)=7146/18.865 = 378.8$

Community pharmacist, N = 3,000: $n= 3000/ (1+ (3000*0.05^2)=3000/8.5 = 352.9$

The ideal sample sizes for hospital pharmacists and community pharmacists were 379 and 353 respectively. However, approximately 50% response rate might have been found with a mail questionnaire, so the minimum number of needed responses was doubled to determine the number of pharmacists invited to participate. Finally, the sample sizes for hospital pharmacist and community pharmacist were 758 and 706 respectively.

5.3.2.2 Justification for using the convenience sampling

Random sampling would be an ideal sampling model in that each unit in the population has a probability of being selected (Bryman, 2012). However, there was insufficient national data available about Thai pharmacists, such as their status, type of practice or address. Therefore, the research effort was devoted to identify possible hospital pharmacists and community pharmacists in Thailand from several databases, including the PCT, professional organisations, organisation websites, preceptor lists, organisation books and internet search engine. However, the lists we developed were not complete due to the absence of an up-to-date database representing the numbers, addresses and workplaces of the hospital pharmacists and community pharmacists (Ngorsuraches and Li, 2006; Prapunwattana, 2012).

Therefore, the respondents in this study were recruited using convenience sampling at the conference organised by pharmacy associations; a practical way to approach large numbers of pharmacists at the same time. Convenience sampling may be useful for exploratory studies (Anderson, 2010) as it has the advantages of saving time and cost. However, it is also a model may be biased and unrepresentative of the population (Anderson, 2010; Lohr, 2008).

5.3.3 Development of the questionnaire

The questionnaire included two types of questions: i) closed-ended questions using dichotomous answers (yes/no) and ii) open-ended questions that aimed to explore the meaning of the responses.

5.3.3.1 The questionnaire consisted of two sections:

i) Section one collected data pertaining to pharmacists' demographics
ii) Section two collected data related to respondents' perceptions of the suitability of the performance of traditional PharmD graduates employed in practice settings (hospital or community pharmacy) and the competency differences between BPharm and PharmD graduates.

5.3.3.2 Suitability and competency were defined as follows:

1) Suitability is the condition of being fitted for or appropriate to a purpose (Shorter Oxford English Dictionary, 2002). Pharmacy professional suitability means the fitness of PharmD graduates to practice in that they are able to demonstrate an agreed-upon professional pharmacy standard, professional knowledge, skills, and appropriate behaviour to perform pharmacy services safely and effectively in hospital or community pharmacy settings. The assessment of professional suitability is important for benefit to the public from pharmacy practices, for the reputation of the pharmacy programme and for the reputation of the pharmacy profession (College of Occupational Therapist, 2011; General Pharmaceutical Council, 2015b; Health & Care Professions Council, 2014; Tam and Coleman, 2009).
2) Competency refers to the PharmD graduates' capacity to perform actions in hospital or community pharmacy workplace settings, as perceived by hospital or community pharmacists, that meet the competency standard guidelines required for both BPharm and PharmD graduates for the licensure examination during the 2002-2014 period (The Pharmacy Council of Thailand., 2002).

5.3.3.3 The first draft of the questionnaire was tested for content validity as the following;

The first draft of the two questionnaires: 1) hospital pharmacists' perceptions survey; 2) community pharmacists' perceptions survey, were tested for content validity by three Thai experts: two from pharmacy practices and one from a Faculty of Pharmaceutical Sciences in Thailand. All items of the questionnaire had an Item-Objective Congruence (IOC) index score higher than 0.5 (Phongrat, 1997), which confirmed the content validity of the questionnaire. Based on the recommendations of the experts, a second draft of the questionnaire was constructed, separating items for enhanced clarity and ease of comprehension.

5.3.3.3 A pilot study

A pilot study was undertaken via a convenience sampling with twenty hospital pharmacists via e-mail and fifteen community pharmacists. The contact email addresses were obtained from the publicly available web pages. A personalised email was sent to the contact persons, which explained the purpose of the study and the confidentiality of the responses.
The pre-test Cronbach's alpha reliability was 0.85 and 0.74 for the hospital pharmacists' survey and the community pharmacists' survey, respectively, which reached the acceptable level for internal reliability.

The questionnaire took approximately 10 minutes to complete. However, some respondents did not have experience working with the traditional PharmD graduates due to there being only a small number of the traditional PharmD graduates in Thailand. Although they did not have experience working with PharmD graduates, the researcher expected that the pharmacists were familiar with the roles, responsibilities, and competencies of PharmD graduates.

One reason for this supposition was because they might have been preceptors for PharmD graduates or have had clerkship experiences with PharmD graduates when they had been pharmacy students. Minor wording changes in some sentences were made after the pilot studies and the questionnaires were modified prior to the final version (see Appendix 8: Hospital pharmacists' perception survey and Appendix 9: Community pharmacists' perception survey).

5.3.4 Data collection

The respondents were Thai pharmacists who participated in their 2013 conference.
The conferences for hospital and community pharmacists were organised by the Association of Hospital Pharmacists Thailand (Thai HP) and the Community Pharmacy Association (CPA), respectively. These conferences provide updated knowledge and skills for pharmacists by the pharmacy professional associations.

1) Thai HP usually holds approximately 15-20 conferences per year (e.g., family pharmacist, advances in adverse drug reaction), each of which normally lasts for 3 days, accommodating 150-180 attendees. The greatest numbers of delegates are hospital pharmacy practitioners, while the minority of participant are the pharmacy administrators.

2) The CPA provides approximately 12 conferences per year, which focus on such community-relevant topics as update on constipation causes and control, and the optimal management of vulvovaginal candidiasis. These gatherings are normally one day events for 100-200 delegates, who are full time or part time community pharmacists.

However, due to time constraints, the researcher did not given out the questionnaires at other conferences to reach the sample size that was expected in the first place.

The ideal of the respondents for these pharmacists' perceptions survey should be the pharmacists who had work experience with the PharmD graduates. However from 2005 to 2013, the total number of the Thai PharmD graduates from the traditional PharmD programme was only 1,600 (approximately 8% of the total existing 20,000 registered pharmacists in Thailand) (Prapunwattana, 2012; Wongpoowarak, 2013a). There was a small number of PharmD graduates and therefore a small number of the pharmacists who had experience with the PharmD graduates.

Therefore, the research inclusion criteria is that all Thai pharmacists who participated in the conferences should be included, regardless of whether PharmD graduates were already working within their hospitals or community pharmacies. This inclusive model would allow the researcher to explore the current perceptions of pharmacists who had, or did not have, experience of working with PharmD graduates.

Respondents who were lacking experience working with PharmD graduates may answer the questionnaire, informed by their attitudes rather than their experiences, which could influence their perceptions and might affect the reliability of comments about the suitability and competencies of PharmD graduates.

Those who agreed to take part were requested to return the completed questionnaire with written informed consent to the researcher's team at the end of the conference. Attendees were excluded from the hospital pharmacists' perceptions survey if they were not a hospital pharmacist; and were excluded from the community pharmacists' perceptions survey if they were not a community pharmacist. Participation was voluntary and participants gave their written inform consent that was returned with the completed questionnaire.

5.3.5 Data analysis

The data were coded and entered into IBM SPSS software (SPSS for Windows, version 21.0, SPSS Inc., Chicago, IL, USA). Ten percent of respondents' data were cleaned by double-checking to make sure that the data were entered accurately and completely. Ten percent of respondents' data were randomised by using Microsoft Excel software.

A. Hospital pharmacists' perceptions survey: Ten records were checked, and one error was found. This error related to the highest academic degree. The respondent had two academic degrees (a 5-year BPharm and a master's degree), but the data was entered only as a 5-year BPharm degree. After rechecking, this entry was amended from a 5-year BPharm to a master's degree.

B. Community pharmacists' perceptions survey: Ten records were checked, and no errors were found.

5.3.5.1 Descriptive statistics

Descriptive statistics of frequencies and percentages were used to describe the participants' demographics and their perceptions. Pearson's Chi-square tests were performed to determine the association between the variables, and Fisher's exact tests were used when more than 20% of the cells had an expected count of less than 5 (Yates et al., 1999). Statistical significance was accepted at a two-tailed p-value of less than 0.05 (Chumney and Simpson, 2006).

5.3.5.2 An inductive thematic analysis

An inductive thematic analysis of concepts generated from the qualitative data (Patton, 2002) was used to analyse the open-ended written answers. The collected information was in the Thai language. The responses were translated from Thai to English for data analysis because this study is a PhD project from a UK university and therefore an English transcript had to be prepared by the Thai and non-Thai researchers to comply with the required audit trail (Lincoln and Guba, 1985).

5.3.5.2.1 The forward-backward translation

Details of the forward-backward translation (Chen and Boore, 2010; Larson, 1998) are provided below.

1) Two bilingual Thai translators (TC, NK) performed the forward translation of the Thai text transcripts (source language) into English (target language) independently. The two academic staff (TC, NK) reached a consensus regarding the English translation that was then checked by another bilingual pharmacy academic in Thailand (PW).

2) A blind backward-translation from English into Thai was undertaken by a fluent Thai-English bilingual speaker (WP).

3) The two Thai versions were compared. Researchers (TC, PW) confirmed the consistency between the Thai and English versions.

5.3.5.2.2 The coding process

The coding process assigned codes to data segments by using NVivo qualitative data analysis software (QSR International Pty Ltd., Version 10, 2012). An inductive thematic analysis was repeated by two researchers (TC, CA) to ensure the reliability or trustworthiness of the outcomes; documentation of the steps in the process of analysis makes it transparent for other researchers to review, enabling procedures to be accurately repeated if required.

5.3.5.2.3 Triangulation

Triangulation of data from different sources, such as government documents, as well as using verbatim quotes of what participants actually said, connected the researchers' interpretations to increase the validity of the research findings (Guba, 1981; Guest et al., 2012; Lincoln and Guba, 1985).

5.4 Results

5.4.1 HP- Results of hospital pharmacists' perceptions survey (HP)

5.4.1.1 HP- Quantitative findings

Questionnaires were distributed to 180 conference attendees. Completed surveys were received from 100 respondents, yielding a response rate of 55.6%. Two respondents were excluded because they were not hospital pharmacists. Therefore, 98 valid responses were included in the data analysis.

5.4.1.1.1 HP- Characteristics of respondents

The majority of respondents were female (n=72, 73.5%). The highest proportion of the respondents (n=59, 60.2%) belongs to the 25-35 age group. In terms of educational levels of respondents, more than half of respondents are BPharm graduates (n=60, 61.2%).

The majority of the respondents had experience working with PharmD graduates (n=75, 76.5%). Sixty-one respondents (62.2%) had 1-10 years of working experience. Approximately half of the respondents worked in the community hospitals run by the Ministry of Public Health.

All respondents are hospital pharmacists. The majority of the respondents (n=66, 67.3%) had their main area of practice in the provision of hospital-based services (dispensing and clinical pharmacy), while the remaining 32 (32.7%) had their practices in primary care services such as consumer protection and family pharmacist services. Only 46 of the respondents (46.9%) were training preceptors of the pharmacy students. The characteristics of the respondents are presented in Table 5.1.

Table 5.1 HP: Respondents' characteristics (n=98)

Characteristics	Frequency	Percentage
Gender		
Male	26	26.5
Female	72	73.5
Age range		
<25 years	5	5.1
25-35 years	59	60.2
36-45 years	28	28.6
46-55 years	6	6.1
>55 years[a]	0	0.0
Highest academic degree		
BPharm[b] no track	40	40.8
BPharm, track: Pharmaceutical care	17	17.3
BPharm, track: Pharmaceutical sciences	3	3.1
PharmD[c]	13	13.3
MPharm[d]	25	25.5
Experienced working with PharmD graduates		
Yes	75	76.5
No	23	23.5
Years at current experiences		
1-5 years	31	31.6
6-10 years	30	30.6
11-15 years	20	20.4
16-20 years	10	10.2
> 20 years	7	7.1
Type of hospital workplace		
MoPH[e] sub-district health promoting hospitals	2	2.1
MoPH[e] community hospitals	50	51.0
MoPH[e] general/regional hospitals	30	30.6
MoPH[e] other institutes	4	4.1
Other ministries	7	7.1
Private hospitals	5	5.1
Setting region		
Bangkok	9	9.1
Central excluding Bangkok	28	28.6
East	3	3.1
North East	29	29.6
North	14	14.3
South	15	15.3
Area of practice[f]		
Consumer protection	11	11.2
Family pharmacist service	21	2.5
Hospital service	66	67.3
Training preceptors	46	46.9

[a] There was no the pharmacists who belonged to the age group of >55 years in this survey. The possible reason might because of the pharmacists who are older than 55 years typically do not attend the conference. In addition, Thai pharmacists have no need to have continuing education for their re-licensing process.
[b] BPharm = Bachelor of Pharmacy, [c] PharmD = Doctor of Pharmacy, [d] MPharm = Master of Pharmacy,
[e] MoPH = the Ministry of Public Health
[f] Area of practice; Hospital pharmacists in Thailand have to get involved in various type of roles and responsibilities: consumer protection (health promotion and disease prevention, health consumer surveillance), family pharmacist service/home health care) and hospital service (drug dispensing, drug purchasing and inventory control, pharmaceutical care service)

5.4.1.1.2 HP- respondents' perceptions

This section presents the HP- respondents' perceptions towards suitability of the PharmD graduates for working in hospital settings and competency differences between the BPharm and PharmD graduates.

The majority of the respondents (n = 75, 76.5%) agreed that the PharmD graduates were suitable to work in hospital settings. Approximately half of the respondents (n = 54, 55.1%) agreed that there were competency differences between the BPharm and PharmD graduates (see Table 5.2).

Table 5.2 HP: respondents' perceptions towards suitability of the PharmD graduates for working in hospital settings and competency differences between the BPharm and PharmD graduates (n=98)

	No. of Respondent (%)
Suitability of PharmD graduates for working in hospital settings	
Yes, PharmD graduates are suitable to work in hospital setting.	75 (76.5)
No, PharmD graduates are not suitable to work in hospital setting.	23 (23.5)
Competency differences between BPharm and PharmD graduates	
Yes, there had been some differences.	54 (55.1)
No, there were no differences.	44 (44.9)

5.4.1.1.3 HP- Relationships between respondents' characteristic and their perceptions

A chi-square test or Fisher's exact test was used to describe the relationship between the respondents' characteristics, such as gender, age group, highest academic degree and work experiences, with their perceptions of "the suitability" of the PharmD graduates for working in hospital settings and any "perceived competency differences" between BPharm and PharmD graduates (Table 5.3).

Experience working with PharmD graduates shows a significant association ($\chi 2 = 23.405$, $p<0.001$) with respondents' perceptions toward the suitability of PharmD graduates for working in hospital settings. The respondents who had experience working with PharmD graduates tended to agree that the PharmD graduates are suitable for working in hospital settings.

The highest academic degree and the experience working with the PharmD graduates show a statistically significant association: $\chi 2 = 8.386$, $p<0.004$ and $\chi 2 = 5.016$, $p<0.025$ with respondents' perceptions toward the competency differences between BPharm and PharmD graduates. The respondents with a traditional PharmD degree, who had experience working with the traditional PharmD graduates, tended to be agree that the PharmD graduates and BPharm graduates had perceived competency differences.

Table 5.3 HP: univariate analyses of relationships between respondents' characteristic (n=98) and their perceptions, namely suitability of PharmD graduates for working in hospital settings and perceived competency differences between BPharm and PharmD graduates

	Suitability of PharmD graduates for working in hospital settings				Perceived competency differences between BPharm and PharmD graduates			
	Number (%) of respondents		Univariate[a]		Number (%) of respondents		Univariate[a]	
Characteristics	Yes	No	χ^2 value	p-value	Yes	No	χ^2 value	p-value
Gender								
Male	20 (76.9)	6 (23.1)	0.003	0.956	15 (57.7)	11 (42.3)	0.096	0.757
Female	55 (76.4)	17 (23.6)			39 (54.2)	33 (45.8)		
Age range								
<25 years- 35 years	48 (75.0)	16 (25.0)	0.241	0.624	33 (51.6)	31 (48.4)	0.934	0.334
36-55 years	27 (79.4)	7 (20.6)			21 (61.8)	13 (38.2)		
Highest academic degree								
PharmD	12 (92.3)	1 (7.7)		0.289[c]	12 (92.3)	1 (7.7)	8.386	**0.004[b]**
Others (BPharm and MPharm)	63 (74.1)	22 (25.9)			42 (49.4)	43 (50.6)		
Experienced working with PharmD graduates								
Yes	66 (88.0)	9 (12.0)	23.405	**<0.001[b]**	46 (61.3)	29 (38.7)	5.016	**0.025[b]**
No	9 (39.1)	14 (60.9)			8 (34.8)	15 (65.2)		
Years at current experiences								
0-10	44 (72.1)	17 (27.9)	1.741	0.187	30 (49.2)	31 (50.8)	2.290	0.130
11-20	31 (83.8)	6 (16.2)			24 (64.9)	13 (35.1)		
Work place								
Public	71 (76.3)	22 (23.7)		1.000[c]	51 (54.8)	42 (45.2)		1.000[c]
Private	4 (80.0)	1 (20.0)			3 (60.0)	2 (40.0)		
Setting region								
BKK & central	29 (78.4)	8 (21.6)	0.113	0.737	19 (51.4)	18 (48.6)	0.338	0.561
Other	46 (75.4)	15 (24.6)			35 (57.4)	26 (42.6)		
Area of practice[d]								
Hospital service	51 (77.3)	15 (22.7)	0.062	0.803	36 (54.5)	30 (45.5)	0.025	0.874
Home health care service/ family pharmacist & consumer protection	24 (75.0)	8 (25.0)			18 (56.3)	14 (43.8)		
Training preceptor								
Yes	33 (71.7)	13 (28.3)	0.701	0.402	27 (58.7)	19 (41.3)	0.416	0.519
No	38 (79.2)	10 (20.8)			25 (52.1)	23 (47.9)		

[a] Chi-square test was used to determine the association between variables, and Fisher's exact test was used when more than 20% of the cells had an expected count of less than 5.
[b] Significant at $p < 0.05$. [c] Fisher's exact test.
[d] Responsibilities of Thai hospital pharmacists were including hospital service and also home health care service/family pharmacist & customer protection.

5.4.1.2 HP: qualitative findings

Five major themes emerged in response to the open-ended written answers from the survey questionnaire. The five themes are presented below, and the summary of the themes is presented in Figure 5.2.

5.4.1.2.1 Theme 1: PharmD graduates are well suited for patient care services in hospitals

5.4.1.2.1.1 Yes, they are suitable

Hospital pharmacists perceived PharmD graduates as being suitable for patient care services in public and private hospitals. They were needed and suitable for the job market in Thailand. Some respondents perceived that the hospital pharmacy job market needs more professionals working in clinical pharmacy services and pharmaceutical care and with multi-disciplinary teams.

> *"They have a high quality of academic knowledge, which is suitable for working with other health care teams." (Hospital pharmacist (HP) 54, female (F), MPharm, general/regional hospital)*

> *"They are suitable and necessary because they have a role in patient care in hospitals." (HP56, F, BPharm, general/regional hospital).*

> *"The job market needs more clinical pharmacy services and pharmaceutical care." (HP11, F, PharmD, general/regional hospital)*

Some respondents thought that PharmD graduates were suitable for tertiary care and for employment in large hospitals. This view might be due to the long-standing tradition of providing pharmaceutical care services in tertiary care hospitals, where the hospital pharmacists might have broader experience with medical conditions, treatment, and working in a multidisciplinary environment.

> *"PharmD pharmacists are suitable for hospitals with sixty beds or more. They can fully show their potential. They will have various cases and have an opportunity to work with multidisciplinary teams." (HP66, F, PharmD, community hospital)*

Pharmacists also reported that PharmD graduates were suitable for employment in the small sub-district health promoting hospitals and community hospitals, as well as in private hospitals because their roles are directed solely towards toward patient care activities.

> *"Yes, suitable. I am working at the MoPH sub-district hospital, which has pharmaceutical care, so, we need to make contact with a multi-disciplinary team." (HP14, F, PharmD, sub-district health promoting hospital)*

> *"PharmD graduates are suitable in community hospitals, where they are involved in patient care." (HP5, F, BPharm, community hospital)*

> *"PharmD graduates are suitable for working in private hospitals". (HP62, F, BPharm, private hospital)*

5.4.1.2.1.2 No, they are not suitable.

A. Over qualified to work in community hospitals or primary care hospital settings

Respondents thought that PharmD graduates might not be suitable or would be overqualified to work in community hospitals or primary care hospital settings. This conclusion was reached because they perceived that PharmD graduates were trained to work in specialised areas or to take responsibility for pharmacy duties, which called for "quality work". Contexts cited were clinical pharmacy activities, pharmaceutical care activities, in-patient department (IPD) services, special clinic services (e.g., HIV clinics), and ward rounds, which are mainly provided in large hospitals. Respondents also perceived PharmD graduates as not being well prepared for working in primary care hospital settings, in terms of filling health promotion and disease prevention roles.

> *"They are suitable in hospital pharmacy work, which emphasise quality work, such as clinical pharmacy activities and pharmaceutical care activities." (HP11, F, PharmD, general/regional hospital)*

"PharmD graduates are not suitable in primary care because they are not prepared for trends in the health care system, which emphasise promotion and disease prevention. Therefore, their understanding of clinical pharmacy or other in-depth knowledge will be less used." (HP41, M, PharmD, community hospital)

B. PharmD graduates need more preparation to work in primary care hospitals

The respondents perceived that PharmD graduates might need more knowledge and skills regarding consumer health protection, health promotion, and disease prevention. They suggested that the PharmD curriculum should include more public health subjects and prepare students for primary care roles so that they can work effectively in the community.

"The six-year PharmD curriculum should have a public health curriculum. PharmD graduates will understand their role and context of work." (HP47, F, PharmD, MoPH other institute)

"A six-year PharmD programme does not teach the current trends for multidisciplinary personnel in a community, such as health promotion and disease prevention. It should not emphasise only pharmacists' role in a hospital job. This programme missed out on social concerns." (HP86, F, BPharm, community hospital)

Some respondents pointed out that the number of community hospitals and sub-district health-promoting hospitals is higher than tertiary care hospitals. Therefore, faculties might plan to produce PharmD graduates for primary care services as well as tertiary care services and might consider the proportion of PharmD production for each level of care by the number and level of job market's needs.

"PharmD graduates are suitable for about 30-40% of all hospitals because there are not many general and regional hospitals. There are many community hospitals and sub-district health-promoting hospitals, but they do not have considerable clinical specialty." (HP40, F, BPharm, Other Ministry)

C. Unrecognised roles and hospital preparedness for PharmD graduates

Respondents were concerned that some PharmD graduates might struggle to start new services due to the system not encouraging new roles of pharmaceutical care. Respondents also noted that PharmD graduates also had to work mainly in dispensing or other non-clinical activities, due to the high workload in dispensing services and the shortage of hospital pharmacists. The PharmD graduates have had to work at length to implement the new roles, particularly in places where there have been no clinical pharmacists before. They must encourage themselves to move away from traditional dispensing services to new territories, similar to being a clinical pharmacist on a medical ward or working with a health care team.

> *"The job market in Thailand does not support or recognise the role of PharmD pharmacists. Therefore, PharmD pharmacists cannot use their potential efficiently." (HP10, F, BPharm, community hospital)*

Due to the unpreparedness of hospitals to absorb them and with no support plans for PharmD graduates, some of the hospital pharmacists were concerned about the low number of jobs available in the government hospitals for PharmD graduates.

> *"There are a lot of pharmacy graduates, but we do not have enough jobs. Why does the government not have jobs available for them? Where is our value?" (HP77, F, BPharm, community hospital)*

Forty-one respondents (41.8%) thought that the PharmD graduates' salaries were fair. In some hospitals, PharmD graduates' salaries were less than other health professionals who also had a 6-year degree, and in some places, the salary was the same as those who had completed a five-year programme.

Two respondents were concerned about the status between temporary employees and government officers or civil servants[12]. They said that the majority of the new pharmacy graduates were temporary employees and not government officers; as a result of this situation they perceived temporary employees had less job security and less social benefits, compared to the government officers. This might discourage the new graduates' commitment to their responsibilities and performance.

One participant was concerned that there has been no preparation for the arrival of PharmD graduates into the workforce, such as a career path in terms of salary and promotion.

> *"PharmD is not suitable for my work place. There have not made any preparation for the PharmD graduates. They have salaries and promotions equivalent to five-year BPharm graduates despite the fact that they graduated from a 6-year programme, the same as a physician or dentist. Therefore, they felt upset and discouraged and then quit this job." (HP68, M, BPharm, Other Ministry)*

[12] Thai pharmacy graduates have choices to work either in the public or private sectors. Salary levels from public sectors are less than private sector for comparable positions but the public sector offers other benefits; for example, job security and welfare benefits.

However, due to the shortage of pharmacists in the public sector, in 1984 the government launched the compulsory working for newly pharmacy graduates in order to recruit the pharmacy graduates from public universities to work in the public sector for two years. These graduates have positions as government officers or civil servants, which have several compensations and rewards; for example, current rewards (e.g., base salary, allowances of housing, cost-of-living), future expectation rewards (e.g., pension) and intangible rewards (e.g., job security, social privileges, reputation).

However, due to the economic crisis and the government's downsizing policy on public workforce, the compulsory working policy was ended in 1998. Many hospitals are faced with a pharmacy workforce shortage problem, so they hire pharmacy graduates as temporary employees; however, they are often unable to retain these graduates due to the temporary positions providing little security and no opportunities for career advancement.

From 2006, the compulsory programme was restarted and provides approximately 350 positions for government officers each year, while the number of new pharmacy graduate is approximately 1,900 per year. Therefore, the remaining pharmacy graduates might work in the public sector as temporary employees or in the private sector.

D. Limitations for PharmD graduates to provide pharmaceutical care

Many respondents were concerned that the community hospital also had other limitations for PharmD graduates regarding the provision of pharmaceutical care, such as a limited medicine supply. Most critically ill patients were referred to secondary or tertiary care hospitals. PharmD graduates might be frustrated by their limited role, or if they were limited in applying their knowledge, or if there were non-existent opportunities to use the pharmaceutical care skills they had acquired. Their in-depth knowledge might be less used and thus less useful. This situation might discourage them.

> *"They might not be suitable for community hospitals because community hospitals have a limited supply of medicines, medical instruments and other potential. Therefore, these hospitals have limited resources for highly skill patient care." (HP48, M, BPharm, community hospital)*

> *"PharmD graduates are suitable for a large hospital. But in a community hospital, I think it is too much. This pharmacist will be limited by the capacity of a community hospital. They might be discouraged when they work in a community hospital." (HP66, F, PharmD, community hospital)*

5.4.1.2.2 Theme 2: Characteristics of PharmD graduates compare to the BPharm graduates:

The hospital pharmacists explained the reasons supporting the competence of the PharmD graduates for working in hospitals. Approximately half of the respondents stated that PharmD graduates were suitable for working in hospitals. There was a perception that PharmD graduates had better knowledge and were better skilled to deliver patient care within the hospital system than were the BPharm graduates. The PharmD graduates were seen as highly competent for working in the wards and had high efficiency in the clinical pharmacy area.

> *"Graduates of the six-year programme have high competency to work on the ward." (HP31, male (M), BPharm, community hospital).*

> *"They know about the hospital system and are full of knowledge. They can work well." (HP33, F, BPharm, general/regional hospital)*

Some respondents thought that an important proficiency that supported the PharmD graduates in working in hospitals and providing better patient care was their skills to communicate and coordinate with the wider healthcare team.

> *"PharmD graduates have more skills in patient care and communicate with the healthcare team." (HP26, F, MPharm, community hospital)*

The influences that affected the competency of PharmD graduates might come from the PharmD curriculum. The respondents thought that the PharmD curriculum encouraged students to be exposed to real patient care, and provided more clinical knowledge and experiences, as well as holistic care and understanding about patients, than did the BPharm curriculum.

The other strength of PharmD graduates, according to the respondents, was that PharmD graduates had more clerkship experience, in the form of clerkship rotations, clerkship periods, and number of mentors. Thus, they had more skills, experiences and expertise and were better at decision making than the BPharm graduates.

Moreover, PharmD graduates were ready to start pharmacy practice efficiently and properly when they first entered the workplace, whereas BPharm graduates needed time to learn to practice and develop clinical skills in the working environment.

> *"The PharmD curriculum emphasises real practice. The students have real experiences before they graduate. Therefore, when they graduate, they can instantly work." (HP88, F, MPharm, other Ministry)*

Some respondents thought that PharmD and BPharm graduates did not necessarily have significant competency differences because the competency levels might depend on the ability of each individual.

> *"No difference. Everyone can learn from working experiences. It depends on the individual." (HP52, F, MPharm, community hospital)*

Some non-PharmD respondents perceived that the competency of both pharmacy qualifications were similar because they performed similar job activities; in particular the standard pharmacy services of dispensing, procurement and inventory management. The respondents perceived these services were the first priorities of hospital pharmacy services.

On the other hand, developing PharmD students' values, attitudes and concerns, as well as knowledge and skills, represents the basic elements to producing pharmacists. However, the most important part of this template is the graduates' attitudes, values, ethics, and behaviour. The respondents also mentioned an issue with PharmD graduates' attitudes. Faculties should introduce general and pharmacy-focused professional ethics to students. They should realise their ethical responsibility to uphold their professional values in society.

> *"Now, some students have less ethics and respect. Some of them do not respect the preceptor sites; they dress inappropriately, neglect greetings, and have less social manners. They should be more enthusiastic for learning. However, they have a good academic knowledge, better than in the past." (HP2, F, BPharm, community hospital)*

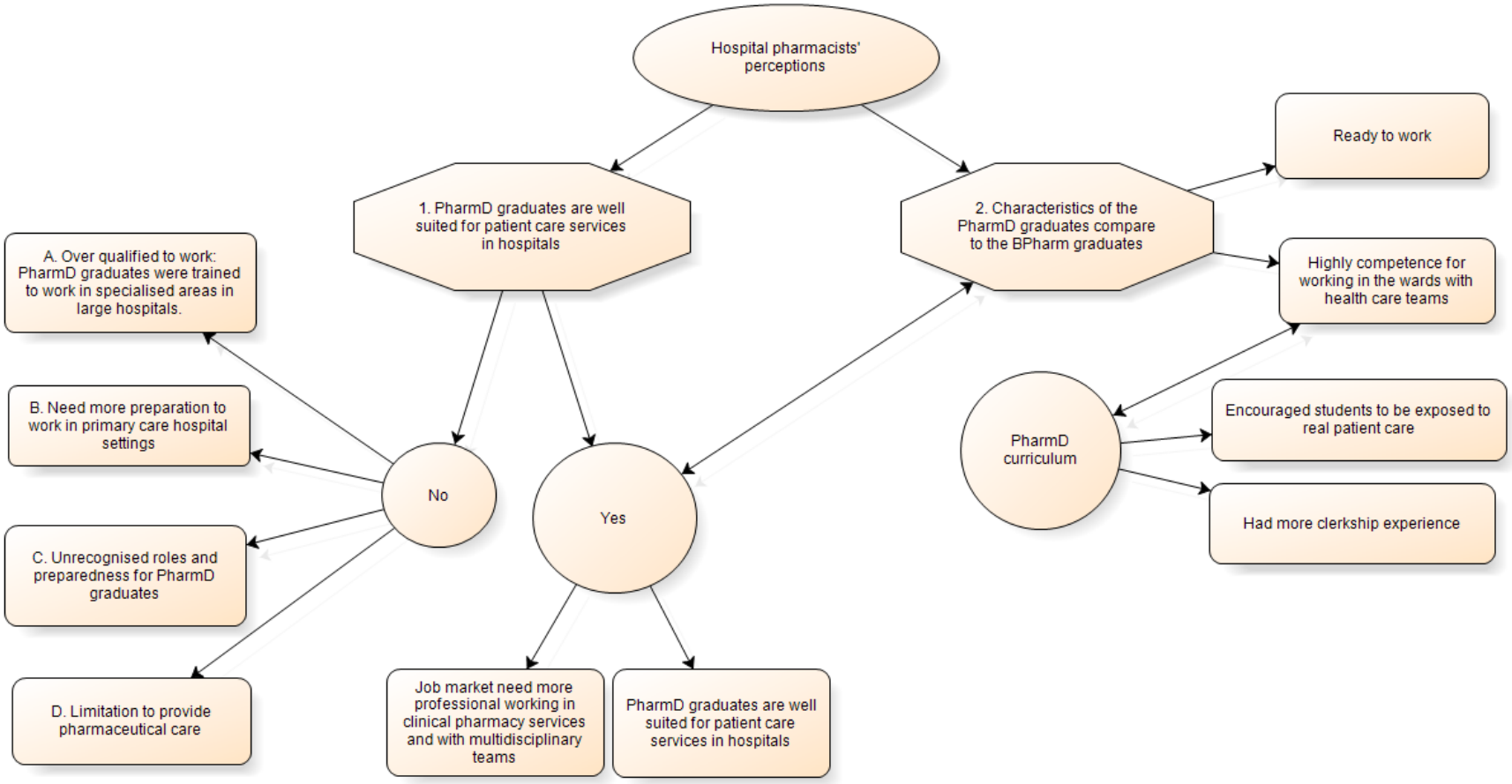


Figure 5.2 Themes of hospital pharmacists' perceptions towards suitability of PharmD graduates regarding employment in hospital settings

5.4.1.3 HP- Discussion of hospital pharmacists' perceptions survey

5.4.1.3.1 Characteristics of the respondents

The majority of the respondents were female, age < 35 years, with a BPharm degrees and less than 10 years of working experience; characteristics that are consistent with the previous national pharmacists' survey (Maitreemit et al., 2008; Ngorsuraches and Li, 2006; Sirirak, 2010), except that the previous studies did not include PharmD respondents, as there were only 90 PharmD graduates in 2006 and 128 in 2008.

5.4.1.3.2 Respondents' perceptions of the PharmD graduates

Overall, the respondents offered positive perceptions of the PharmD graduates. They thought that PharmD graduates were suitable for pharmaceutical care services in hospitals, worked well with health care teams, and had knowledge of the hospital system from their clerkship experiences.

Responses also related to aspects of care regarding the types of hospitals. Those at the primary care level deal with less acute illnesses and health promotion/prevention of diseases; secondary level hospitals care for chronic cases, and tertiary hospitals deal with care for severe cases that require hospitalisation (Bureau of Health Administration and Office of the Permanent Secretary, 2013; Kittipibul et al., 2006).

Some respondents noted that PharmD graduates might not be suitable for primary care hospital settings because the respondents perceived the majority of pharmaceutical care as taking place in tertiary care settings. Respondents were also concerned about PharmD graduates' competency for providing primary care services.

The topic for the conference, from which this study recruited its respondents, was 'family pharmacists'. Thus, the respondents might have been interested in pharmaceutical care in primary care settings, so it is reasonable to suggest that more curriculums related to health promotion and disease prevention are needed to fill the workforce gap.

However, the finding in this study is in line with a previous study in which PharmD graduates reported their competency in consumer health protection, which is mainly located in primary care hospital settings, as being lower than PSc-BPharm graduates (Sumpradit et al., 2014).

This situation is similar to other countries, in which the curriculum provided inadequate public health subjects in the PharmD programme (Christensen and Farris, 2006). Pharmacy education should include and integrate the subject of health promotion and public health. Competency in health promotion is one of the recommendations of the FIP*Ed* Global Competency Framework, as well as in several other countries (Burke et al., 2008; FIP Education Initiatives, 2012; Pharmaceutical Society of Australia, 2010).

The proportion of pharmacists in tertiary care, compared to secondary care and primary care, should be approximately 35% and 65%, respectively (Bureau of Health Administration and Office of the Permanent Secretary, 2013). Therefore, faculties should consider producing more general PharmD graduates for primary care and secondary care settings, who work for standard pharmacy services. Such services include procurement and inventory management, pharmaceutical compounding, out-patient and in-patient services and pharmaceutical individual care. The field of community pharmaceutical care involves home care, primary health care, public health community service and consumer protection. Faculties should continue to produce specialised PharmD graduates to operate in such area as cardiovascular, oncology, trauma, and neonatal intensive care at the tertiary level. However, few faculties planned to produce PharmD graduates to provide primary and secondary care.

5.4.1.3.3 Competency differences between the PharmD and BPharm graduates

The majority of PharmD respondents, some non-PharmD respondents, and the majority of the respondents who have experience working with PharmD graduates perceived competency differences between the two pharmacy qualifications. Possible reasons for these trends are as follows:

1) The PharmD graduates were perceived to possess higher competencies such as more clinical knowledge, more clinical skills and better decision making, than BPharm graduates. This finding was similar to the findings from the study about employer satisfaction, where PharmD graduates were perceived to have high skills in providing pharmaceutical care, had self-learning competencies and showed high responsibility in their work (Sitaruno et al., 2013).

2) PharmD graduates were ready, upon qualification, to work clinically, whereas BPharm graduates needed time to learn to practice. This observation was consistent with other studies that concluded PharmD graduates were ready to work (Sitaruno et al., 2013) and such graduates only needed a short period of induction (Lohitnavy et al., 2009).

'To be ready to work' is an important competency for pharmacy graduates, valued and needed in many countries including Thailand (Faculty of Pharmaceutical Sciences: Khon Kean University, 2013). For example, the ACPE Standards 2016 emphasised that the US pharmacy student must be "practice-ready" and "team-ready" to contribute to patient care working in collaboration with healthcare teams (Accreditation Council for Pharmacy Education, 2015). In the UK, the publication *"Pharmacy in England: building on strengths, delivering the future"*, also sets the aim of ensuring that the UK's pharmacy graduates are ready to work from day one to deliver quality services to patients and populations (Guile and Ahamed, 2011).

However, some non-PharmD pharmacists thought that the competency of both pharmacy qualifications were similar because they performed similar job activities, particularly standard pharmacy services or non-clinical activities (e.g., dispensing, procurement and inventory management), which were the top priorities of hospital pharmacy services.

This might be because hospital pharmacists experienced a high dispensing workload and a shortage of pharmacy staff. In some hospitals, pharmacists have had to manage those basic activities; otherwise, they would not be able to provide special clinical activities. Respondents also noted that in some hospitals, PharmD graduates have struggled to implement clinical roles, particularly in places where previously there had been no clinical pharmacists. It was felt the graduates must position themselves to move away from traditional dispensing services to work as clinical pharmacists on a medical ward or with a health care team.

Similar findings were reported in the US during the 1980s. BPharm and PharmD graduates had similar job activities, such as prescription processing and providing patient care and both sets spent a similar amount of time in those activities. The US PharmD graduates have mainly worked as nonclinical skilled staff rather than in clinical positions, possibly due to a higher level of drug distribution responsibilities (Barnett and Matthews, 1992; Carroll et al., 1984; Hill, 1999).

In addition, some respondents explained that competencies were individualistic and that BPharm graduates will increase their competencies by practicing. Thus, if BPharm graduates acquired more experiences and continued practicing in pharmaceutical care activities, they would have the same competency as PharmD graduates.

5.4.1.3.4 Concerns over PharmD graduates' roles in patient care, jobs available and the healthcare system's preparedness for PharmD graduates

Respondents were also concerned about the development of PharmD graduates' roles in patient care; these concerns are consistent with several studies that noted barriers to providing pharmaceutical care services in hospitals. Examples of such impediments include lack of time, high dispensing workload, shortage of pharmacy staff, lack of recognition of the pharmacy profession by other health care providers, lack of funds or a low financial incentive, and lack of employer's recognition about the pharmacist's role and responsibilities (Basak and Sathyanarayana, 2010; Farris et al., 2005; Hamarneh et al., 2011; Ngorsuraches and Chaibu, 2004; Ngorsuraches and Li, 2006).

Many of the respondents were concerned about the limited number of government jobs available for PharmD graduates. Jobs were limited due to financial constraints, even though there is predicted to be a shortage of hospital pharmacists until 2019 (Prapunwattana, 2012). However, career opportunities in private settings appear abundant and therefore present a more optimistic situation (Chan and Ching, 2005; Prapunwattana, 2012). World-class private hospitals, which provide high-quality services, have a high demand for PharmD graduates to provide specialist pharmaceutical care. The need for PharmD graduates in local private hospitals and local drug stores requires further study.

The respondents also had concerns about the healthcare system's preparedness for PharmD graduates; particularly referring to lack of adequate salary, compensation and career path. This finding is consistent with those of Thammatacharee et al. (2013), who found imbalances in the financial circumstances of healthcare professionals. New medical and dental graduates receive higher salaries if they are working in rural areas, whereas pharmacists do not.

The lack of maintenance factors, such as proper strategies by policy makers and hospital administration committees toward professional career development, might also affect pharmacists' motivation (Jullasat and Polprasert, 2012). Stakeholders should increase their awareness about the preparedness for this new generation of pharmacists for the challenges they will inevitably meet.

The following recommendations emerged from the findings:
1) The PharmD curriculum should include more public health subjects and prepare students for health promotion and health education roles to meet local pharmacy practice needs, as well as global pharmacy competency and service standards (Anderson et al., 2009; Vlasses et al., 2013). Encouraging professional ethical issue in curriculum is also important as well as the knowledge and skills to be a successful pharmacist (Loennechen et al., 2007; Richards, 2012).

2) Academic institutes should collaborate in planning and designing the curriculum to produce pharmacy graduates by closely following the national service plan that stipulates the need to increase the pharmacy workforce in tertiary care, compared to secondary care and primary care by approximately 35% and 65%, respectively.
3) Professional bodies and the government should clearly define job descriptions, career structures and career development for PharmD graduates (Babar et al., 2013; WHO, 2013).

5.4.1.4 HP: Conclusion

The respondents perceived that PharmD graduates were suited for tertiary care and for employment in large hospital settings, as they were well coordinated with the health care team and were trained to work in specialised areas; for example pharmaceutical care activities, specialised clinic services and ward rounds.

However, there were concerns about the suitability of the PharmD graduates for community hospital/primary care hospital settings due to the insufficiency of health promotion and disease prevention training in the PharmD curriculum.

Approximately half of the respondents perceived a competency difference between the two pharmacy qualifications. They thought that the PharmD graduates had higher competencies than BPharm graduates in clinical knowledge, more clinical skills, and better decision making. It was also suggested the PharmD graduates had been prepare to work straight away, whereas BPharm graduates needed time to learn to practice clinically.

The other half of the respondents perceived the competency of both pharmacy qualifications as being similar, because they had similar job activities, particularly in non-clinical field, where hospital pharmacists had a high dispensing workload and there was a shortage of pharmacy staff. Thus, PharmD graduates had to work in non-clinical activities, which indicated that both degrees had the same competency. PharmD graduates have struggled to identify and implement a clinical role. They need an encouraging environment and must inspire themselves to move away from traditional dispensing services to work as clinical pharmacists on a medical ward or within a health care team.

5.4.2 CP- results of community pharmacists' perceptions survey (CP)

5.4.2.1 CP - quantitative findings

Questionnaires were distributed to 200 conference attendees. Completed surveys were received from 40 respondents, yielding a response rate of only 20%.

5.4.2.1.1 CP- Characteristics of respondents

The majority of respondents were female (n=29, 72.5%) and belonged to the 36-65 year age group (n=26, 65%). In terms of educational levels of the respondents, the majority are BPharm graduates (n=28, 70%) and none were PharmD graduates.

The majority of respondents had experienced working with PharmD graduates (n=25, 62.5%). Twenty-six respondents (65.0%) had more than 10 years of current experiences. Approximately half of the respondents work as fulltime community pharmacists. The other half are working as part time community pharmacists, while their main jobs are in private hospitals, pharmaceutical manufacturers or MoPH hospitals. The majority of respondent (n=36, 90%) has their workplace settings in Bangkok and central area. Thirteen respondents (32.5%) are training preceptors of pharmacy students. The characteristics of the respondents are presented in Table 5.4.

Table 5.4 CP: Respondents' characteristics (n=40)

Characteristics	Frequency	Percentage
Gender		
Male	11	27.5
Female	29	72.5
Age range		
<25 years	1	2.5
25-35 years	13	32.5
36-45 years	8	20.0
46-55 years	11	27.5
56-65 years	7	17.5
Highest academic degree		
BPharm[a] no track or pharmaceutical sciences track	19	47.5
BPharm, track Pharmaceutical care or community pharmacy	9	22.5
PharmD[b]	0	0.0
MPharm[c]	12	30.0
Experienced working with PharmD graduates		
Yes	25	62.5
No	15	37.5
Years at current experiences		
1-5 years	5	12.5
6-10 years	9	22.5
11-15 years	4	10.0
16-20 years	4	10.0
> 20 years	18	45.0
Type of workplace		
Community Pharmacy, owner, full time	19	47.5
Community Pharmacy, chain, employer, full time	2	5.0
Community Pharmacy, part time	19	47.5
Note: they work fulltime job in the following settings; - Private hospital (n=4) - Pharmaceutical manufacturer (n=4) - Hospital, MoPH[d] (n=3) - Other institution, MoPH (n=4) - Others Ministry (n=3) - Others (n=1)		
Setting region		
Bangkok	31	77.5
Central exclude Bangkok	5	12.5
East	3	7.5
North East	1	2.5
North	0	0.0
South	0	0.0
Training preceptors	13	32.5

[a] BPharm = Bachelor of Pharmacy, [b] PharmD = Doctor of Pharmacy, [c] MPharm = Master of Pharmacy,
[d] MoPH = the Ministry of Public Health

5.4.2.1.2 CP- respondents' perceptions regarding the suitability of the PharmD graduates for working in hospital settings and competency differences between the BPharm and PharmD graduates

The majority of the respondents (n = 26, 65%) agreed that the PharmD graduates were suitable for working in community pharmacy settings as they have knowledge and skills in pharmaceutical care. Approximately half of the respondents (n = 21, 52.5%) agreed that there were competency differences between the BPharm and PharmD graduates with regards to their work performance in community pharmacies (Table 5.5).

Table 5.5 CP: respondents' perceptions towards suitability of the PharmD graduates for working in community pharmacy settings and competency differences between the BPharm and the PharmD graduates (n=40)

	No. of Respondent (%)
Suitability of PharmD graduates for working in community pharmacy settings	
Yes, PharmD graduates are suitable to work in community pharmacy settings.	26 (65.0)
No, PharmD graduates are not suitable to work in community pharmacy settings.	14 (35.0)
Competency differences between BPharm and PharmD graduates	
Yes, there had been some differences.	21 (52.5)
No, there were no differences.	19 (47.5)

A chi-square test or Fisher's exact test was used to describe the relationship between the respondents' characteristics (e.g., gender, age range, highest academic degree, work experiences) with their perceptions of the suitability of the PharmD graduates for working in community pharmacy settings.

There is no statistically detected difference between the respondents' characteristics and their perceptions of the suitability of the PharmD graduates for working in community pharmacy settings. The same conclusion applies to the respondents' characteristics and the respondents' perceptions toward the competency differences between BPharm and PharmD graduates (Table 5.6).

Table 5.6 Univariate analyses of relationships between respondents' characteristic (n=40) and their perceptions, namely suitability of PharmD graduates for working in community pharmacy settings and perceived competency differences between BPharm and PharmD graduates

	Suitability of PharmD graduates for working in community pharmacy settings				Perceived competency differences between BPharm and PharmD graduates			
	Number (%) of respondents		Univariate[a]		Number (%) of respondents		Univariate[a]	
Characteristics	Yes	No	χ^2 value	p-value	Yes	No	χ^2 value	p-value
Gender								
Male	8 (72.7%)	3 (27.3%)		0.715[c]	8 (72.7%)	3 (27.3%)	2.489	0.115
Female	18 (62.1%)	11 (37.9%)			13 (44.8%)	16 (55.2%)		
Age range								
<25 -35 years	10 (71.4%)	4 (28.6%)		0.730[c]	6 (42.9%)	8 (57.1%)	0.803	0.370
> 35 years	16 (61.5%)	10 (38.5%)			15 (57.7%)	11 (42.3%)		
Highest academic degree								
BPharm	17 (60.7%)	11 (39.3%)	0.754	0.385	14 (50.0%)	14 (50.0%)	0.234	0.629
MPharm	9(75.0%)	3 (25.0%))			7 (58.3%)	5 (41.7%)		
Experienced working with PharmD graduates								
Yes	19 (76.0%)	6 (24.0%)	3.546	0.060	15 (60.0%)	10 (40.0%)	1.504	0.220
No	7 (46.7%)	8 (53.3%)			6 (40.0%)	9 (60.0%)		
Years at current experiences								
0-10	10 (71.4%)	4 (28.6%)		0.730[c]	7 (50.0%)	7 (50.0%)	0.054	0.816
11-20	16 (61.5%)	10 (38.5%)			14 (53.8%)	12 (46.2%)		
Work place								
Full time	14 (66.7%)	7 (33.3%)	0.054	0.816	11 (52.4%)	10 (47.6%)	0.000	0.987
Part time	12 (63.2%)	7 (36.8%)			10 (52.6%)	9 (47.4%)		
Setting region								
BKK & central	22 (61.1%)	14 (38.9%)		0.278[c]	18 (50.0%)	18 (50.0%)		0.607[c]
Other	4 (100.0%)	0 (0.0%)			3 (75.0%)	1 (25.0%)		
Training preceptor								
Yes	9 (69.2%)	4 (30.8%)		1.000[c]	6 (46.2%)	7 (53.8%)	0.311	0.577
No	17 (63.0%)	10 (37.0%)			15 (55.6%)	12 (44.4%)		

[a] Chi-square test was used to determine the association between variables, and Fisher's exact test was used when more than 20% of the cells had an expected count of less than 5.
[b] Significant at $p < 0.05$. [c] Fisher's exact test.
[d] Responsibilities of Thai hospital pharmacists were including hospital service and also home health care service/family pharmacist & customer protection.

5.4.2.2 CP- qualitative findings

Two major themes emerged in response to the open-ended written answers from the survey questionnaire, as presented below and in Figure 5.3.

5.4.2.2.1 Theme 1: Suitability of PharmD graduates for the community pharmacy job market

5.4.2.2.1.1 Yes, they are suitable

Approximately half of respondents perceived that the job market in community pharmacy needs more professional services; particularly pharmaceutical care services. The community pharmacies also need highly competent pharmacists to provide better services in community pharmacies; something PharmD graduates could offer.

> *"Job market in community pharmacy area needs more professional services which PharmD graduates will able to do." (CP34, F, BPharm, full time (FT))*

5.4.1.2.1.2 No, they are not suitable

A. Over qualified to work in community pharmacies

Two respondents perceived that the 6-year PharmD graduates are suitably qualified to work in public sector hospitals, providing specialised hospital-based services, rather than being employed in the community pharmacy private sector. They thought that working in community pharmacies does not require the level of specialisation possessed by PharmD graduates.

> *"The PharmD graduates suit for the public sector not the private sector." (CP28, F, MPharm (Public health), PT)*

> *"Working in community pharmacy setting does not need specialisation." (CP29, M, BPharm, PT)*

Some respondents thought that the 5-year BPharm graduates are able to work well in community pharmacy, as there were no differences in pharmacy services or activities in community pharmacy, provided by the 5-year BPharm and the 6-year PharmD graduates. Thus, there was no need to study in a longer programme.

> *"The 5-year BPharm graduates are able to work in community pharmacy. There was no need to study in a longer programme." (CP33, F, MPharm (Pharmacy management), FT)*

> *"In the community pharmacy setting, graduates from both programmes have the same activities." (CP36, M, BPharm, FT)*

Some respondents suggested that the Thai pharmacy curriculum should not only offer the 6-year PharmD programme but it should provide both the 5-year BPharm and the 6-year PharmD programme due to student who should have choice to choose regarding their study programme.

> *"It should not be an all-PharmD programme. Students should have choices." (CP21, F, BPharm, FT)*

B. PharmD graduates need more preparation to work in community pharmacies

Some respondents perceived that PharmD graduates required more preparation to work in community pharmacies. They thought that the PharmD curriculum provided fewer experiences in community pharmacies, and more experience via clerkships in hospital settings. The PharmD curriculum should increase applied knowledge, such as that related to disease screening, home health care services, and pharmacy marketing.

> *"The PharmD curriculum provided limited experiences in community pharmacies when compared to clerkships in hospital settings. The PharmD curriculum should increase applied knowledge especially home health care services and pharmacy marketing". (CP11, F, BPharm, part time PT))*

C. Unrecognised roles and preparedness for PharmD graduates

Two respondents perceived that Thai society does not recognise the role of the PharmD graduates. Therefore, PharmD graduates, who work in community pharmacy, will not able to provide pharmaceutical services and will not be able to work to their full potential.

> *"It should not be a 6-year PharmD programme. Thai society does not recognise role of PharmD graduates. The PharmD graduates will not use their potential efficiently in community pharmacies." (CP33, F, MPharm (Pharmacy management), FT)*

Some respondents were concerned that the salary in the private sector will not increase for the 6-year PharmD graduates.

> *"There was no need to take a 6-year programme due to salaries, in the private sector, will not increase." (CP5, F, BPharm, PT)*

D. Disadvantages of PharmD programme: wastes time and investment

Some respondents perceived that the job market in community pharmacies does not need PharmD graduates. They thought that studying the 6-year PharmD programme wastes time and investment. Faculties should continue to improve the 5-year BPharm programme to produce high competency graduates with, for example, skills in pharmacy marketing and customer communication, rather than change to a single PharmD programme.

> *"To provide better community pharmacy services needs a higher competency pharmacist but does not need a 6-year PharmD graduates because it wastes time and money. Faculties should improve a 5-year programme instead." (CP3, F, BPharm, PT)*

Some respondents perceived that to provide services in community pharmacy needs the practicing experiences from real situations, rather than from studying or clerkship training. Therefore, increasing clerkship training in the PharmD programme would not help in terms of preparing graduates to work in community pharmacy setting.

> *"Providing services in community pharmacy need real experiences rather than studying. Real situations are difference from training. Increasing clerkship would not help graduates to work in community pharmacy setting." (CP4, M, BPharm, PT)*

5.4.2.2.2 Theme 2: Characteristics of PharmD graduates compare to the BPharm graduates

Approximately half of the respondents perceived that PharmD graduates have an in-depth knowledge and skills in patient care that are higher than those of BPharm.

Some respondents thought that PharmD graduates were able to apply their knowledge to solve problems in real life situations, had a wider vision on their work, were ready to work, learn faster, and had more confidence than BPharm graduates had.

> *"PharmD graduates have in-depth knowledge and skills in patient care. They had higher competency than BPharm graduates." (CP22, M, BPharm, full time)*

> *"PharmD graduates apply their knowledge to solve problem in real life situation." (CP30, M, MSc (Pharmacy management), full time)*

> *"PharmD graduates had wider vision on their work, ready to work and learn faster." (CP37, F, BPharm, PT)*

The reasons supporting the notion that PharmD graduates had higher competencies than BPharm graduates are that the PharmD graduates had more clerkship trainings and had more experiences in real practice settings.

> *"PharmD graduates have higher skills due to they had more clerkship period and experiences." (CP9, F, BPharm, PT)*

On the contrary, another half of the respondents perceived that there were no differences between the graduates from those two programmes. It depends on individual knowledge, commitment and experiences.

> *"There is no difference. It is depending on individual's knowledge, commitment, experiences, and expertise." (CP8, M, MPharm (Community pharmacy), PT)*

Some respondents thought that the BPharm graduates also had high competency as well, as all Thai pharmacy graduates from every pharmacy curricular should have the same core competencies in order to meet the PCT standard guideline.

> *"The 5-year BPharm graduates have high competency and had the same core competency as the 6-year PharmD graduates." (CP32, F, BPharm, FT)*

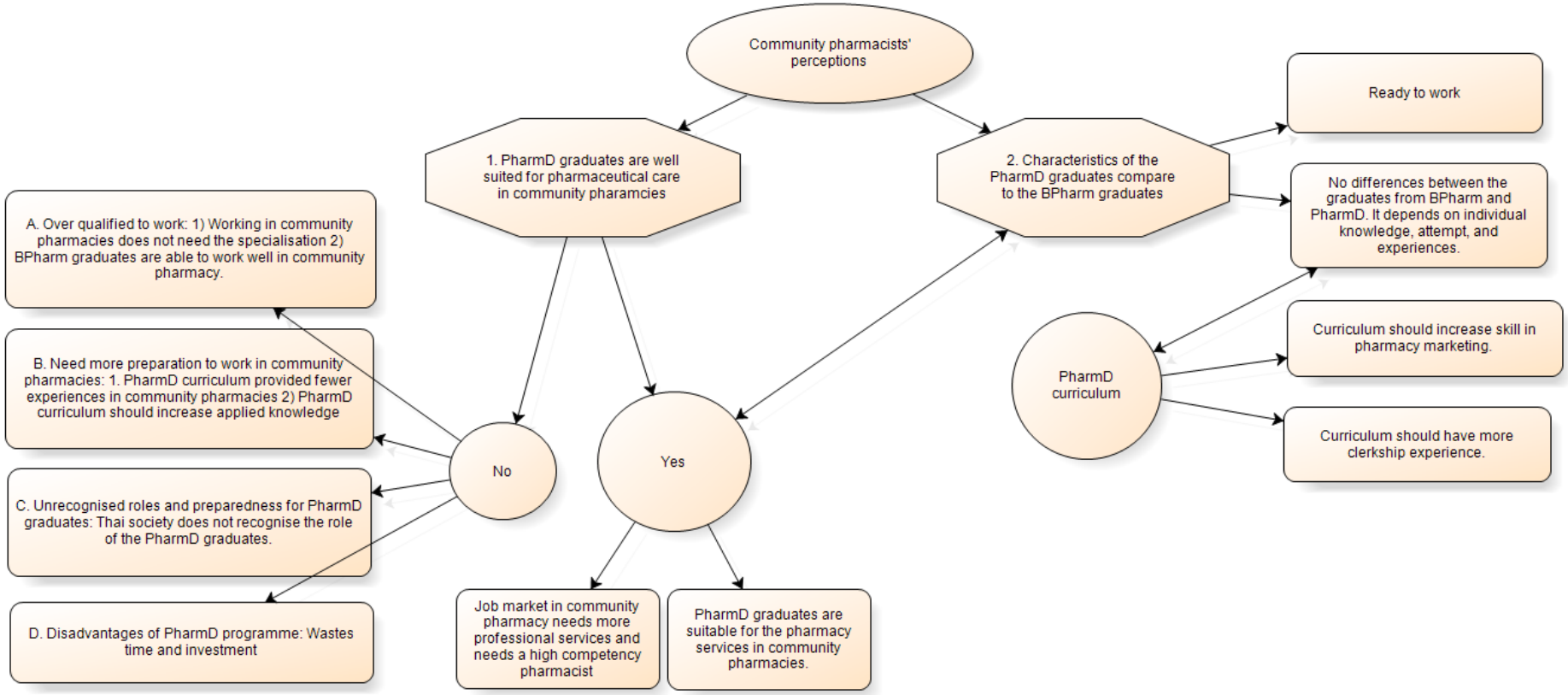


Figure 5.3 Themes of community pharmacists' perceptions towards suitability of PharmD graduates regarding employment in community pharmacy

5.4.2.3 CP- discussion

Respondents' and non-respondents' characteristics

Most of the community pharmacists who responded are female, belonging to the 36-65 age group, and holding the BPharm degree; none of them was a PharmD graduate. Approximately half are fulltime community pharmacists working in Bangkok.

This survey study had low response rate (20.0%). Some of the non-respondents, who were senior full time owner-community pharmacists and who were not training preceptors, told the researcher that they felt uncomfortable to participate in this survey and declined to this study. The reasons for declining related to the fact that they had graduated a long time ago, so had insufficient understanding about the transition of pharmacy education, and had no experience working with PharmD graduates.

It is difficult to compare the respondents' characteristics with previous studies, due to their lack of similarity (Keeratipattarakul and Jantanasam, 2013; Steering Committee on Formulation of 11th National Health Development Plan, 2012) and a lack of statistics at the national level. However, the respondents' characteristics in this study seem similar to the Thai health profile (2008-2010), which recorded that Thai community pharmacists mostly work at independent drugstores, with Bangkok having a high density of community pharmacies (Wibulpolprasert, 2010). However, due to the low response rate, it is not realistic to suggest that the findings represent the view of all community pharmacists in Thailand.

Perceptions about the suitability

According to the assessment of the influence of the respondents' characteristics on their perceptions, no statistically detected difference between the respondents' characteristics and their perceptions of the suitability of PharmD graduates to be employed in community pharmacy were indicated. Nor were there any differences in the perceptions of the competency between BPharm and PharmD graduates. These results could be due to the small sample size in this study (Kadam and Bhalerao, 2010).

The majority of the respondents (65%) offered positive perceptions about the PharmD graduates: they were suitable for pharmaceutical care services in community pharmacy because the community pharmacy needs a highly competent community pharmacist to provide first class services, and PharmD graduates are suitable to meet this need.

This result is similarly to the self-assessment study, where PharmD graduates registered that they have higher competency scores on pharmaceutical care than the BPharm graduates (Sumpradit et al., 2014). This result might due to PharmD graduates having more clerkship training and more experiences in real practice settings in comparison to the BPharm programme (The Pharmacy Council of Thailand, 2012b).

Perceptions about the competency difference

Half of the respondents (52.5%) agreed that there were competency differences between the BPharm and PharmD graduates concerning their work performance in community pharmacies. Conversely, another half of the respondents perceived that there were no differences between the graduates from the two programmes. These findings were similar to other reports (PharmaCafe.com, 2008; Pramyothin et al., 1999).

This 'no difference' perception might be due to the ideal that all Thai pharmacy graduates from both the BPharm and the PharmD programme should have the same core competencies to meet the PCT standard guideline. In addition, competency depends on individual knowledge, commitment, and experiences.

Some respondents perceived that the services provided in community pharmacy are traditional pharmacy services, such as dispensing, that the BPharm graduates are able to manage. Therefore, there is no need to have the PharmD graduates to provide that service.

The barriers to extending the community pharmacists' roles in pharmaceutical care have been reported; for example a lack of pharmacists' time, lack of staff support, lack of remuneration, lack of computer programme to assist in practice via patient medication record, pharmacists' attitudes, lack of patients' time and lack of pharmaceutical training for pharmacists (Kittipibul et al., 2006; Nathisuwan, 2010; Tunpichart et al., 2012).

In addition, community pharmacy in Thailand is an independent private business centred on 'drug stores', a network that has not yet been connected to the Thai health system. Thus community pharmacies in Thailand are more commercial than in many other countries and therefore they might have fewer resources to provide pharmaceutical care (Saramunee et al., 2011).

The future roles of community pharmacists

There is an attempt from Thai community pharmacists, the Community Pharmacy Association (CPA) and certain university pharmacy faculties to collaborate with each other to achieve the aim of expanding pharmacy's public health roles. This expansion could include providing sexual health services (Saramunee et al., 2011), information regarding smoking cessation (Nimpitakpong et al., 2010) and cardiovascular and associated risk screening (Ploylearmsang et al., 2013). In addition, other sources of support are:

- The government policy regarding law enforcement toward pharmacists' responsibilities, in order to have pharmacists in all community pharmacies
- The accredited community pharmacy project, from the PCT and Thai FDA, that encourages community pharmacists to provide pharmaceutical care practically, in order to make the community pharmacist different from the widely known retail drug sellers
- The NHSO primary care project, designed to facilitate and encourage the primary care roles of community pharmacists (National Health Security Office, 2013; Payanantana et al., 2013).

Curriculum development

Some of respondents perceived that PharmD graduates are more suitable to work in tertiary hospitals because they have been trained in specialisation in specific area for working in hospital setting and had fewer clerkship training in community pharmacies compared to clerkships in hospital settings.

Therefore, faculty of pharmacy should redesign their curriculum to provide more preparation for their graduates to work in community pharmacies, for example, increase applied knowledge for working in community pharmacy (e.g., disease screening, home health care services, pharmacy marketing especially about balancing between the pharmacy professional services and business), and consider enough clerkship training in community pharmacy (Subcommittee on the Pharmacy Education Consortium of Thailand in Pharmaceutical Sciences track., 2013a; Subcommittee on the Pharmacy Education Consortium of Thailand in Pharmaceutical Sciences track., 2013b).

Likewise, the survey of Thai BPharm graduates from one faculty of pharmacy, they perceived that pharmacy curriculum should have included more about primary care activities (e.g., DM and HT screening, smoking cessation counselling and home health care) (Sethabouppha et al., 2012).

Moreover, the 2012 Competency standard guidelines of the PCT; that all faculty must follow to ensure that their graduates meet those competency; had insufficient competency requirement in the pharmacy marketing or business management (outside of the inventory management) (The Pharmacy Council of Thailand, 2011; The Pharmacy Council of Thailand, 2012c; The Pharmacy Council of Thailand, 2013a; The Pharmacy Council of Thailand., 2002).

Some studies reported that pharmacy students are having a limited exposure to the business management topic from the pharmacy curriculum (Hicks et al., 2004; Moultry, 2011; Rollins et al., 2014). It showed that pharmacy students might lack of connection between pharmacy and business, which might threaten the profession due to the highly competitive environment in community pharmacy business (Anscombe et al., 2012).

5.4.2.4 CP- Conclusion

The respondents perceived that PharmD graduates had high competency to provide pharmaceutical care in community pharmacy settings. However, more preparation was required before the PharmD graduates were deemed suitable for employment in community pharmacy settings.

5.4.3 HP&CP- results from both the hospital pharmacists' perceptions survey and the community pharmacists' perceptions survey

The majority of respondents from both surveys are female and had BPharm degrees. More than 60% of respondents from both groups had experienced of working with PharmD graduates and more than half were not training preceptors.

There was a significant difference in the age range of the two groups of respondents ($\chi 2$ = 10.616, p = 0.001). The majority of respondents from the CP group belonged to the 36-65 year age range while the majority of respondents from the HP cohort were between less than 25-35 years (Table 5.7).

There was a significant difference in the years at current experiences of the two groups of respondents ($\chi 2$ = 8.498, p = 0.004). The percentage of respondents who had more than 10 years of pharmacy experience was highest in the community pharmacists group, while the majority of respondents from the HP group had less than 10 years experience.

There was also has a significant difference in regional workplace settings for the groups of respondents ($\chi 2$ = 31.118, p < 0.001); the percentage of respondents was highest in the community pharmacists group who worked in Bangkok and the central area of Thailand.

There were no differences in the respondents' perceptions regarding the suitability of PharmD graduates for working in the respondents' workplace settings. Also there were no differences in the respondents' perceptions regarding the competence of BPharm and PharmD graduates.

The themes emerge from the hospital pharmacists' and community pharmacists' perceptions towards suitability of the PharmD graduates for working in their settings and competency differences between the BPharm and PharmD graduates are summarised in Table 5.8.

Table 5.7 HP-CP: Univariate analyses of relationships between group of the respondents, namely, hospital pharmacists and community pharmacists and respondents' characteristics and respondents' perceptions towards suitability of PharmD graduates for working in hospital and community pharmacy settings and perceived competency differences between BPharm and PharmD graduates

Characteristics	Group of respondents				Univariate	
	Hospital pharmacists (n=98)		Community Pharmacists (n=40)			
Gender		**%**		**%**	χ^2	p-value
Male	26	26.5	11	27.5	0.014	0.907
Female	72	**73.5**	29	**72.5**		
Age range						
<25 years-35 years	64	**65.3**	14	35.0	10.616	**0.001**[b]
36-65 years	34	34.7	26	**65.0**		
Highest academic degree						
BPharm[d]	60	61.2	28	70.0	5.863	0.053
PharmD[e]	13	13.3	0	0.0		
MPharm[f]	25	25.5	12	30.0		
Experienced working with PharmD graduates						
Yes	75	**76.5**	25	**62.5**	2.802	0.094
No	23	23.5	15	37.5		
Years at current experiences						
1-10 years	61	**62.2**	14	35.0	8.498	**0.004**[b]
11- > 20 years	37	37.8	26	**65.0**		
Setting region						
Bangkok+ central	37	37.8	36	**90.0**	31.118	**<0.001**[b]
Others	61	**62.2**	4	10.0		
Training preceptors[c]						
Yes	46	48.9	13	32.5	3.076	0.079
No	48	**51.1**	27	**67.5**		
Perceptions						
Perception about suitability of PharmD graduates for working in respondents' workplace settings						
Yes, PharmD graduates are suitable.	75	**76.5**	26	**65.0**	1.925	0.165
No, PharmD graduates are not suitable.	23	23.5	14	35.0		
Perception about competency differences between BPharm and PharmD graduates						
Yes, there had been some differences.	54	**55.1**	21	**52.5**	0.078	0.781
No, there were no differences.	44	44.9	19	47.5		

[a] Chi-square test was used to determine the association between variables, and Fisher's exact test was used when more than 20% of the cells had an expected count of less than 5.
[b] Significant at $p < 0.05$. [c] Hospital pharmacists; n=94; missing data, n = 4, 4.1%
[d] BPharm = Bachelor of Pharmacy, [e] PharmD = Doctor of Pharmacy, f MPharm = Master of Pharmacy,

Table 5.8 HP-CP: Summary of the themes emerge from respondents' perceptions towards suitability of the PharmD graduates for working in their settings and competency differences between the BPharm and PharmD graduates

Themes	Hospital pharmacists' Perceptions	Community pharmacists' Perceptions
1. Suitability of PharmD graduates for the job market		
1.1 Yes, they are suitable.	-The job market in hospital pharmacy needs more professionals working in clinical pharmacy services and pharmaceutical care and with multi-disciplinary teams. -PharmD graduates were suitable for tertiary care and for employment in large hospitals.	-The job market in community pharmacy needs more professional services and needs high competency pharmacists to provide better services in the field of community pharmacy -PharmD graduates are suitable for this need.
1.2 No, they are not suitable.		
A. Over qualified to work	-PharmD graduates were trained to work in specialised areas in large hospitals.	-Working in community pharmacies does not need the specialisations. -The 5-year BPharm graduates are able to work well in community pharmacy.
B. PharmD graduates need more preparation	-PharmD graduates might need preparation about consumer health protection, health promotion, and disease prevention to work in primary care hospitals.	- PharmD curriculum provided less experiences in community pharmacies as compared to clerkships in hospital settings -PharmD curriculum should increase applied knowledge (e.g., disease screening, home health care services, and pharmacy marketing).
C. Unrecognised roles and preparedness for PharmD graduates	-PharmD graduates might struggle to start new services due to the system not encouraging the pharmacists' new role, due to their high workload in dispensing services and shortage of hospital pharmacists.	-Thai society does not recognise the role of the PharmD graduates. Therefore, PharmD graduates will not able to provide pharmaceutical services and will not be able to work to their full potential. -Some respondents were concerned that the salary in the private sector will not increase for the 6-year PharmD graduates.
D. Limitations to provide pharmaceutical care	-Limitations for PharmD graduates to provide pharmaceutical care, such as a limited medicine supply.	No mention
E. Disadvantages of PharmD programme	No mention	Wastes time and investment
2. Characteristics of PharmD graduates compare to the BPharm graduates: Higher competency and readiness to work	-Ready to work -They were highly prepared for working in the wards and were highly efficient in the clinical pharmacy area. PharmD graduates had better knowledge and were better skilled in delivering patient care within the hospital system than were the BPharm graduates.	-Ready to work -PharmD graduates have in-depth knowledge and skills in patient care that are greater than the BPharm graduates. PharmD graduates were able to apply their knowledge to solve problems in real life situations, and had more confidence than BPharm graduates had. -Contrary: No differences between the graduates from BPharm and PharmD programme. It depends on individual knowledge, commitment, and experiences.

5.5 Discussion

There is a significant different in age range by the group of respondents ($\chi 2 = 10.616$, $p = 0.001$), years at current experiences by the group of respondents ($\chi 2 = 8.498$, $p = 0.004$) and the setting region by groups of respondents ($\chi 2 = 31.118$, $p = 0.000$).

The majority of the respondents from HP group are younger than the CP group and had less than 10 years work experience. This fact might be related to the public service programme, which was resumed in 2006, regarding the unilateral contract applied between the MoPH and pharmacy students.

This compulsory public service programme, launched by the MoPH, aimed to solve a severe shortage of pharmacists in the public sector. Approximately 350 pharmacy graduates from public universities each year, who enrolled in the public service programme, have to work for the government for two years after graduating, or pay a penalty fee of 250,000 Thai baht or £4,849/$6,938: currency rate 22/01/2016 (Ngorsuraches et al., 2013; Sumpradit et al., 2014). Therefore, the majority of HP respondents were younger than the community pharmacists, and also had fewer years of work experience than the CP respondents.

The community pharmacists in this research mostly worked in Bangkok and central area, which confirms the proportion of pharmacists by region: most of the pharmacists in Bangkok and central work in the private/commercial sector in community pharmacies. The respondents from the hospital pharmacist group mainly work in MoPH hospitals in other regions of Thailand (Wibulpolprasert, 2010).

Most of the respondents from both groups of respondents perceived that the PharmD graduates were well suited for patient care related job markets, in both hospital and community pharmacy settings. They perceived that PharmD graduates had higher competency in patient care services, compared to the BPharm graduates.

Job markets in patient care areas need highly competent pharmacy graduates to meet the "11th National Health Development Plan" for public and private sectors that aimed to improve the quality of health care and the promotion of health (Steering Committee on Formulation of 11th National Health Development Plan, 2012).

However, many respondents from both groups of pharmacists perceived that the PharmD programme emphasises developing competencies in tertiary level patient care (the areas of cardiovascular diseases, oncology, trauma and neonatal intensive care). Less attention was paid to developing skills in primary care services involving public health, health promotion and disease prevention, as well as consumer health protection. Pharmacy management focusing on establishing a successful balance between profession and business was also perceived to be lacking attention.

This finding is similar to other studies, which found the curriculum provided inadequate coverage of public health subjects and pharmacy management in the PharmD programme (Christensen and Farris, 2006; Sumpradit et al., 2014).

In addition, the Thai health care service needs pharmacy graduates in primary care hospitals and community pharmacies who are highly competent (Bureau of Health Administration and Office of the Permanent Secretary, 2013; Payanantana et al., 2013). With this point in mind Thai pharmacy faculties should produce more general PharmD graduates able to take their place in primary care and secondary care settings; whilst also producing specialised PharmD graduates for tertiary care in fewer numbers. However, few faculties are planning to produce PharmD graduates to provide primary and secondary care (Sookaneknun et al., 2009).

5.7 Strengths and weaknesses of this phase 2 study

5.7.1 Strengths

These cross-sectional surveys are the first surveys of hospital and community pharmacists' perceptions of the suitability of PharmD graduates employed in hospital and community pharmacy settings in Thailand. They are also the first surveys of the pharmacists' perceptions of the competency differences between BPharm and PharmD graduates. Researchers with both Thai and non-Thai pharmacy backgrounds participated in the data analysis to minimise any bias in the findings (Anderson, 2010; Guest et al., 2012; Hughes and McCann, 2003).

To establish the quality of the analysis of the qualitative research data, the criteria for "trustworthiness" are described as follows:

Credibility: this study did not present the analysis to the participants because the information from the questionnaire was anonymous. However, triangulation (Guba, 1981) was used to confirm the results with the head of hospital pharmacy department, community hospital, Thailand, as well as with one expert from the Community Pharmacy Association of Thailand; documentary evidence was also used.

Transferability: this study might serve as an overview for educators in other developing countries who might wish to consider the implications of this study.

Dependability: the methodology was description in detail to allow this study to be repeated.

Confirmability: the researcher's bias was reduced by using triangulation; several other researchers were involved in the development and cross-checking of the themes to ensure that the findings were the perceptions of respondents rather than the researcher's (Babar et al., 2013; Shenton, 2004).

This study may also be helpful for academic institutions and regulatory bodies to review their curricula and effectively produce PharmD graduates who meet the needs of the specific health care system in Thailand. The research data may also be of value for developing national competency standards for the pharmacy licensure examination.

5.7.2 Weaknesses

This study has certain limitations. First, the respondents in this study were recruited by using convenience sampling. The effort was devoted to identifying lists of pharmacists; however, the lists were not complete due to the absence of an up-to-date database representing the numbers and addresses of Thai pharmacists (Ngorsuraches and Li, 2006; Prapunwattana, 2012). Convenience sampling may have the disadvantage that it is not reliable for making inferences to the population (Anderson, 2010; Lohr, 2008).

Second, the study targeted participants who were attending two different professional conferences. Therefore, those participants could be different from the general population of hospital pharmacists or community pharmacists, because those who attended their conferences might be more interested in the profession, and related issues, than other pharmacists who did not attend.

Third, the sample size was small. The response rate was quite low at 55.6% for the hospital pharmacists' perceptions survey and 20% for the community pharmacists' perceptions survey. There are chances that the samples from which data were collected were unrepresentative and bias occurred due to non-response. The respondents might have different perspectives from who did not respond. It might be difficult, or even methodologically dangerous, to generalise from the sample to the Thai hospital pharmacists and community pharmacists (Yamane, 1967). It would be better to have bigger sample size enabling the findings to generalise to the population.

Fourth, the number of years that the respondents had worked among BPharm and PharmD graduates was not included in the questionnaire, even though this factor might influence the respondents' perceptions regarding both sets of graduates.

Fifth, the questionnaire used dichotomous questions (yes/no), which had some advantages such as being time-efficient, thus simplifying data coding and analysis. However, answers to the open-ended questions showed that the respondents could provide more than a yes/no response. For example, some respondents answered that the suitability of PharmD graduates in hospitals depends on the type of hospital setting. Therefore, exploring perceptions might not be as simple as yes or no. Further study might consider other types of question, such as multiple-choice questions or those requiring Likert scale responses. Such options would allow respondents to express their true uncertainty concerning their perceptions (Brace, 2008; Donald Treadwell, 2014).

Sixth, the survey is too broad, due to this study aiming to explore the general picture of hospital pharmacists' and community pharmacists' perceptions. A future study should provide specific criteria to evaluate the suitability of PharmD graduates for both hospital and community pharmacy practice, which might produce more specific answers, rather than relying on the answers from open-ended questions to evaluate suitability.

Seventh, the PharmD programme is new. There were only a small number of PharmD graduates working in hospital settings; therefore, it is unclear whether the respondents given are based on experience or assumption. The respondents' evaluations about suitability and competency of PharmD might have come from recognition, rather than real or formal information.

Eighth, the survey did not provide details of the eight domains of competency standard guidelines required for both BPharm and PharmD graduates for the licensure examination during the 2002-2014 period. Nor did it provide specific question about the eight domains of competency that informed the participants' perceptions regarding the differences between BPharm and PharmD graduates.

Ninth, the transferability of the finding regarding the suitability of the graduates from the 'traditional PharmD programme', as compared to the graduates from the 'new PharmD programme', should be considered carefully, due to significant changes in the education environment; in particularly the quantity and quality of training sites for the new PharmD programmes.

Finally, this study did not provide an objective measure of competency. Further research should specify the competency domain which the hospital pharmacists' used to perceive the difference between graduates from those two programmes, and also should investigate the PharmD graduates' actual competency (Sumpradit et al., 2014).

5.8 Conclusions

Most of the respondents from both groups perceived that the PharmD graduates are well suited for patient care related job markets, in both hospital and community pharmacy settings. They thought that the PharmD graduates had higher competencies, including more clinical knowledge, more clinical skills, and better decision making abilities than BPharm graduates, particularly in pharmaceutical care activities. The PharmD graduates' education had prepared them to be able to work immediately, whereas BPharm graduates needed time to learn to practice clinically.

A major concern is that there are insufficient primary health care subjects in the PharmD curriculum. Another important concern noted from both groups of pharmacists related to the barriers that might cause PharmD graduates to struggle to provide clinical services and primary care services in real practice settings; specifically the high dispensing workload and shortage of pharmacy staff. Therefore, PharmD graduates will have to perform similar activities to the BPharm graduates, particularly in non-clinical situations. PharmD graduates must inspire themselves and be supported to move away from traditional dispensing services to work as clinical pharmacists and primary care pharmacists.

However, these two pharmacists' perceptions surveys had low response rate, therefore the results obtained may not be generalised.

CHAPTER 6:

Thai stakeholders' perceptions of the introduction of the Doctor of Pharmacy programme

6.1 Introduction

This chapter presents the findings from interviews with 130 Thai stakeholders (e.g., policy makers, pharmacy experts, educators, health care providers, patients, students and parents) about their perceptions of the introduction of the Doctor of Pharmacy programme.

6.1.1 Justification for considering this study

This study is needed because, the literature review in chapter 2 pointed to the fact that, despite the transition to an all-PharmD programme in Thailand being very important, due to its effects on pharmacy education and pharmacy practice, there was a very little evidence concerning the goals and merits of adopting the PharmD curriculum as the single pharmacy degree (Pongcharoensuk and Prakongpan, 2012).

Stakeholders play an important part in the "needs-based model" due to the local stakeholders being the population who decide the local or national needs (Hoat et al., 2009; Rouse and Meštrovic, 2014). It is worth paying attention to the stakeholders' experiences of this transition. There was an important question regarding this study; "Why are you seeking stakeholders' opinions now, after the change has been made, is it worth your attention?" In this writer's opinion, it is worth understanding the reasons for the curriculum change, because we will know what the pharmacy education and pharmacy practice expected from this change, and what is actually happening now.

Individuals live in the present and plan for their future but studying the past helps us to understand how the present came to be; the past builds the present and the future. Therefore, to understand why something happened, how things changed; to look back to identify the influences that caused change might help us to learn from the mistakes in the past and to improve in the future.

Although the curriculum has been changed, a curriculum is a dynamic process which needs to be reviewed constantly (American Association of Colleges of Pharmacy, 2016b). Therefore, this study might contribute as one of the feedback loops of data to inform the policy makers and educational institutions about stakeholders' perceptions of the implementing of a 6-year PharmD programme in Thailand.

6.2 Objectives

The overall aim of this qualitative study is to explore the perceptions of stakeholders regarding the transition to an all-PharmD programme in Thailand.

6.3 Methods

6.3.1 Study design

The aim of this qualitative study was addressed using a cross-sectional semi-structured interviews design.

6.3.2 Justification for using semi-structured interviews

Qualitative research can provide meaning and understanding and is ideally suited to explore a little researched area (Harvey et al., 2015; Hinton et al., 2012) and provide useful information to understand the story behind the observed results and people's perceptions (Creswell, 2014).

Interviews are one of the qualitative approaches that provide a means of trying to understand people's perspectives on subjects that cannot be observed directly (Patton, 2002). Interviews are well suited for this study that aimed to explore people's experiences and self-understanding, while also clarifying and elaborating their own perceptions on their lived world (Kvale and Brinkmann, 2009).

Interviews can be carried out with a focus group or individuals. An interview with individuals was selected for this study because this approach provided a comfortable environment for the interviewees and was most likely to provide the desired depth of information and emphasis (Harrell and Bradley, 2009). In addition, focus group discussions were more difficult to arrange (Goicolea et al., 2010) for most of the busy stakeholders (e.g., policy makers, deans, academic staff, and doctors) than were one-to-one interviews.

Some of the topics discussed might be sensitive and might affect other people. Therefore, interviews were appropriate due to being able to minimise the influence of others on an individual's responses.

Interviews have many types of structures; for example, structured, semi-structured or unstructured (Patton, 2002). Semi-structured interviews were adopted for this study because an interview guide can be employed that lists a predetermined set of questions that are to be explored during the interview.

Such an approach ensures that the interviews remain focused on the areas of interest to the researcher, as well as providing the flexibility for interviewees to express their related experiences or, perceptions. Equally, the direction of the interviews could be determined by the interviewees' answers, rather than being directed only by the researcher, providing those answers address the research issue.

Semi-structured interviews have been found to be among the most common qualitative research methods used and have been used to study stakeholders' views about curriculum change in education (Priestley and Minty, 2012; Ryan et al., 2009).

6.3.3 Justification for the selection of stakeholders and inclusion criteria

Key informants of this study were the stakeholders who were involved in the quality assurance of Thai pharmacy education, according to the FIP definition (Rouse and Meštrovic, 2014). The stakeholders of pharmacy education can be categorised into two types: internal stakeholders and external stakeholders (Amaral and Magalhães, 2002).

Internal stakeholders are persons who take part in the everyday life of the pharmacy faculties (e.g., dean, academic staff, and students). External stakeholders are individuals that have an interest in pharmacy education despite the fact that they are not members of the pharmacy faculties (e.g., regulatory bodies such as the Pharmacy Council of Thailand (PCT) and the Pharmacy Education Consortium of Thailand (PECT), pharmacy experts, parents, health care providers, patients, general population) (Rouse and Meštrovic, 2014).

In this study, the sample was purposive, designed to ensure that participants at different stages in the curriculum change were included during fieldwork. The participants were among those involved in the earlier stages; some participants were involved in later stages of the change, and some were involved in both earlier and later stages of the change.
For example, the interview guide for policy makers had questions focused on the events in the earlier stage of the transition to an all-PharmD programme while users were asked about their perceptions on the situation in year 2013, when there were no graduates from the new PharmD programme.

Deciding the inclusion criteria was an important step in the study design. The next section of this chapter contains a detailed description of the roles and importance of each stakeholder in pharmacy education, consideration of inclusion criteria and the recruitment of the stakeholders.

The exclusion criteria for all stakeholder groups were those under the age of 18, those who could not verbally communicate and those who were not able to give informed consent. However, the researcher was unsuccessful in gaining permission to interview some key informants and a representative of some pharmacy organisations despite repeated requests. Therefore, interviews took place with other participants in the same topic areas and same roles, hopefully providing similar perceptions to those of the non-participants (Boyden, 2006).

6.3.3.1 Internal stakeholders of pharmacy education

6.3.3.1.1 Faculties of Pharmacy

More than one faculty of pharmacy was needed in this study because the findings from Chapter 4 had shown that there was a wide range of faculty characteristics in the research sample. Five faculties from 19 universities were selected. This choice aimed for diverse, maximum variation of possible experiences and perceptions of stakeholders who were going through the transition of pharmacy curriculum in faculties with different characteristics (Hinton et al., 2014).

The selection criteria were based on the various characteristics of faculties as shown in Figure 6.1 and were explained as the following criteria.

1) Type of ownership (e.g., public or private university): There were 19 faculties of pharmacy which can be divided in to two groups: those run by the Ministry of Higher Education and those operating as private universities.

2) Regional location: Central and not central region

3) Type of pharmacy degree offered before year 2010 (the year that the all- PharmD programmes in Thailand were started); degrees offered: Bachelor of Pharmacy (BPharm), Doctor of Pharmacy (PharmD) in pharmaceutical care

4) Type of new PharmD programme (2008-announced PharmD programme) offered after year 2009 (e.g., PharmD in pharmaceutical care programme (PC-PD), PharmD in industrial pharmacy (IP-PD)

5) Year 5 or Year 6 PharmD student: Faculties had year 5/year 6 PharmD students who are studying in the 2008-announced PharmD programme

6) Dean's permission: Dean allowed academic staff and students to participate in the study.

To conclude, the details of the five faculties are as follows:

- U1 (public, central region) used to offer BPharm and then changed to PC-PD & IP-PD
- U2 (private, central region) used to offer BPharm and then changed to PC-PD & IP-PD
- U3 (public, not central region) offering PC-PD
- U4 (public, not central region) used to offer BPharm and then changed to PC-PD
- U5 (public, not central region) used to offer BPharm and PC-PD and then changed to PC-PD & IP-PD

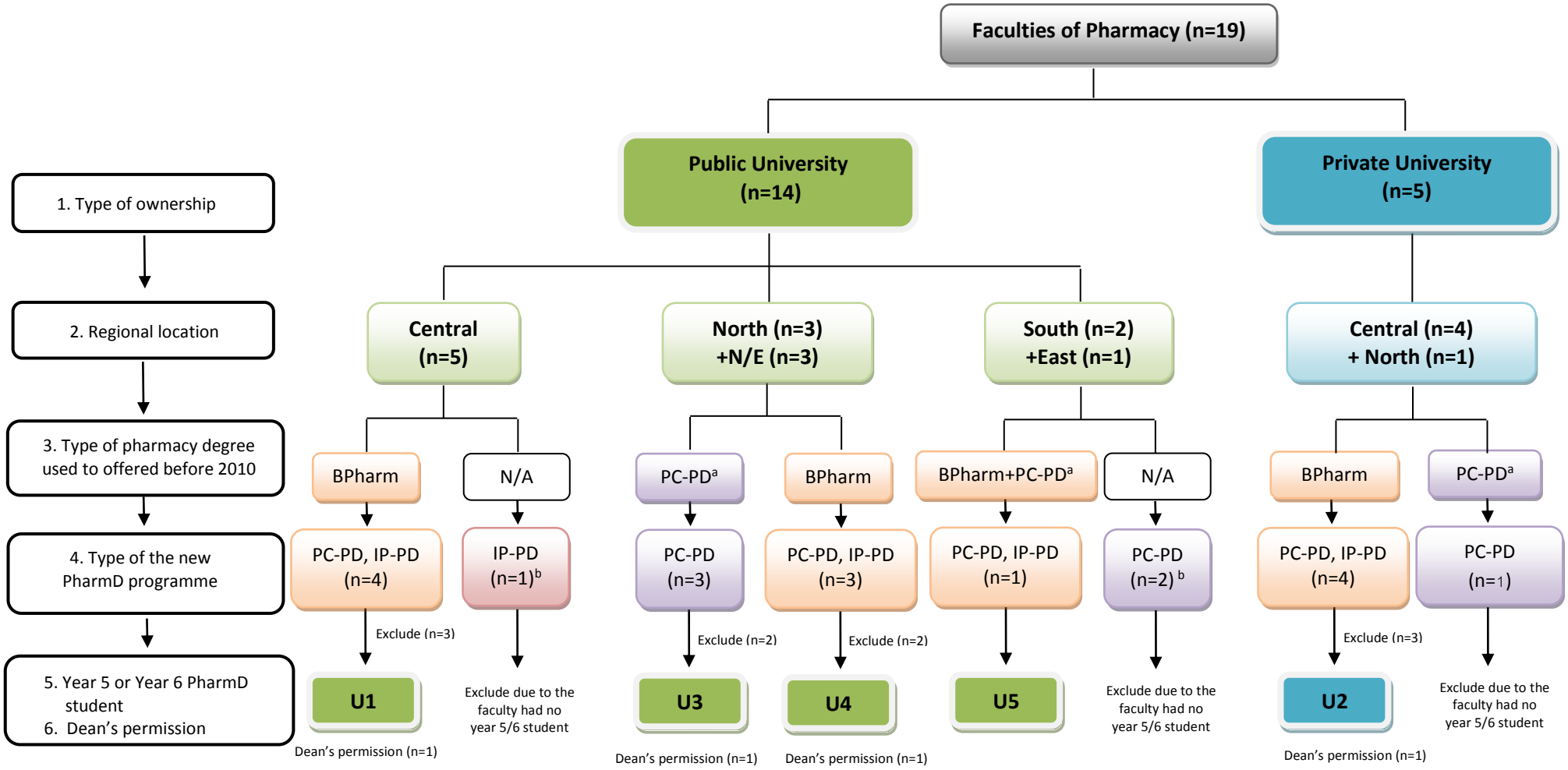


Figure 6.1 Selection criteria for the faculties of pharmacy in this study,

[a] 1995-announced PC-PD, [b] In 2013, these faculties did not had year 5/year 6 PharmD students.

6.3.3.1.2 Academic staff

- Roles and importance in pharmacy education

Faculties of pharmacy and academic members have responsibilities to ensure the quality of pharmacy education and value of investment in higher education for students and families. Faculty should ensure that educational programmes will be able to produce competent pharmacy graduates who can meet the needs of patients and society (Rouse and Meštrovic, 2014).

Faculty members should be committed to lifelong learning in their specialty and continuous improvement of their teaching skills (e.g., encourage classroom interaction; be a facilitator for student learning) (Hughes et al., 2010). Ideally they will devote sufficient time to teaching along with research, administrative or academic services (e.g., clinical roles) and also have a duty to develop learning opportunities and encourage pharmacy students to participate (Cain et al., 2014c). Faculty staff have influence on promoting learning environments, demonstrate professional responsibility, encouraging and assisting their students to assume responsibility for their learning and express concern regarding student development (Cain et al., 2014c) which are the vital parts the quality assurance process (Rouse and Meštrovic, 2014).

- Inclusion criteria and recruitment

Five universities were selected and invited to take part and a letter requesting permission to conduct research with each faculty was sent to the dean. Once the dean of each pharmacy faculty granted permission to conduct this research, the deans, deputy deans and academic staff were invited to take part in the study.

Both past and present academic staff who were relevant to the process of curriculum change were contacted and invited to take part in the study. All academic members who were invited to participate were willing to do so.

6.3.3.1.3 Students

- *Roles and importance in pharmacy education*

Students and their families invest funds and time to obtain a pharmacy degree and students aim to learn within a pharmacy curriculum designed to prepare them for the profession (Cain et al., 2014c). They have the right to expect that the PharmD programme has been sufficiently evaluated and meets the standards outlined by the PCT which should able to prepare them for a professional career as a pharmacist. Students should expect that the pharmacy curriculum is timely, practical and provide essential knowledge and skills for successful professional practice (Cain et al., 2014c). Students' feedback can, at least in theory, influence quality of teaching and learning methods, as well as curriculum assessments, which are the essential components of the quality assurance process (Rouse and Meštrovic, 2014).

- *Inclusion criteria and recruitment*

Inclusion criteria covered students who were currently studying in the final year of a 6-year PharmD programme, because they had experience with the new 6-year PharmD programme, or the students who were studying in the 5th year if their faculties did not have 6th year students during this study period (Aug-Oct 2013). Participation was voluntary. Students were invited to participate by a researcher at the cafeteria or library of their faculty at least one day prior to an interview date. All students who were invited to participate were willing to do so.

6.3.3.2 External stakeholders of pharmacy education

6.3.3.2.1 Policy makers

Policy makers who had roles in curriculum change were members of the Pharmacy Council of Thailand (PCT) and the Pharmacy Education Consortium of Thailand (PECT).

- *Roles and importance in pharmacy education*

1) The Pharmacy Council of Thailand (PCT) is the regulatory body for pharmacists in Thailand. The PCT has a role to protect and maintain the wellbeing of the public by maintaining standards and public trust in pharmacy (e.g., setting standards for conduct, ethics, and competency, accrediting pharmacy degree programmes and pharmacy educational institutions, processing licensure examination and registration). They must ensure that pharmacists receive appropriate education and training and thus are competent to deliver services (Hall, 2013; Maitreemit et al., 2008; Rouse and Meštrovic, 2014).

2) The Pharmacy Education Consortium of Thailand (PECT) has seventeen pharmacy educational institution members across Thailand. The PECT aims to promote the advancement of pharmacy education, support pharmacy professional practice, protect common interests among members, facilitate pharmacy student activities, and promote collaborative work with other professional organisations, such as the PCT and Thai pharmacy associations (The Pharmacy Education Consortium of Thailand, 2014).

PECT prepared a government scholarship to support faculty development and by 1993 PECT signed the first bilateral collaboration between US and Thai pharmacy schools, known as the US-Thai Consortium for the Development of Pharmacy Education in Thailand. This consortium opened opportunities for Thai academic members and students to be trained and study in the US.

- *Inclusion criteria and recruitment*

Policy makers, who had or still have roles in curriculum change since the issue of an all-PharmD was raised in 1993, were invited by email or letter and telephone at least one month prior to the interview schedule, to become involved in the research. Eleven policy makers were invited to participate; one policy maker from the Pharmacy Council did not respond within the timeframe of the study.

6.3.3.2.2 Pharmacy experts

- Roles and importance in pharmacy education

Pharmacy experts had a vital role to share their responsibilities for pharmacy education by being involved in the design, implementation and evaluation of pharmacy programmes, creating co-operative working relationships with faculties of pharmacy and promoting the appointment of practitioners as teachers in faculties of pharmacy. Their opinions are very important for the education of future pharmacy practitioners in their specific areas (Rouse and Meštrovic, 2014). There are representatives of professional associations in five pharmacy practice areas in Thailand as follows;

1) The Association of Hospital Pharmacy (Thailand)
2) The Community Pharmacy Association (Thailand)
3) The Thai Industrial Pharmacist Association
4) The Marketing Pharmacy Association (Thailand)
5) The Thai Food and Drug Administration (FDA) as well as law and consumer protection area

- Inclusion criteria and recruitment

Pharmacy experts were identified primarily through the public websites of their organisations; they were then selected by the researcher, and invited by email and telephone, at least one month prior to the interview date, to participate in the study.

Experts or representatives from pharmacy associations who were current practitioners, were well known and were accepted by pharmacists in their professional practice areas, were invited. Sixteen experts or representatives of pharmacy organisations were invited to participate in this study; three experts (one from a hospital, one from industry and one from marketing) did not respond within the timeframe of the study.

6.3.3.2.3 Health care professionals and patients at hospital settings

This study involved three hospitals in rural and urban areas in Thailand. These three hospitals were selected by the researcher because they had good reputations regarding the pharmaceutical care activities provided by the traditional PharmD graduates. These PharmD graduates provided pharmaceutical care services and worked as part of a multidisciplinary health care team.

Each hospital had the different characteristics (see Table 6.1). Two hospitals (H1, H2) were the medical education centre hospitals in an urban (municipality) area, which were providing tertiary care services and had a range of specialist doctors available. The third hospital (H3) was a large community hospital, which provided secondary and primary care services in urban area in Thailand (Sirirak, 2010).

Table 6.1 Hospitals characteristics and number of participant from hospital settings

Characteristics	**H1**	**H2**	**H3**
Type of hospital	Regional Hospital	Regional Hospital	Community hospital
Level of care settings	Tertiary care	Tertiary care	Secondary and primary care
Bed	900	1000	120
OPD patient per day	750	1,500	750
IPD patient per day	1,000	1,100	100
Thai hospital accreditation	Yes	Yes	Yes
Pharmacy department			
Accredited pharmacy residency programmes	Yes	No	No
Provide preceptor clerkships for pharmacy students on clinical rotations	Yes	Yes	Yes
Number of pharmacists	42	40	16
Highest degree of pharmacists			
-BPharm	7	12	6
-PharmD	18	8	2
-MPharm	7	9	8
-MSc	10	11	0
Participants			
Doctors[a] (n=6)	1	2	3
Nurses[b] (n=5)	3	0	2
Hospital pharmacists[c] (n=11)	3	4	4
Pharmacy technicians (n=5)	0	2	3
Patients (n=14)	10	0	4

[a]Three physicians are the administrators, [b]Two nurses are the administrators
[c]Three hospital pharmacists are the administrators.

To gain ethical approval in any hospital in Thailand, a researcher can submit a direct application to the ethical approval committee at the chosen hospital. The approval process and time to process is different between hospitals. The directors of the three hospitals were identified primarily through the public websites of their organisations. The researcher sent invitation letters to the hospital directors and the ethical committees to explain the purpose of this study, to ask for their willingness to take part in the qualitative interviews and to obtain access to the research sites. The invitation letters (Appendix 11) were sent by email approximately three months prior to the interview schedule to ensure there was enough time for the ethical approval process to be carried out.

Two hospitals (H2, H3) accepted the ethical approval from the University of Nottingham and the Ubon Ratchathani University Thailand. Therefore, the study protocol was submitted to one local ethics committee (H1). Local ethical approvals and permission from all hospitals were gained for this study.

A. Health care professionals

- *Roles and importance in pharmacy education*

The pharmacy profession has embraced a patient-focused role and works closely with other health care professionals. Health care providers' opinions are very important for the development of the pharmacy curriculum as multidisciplinary education, especially in terms of advanced practice experience or clinical clerkships, during which pharmacy students are exposed to other health care providers and learn how to become a member of a team after they graduate (Yanchick, 2004). In addition, health care providers' opinions will explain how other health profession view the role of PharmD pharmacists in health care teams.

- *Inclusion criteria and recruitment*

Health care professionals were purposively sampled in order to represent stakeholders who had at least 6 months work experience with PharmD graduates, in their hospital settings. After ethical approvals by the local ethical committees were granted, doctors, nurses, hospital pharmacists and pharmacy technicians were invited directly to participate in an interview at their workplace at least one-three days prior to an interview date because it was a practical way to arrange appointments with the health care providers in those hospital settings.

B. Patients

- Roles and importance in pharmacy education

Patients are the final users of pharmacy practitioners' services. The duty of pharmacists is to ensure that their patients receive the best outcomes from medications. Patients' opinions are important to improve the quality of pharmacy services and enhance communication and expectations between patients and pharmacists (Al-Arifi, 2012). Their opinions can also increase the quality of pharmacy education and improve the accountability of health care delivered to patients (O'Keefe and Jones, 2007; Shiyanbola and Mort, 2015).

- Inclusion criteria and recruitment

1) In-patients who had received pharmaceutical services on the medical wards from PharmD pharmacists, within the last two weeks prior to interview, were selected and invited. The nurses were requested to identify and invite patients who were willing to participate. Interviews took place bed-side on patients' wards with respect for the privacy of patients' interviews.

2) Out-patients at chronic disease clinics (e.g., DM clinic, oncology clinic and warfarin clinic), who had received counselling services from PharmD pharmacists within the last three months, were selected and invited. To minimise the selection bias from pharmacists, the patients had been selected by the researcher via the outpatient department (OPD) card screening on the visit day. If patients had pharmacy counselling in the last three months, then the researcher asked the pharmacist to invite patients to participate during the lag interval, while those patients were waiting to see their doctor or waiting for their prescription. Interviews took place in private counselling rooms.

6.3.3.2.4 Pharmacy practitioners

Pharmacists in Thailand work in various practice areas, such as, hospital pharmacy, community pharmacy, industrial pharmacy, consumer protection, pharmacy marketing and research and development.

- *Roles and importance in pharmacy education*

Pharmacists provide their services in a variety of settings in response to local health care needs. Pharmacists have an important role to co-operate with faculty of pharmacy to identify any gaps of knowledge and skills of pharmacy professionals in real life situations to faculty that will help to improve pharmacy education programmes and to produce sufficiently professionally skilled future pharmacists (Atkinson and Rombaut, 2010). Pharmacy practitioners are also able to support the education of pharmacists, such as serving as preceptors for pharmacy students and providing intern pharmacy practice experiences (Freeman and McVea, 2001).

- *Inclusion criteria and recruitment*

Pharmacy practitioners were purposively sampled in order to represent each group of pharmacists who had at least 6 months' work experience in services with PharmD graduates in their workplace settings. Some pharmacy practitioners were identified primarily through the public websites of their organisations (e.g., private hospital pharmacists), selected by the researcher, and invited by email and telephone at least one month prior to the interview date to participate in the study. Some pharmacists were invited directly at their workplaces (e.g., community pharmacists) or via personal contact (e.g., consumer protection pharmacists) or through snowball sampling (e.g., industrial pharmacists) from the previous interviewees at least one day prior to an interview date.

6.3.3.2.5 Parents

- *Roles and importance in pharmacy education*

Parents play an important role in students' university lives. Parents support their children in terms of financial and moral support (Harper et al., 2012). Parents are concerned about the accreditation of institutions for the mature and appropriate development of their children; particularly if preparing their children for the pharmacy profession (Cain et al., 2014c).

- *Selection and recruitment*

Inclusion criterion was a parent of the student who was currently studying in the final year of a 6-year PharmD programme. The researcher asked the students about the possibility of contacting their parents to participate in this study. All parents lived in their hometown, which were in different provinces from the university settings. Therefore, parents were invited and interviewed by the researcher via telephone.

6.3.3.2.6 General publics

- *Roles and importance in pharmacy education*

The roles of pharmacists and pharmacy education have changed and are now involving far more direct patient care and primary care services. The public's opinions will help to determine how the pharmacy profession and education can improve public understanding and perceptions of pharmacists in the future (General Pharmaceutical Council, 2014).

- *Selection and recruitment*

General population at a local supermarket in Bangkok (capital city), Ubon Ratchathani and Songkhla province (outside the capital city) were invited by convenience sampling. All interviews took place at a location of the participant's comfortable choice from the following locations: food court or coffee shop at local supermarkets where there were private area available to participant confidentiality.

6.3.4 Recruitment and access

Consensus between the researcher and her academic supervisors was reached with regards to the selection process and sampling of participants.

6.3.4.1 Fieldwork locations

Interviews were carried out over a period of 11 weeks, between 1 Aug - 20 Oct, 2013, in the Thai language. The timetable for the fieldwork data collection process in Thailand is shown in Appendix 14.

The fieldwork locations covered four regions in Thailand: the North, North-East, Central and South in order to gain access to the stakeholders who were located in different places throughout the country, by linking with their stake in pharmacy education. All types of stakeholders in the different regions were selected in order to maximise sample variation (Creswell, 2013; Hinton et al., 2015). Numbers and types of stakeholders in different regions, and methods used in the interview process with each cohort of stakeholders, are presented in Table 6.2.

Table 6.2 Stakeholder group by region and method of involvement

Stakeholder group	Central	North	North-East	South	Total	Method of involvement
1. Policy makers/regulatory bodies (n=10)						Interview
-The Pharmacy Council of Thailand (PCT)	3	0	1	1	5	
-The Pharmacy Education Consortium of Thailand (PECT)	1	1	3	0	5	
2. Pharmacy experts (n=13)						Interview
-Hospital pharmacy (from both public and private hospitals)	1	0	1	1	3	
-Community pharmacy	2	0	1	0	3	
-Industrial pharmacy	3	0	0	0	3	
-Public health and consumer protection	3	0	0	0	3	
-Marketing pharmacy	1	0	0	0	1	
3. Academic staff (n=25)						-Interview
-Dean	2	1	1	1	5	-Skype[a]
-Deputy dean (academic/ professional development)	1	1	1	1	4	-Telephone interview[a]
Academic staff						
-Pharmaceutical care area	1	2[b]	2	1	6	
-Industrial pharmacy/pharmaceutical sciences area	2	1	1	1	5	
-Social and administrative pharmacy area	1	1	2[c]	1	5	
4. Students (n=9)	3	1	3	2	9	-Interview
5. Parents[d] (n=4)	2	2	0	0	4	-Telephone Interview[a]
6. Pharmacists (n=30)						-Interview
-Tertiary hospital	2	3	4	2	11	
-Community hospital	0	0	4	0	4	
-Community pharmacy	2	0	2	1	5	
-Private hospital (One pharmacists is an administrator)	1	0	1	0	2	
-Industrial	1	0	0	1	2	
-Public health and consumer protection	0	0	2	0	2	
-Marketing	2	0	0	0	2	
-Research and development	0	0	2	0	2	
7. Health care providers (n=18)						
-Physicians	1	1	5	0	7	-Interview
-Nurses	2	2	2	0	1	
-Pharmacy technicians	0	2	3	0	5	
8. Patients (n=14) from two hospitals (tertiary care hospital and community hospital)	0	4	1	0	5	-Interview
-In-Patient Department, IPD (n=5)	0	6	3	0	9	
-Out-Patient Department, OPD (n=9)						
9. General population (n=7)						-Interview
-Taxi driver	0	0	1	0	1	
-Merchant	1	0	2	0	3	
-Government officer	1	0	0	1	2	
- Non-governmental organisation (NGO)	1	0	0	0	1	
Total	40	28	48	14	130	

[a] participants were asked for verbal consent before skype interview or telephone interview
[b] one academic staff was a via Skype interview; [c] one academic staff was a via telephone interview; [d] four parents were a via telephone interviews.

6.3.4.2 Recruitment

Most participants were invited by email, letter or telephone to participate in the research, at least one month prior to the interview date. Health care providers (doctors, nurses, pharmacists and pharmacy technicians), as well as students and their parents, were contacted directly at their workplace at least one day prior to an interview date. However, the patients (at two hospitals) and general population (at local supermarkets in urban and rural areas) were asked for their participation on the actual interview date, due to employing convenience sampling.

Stakeholders who met the inclusion criteria and provided their consent for their interview data being included in a PhD thesis and publications (Hinton et al., 2014) were recruited and interviewed using an interview guide (see Appendix 10). All participants were sent the recruitment materials included with an invitation letter (Appendix 11), a participant information sheet explaining the study to them, and consent forms (Appendix 12).

Recruitment was conducted mostly by purposive sampling. However, snowball sampling was used to engage with people who were hard to access, such as health care team members and parents. For example hospital pharmacists were asked about other health care providers who had experience of working with PharmD graduates. Then, the researcher chose the next respondents on the basis of previous respondents' recommendations or relationship networks. In addition, convenience sampling was used for PharmD students and members of the general public, whoever was willing and available to participate.

6.3.4.3 Sampling

Sampling and data collection was guided by emerging themes and continued until the point of data saturation that was established when the interviews did not yield any new data or emerging themes (Glaser and Strauss, 1967) and the depth and extent of the data collected, together with the data analysis seemed sufficient to allow the researcher to tell a reasonable story (Charmaz, 2006; Flick, 2009).

Data saturation was reached with varying numbers of participant from each sub-group of stakeholders. The depth and extent of data collection depended on participants' roles and involvement in pharmacy education. For example, saturation was reached with 20 academic members from the three specialised pharmacy areas of pharmaceutical care, pharmaceutical sciences and social and administration pharmacy. Saturation was also reached with the 5 doctors and 5 nurses; with 10 policy makers and with 7 students. However, additional participants from each subgroup of stakeholder were interviewed to confirm the saturation of themes.

6.3.4.4 The role of the researcher

I gave careful consideration to constructing role into the fieldwork settings. I introduced myself to the key informants as "I am a student from the University" because it would be easier to describe, discover information and likely to build rapport with the key informants.

A. Interview with policy makers and academic members

They knew that I was a pharmacist and academic staff member from a faculty of pharmacy. However, I introduced myself as a "PhD student" who did not know about the birth of the curriculum change. They were very kind and patiently explained the sequences of the historical event of the curriculum change and also provided invaluable historical documents and data (e.g., the minutes of meetings, unpublished work, research reports).

B. Interview with pharmacists and other health care providers

My background as a pharmacist helped me to contact the hospital pharmacy departments and gain access to them, in order to ask pharmacists and pharmacy technicians about pharmacy education issues. However, for other health care professionals (e.g., doctors, nurses), I introduced myself as "I am a PhD student" and tried not to identify my pharmacy professional background to them, as they were being asked for their perceptions of the PharmD graduates in their teams. I told them that I was not involved with the pharmacy services in their workplace settings.

C. Interview with patients and general publics

Pharmacists or nurses introduced me to patients as a student as well. I told patients that I was not involved with the hospital services. I confirmed about the issue of confidentiality and that the interview would not have any effect on their treatment. I also tried not to identify myself as a pharmacist, due to the patients being asked about their perceptions to pharmacy services. Therefore, patients had more freedom to express their feeling and experiences.

6.3.4.5 Reflexivity

I am a PhD research student and the main researcher has been a university lecturer in clinical pharmacy at Ubon Ratchathani University, Thailand, for the last ten years and has observed the changes in pharmacy education, but has not been involved in influencing the policy of the all-PharmD programme. I interviewed the participants in the setting of their choice (usually their workplace). BL and CA are my supervisors who had not been involved in the transition of an all-PharmD programme in Thailand. Two Thai advisors, PW and SM, are university associate professors in Thailand; PW had been involved in the transition period as a deputy dean of academic affairs and now is a policy maker of the PCT.

6.3.5 Interview setting and interview process

6.3.5.1 Pilot study

Before the main study commenced, a pilot study was undertaken to test the interview process and the interview schedule. Pilot interviews with two academic staff members, two pharmacists, one nurse, one doctor, one member of the general population and two students were conducted to refine the interview strategy. Information from the pilot interviews was included in the data analysis.

The purpose of the study and the pilot interview was explained to participants. They were asked if they would be willing to provide feedback on the interview experience at the end of the session. They were also was encouraged to ask questions at any point during the interview session. Permission to record the interviews was requested prior to utilising the audio recorder.

The participants were reminded that at any point of the process they could withdraw consent with no resulting consequences to them, and that they only needed to answer questions they felt comfortable answering. The participants were assured that confidentiality and anonymity would be maintained. This introductory part of the interview process aimed to create a non-threatening environment that would encourage people to 'open up' and to share their opinions. The interview guide was used to direct the interview process. The interview was allowed to progress and emergent issues explored as they arose. Demographic data including age, education, career, area of expertise, year of current work experience, experience working with PharmD graduates, were collected from the participants. At the end of the interview session they provided feedback on the pilot interview experience.

6.3.5.1.1 Pilot study: Results

The pilot interviews lasted for between 45-60 minutes. One academic staff interviewee asked for clarification on one question regarding the timeframe of curriculum development because his faculty of pharmacy had two major revisions of curriculum development after an all-PharmD programme was adopted. During a nurse pilot interview, the nurse raised awareness of some sensitive issues, such as the salary comparisons between health care providers and inter-profession relationships. At the end of interviews, all of the pilot participants were asked whether they wanted to share any additional information. They indicated that they did not have anything further to add but some of them would like to know the findings as well. The interview recordings were transcribed verbatim and the data were included into the main study results.

6.3.5.1.2 Pilot study: Discussion

No major problems were identified with the pilot interview as a whole. Minor alterations to the interview schedule were made. The revised interview guide used for the main research interviews is included in Appendix 10.

6.3.5.2 Arrangement of interviews

The interview guide was developed based on both the purpose of this study and a literature review. The interviews lasted between 45-60 minutes. All interviews were audio recorded with informed consent. The interviews had two sections, an introduction and personal background section to access details of age, education, career, area of expertise, and years of current work experience, as well as a section with questions about their past and current experiences regarding the transition to an all-PharmD programme.

6.3.6 Data management

6.3.6.1 Transcription

Transcription refers to the process of reproducing spoken words, as from an audio-recorded interview, into written text. Transcription needs listening, understanding, typing and sometimes checking. The transcription style used in this study is verbatim transcription, where the written words are an exact replication of the audio-recorded words (word-for-word transcription of verbal data), in order to enhance accuracy of transcription. However, basic editing to remove the "ums and ahs" and repetition was conducted (Bailey, 2008).

One hour of interview recording took approximately 6-7 hours of transcription. For the first few recordings (e.g., pharmacists, doctors) the researcher used a transcription service but there were challenges about lots of technical terminology (e.g., counselling, oncology, PharmD), many names of places, organisation (e.g., PECT, PCT) and key persons, which were difficult for the transcribers to cope with; thereby costing the researcher more time to edit the transcripts.

Another important thing is the confidentiality of subject mentioned in the interview. The researcher and transcribers had an agreement that they will secure storage of recordings and transcripts and erase the recordings when the transcribing is finished. However, the researcher decided to do the transcriptions herself; a move designed to protect the confidentiality of the persons and institutions mentioned in the interviews and to gain an understanding of meanings from interviews. The researcher has typing skills with typing speed around 60-70 words per minute in the Thai language and 40-50 words per minutes in the English language.

All interviews were conducted in the Thai language and the interviewer-researcher was familiar with the communication style and words that the interviewees commonly used. Those factors might help to improve transcription time and accuracy.

In addition, transcription turnaround time (3 days/transcription) and high transcription service charges by the number of transcript page (300 baht or £6 per page) were a challenge. As stated above the most of the interviews in this study lasted between 45-60 minutes; however, exceptions were interviews with the general population and parents; the average duration being quite short at 10 - 15 minutes. Finally, there were approximately 700 pages of transcripts in this study.

Audio recordings were transcribed verbatim in Thai. To enhance reliability of transcription, ten Thai transcripts were randomly checked twice for accuracy with the audio recordings by TC and one Thai pharmacist (Lee et al., 2013). To enhance validity of transcription, transcripts were sent back to the interviewees for them to read or modify the transcript if necessary (Corden and Sainsbury, 2006; Hinton et al., 2012). However, the majority of participants chose not to check the transcripts. The transcripts were checked and confirmed for correctness by ten requested interviewees (Creswell, 2013).

6.3.6.2 Translation

The interviews in this research were conducted in the Thai language. For the data analysis, it was necessary to translate the interviews from the Thai language into English as this PhD thesis is in English and it was essential that the transcripts be translated as CA, a non-Thai researcher and a senior qualitative researcher was directly involved in the analysis and coding process.

The Thai transcripts were translated into English to comply with the required audit trail (Lincoln and Guba, 1985) by a Thai researcher (TC), who is a PhD student in the UK, and a non-Thai researcher (CA), a senior qualitative researcher. The audit trail is an essential part of rigorous qualitative study that will enable another researcher, or anyone interested, to track how the data were analysed and how themes were generated through interviews and interpreted, in order to assess the trustworthiness of the research (Guba, 1981).

Translation is the process of changing something that is written or spoken into another language. This study used meaning-based translation that is commonly used when translating across language (Larson, 1998). The aim of meaning-based translation is to transfer from source language (in this study: the Thai language) to a target language (in this study: the English language) by communicating the same message of the source language but using the vocabulary and grammatical choice of the target language (Larson, 1998; Squires, 2009).

To maintain the accuracy of people's sense and perspective is important but challenging, especially when the research is conducted in one language and then analysed in another language. Sometimes ideas and feeling might not always translate exactly from one language to another or even may not reflect what the participant actually said. It is important that a researcher should be aware of, and understand, the linguistic or social context. Therefore, to ensure accuracy in translation, the study should use different competent bilingual translators who familiar with the research area to check audio-records and transcripts (Chen and Boore, 2010; Larson, 1998; Squires, 2009).

Meaning-based translation from Thai to English was performed by TC and followed a forward-blind backward translations process (Larson, 1998) to check the correctness of the translation. Twenty English transcripts were checked against the Thai transcripts, with reference to the original audio-recorded interviews in Thai, by TC and SB[13]; the latter a bilingual Thai-English pharmacy academic researcher. The two translators reached consensus regarding the English translation. Then, convenience blind backward translations (Chen and Boore, 2010; Larson, 1998) of English transcripts into Thai were undertaken for 13 of the 130 transcripts (10%) by CP[14], a fluent Thai-English bilingual speaker. This process was performed to validate the translations and ensure no loss of conceptual equivalence had taken place (Squires, 2009).

[13] SB: Dr.Sathon Boonyaprapa; SB obtained her PhD degree in pharmacy from the University of Nottingham, United Kingdom and has lived in the UK for approximately 10 years.

[14] CP: Dr.Chonladda Pitchayajittipong; CP obtained her PhD degree in pharmacy from the University of Bath, United Kingdom. She is a fluent Thai-English bilingual speaker.

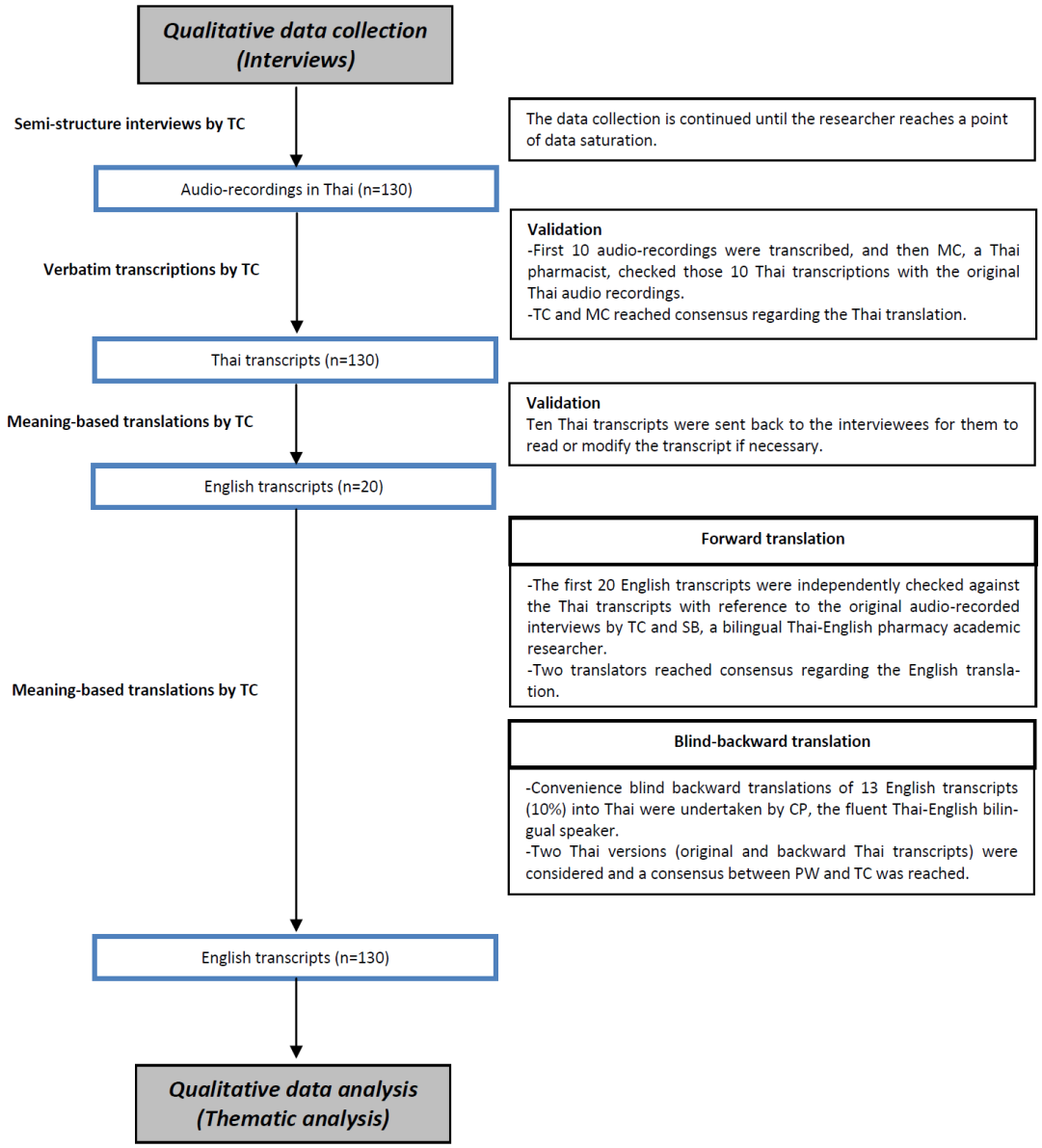


Figure 6.2 Diagram of the transcription, translations, and forward-blind backward translations process

note:
i) “Consensus” means a general agreement between researchers; ii) The Thai transcripts were translated into English to comply with the required audit trail (Lincoln and Guba, 1985) by a Thai researcher (TC), who is a PhD student in the UK, and a non-Thai researcher (CA), a senior qualitative researcher. The audit trail is an essential part of rigorous qualitative study that will enable another researcher, or anyone interested, to track how the data were analysed and how themes were generated through interviews and interpreted, in order to assess the trustworthiness of the research (Guba, 1981).

6.3.6.3 Data storage

Anonymity and confidentiality are important issues related to the Data Protection Act, 1998. All personal information including names, telephone numbers, email or any other identifying information was kept strictly confidential. Lists of participants were allocated an identification number. All computer files that contain personal or identifiable data were protected by full passwords and only accessed by authorised researchers. All hard copy data such as interview notes and consent forms were stored securely in a locked filing cabinet in TC's office at School of Pharmacy, the University of Nottingham.

6.3.7 Data analysis

English transcripts were analysed thematically using NVivo qualitative data analysis software (QSR International Pty Ltd., Version 10, 2012). This study used an inductive thematic analysis approach (Fereday and Muir-Cochrane, 2006), which was influenced by the principle of grounded theory[15] (Creswell, 2013; Glaser and Strauss, 1967; Hinton et al., 2012; Hinton et al., 2015; Whiteley, 2004). However, this study aimed to understand and develop an explanation regarding this transition, which differs from pure grounded theory as grounded theory aims to build the theory (Whiteley, 2004).

Thematic analysis is one of the most common approaches in qualitative data analysis. It is a process that this researcher used to search for themes. A theme is a category identified by the researcher through the data, which related to the research questions (Guest et al., 2012).

To identify themes, Ryan and Bernard (2003) suggested some tips as follows:

- look for word repetitions (e.g., US-Thai consortium, the PCT, the PECT)
- local terms (chicken or eggs which come first, ducks)
- key words (competency, mismatch)
- constant comparison methods (how is this text different for the previous text? What kinds of things are mentioned by both internal stakeholders and external stakeholders?) (Ryan and Bernard, 2003) .

[15] Grounded theory is the general explanation or theory development generated or "grounded" in data from the views of participants who have experience with the process; while the researcher collects data, they begin analysis and go back to the field to collect more information until data saturation is achieved, used constant comparison analysis and theoretical sampling to maximise the variation of participants (Creswell, 2013; Hinton et al., 2015)

6.3.7.1 Steps of data analysis

The data analysis was undertaken with the following steps (Saleh et al., 2015):
1) The analysis began after the first two interviews for each stakeholder group were transcribed and continue processing during and after data collection.

2) The first two English transcripts from each stakeholder group were read and re-read to gain an understanding of the interviewees' perceptions and experiences (Fereday and Muir-Cochrane, 2006; Hinton et al., 2012) by the researcher (TC) and academic supervisor (CA). They independently read transcripts carefully line-by-line, noted possible codes within the transcript hard copy, and then started to code and produce a coding structure.

3) The coding structure was revised and further developed (Hinton et al., 2012).

4) The codes were compared and discussed by the researcher (TC) and academic supervisor (CA)

5) The coding process was started again for all transcripts using the NVivo 10.0 software. A constant comparative analysis approach (moving back and forth between the identification of similarities and differences among emerging categories) was taken; for example, new information that might add to the code was constantly compared with previous codes, categories or themes that it might fit, or it was determined whether a new code or category should be created. The emerging themes were coded and constantly compared and contrasted with other interviewees' transcripts (Braun and Clarke, 2008).

6) To establish the reliability or the stability of responses to multiple coders of the dataset, this study used the inter-coder agreement process (see Figure 6.3). A draft codebook was developed with approximately 50 text segments as codes, which were aimed at determining the agreement of the coding in terms of code names and coded passages. TC and CA independently coded another two transcripts using a codebook and comparing codes. They considered the agreement of coding for these passages to be more than 80% (Creswell, 2013).

7) TC read through all transcripts repeatedly and coded them for analysis (all final codes were approximately 380 text segments) while CA checked and revised the coded text (Gill et al., 2012).

8) Thematic analysis was carried out using the "One Sheet of Paper, OSOP" mind map method to ensure that all the codes extracted within each theme were included and compared in the analysis (Hinton et al., 2012). The researcher wrote the coding interview data and the ID of participants on "one sheet of paper" and used these data to construct the broader categories or conceptualise the data. This process aimed to find a story in the data, which involved reading through each section of the data and making notes on a single sheet of paper. Such an approach was used to ensure that all different issues were raised by the coded extracts, along with the relevant participant IDs (Hinton et al., 2012; Ziebland and McPherson, 2006) (see Figure 6.4). TA, CA, and BY considered the development of broader themes from the codes.

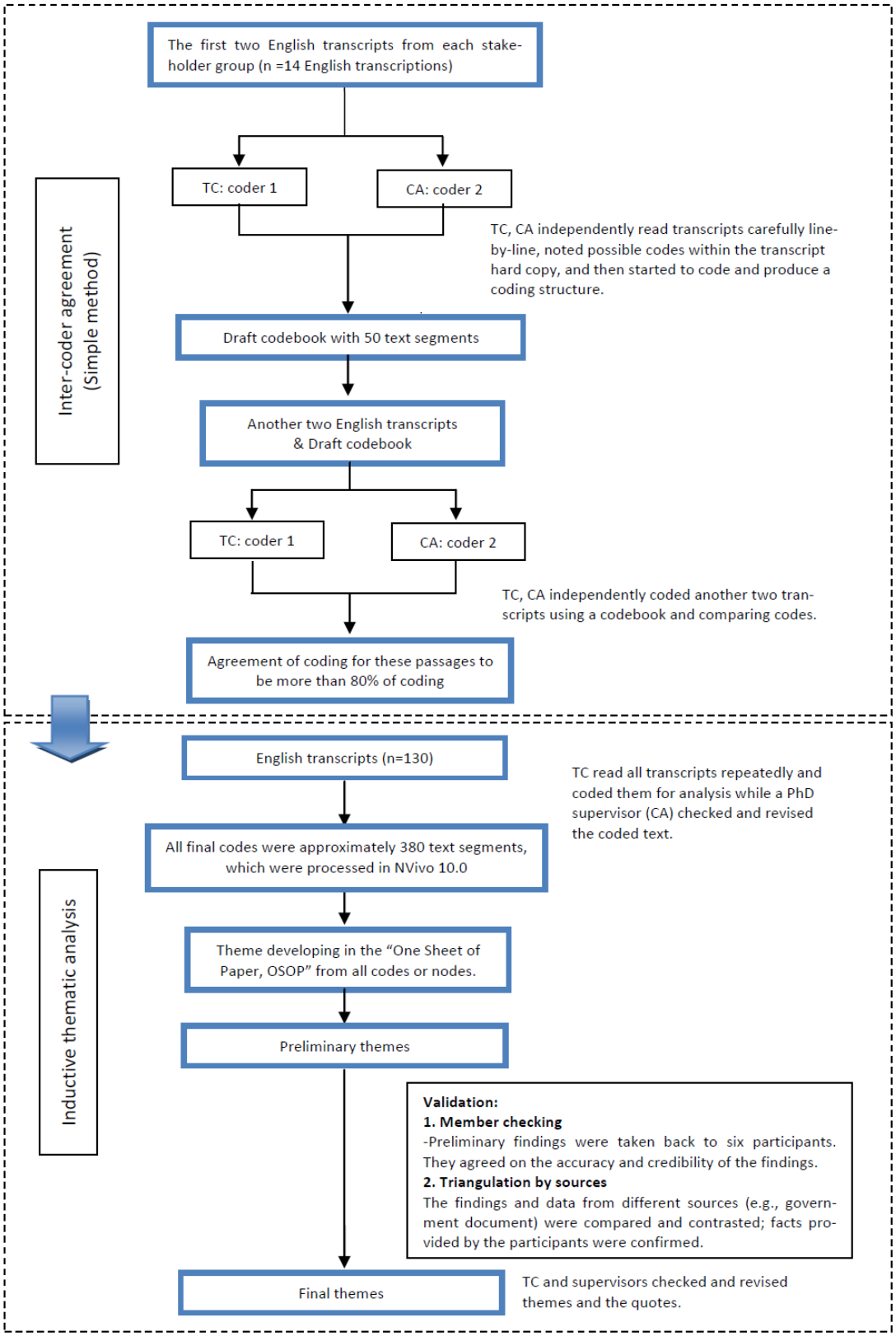
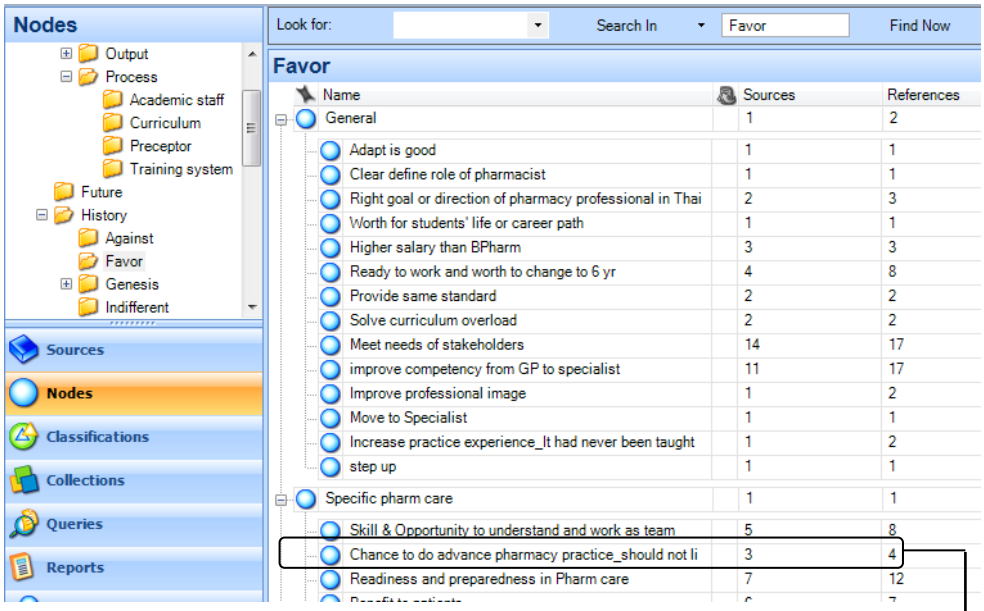


Figure 6.3 Process of the inter-coder agreement and the inductive thematic analysis

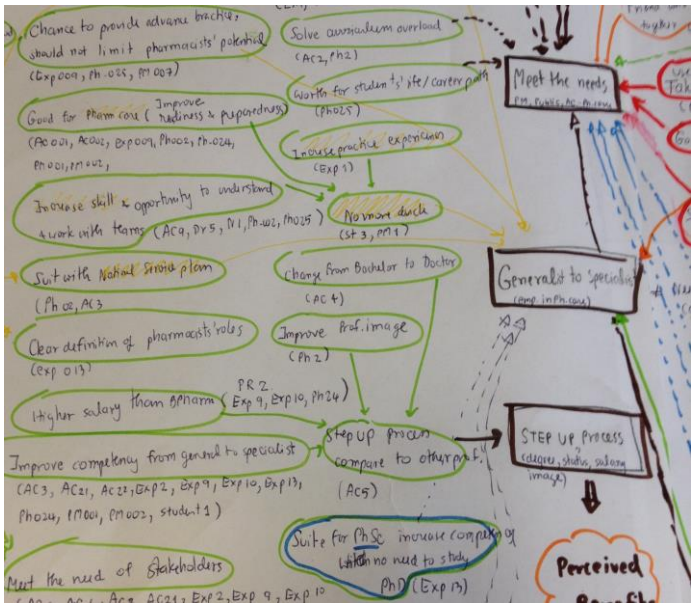


Example of codes processed in NVivo 10.0

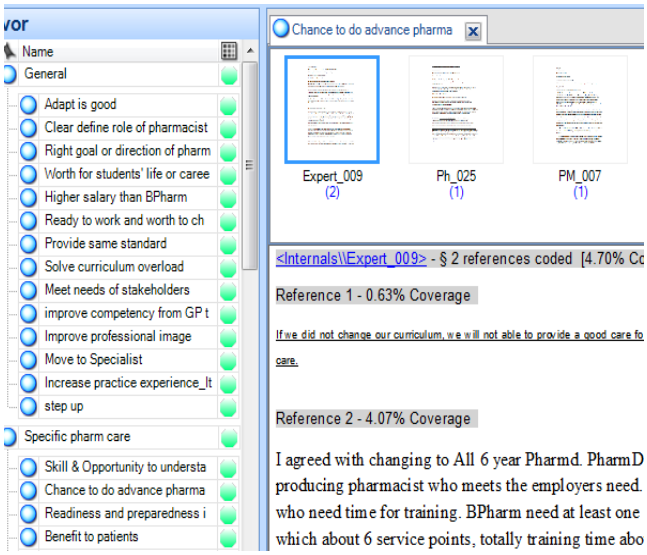
Stakeholder Codebook Jan15

Name	Number Of Coding References	Hierarchical Name
Capacity of production depend on supply side not market need	3	Nodes\\Current status\\Input\\Capacity of production depend on supply side not market need
Imbalance between number of student in pharm sc and job available	7	Nodes\\Current status\\Input\\Imbalance between number of student in pharm sc and job available

Codebook



An example of an "OSOP" mind map



Example of node "Chance to provide advance practices" and reference coded from participants

Figure 6.4 The process of theme developing in the "One Sheet of Paper, OSOP"

6.3.7.2 Transcript coding

Transcript coding (the process by which a qualitative analyst links specific codes to specific data segments or the process of organising data) involved four steps as follows:

Table 6.3 Steps of transcript coding and examples

Steps of transcript coding	Example
1. In vivo coding or initial coding in-text indicates the coding of special terms of participants. In vivo codes help us to preserve interviewees' meaning regarding their perspectives or experiences in the coding itself (Charmaz, 2006)	"We are too broad, like a duck. We should good at something better than know everything, but we are not good in anything." (ST3)
2. Open coding (concepts/categories or free codes/free nodes in NVivo 10.0 software)	Concepts- No more duck
3. Axial coding (relationship between categories or tree code or tree nodes in NVivo 10.0 software)	Subtheme- Move from generalist to specialist
4. Selective coding (core categories or higher level of concepts/themes) (Guest et al., 2012; Strauss and Corbin, 1990)	Themes- Perceived benefits

6.3.7.3 Triangulation of data analysis

1. In order to validate the information from interviews, the interviews have been triangulated with the analysis of peer-reviewed publications, meeting minutes, unpublished reports, and pharmacy professional association reports.

2. In order to validate the interpretation of researchers, this study took the preliminary analyses consisting of themes back to six participants (i.e., two policy makers, two academic staff members, one expert from the consumer protection area and one expert from industrial pharmacy), who shared their views of the analyses (Creswell, 2013) to triangulate the data (member checking) (see Appendix 13: An invitation letter to invite as a member checking).

They agreed on the accuracy and credibility of the findings. The findings and data from different sources (e.g., government document, conference proceedings, unpublished reports, unpublished meetings' minutes) were compared and contrasted; facts provided by the participants were confirmed (Creswell, 2013; Guion, 2002).

6.4 Results

124 interviews were conducted face-to-face, five via telephone (with parents and academic staff), and one was a Skype interview (with academic staff). Types and numbers of stakeholders who participated in this study are shown in Figure 6.5. Descriptive characteristics of the interviewees are given in Table 6.4.

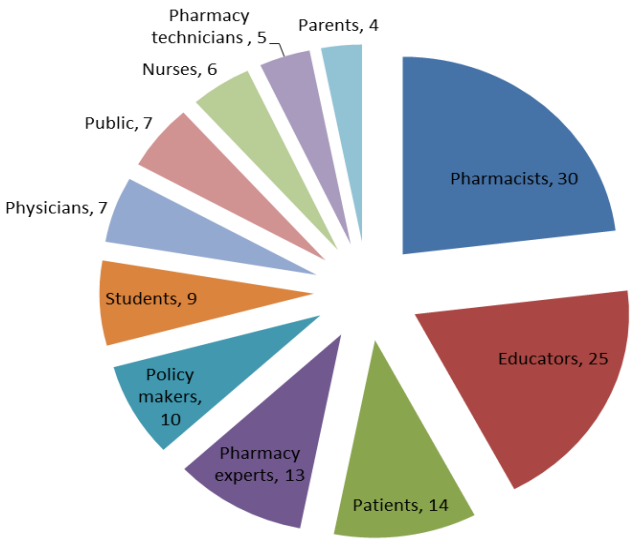


Figure 6.5 Type and number of 130 stakeholders who participated in this study

Table 6.4 Descriptive characteristics of participants (n=130)

Participants	Policy makers	Pharmacy Experts	Educators	Pharmacy students	Parents	Physicians	Nurses	Pharmacists	Pharmacy technicians	Patients	General public
Number of participants	10	13	25	9	4	7	6	30	5	14	7
Gender											
Male	7	7	13	4	1	5	0	7	1	4	4
Female	3	6	12	5	3	2	6	23	4	10	3
Age group (years)											
20-30	0	0	3	9	0	0	2	8	3	2	0
31-40	0	0	2	0	0	3	1	11	1	2	2
41-50	0	6	13	0	2	1	2	6	1	5	4
51-60	5	6	6	0	2	3	1	5	0	2	1
More than 60	5	1	1	0	0	0	0	0	0	3	0
Work experience (years)											
less than 5	0	0	3	0	NA	0	2	1	3	NA	NA
5-10	0	0	0	0	NA	2	0	15	1	NA	NA
11-15	0	0	0	0	NA	1	0	2	0	NA	NA
16-20	0	2	8	0	NA	0	1	4	1	NA	NA
more than 20	10	11	14	0	NA	4	3	8	0	NA	NA
Working area (pharmacy practice)											
-Hospital pharmacy (tertiary care hospital, public)	1	3	0	NA	NA	4	3	12	3	NA	NA
-Hospital pharmacy (community hospital, public)	0	1	0	NA	NA	3	3	4	2	NA	NA
-Hospital pharmacy (private)	0	1	0	NA	NA	0	0	2	0	NA	NA
-Community pharmacy	0	3	0	NA	NA	0	0	4	0	NA	NA
-Industrial pharmacy	1	2	0	NA	NA	0	0	2	0	NA	NA
-Public health and consumer protection	1	2	0	NA	NA	0	0	3	0	NA	NA
-Marketing pharmacy	0	1	0	NA	NA	0	0	2	0	NA	NA
-Research and development	0	0	0	NA	NA	0	0	1	0	NA	NA
-Academic (pharmaceutical care)	3	0	10	NA	NA	0	0	0	0	NA	NA
-Academic (Pharmaceutical technology	4	0	10	NA	NA	0	0	0	0	NA	NA
-Academic (Social and administrative pharmacy)	0	0	5	NA	NA	0	0	0	0	NA	NA

Table 6.4 (Continued)

Participants	Policy makers	Pharmacy Experts	Educators	Pharmacy students	Parents	Physicians	Nurses	Pharmacists	Pharmacy technicians	Patients	General public
Highest education											
1. Physician											
-Doctor of Medicine (MD)	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA
-MD, Diploma	NA	NA	NA	NA	NA	2	NA	NA	NA	NA	NA
-MD, Specialist	NA	NA	NA	NA	NA	4	NA	NA	NA	NA	NA
2. Nurse											
-Bachelor of Nursing Science	NA	NA	NA	NA	NA	NA	4	NA	NA	NA	NA
-Master of Nursing Science	NA	NA	NA	NA	NA	NA	2	NA	NA	NA	NA
3. Pharmacist											
-BPharm	0	2	0	NA	NA	NA	NA	11	NA	NA	NA
-MPharm/ MSc	2	7	2	NA	NA	NA	NA	12	NA	NA	NA
-PharmD	0	0	0	NA	NA	NA	NA	7	NA	NA	NA
-PhD	8	3	17	NA	NA	NA	NA	0	NA	NA	NA
-PharmD, Pharmacy residency	0	0	3	NA	NA	NA	NA	0	NA	NA	NA
-PharmD, Board specialties	0	1	3	NA	NA	NA	NA	0	NA	NA	NA
4. Pharmacy technician											
-Diploma of Public Health (Pharmacy Technique)	NA	NA	NA	NA	NA	NA	NA	NA	4	NA	NA
-Bachelor	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA
5. Patient, parent, public											
-Less than secondary education	NA	NA	NA	0	0	NA	NA	NA	NA	5	1
-Secondary education/ vocational education	NA	NA	NA	9	2	NA	NA	NA	NA	5	2
-Bachelor	NA	NA	NA	0	2	NA	NA	NA	NA	4	3
-Higher than bachelor	NA	NA	NA	0	0	NA	NA	NA	NA	0	1

The findings revealed three major themes regarding stakeholders' perceptions towards the transition to the 6-year PharmD programme in Thailand: influences on an all-PharmD programme in Thailand, perceived benefits and perceived concerns regarding the transition to an all-PharmD programme.

6.4.1 Theme 1: Influences on an all PharmD policy

The most frequent influence of an all-PharmD policy noted in the findings was the need for pharmacists to provide a better standard of patient care. This was perceived as necessary due to the competencies of pharmacy graduates from the previous 5-year BPharm programme being too broad and therefore unsuitable for pharmacy practice in the patient care area in Thailand. The detailed themes and subthemes are presented in Figure 6.6. The subthemes and supporting quotes are presented in Table 6.5.

> *"Hospital pharmacists should have the in-depth knowledge to serve patients by doing more than dispensing medication, so a PharmD in pharmaceutical care is the answer." (Policy maker 9)*

Policy makers who were involved in this transition remembered the initiatives of this change as part of a global trend towards providing patient care services.

> *"We considered the direction at an international level and saw that the trend for developed countries was normally to adapt a practice role that emphasised patient care. This might be more suitable due to the PharmD programme giving us higher competencies as pharmacists." (Policy maker 1)*

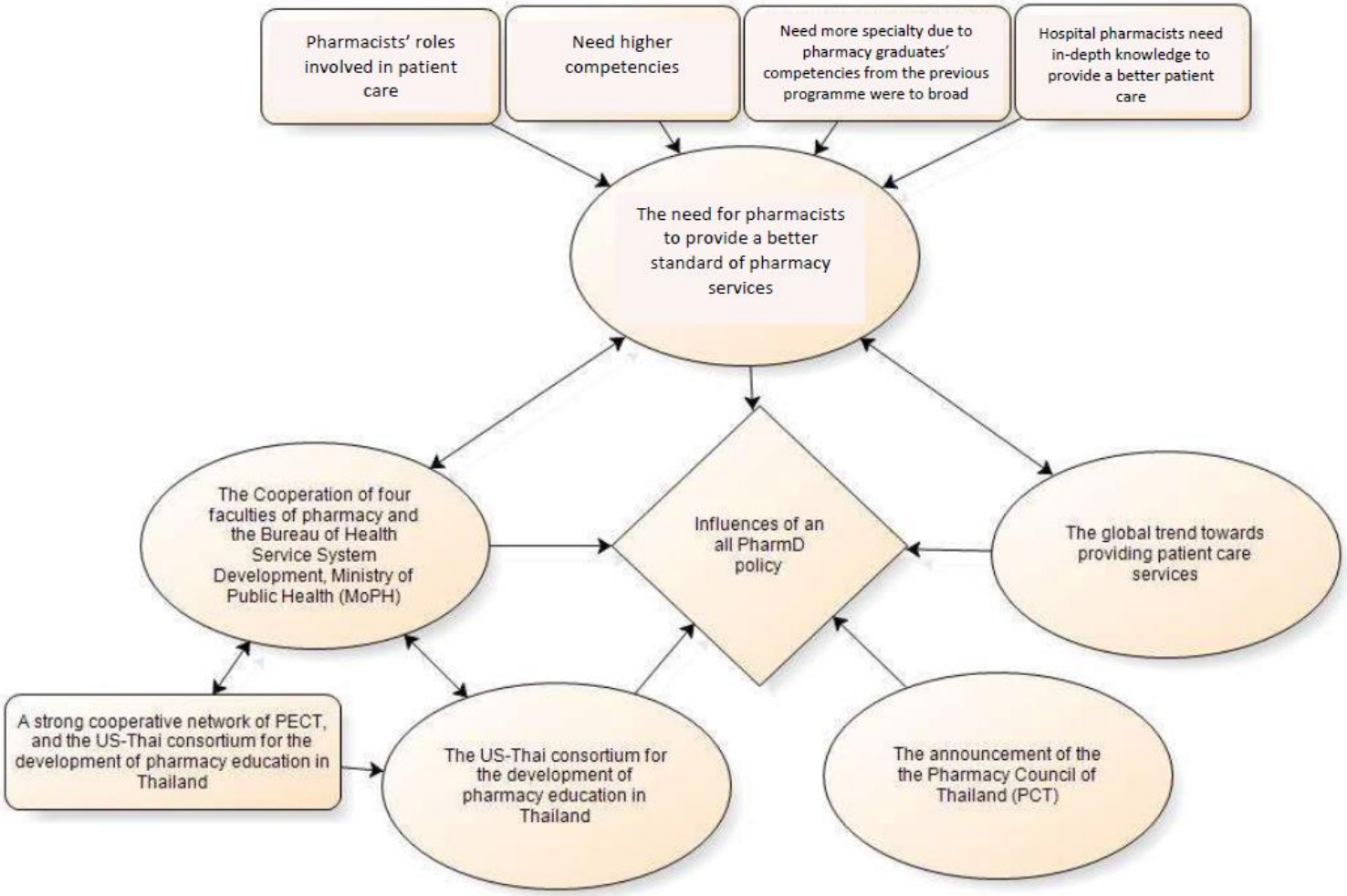


Figure 6.6 Theme: "Influences on an all-PharmD policy"

Table 6.5 Subthemes and supporting quotes within the theme "Influences on an all-PharmD policy"

Subthemes	Concepts	Participants*	Example of supporting quotes
The need for pharmacists to provide a better standard of pharmacy services	Hospital pharmacists need in-depth knowledge to provide a better standard of patient care	PM9	*"Hospital pharmacists should have the in-depth knowledge to serve patients by doing more than dispensing medication, so a PharmD in pharmaceutical care is the answer." (PM 9)*
	Need more specialty due to pharmacy graduates' competencies from the previous pharmacy programme (a 5-year BPharm) were too broadpharmacist	AC1_PSc_U1, AC14_SAP_U5, AC22_D_U5, PM1, PM3, PM5, PM8	*"Policy makers believed that separate pharmacy specialty by have separate curriculum and training will meet the social need rather than general pharmacist." (AC14_SAP_U5)* *"They see the problem that our pharmacist was too generalised. Employers thought graduates did not have in-depth knowledge either in patient care or product focused." (AC22_D_U5)* *"Another reason was regard to the 5-year programme which does not make us experts in medicines and patient care." (PM1)*
	Need higher competencies	AC3_PC_U4, AC14_SAP_U5, PM1, PM8	*"The reason is increasing competency which should have to separate to two special tracts (PC-PD, IP-PD) with more practice training." (AC14_SAP_U5)*
	Pharmacists' roles involve patient care	AC8_PC_U4, PM1	*"Now pharmacist's roles are more involvement in patient care." (AC8_PC_U4)*
The global trend towards providing patient care services	The global trend of patient care services	PM1, PM7, PM8	*"We considered the direction at an international level and saw that the trend for developed countries was normally to adapt a practice role that emphasised patient care. This might be more suitable due to the PharmD programme giving us higher competencies as pharmacists." (PM1)* *"Global trends are likely to come to specifically in pharmaceutical care. This global trend needs a quality pharmacy the other way around, one more heavily weighted towards pharmaceutical care. Pharm care was requiring more profound training for new pharmacists to be ready to work." (PM7)*
The cooperation of four faculties of pharmacy and the Bureau of Health Service System Development, Ministry of Public Health (MoPH)	The cooperation of four faculties of pharmacy and the Bureau of Health Service System Development, Ministry of Public Health (MoPH)	PM1, PM9	*"There were agreed and jointed investment between four faculties of pharmacy and the Bureau of Health Service System Development, Ministry of Public Health (MoPH). It was an atmosphere of new learning." (PM1)*

*Abbreviation
AC_PSc = Academic member in pharmaceutical sciences area, **AC_PC**=Academic member in pharmaceutical care area**,** **AC_SAP** = Academic member in social and administrative pharmacy), **AC_D** = Dean
EXP_HOS = Expert in hospital pharmacy, **EXP_COM** = community pharmacy, **EXP_PSc** = Expert in industrial pharmacy, **EXP_PB** = Expert in public health and consumer protection, **EXP_MP** = Expert in marketing pharmacy
N = Nurse
PH_HOS = Hospital pharmacist, **PH_COM** = community pharmacist, **PH_IP** = Industrial pharmacist, **PH_PB** = Pharmacist in public health and consumer protection, **PH_MP** = Pharmacist in marketing pharmacy, **PH_RD** = Pharmacist in Research and development, **PHY** = Physician, **PM** = Policy maker, **PTECH** = Pharmacy technician
PT = PT_IPD = Patient in In-Patient Department, **PT_OPD** = Patient in Out-Patient Department
PUB = Public/general population, **ST** = Student, **PR** = Parent
U1 = University1, **U2** = University2, **U3** = University3 **U4** = University4 **U5** = University5

Table 6.5 (Continued)

Subthemes	Concepts	Participants	Example of supporting quotes
The US-Thai consortium for the development of pharmacy education in Thailand	A strong cooperative network of PECT, and the US-Thai consortium for the development of pharmacy education in Thailand	AC3_PC_U4, AC4_PC_U3, AC10_PSc_U5, AC21_D_U5, AC22_D_U1, EXP13_HOS, PM1, PM2, PM10	*"The administrator of faculty of pharmacy had been visited the pharmacy school in the US. They thought that they should have a clinical pharmacy focused programme which this future direction of pharmacist." (*AC4_PC_U3*)* *"The PECT and Ministry of Public health were co-ordinators for the US-Thai consortium. We received ideas from the US and learnt from them. Both academic and pharmacists were train from US." (AC10_PSc_U5)* *"A 6-year PharmD programme was implemented by policy of the pharmacy council. Literally, I think it was influenced from US-Thai consortium which they (pharmacy council) had accepted concept from US quite a lot." (AC21_D_U5)* *"It started from PECT since 1996-1997 that we have Thai-US consortium which is a subset of the project of pharmacy workforce development of MoPH. The PECT thought that change to a 6- year programme might be the way to develop the pharmacy profession in Thailand as in a developed country." (PM2)* *"The result of the consortium has had a great impact on Thai pharmacy education and the Thai pharmacy profession" (PM10)*
The announcement of the Pharmacy Council of Thailand (PCT)	The announcement of the Pharmacy Council of Thailand (PCT)	AC21_D_U5, PM2, PM3, EXP12_COM, EXP13_HOS	*"The Pharmacy Council stated that if we did not provide a 6-year PharmD curriculum, our students will not qualify to take the licensure examination. All faculties have to adapt their programmes to 6 years, no matter whether it is pharmaceutical sciences or pharmaceutical care." (AC21_D_U5)* *"This policy was commenced as law by the Pharmacy Council." (PM2)* *"If PCT did not announce as a regulation, this would never be ready, right? It was very confused at that time. We needed someone to make decisions for our future." (PM3)* *"The intention of the PCT was good. They proposed to clarify the position of the pharmacy profession which might useful to our society and our profession." (EXP 13_HOS)*

A factor that has also been mentioned as an influence on the transition to an all-PharmD programme was the cooperation of four faculties of pharmacy and the Bureau of Health Service System Development, Ministry of Public Health (MoPH), in the development and establishment of a master's degree in clinical pharmacy via a modular system programme. This foundation of clinical pharmacy activities in real workplace settings was supported by the US-Thai consortium for the development of pharmacy education in Thailand, which was founded in May 1994 by the Pharmacy Education Consortium of Thailand (PECT).

> *"The result of the consortium has had a great impact on Thai pharmacy education and the Thai pharmacy profession." (Policy maker 10)*

The mission of this consortium was to provide Thai pharmacy academic staff and pharmacists, who were selected by a Royal Thai Government Panel, to access advanced professional (PharmD) or graduate (PhD) studies and training in selected pharmacy schools in the US. Pharmacy educators adopted the US PharmD programme to establish the first Thai PharmD programme (pharmaceutical care) at the Faculty of Pharmaceutical Sciences, Naresuan University, in 1999.

However, the big drive for advancement came from the announcement of the Pharmacy Council of Thailand (PCT) in 2008 that, starting in 2014, all new pharmacy graduates would have to graduate from pharmacy faculties accredited by the Council through the 6-year PharmD curriculum only.

> *"The Pharmacy Council stated that if we did not provide a 6-year PharmD curriculum, our students will not qualify to take the licensure examination. All faculties have to adapt their curriculum for all their programmes to 6 years." (Academic member 21)*

6.4.2 Theme 2: Perceived benefits of the transition of pharmacy education to an all-PharmD programme

Most interviewees from academic institutions and pharmacy practitioners perceived benefits of the transition to an all-PharmD programme. Firstly, it was a step-up process for pharmacy education and the profession because it enhanced a move from generalists to specialists. On the other hand the users of the graduates' services, specifically patients, health care teams and employers, perceived benefits as the PharmD graduates would have a higher competency to meet their needs. The detailed themes and subthemes are presented in Figure 6.7. The subthemes and supporting quotes are presented in Table 6.6.

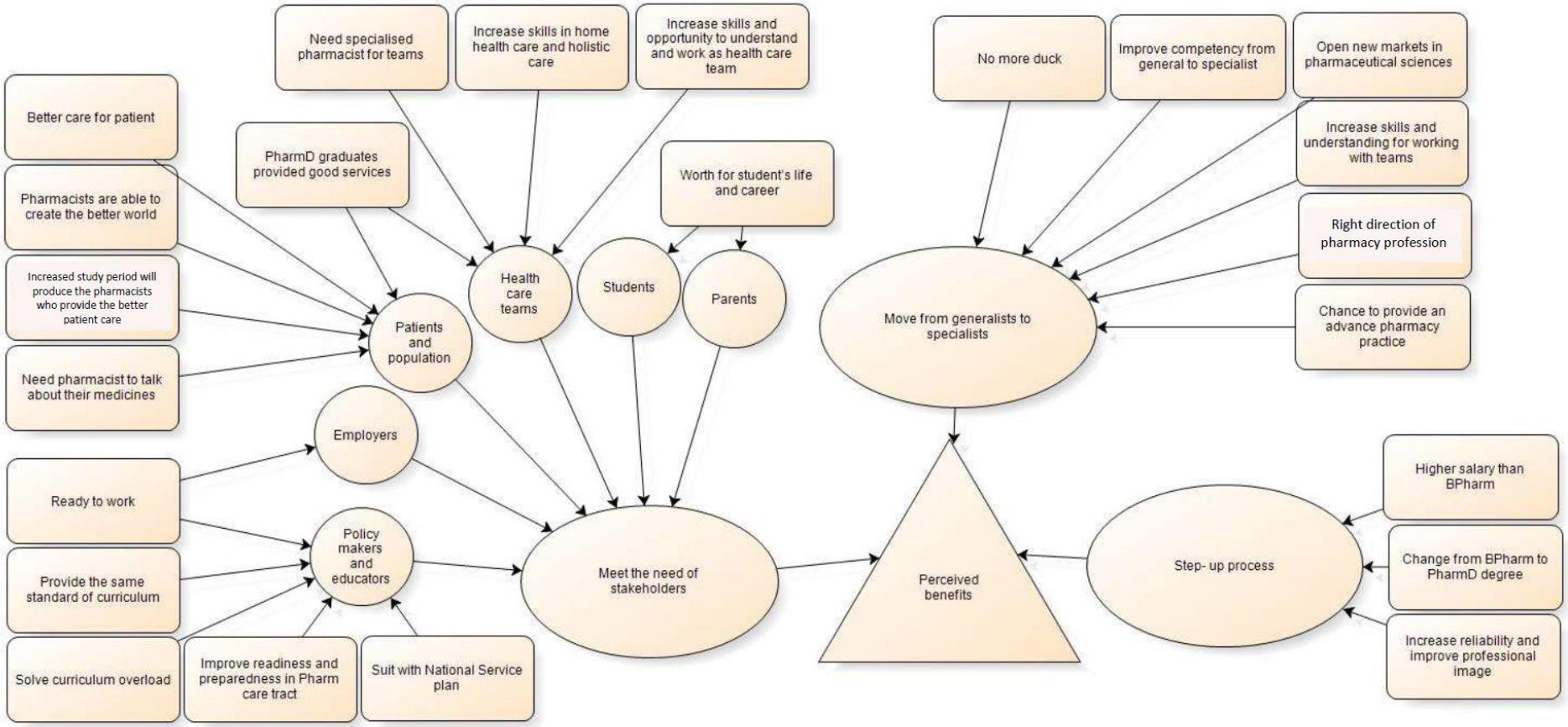


Figure 6.7 Theme "Perceived benefits"

Table 6.6 Subthemes and supporting quotes within the theme "Perceived benefits"

Subthemes	Concepts	Participants*	Example of supporting quotes
Step-up process	Change from BPharm to PharmD degree	AC4_PC_U3	*"It was a step up from the Bachelor degree to the Doctorate degree which is a 6-year professional degree similar to other professions such as physicians and dentistry." (AC 4_PC_U3)*
	Increase reliability and improve professional image	PH2_HOS, PH23_PB, PH_21_IP, PH_13_MP, PH_14_RD, PM1	*"This change might increase reliability to pharmacy professional." (PH2_HOS)* *"We should give the good services first so we will get trust from public." (PM1)*
	Higher salary than BPharm	EXP9_HOS, EXP10_HOS, PH24_HOS, PR2	*"The career progression of PharmD pharmacist is faster than a 5 year programme. The 6-year PharmD graduates have higher salary than a 5 year pharmacist who works for 3-4 year before PharmD graduates." (EXP10_HOS)* *"Career ladder is also good because a 6 year graduates had salary equivalent to* a master's degree*. Duration to higher position is shorter than a 5 year BPharm." (PH24_HOS)*
Move from generalists to specialists	Chance to provide an advanced pharmacy practice	EXP9, PH25_HOS, PM1	*"A 5-year BPharm programme does not make us experts either in medicines or patient care. This 6-year programme would give us higher competencies." (PM 1)*
	Increased skills and understanding for working with teams	AC9_SAP_U1, N1, PH2_HOS, PH25_HOS, PHY5	*"PharmD graduates had better skills in patient care. They had more confident and work well with health care team." (PH2_HOS)*
	Clear definition of pharmacists' roles	EXP13_HOS, PM1, PH2_HOS	*"The intention of PCT was good. They proposed to clarify the position of the pharmacy profession which might be useful to our society and our profession." (EXP13_HOS)* *"We see the clearer picture of patient care. It is a view, that this is the direction we are going to do and the old curriculum was still missing a lot of thing that we need to learn." (PM1)* *"Pharmacy professional will be recognised from this pharmaceutical care." (PH2_HOS)*
	Improve competency from general to specialist	AC3_PC_U4, AC21_D_U5, AC22_D_U1, EXP2_COM, EXP9_HOS, EXP10_HOS, EXP11_MP EXP13_HOS, PH24_HOS, PHY4, PM1, PM2, PR1, ST1	*"Pharmacist should prepare for specialty as well so they can work as a health care team and easy to communicate." (PHY4)*
	Right direction of pharmacy profession	EXP9_HOS, PH24_HOS, EXP13_HOS, AC13_PC_U1	*"It is the right way and it was partial success. I give credit to everyone. Everyone has good intention but it will be sustained or not?." (AC13_PC_U1)*
	No more duck	PM1, ST3	*"A 5-year BPharm programme does not make us experts either in medicinal products or patient care. This 6-year programme would give us higher competencies." (PM1)* *"We are too broad, like a duck. We should good at something better than know everything, but we are not good in anything." (ST3)*
	Open new markets in pharmaceutical sciences	PM5	*"Job markets are still available but we have to open new markets, such as areas in vaccines, blood substitutes, nanotechnology, in herbal medicine. Faculty should move to design our graduates." (PM5)*

Table 6.6 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Meet the needs of stakeholders	Patients and population: better care for patient	AC3_PC_U4, AC5_SAP_U1, N1, PHY5, PH2_HOS, PM9, PT_IPD4, PT_OPD2, PT_OPD6	*"PharmD graduates have better skills in patient care. They are more confident and work well with health care teams." (PH2_HOS)* *"Employers from hospitals and community pharmacies had high satisfaction with PharmD graduates." (PM9)* *"For the 6-year Pharmacy programme, I think it must be good. I know that if patients have problems with medicine they can talk with a pharmacist and the pharmacist will talk to the doctor for them. It makes for better care for us." (PT_OPD2)*
	Patients and population: need pharmacist to talk about their medicines	PT_IPD2, PT_IPD4	*"Pharmacist told us about how many tablets we have to take or what the medicines is used for. But I think it is not enough. They should tell us more about how to monitor other symptoms which might happen or how to monitor about side effect." (PT_IPD4)*
	Patients and population: pharmacists are able to create a better world	PUB7, PUB3	*"I am glad to know that some faculties encouraged their pharmacy students to visit homes in poor community and help people about drug related problems. Students should know about suffering in people's life who did not know their right to accessible to health care system.* *Pharmacy professionals had impact on society and pharmacists are able to create the better world." (PUB7)*
	Patients and population & health care teams: PharmD graduates provided good services	EXP2_COM, N3, PHY2, PHY6, PT_IPD1, PT_IPD3, PT_IPD4, PT_IPD6, PT_OPD1, PT_OPD2, PT_OPD3, PT_OPD4, PT_OPD5, PT_OPD6, PT_OPD7, PT_OPD8, PT_OPD9 PUB3	*"The 6-year pharmacists help us to adjust doses, increase patients' compliance and follow-up drugs 'side effects." (PHY2)* *"I think it is good to have a pharmacist on ward. We discuss and shared opinions which is beneficial for our patients." (PHY6)* *"They (PharmD graduates) explained very well. They told me about diet, exercise and medicines." (PT_OPD1)* *"Her (PharmD graduate) service is very good. She takes good care of patients. I feel courage and able to talk with her. She makes us feel warm. She is willing to treat us. I feel confident in her knowledge for 100 percent sure." (PT_OPD2)* *"Pharmacist taught me how to use this medicine. I have to remove it from the sealed pouch, peel off this, and clean the skin where the patch will be applied. Pharmacist also told me that this medicine will have side effect." (PT_OPD5)* *"The 6 year graduates are very important team member especially in medicinal wards and ICU." (N3)*

Table 6.6 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Meet the need of stakeholders (continued)	Employers: ready to work	AC6_SAP_U4, EXP9_HOS, EXP10, PH24_HOS, PH25_HOS, PH16_COM	*"PharmD graduates are ready to work. It meets the needs of employers" (AC6)* *"The 6-year PharmD programme is a perfect package. There was a significant different in the competency of patient care between PharmD and BPharm. I will choose a six year programme graduate because they are ready to work." (EXP9*_HOS*)* *"PharmD graduates have the skills to approach other health care providers. They are ready to work after graduation." (EXP10_HOS)*
	Policy makers and educators: solve curriculum overload	AC2_PC_U4, PH2_HOS, PM5	*"I think the 6- year PharmD programme is good because I graduated from a 5-year programme which was too tight and clerkship period too short." (PH2_HOS)* *"The previous programme had curriculum overload but still lack of skill. Policy makers discussed about this issue that if we change to a 6 year curriculum, this will provide more time to practice." (PM5)*
	Students and parents: worth for student' s life and career	PH25_HOS, PR1, ST2	*"I think it is worth another year. It is an opportunity to choose the way of life from the internship experience. Learning a six year programme made the longer internship and had much more experiences." (PH25_HOS)* *"The 6-year programme provides more practice and includes additional things to learn." (PR1)* *"I think the-6 year programme is worth. We can expose the real situation. In the sixth year we had clerkship all year. It is very useful that we can learn a lot from training."* (ST 2)
	Patients and population: increased study period will produce the pharmacists who provide the better patient care	PHY5, PM8, PTECH3, PT_IPD4, PT_OPD6,	*"The time for practicing in previous programme was too short and had too much type of training sites." (PM8)* *<u>Contrast view</u>* *"I think all pharmacists have high competence. There was no different between a 5-year and 6-year graduates. They did not have a different job description. They are working together." (PTECH3)* *<u>Room for improvement</u>* *"I observe their white gowns. In some drugstores, the person who sells the drug is not a pharmacist. I look for the picture which declares who is the pharmacist. I have more confidence if they said they are pharmacist." (PUB 3)*
	Policy makers and educators: improve readiness and preparedness in Pharm care tract	AC1_PSc_U1, AC2_PC_U4, EXP9_HOS, EXP13_HOS, PH9_HOS, PH25_HOS	*"It will be very useful toward preparing the student for their work. A 5-year programme provided only 3 months of training rotation. They have not enough time to practice." (EXP 13_HOS)* *"PharmD graduates had better skills in patient care. They had more confident and work well with health care team."* (PH9_HOS)

Table 6.6 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Meet the need of stakeholders (continued)	Health care teams: Increase skills and opportunity to understand and work as health care team	N1, PH10_HOS, PH25_HOS, PHY5, PTECH1, EXP11_MP	*"The 6-year pharmacy graduates have higher knowledge. Their views or critical thinking seem wider or have more understanding about the concept of a multidisciplinary team. We are friends who will walk together." (N1)* *"We extend to six year in order to do more work with patient. We had the opportunity to work with doctors and nurses. When we work with team, I felt that I am valuable. Dispensing is limiting our potential. We used fully potential when we work on ward." (PH25_HOS)* *"We work as health care team. Doctors cannot work by themselves. The processes need other profession to take care and check. Pharmacists help physicians about medicines. That is a confirmation process for the best care to our patients." (PHY5)* *"The six-year graduates have more in-depth knowledge." (PTECH1)*
	Policy makers and educators: provide the same standard of curriculum	AC22_D_U1, PM3	*"At that time our country had both 5-year programme and 6-year programme that might have some confusion in term of the difference of certified of degree and salary of graduates." (AC22_D_U1)* *"They all have to be graduates of the six-year programme and managed in a similar manner." (PM 3)*
	Health care teams: increase skills in home health care and holistic care	PHY3	*The six-year graduates provide home health care service and follow up patient at home. They work like a family medicine but they are family pharmacist. They had been added this skill. In the past, they manage only medicine, but now they provide holistic care to patients. (PHY3)*
	Health care teams: need specialised pharmacist for teams	PHY4, N4, N6	*"Pharmacist should prepare for specialty as well so they can work as a health care team and easy to communicate."* (PHY4)
	Policy makers and educators: suit with National service plan	AC3_PC_U4, EXP9_HOS, PH12_HOS	*"The 6-year programme follows context of national policy towards health care and services excellence in Asia pacific. The National service plan also encourage the developing of pharmacy services in all level of care." (AC3_PC_U4)*

6.4.2.1 Step-up process

Thai pharmacy education has changed from the 5-year BPharm degree (with three main tracks: PC, PSc, SAP) and the 6-year PharmD degree focused on patient care to a single national PharmD programme (offering both pharmaceutical care (PC-PD) and industrial pharmacy (IP-PD). Faculty members thought that this change was a step up for the pharmacy profession and for pharmacy education in Thailand.

> *"It was a step up from the Bachelor degree to the professional degree, which is a 6-year professional degree similar to other professions such as physicians and dentistry." (Academic member 4)*

Unfortunately the Thai government originally gave the PharmD the same status as a bachelor degree due to it being an entry level programme, but they later rewarded progression by matching the promotions and salaries of PharmD graduates similar to those with a master's degree. Other 6-year programmes that have also been awarded similar to a master's degree include the Doctor of Medicine (MD), Doctor of Dental Surgery (DDS) and Doctor of Veterinary Medicine (DVM) in Thailand.

6.4.2.2 Move from generalists to specialists

The direction of pharmacy education in Thailand was not clear before the transition process. After the Pharmacy Council announced the all-PharmD policy, there were efforts to equip existing pharmacists with specialised competencies. Most interviewees thought that the transition to the 6-year programme would improve pharmacy competencies from generalists to advance general pharmacists or specialists. The frequent phrase noted in the findings was *"the Thai pharmacist should not be a **duck** anymore"*. The Thai meaning of duck is that this bird is able to perform many tasks (e.g., flying, running and swimming) but does not excel in any of them.

> *"We are too broad, like a duck. We should good at something better than knowing everything, but we are not good in anything." (PharmD Student 3)*

> *"A 5-year BPharm programme does not make us experts either in medicinal products or patient care. This 6-year programme would give us higher competencies." (Policy maker 1)*

On the contrary, some experts and academic members perceived that the specialisation in the 6-year PharmD graduates might only be suitable in patient care, rather than the other areas of industrial pharmacy, pharmacy marketing. They perceived that the 5-year BPharm pharmacists had sufficient knowledge and competency to work well in industrial pharmacy and pharmacy marketing. Therefore, the 6-year PharmD programme in pharmaceutical sciences that aimed to produce the specialised PharmD in pharmaceutical sciences area might not be necessary.

> *"A 5-year programme in Pharmaceutical had enough and appropriate basic knowledge to work as a pharmacy professional." (EXP4_PSc)*

> *"I think they are suitable to work in hospital settings but detailer (medical representative) might not need 6 years or production line in hospital might need a 5 year programme." (EXP10_HOS)*

> *"I want it to be a voluntary PharmD, rather than all six year PharmD. Who want to learn for six years? The five year curriculum is also needed." (PM10)*

6.4.2.3 Meet the needs of the stakeholders

The minimum credit requirement for the 5-year BPharm programme was 150, whereas the 6-year PharmD programme requires a minimum of 220 credits. The 6-year PharmD programme requires 2,000 hours of practice training, which is 1,500 hours more compared to the 5-year BPharm programme. The increased credits in the 6-year PharmD curriculum provide in-depth knowledge within special tracks. The one-year extension provides the PharmD students with more practice rotations. The stakeholders expect the PharmD graduates to have higher competencies and be ready to work as pharmacists due to the greater number of didactic credits and the longer training experience.

> *"The 6-year programme provides more practice and includes additional things to learn." (Parent 1)*

The majority of pharmacists who work in pharmaceutical care areas perceived the benefits of the PharmD programme, such as preparing PharmD graduates for work immediately after graduation, understanding other health care professionals, and providing high quality patient care.

> *"PharmD graduates have the skills to approach other health care providers. They are ready to work after graduation." (Pharmacy expert 10)*

> *"PharmD graduates have better skills in patient care. They are more confident and work well with health care teams." (Pharmacist 2, hospital pharmacist)*

Physicians and nurses also have positive perceptions regarding the 6-year PharmD graduates' services and thought that they were effective members of the multidisciplinary team.

> *"I think it is good to have a PharmD pharmacist on ward. We discuss and share opinions, which is beneficial for our patients." (Physician 6)*

> *"The 6-year pharmacy graduates have higher knowledge. Their views or their critical thinking seem wider or have more understanding about the concept of a multidisciplinary team." (Nurse 1)*

Patients also perceived the benefits of pharmacists in the health care team, which would provide better care for them.

> *"For the 6-year Pharmacy programme, I think it must be good. I know that if patients have problems with medicine they can talk with a pharmacist and the pharmacist will talk to the doctor for them. It makes for better care for us." (Patient 2, Out-patient Department)*

Most policy makers agreed that the transition to a single PharmD programme provided the same curriculum standard throughout the country.

> *"They all have to be graduates of the six-year programme and managed in a similar manner." (Policy maker 3)*

Community pharmacy customers perceived that the PharmD graduates provided an excellent service about minor illnesses and are highly knowledgeable about medicines. However, there is still room for improvement as follows:

Appearance:

The PharmD graduates and community pharmacists should wear a white coat and identify themselves to increase confidence and trust due to services in some Thai drugstores being provided by non-pharmacists.

> *"I observe their white gowns. In some drugstores, the person who sell the drug is not a pharmacist. I look for the picture which declared who is the pharmacist. I have more confidence if they said they are pharmacist." (PUB 3)*

History-taking skills:

The PharmD graduates should ask about customers' symptoms in detail because some customers had difficulty in explaining their symptoms. Some users would like the PharmD graduates to have skills in speaking Thai regional dialects due to some dialect's vocabulary being different from standard Thai language (e.g., "หยั่ม (Yum)" in North-Eastern part of Thailand means "เคี้ยว (Khio)" in standard Thai language or "chew" in English). Some customers also expected that the PharmD graduates should be able to diagnose suspicious symptoms, which might lead to early detection of serious illness.

Most of the health care providers (e.g., physicians, nurses, and community pharmacists) expected the PharmD graduates in both primary care hospitals and community pharmacies to provide more home health care services. However, some pharmacists felt that the PharmD graduates still needed more preparation before they could provide home health care services. Some pharmacists also perceived barriers for the community pharmacists to provide home health care services. These impediments included a lack of pharmacy workforce and the remunerations that might support these roles from the government.

Also there is likely to be a compromise between professional and business activities during time spent providing counselling services and home visits; barriers and difficulties about the accessibility of a patient's information. Finally, there is the possibility of integrating the health care system and inter-professional working for the provision of effective home health care).

> *"High volume of OPD patient is the most important burden in our health care system. We should have outsources such as qualified local drug store. If patients need to refill their medicine for 1-2 items, is it necessary for them to wait to queue for about two hours in hospital? Just go to the nearby community pharmacy which they can do the reimbursement as well. If the reimbursement system could happen in our community pharmacy, this is a solution."* *(EXP1_COM)*

6.4.3 Theme 3: Concerns

Interviewees such as hospital pharmacists, other health care providers and patients, students and parents, and academic staff in patient care areas were positive overall regarding the all-PharmD programme. However, academic staff in the pharmaceutical sciences area, and industrial pharmacy experts, still had concerns about the curriculum change and suggestions for its improvement. The detailed themes and subthemes are presented in Figure 6.8. The subthemes and supporting quotes are presented in Table 6.7.

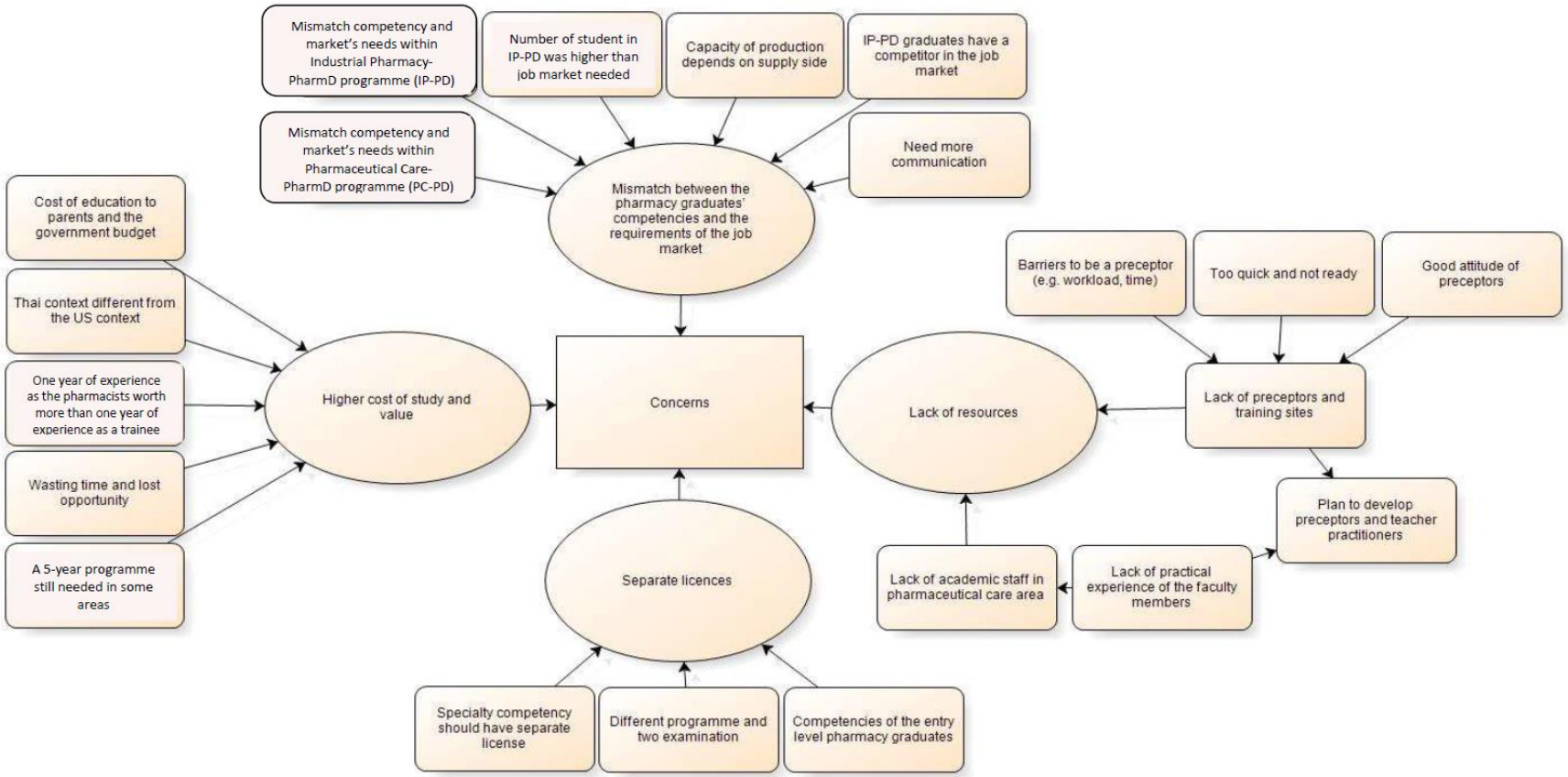


Figure 6.8 Theme "Concerns"

Table 6.7 Subthemes and supporting quotes within the theme "Concerns"

Subthemes	Concepts	Participants*	Example of supporting quotes
Higher cost of study and value	Cost of education to parents and the government budget	AC12_SAP_U4, EXP4_PSc, PR1, PR3, ST1	*"The negative effect is the cost of education to parents and the government budget of at least six hundred million baht (£12,253,000 or $18,421,000) a year, without being able to see the benefit in the short or long term. Improving pharmacists' competencies is a great thing but we have many ways to improve them, such as, via studying or working in real life situations." (AC12_SAP_U4)* *"A 5 yr programme will not increase cost. This increasing cost gave a burden to the government, students and users or employers due to when we had longer period of study, we will ask higher rate of salary in both public and private sector." (EXP4_PSc)* *"I think the cost is quite heavy. In case where we do not have money, this might be a problem." (PR 1)* *"The cost is not much harder because he (her son) helps himself. He got a scholarship from the faculty and works part-time job with his teacher. When he comes back home, he rarely asks for money. He needs only approximately 5,000 baht (£100 or $150) per month. He is a very good saver. He rarely buys new clothes." (PR 3)* *"The Pharmacy Council should prepare salary or compensation for our degree. I heard that they increased our salary by only 1,000 baht (£20 or $31) a month compared to the 5 year programme. It is not worth it to study another one year, when we have to spend approximately 100,000 baht (£2042 or $3070) for this extended year. There should be other ways to encourage us to work hard and deserve our salary." (ST1)*
	One year of experience as the pharmacists worth more than one year of experience as a trainee	AC2_PC_U4, AC7_PSc_U4, AC12_SAP_U4	*"I think about the difference between a 6th year pharmacy student who has clerkship with an unprepared preceptor for one year and a 5- year pharmacist who works for one year. They should have different levels of maturity." (AC12_SAP_U4)*

*Abbreviation
AC_PSc = Academic member in pharmaceutical sciences area, **AC_PC**=Academic member in pharmaceutical care area**, AC_SAP** = Academic member in social and administrative pharmacy), **AC_D** = Dean
EXP_HOS = Expert in hospital pharmacy, **EXP_COM** = community pharmacy, **EXP_PSc** = Expert in industrial pharmacy, **EXP_PB** = Expert in public health and consumer protection, **EXP_MP** = Expert in marketing pharmacy
N = Nurse
PH_HOS = Hospital pharmacist, **PH_COM** = community pharmacist, **PH_IP** = Industrial pharmacist, **PH_PB** = Pharmacist in public health and consumer protection, **PH_MP** = Pharmacist in marketing pharmacy, **PH_RD** = Pharmacist in Research and development, **PHY** = Physician, **PM** = Policy maker, **PTECH** = Pharmacy technician
PT = PT_IPD = Patient in In-Patient Department, **PT_OPD** = Patient in Out-Patient Department
PUB = Public/general population, **ST** = Student, **PR** = Parent
U1 = University1, **U2** = University2, **U3** = University3 **U4** = University4 **U5** = University5

Table 6.7 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Higher cost of study and its value (continued)	Wasting time and lost opportunity	AC11_PSc_U5, AC12_SAP_U4, EXP4_PSc	*"IP-PD student study for 6 year in laboratory and train for R&D but they work in community pharmacy due to the higher salary. They did not use their knowledge and their specialty. It wasted their time and opportunity to work because they have to study and training for one more year instead of working," (AC11_PSc_U5)* *"Improving pharmacist's competency is a great thing but we have many ways to improve it, such as, via studying or working in real life situation. I did not see the benefit of the extended for one year or the worth of this change. Why should it not be Master degree instead of bachelor degree?. Parents have to support cost for another year and social lost pharmacist for another year." (AC12_SAP_U4)* *"They lose opportunity to work. If they graduate in five year, they will work faster for 1 year." (EXP4_PSc)*
	A 5-year programme still needed in some areas	EXP4_PSc, EXP10_HOS, PM10, PHY7	*"A 5-year programme in Pharmaceutical had enough and appropriate basic knowledge to work as pharmacy professional." (EXP4_PSc)* *"I think they are suitable to work in hospital setting but detailer might not need 6 years or production line in hospital might need a 5 year programme." (EXP10_HOS)* *"I want it to be a voluntary PharmD, rather than all six year PharmD. Who want to learn six year, they can learn. Five year curriculum is also need." (PM10)* *"I think the 6 year programme probably too much due to their services might not need to study for 6 years. Most of them might not work with patient in the hospital. Some pharmacists work at community pharmacy that might need the different competencies." (PHY7)*
	Thai context different from the US context	AC16_SAP_U2, PM2, PM9, PM10	*"I do not see the benefit of the extended one year or the worth of this change. Why should it not be a master's degree instead of a bachelor degree? Parents have to support the cost for another year and society has lost a pharmacist for another year." (AC16_SAP_U2)* *"We are not prosperous but we are not very poor either. We should undertake appropriate education. The issue is that we would like to follow the western model. We can find our own way. I do not think six years is the best study programme in the world." (PM10)*

Table 6.7 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Mismatch between the pharmacy graduates' competencies and the requirements of the job market	Mismatch competency and market needs within pharmaceutical care tract (e.g. hospital and community pharmacy settings)	EXP1_COM, EXP2_COM	*"In the past, the basic skill of Thai pharmacist is able to work as a community pharmacist. Now, the responsibility of community pharmacy had totally changed. Within PC-PD programme, it should be separated into hospital pharmacist and community pharmacist because they have different required competencies." (EXP 1_COM)* *"Some faculties taught their PC-PD graduates that they should work in hospitals only. Students told me that they were not interested in community pharmacy but came here because it is only a compulsory rotation." (EXP2_COM)*
	Mismatch competency and market needs within industrial pharmacy tract	AC10_PSc_U5, AC11_PSc_U5, EXP1_COM, EXP5_COM, PM9	*"The private sector hired graduates from other areas such as scientists who have a PhD degree. If you compare pharmacists who have a bachelor's degree and scientists who have a PhD. pharmaceutical companies need PhDs more than pharmacists because they have more experience in R&D" (AC10_PSc_U5)* *"Most of the pharm sciences students worked in community pharmacies because they got higher salaries than industrial plants but they were not well trained." (AC11_PSc_U5)* *"PSc-PD graduates should not do practice in community pharmacies unless they have been passed the training and gained skills and competency to qualify to work as community pharmacist." (EXP1_COM)* *Although IP-PD graduates can work in other services such as community pharmacy but they can work in certain levels. It will be difficult when they work in advanced services. Community pharmacy career is improved the services. It will provide the services to chronic and complex diseases patients. IP-PD graduates will struggle. (PM9)*
	Number of IP-PD was higher than job market needed	AC1_PSc_U1, PM7, PM9	*"The number of IP-PD students was higher than job market need. I knew the job market. I feel empathy for students." (AC1_PSc_U1)* *"There is limited job position in pharmaceutical industrial. They need only 200 pharmacists per year. However, it still has pharmacy shortage. I do not know the reason why graduates do not want to work in industrial." (PM7)* *"The number of pharmaceutical sciences graduates should be reduced." (PM9)*

Table 6.7 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Mismatch between the pharmacy graduates' competencies and the requirements of the job market.	Capacity of production depends on supply side	AC1_PSc_U1, AC15_PSc_U2, AC21_D_U5, PM9	*"This is problem in a level of policy. We might not base on principles of market demand." (AC1_PSc_U1)* *"We have a readiness and preparedness in industrial pharmacy more than clinical pharmacy so we have the number of IP-PD more than PC-PD."(AC15_PSc_U2)* *"Basically, our basic structure is mainly in pharmaceutical sciences area. Number of pharmaceutical sciences academic staff higher than Pharm care staff. So, we have high number of student in IP-PD tract because we have to consider about education management." (AC21_D_U5)*
	IP-PD graduates have a competitor in the job market	AC11_PSc_U5, EXP7	*"Pharmaceutical company need PhD more than pharmacist because they had more experience in R&D" (AC11_PSc_U5)* *(Note: PharmD degree in Thailand equivalent to Bachelor degree)* *"The opportunity of the 6-year IP-PD students would be less because manufacturers might hire a 4-year scientist instead. It might save cost for manufacturers. Pharmacist will have competitor in the job market." (EXP7)*
	Need more communication	AC1_PSc_U1, AC13_PC_U1, AC21_D_U5, AC22_D_U1, EXP4_PSc, EXP5_PSc, PM1, PM4, PM5, PM10, ST1	*"I feel uncomfortable about this change. It needed more consideration before creating this new curriculum. It needed communication to answer questions such as the necessity for change, the direction of change, and the main barrier that should be considered"* (AC13_PC_U1) *"There was confused about Pharmaceutical sciences. What is their scope and competency? Someone said all work which is non-pharm care is pharm sciences. We have to discuss about their competencies, regarding to the need of users."* (EXP5_PSc) *"It's a top down policy of the powerful people at that time. It should have more serious consideration of views or listening to each other."* (PM10)

Table 6.7 (Continued)

Subthemes	Concepts	Participants *	Example of supporting quotes
Lack of resources	Too quick and not ready	AC1_PSc_U1, AC2_PC_U4, AC3_PC_U4, AC12_SAP_U4, AC15_PSc_U2, AC21_D_U5, EXP5_PSc, PM2	*"Everything was done too fast. Even policy is suite for the future but we have no personnel to serve the policy. We should prepare PharmD preceptors then change to an entry level PharmD."(AC3_PC_U4)* *"There was many problems such as preceptors were not ready, academic staff also were not ready." (EXP5_PSc)* *<u>Contrast view</u>* *"We have been informed about this change for many years before the PCT announced."(AC15_PSc_U2)* *"It seems like question of "Which came first the chicken or the egg?" If preceptors are not ready, we should train them. If preceptor is not enough, we have to increase the number of preceptor." (PM2)*
	Lack of preceptors and training sites	AC2_PC_U4, AC5_SAP_U1, AC22_D_U1, PM4	*"We have to have our own staff to teach our students at practice sites because pharmacists have high workload. We have MOU with hospitals and have a great support from both faculty and hospital administrators." (AC5_SAP_U1)* *"It increases the load of preceptors, of which they are still the same number. Every faculty is competing." (AC22_D_U1)* *"Increasing to the 6-year programme and release students out into the real world to find experience for themselves is not the right way. Lecturers or master's degree students should be trained and transfer their experience to students. At least 20 students will be trained at each site, but the site employs only one pharmacist." (PM4)*
	Plan to develop preceptors and teacher practitioners	AC3_PC_U4, AC5_SAP_U1	*"Newly PhD or young staff work hard for faculty but they did not have time to do their own career ladder. Leaders have to protect them. We should have a good mentor for them." (AC3_PC_U4)* *"The most important factor in the new programme is preceptors and teacher practitioners. We have teacher practitioners (TP) to work in hospital as teacher for students and also practice at training site." (AC5_SAP_U1)*
	Good attitude of preceptors	PH24_HOS	*"Training pharmacy students is my responsibility. I am a pharmacist and I want to make the pharmacy profession stronger. I am proud to be a preceptor." (PH24_HOS)*
	Barriers to be a preceptor (e.g. workload, time)	EXP13_HOS, PH25_HOS, PH16_COM, PH17_COM, ST8, PH021_IP, PH23_PB	*"Being preceptor took a pharmacists' time." (EXP13)* *"You want an effective preceptor but you never train us. Is it too demanding? We already have a high workload." (PH25_HOS)* *"Some of them might not ready to train us because of they did not have enough time due to their high workload." (ST8)*

Table 6.7 (Continued)

Subthemes	Concepts	Participants*	Example of supporting quotes
Lack of resources (continued)	Lack of academic staff in pharmaceutical care area	AC21_D_U5, PM9	*"We need expertise staff in pharm care that they should have residency degree or board certify but there were a very low number of this group of academic staff." (AC21_D_U5)* *"Pharmacy graduates in pharm care prefer to work in the hospital more than to be a lecturer because of high salary and less stress. We lack lecturers and teacher practitioners." (PM9)*
	Lack of practical experience of the faculty members in both pharmaceutical care and pharmaceutical sciences	EXP7_PB	*"Most of academic staff works on their research but rarely work in real practice settings." (EXP7_PB)*
Separate licences	Specialty competency should have separate license	EXP1_COM, EXP5_PSc, PM1, PM5, PM6,	*"I encourage the separate license because each specialty required different competency. For example, within pharmaceutical care, there should separate into hospital pharmacist and community pharmacist. IP-PD should not practice in community pharmacies unless they pass the training and qualify to work as community pharmacist."(EXP1_COM)* *"Pharmacy professionals in each track will be developed. In far future, there is might be a separation of licenses. (PM1)* *"The big issue was relating to license, but at that time, the council is not ready to give two licenses. As a result, every university had to change to six-year curriculum with one license." (PM5)* *"Separate licences seems to narrow down pharmacists' opportunities to work in various settings. However, we need to be specialised, which requires different competencies. So, there should be separate licenses." (PM 6)* <u>Contrast view</u> *"I did not agree about separate license. Why we have to close our opportunity?(EXP5_PSc)*
	Different programme and two examinations	AC9_SAP_U1, PM6	*"If they study the difference programmes from first year, they should have difference license." (AC9_SAP_U1)* *"We will have two pharmacy licensure examinations. The first examination is for the core competency. The second examination is for the specialty. Why we have just only one license?" (PM6)*
	Competencies of the entry level pharmacy graduates	EXP6_PB	*"The confusion in our pharmacy profession that we never talk is about the in- depth of core competency in the entry level PharmD programme." (EXP6_PB)*

6.4.3.1 Higher cost of study

Some academic staff thought that the policy makers should consider the increased cost of study due to the extra year. The students also discussed whether the increased cost of study was worth it.

> *"The negative effect is the cost of education to parents and the government budget of at least six hundred million baht (£12,253,000 or $18,421,000) a year, without being able to see the benefit in the short or long term. Improving pharmacists' competencies is a great thing but we have many ways to improve them, such as via studying or working in real life situations." (Academic member 12)*

> *"The Pharmacy Council should prepare salary or compensation for our degree. I heard that they increased our salary by only 1,000 baht (£20 or $31) a month compared to the 5-year programme. It is not worth it to study for another year, when we have to spend approximately 100,000 baht (£2042 or $3070) for this extended year. There should be other ways to encourage us to work hard and deserve our salary." (PharmD student 1)*

Some interviewees were concerned that this change might not deliver an effective pharmacy curriculum that is suitable for the Thai context. They suggested that the new curriculum might cause problems in terms of students' time and money and might limit the ability to produce pharmacists who could quickly begin to work for Thai society.

> *"We are not prosperous but we are not very poor either. We should undertake appropriate education. The issue is that we would like to follow the western model. We can find our own way. I do not think six years is the best study programme in the world." (Policy maker 10)*

> *"I do not see the benefit of the extended one year or the value of this change. Why should it not be a master's degree instead of a bachelor degree? Parents have to support the cost for another year and society has lost a pharmacist for another year." (Academic member 16)*

Parents of pharmacy students who studied at private universities said that the cost of their children's education was at least 100,000 baht/year and approximately 500,000 baht *(£10,200 or $15,300)* in the 6th year; the total cost was approximately 1,600,000 baht *(£32,600 or $49,100)*. One father thought that the cost might cause problems for some families who had low to medium incomes, but for him, it was acceptable.

> *"I think the cost is quite heavy. In cases where we do not have money, this might be a problem." (Parent 1)*

Another interviewee, from a family with a low income, thought the cost of education at public university of approximately 40,000 baht/year (£800 or $1,200), and that the total cost, which was approximately 300,000 baht (£6,100 or $9,200), was acceptable. Her son was granted a scholarship from his faculty and he was very careful with his money and also had a part time job for his living expenses. However, in terms of the cost of education, even at a public university, it is still a large amount of money for students' families.

> *"The cost is not much harder because he (her son) helps himself. He got a scholarship from the faculty and works part-time job with his teacher. When he comes back home, he rarely asks for money. He needs only approximately 5,000 baht (£100 or $150) per month. He is a very good saver. He rarely buys new clothes." (Parent 3)*

6.4.3.2 Mismatch between the pharmacy graduates' competencies and the requirements of the job market

The traditional PharmD programme focused on patient care but the PharmD curriculum in Thailand is divided into two main streams: a pharmaceutical care-PharmD (PC-PD) programme and a pharmaceutical sciences or industrial pharmacy-PharmD (IP-PD) programme. However, both give students the same license to work across all sectors.

There is a general consensus among the interviewees that the aim of the development of a 6-year programme in Thailand was to improve pharmacy competencies from generalists to specialists, focusing on pharmaceutical care and preparing pharmacy graduates to be ready to practice upon graduation in real workplace settings. Such preparations would serve to meet the required needs of the stakeholders. The greatest benefits of producing competent clinical pharmacists should be to patients, health consumers and Thai society.

However, community pharmacy employers presented contrasting views. Some argued that the pharmaceutical care aspect of the PC-PD is very hospital-centred and the skills acquired are more suited for tertiary and secondary care settings than primary hospital and community pharmacy settings.

> *"The PC-PD programmet should be separated into hospital pharmacist and community pharmacist because they have different required competencies." (Pharmacy expert 1, community pharmacy)*

> *"Some faculties taught their PC-PD graduates that they should work in hospitals only. Students told me that they were not interested in community pharmacy but came here because it is only a compulsory rotation." (Pharmacy expert 2, community pharmacy)*

Pharmacists and pharmacy experts from the consumer protection area also shared the opinion that the curriculum should prepare pharmacy graduates for primary care services due to the higher number of primary care hospital settings (community hospitals and sub-district health-promoting hospitals).

On the other hand, the majority of the interviewees were less positive about the IP-PD graduates meeting the needs of the market; the number of graduates currently exceeds the needs of industry, and graduates from this track often have to pursue career paths in community pharmacy, a sector for which they are not prepared.

It is interesting that some ID-PD students, BPharm graduates in pharmaceutical sciences and academic staff perceived that IP-PD graduates might prefer to work in community pharmacy, rather than industrial pharmacy, due to the community pharmacists' salaries being higher than the industrial pharmacists' salaries, and less stress comparing to the responsibility in industry.

> *"Most of the pharmaceutical sciences students worked in community pharmacies because they got higher salaries than industrial plants but they were not well trained." (Academic member 11)*

In addition, this view is also shared by participants from the industrial sector, who believe that IP-PD graduates lack the research skills required for the research and development industry. PhD holders with non-pharmacy science backgrounds are preferred.

> *"The private sector hired graduates from other areas such as scientists who have a PhD degree. If you compare pharmacists who have a bachelor's degree and scientists who have a PhD, pharmaceutical companies need PhDs more than pharmacists because they have more experience in R&D." (Academic member 10)*

In contrast, some policy makers perceived that the PharmD graduates will be more skilled in research and development, which might meet the needs of employers. There are plenty of opportunities to create the curriculum and make a difference for graduates, but this depends on the cooperation of the leaders, deans and academic staff in the pharmaceutical sciences area to prepare this new curriculum.

> *"Job markets are still available but we have to open new markets, such as areas in vaccines, blood substitutes, nanotechnology, in herbal medicine. Faculty should move to design our graduates." (Policy maker 5)*

To fulfil the needs of the IP-PD graduates' competency for the area of research and development, an integrated PharmD-PhD programme was developed at one of the universities in Thailand, aiming to prepare highly competent graduates to study in PhD programmes. This is an interesting programme designed to suit the needs of the pharmaceutical industry.

6.4.3.3 Lack of preceptors and training sites

The crucial issue for the transition to an all-PharmD programme is providing a sufficient number of qualified PharmD preceptors. The new PharmD curriculum has a four-fold increase in the number of hours for practice training compared with the BPharm programme. However, the number of qualified preceptors remains the same. The PECT tried to establish a preceptor development programme to prepare for this change but the majority of the stakeholders perceived that this was still not enough.

> *"It increases the load of preceptors, of which there are still the same number. Every faculty is competing." (Academic member 22)*

Stakeholders felt there were benefits for institutions if they are offered as training sites. These advantages include contributing to the pharmacy profession, updating preceptors' knowledge and skills, having highly competent academic members who are able to empower preceptors and enhance training sites, and opportunities to recruit well-performing pharmacy students.

> *"Training pharmacy students is my responsibility. I am a pharmacist and I want to make the pharmacy profession stronger. I am proud to be a preceptor." (Pharmacist 24)*

However, the majority of the interviewees had common concerns regarding the insufficient quantity and quality of preceptors. Some preceptors mentioned that they were not a PharmD graduate and therefore lacked the knowledge and expertise to train PharmD students.

Stakeholders' perceived barriers towards formal preceptor preparation, such as preceptors having a heavy routine workload, a lack of time/money/management staff/space, and inadequate role models. Some stakeholders, who were preceptors, perceived that they needed more recognition and support from administrators regarding the importance of their roles as preceptors.

In addition, the majority of preceptors also raised other issues: the training sites required standardisation and quality assurance, career progression as preceptors should be established and a reward system for their clerkship workload should be initiated. They suggested that there was a need to put in place a preceptor development programme and the establishment of an active memorandum of understanding (MoU)/ long term commitment between training sites and universities.

> *"You want an effective preceptor but you never train us. Is it too demanding? We already have a high workload." (Pharmacist 25)*

One employer in industrial pharmacy thought that the training patterns in the pharmaceutical sciences area should be reconsidered and needed changing. Academics who have more training in research should teach students about pharmaceutical sciences in the universities.

This strategy might be better than sending students to be trained in industry, which has a limited number of preceptors, insufficient space and too few training sites. Of more concern, some trainers who were non-pharmacists in industrial pharmacy settings, were diploma graduates who wondered about their qualification to teach pharmacy students.

> *"Increasing to six years and releasing students out into the real world to find experience for themselves is not the right way. Lecturers or master's degree students should be trained, and their experience will transfer to students. At least 20 students will be trained at each site, but the site employs only one pharmacist." (Policy maker 4)*

6.4.3.4 Lack of practical experience of the faculty members

Deans and policy makers had planned to increase the number of instructors in the pharmaceutical care area due the lack of pharmacy practice staff within academic institutions. Unfortunately, they found it was difficult to recruit pharmacy graduates to work as instructors in pharmaceutical care within academic institutions. The main reason for this reluctance was because they preferred to work in other pharmacy practice areas such as hospital or community pharmacy settings, due to higher salaries and less stressful environments.

> *"Pharmacy graduates in pharm care preferred to work in the hospital more than to be a lecturer because of high salary and less stress." (Policy maker 9)*

Highly performing academic staff in the pharmaceutical care area who have graduated from a pharmacotherapy residency programme are scarce and are in great demand. They also act as role models for PharmD students. Senior academics and experts said that they work very hard and that faculty have to take care of them and not let them become burnt out by their high workload.

6.4.3.5 Separate licences

Previously there has only been one type of license for Thai pharmacists across all pharmacy practice settings. Pharmacy graduates from both the BPharm and PharmD programmes have been required to take the same national licensure examination.

However, the PharmD students who start their pharmacy education in and after 2015, will have to take two pharmacy licensure examinations: the first examination is for pharmacy core competency at the end of their fourth year and the second examination is for their specialised competency at the end of their sixth year.

The examination had to be separated into two different examinations because those two tracks were very different in terms of their specialties (e.g., knowledge content, clerkship experiences and specialised skills) but they still have the same license. Separate licenses were mentioned in earlier stages of decision making.

Some faculty members were concerned about the vision of the Thai pharmacy profession. If it aimed to move practitioners from being generalists to specialist pharmacists, different types of pharmacy licenses should be offered. Some policy makers advised to offer separate pharmacy licences in the future, and pharmacists should not work across the professional pharmacy tracks; for instance, pharmacy graduates in pharmaceutical industry should not work in community pharmacy because they may not have sufficient competency. Pharmacy professionals in specific areas should work only in their area because this represents a commitment to the development of the pharmacy profession in those specific areas.

They might cross over to other tracks, but there should be a system to assess their competencies, such as taking a training course or continuation of their pharmacy education, to ensure the delivery of good pharmacy practice and to meet the required standard in each practice area.

> *"Separate licences seems to narrow down pharmacists' opportunities to work in various settings. However, we need to be specialised, which requires different competencies. So, there should be separate licenses." (Policy maker 6)*

On the other hand, some academics said that there should be only one license. They thought that the advantages were as follows: an opportunity to work in various areas of pharmacy practice, as in the past; also one license would, or at least could, unite the pharmacy profession. The situation was frequently compared to the doctor's license: a doctor has only one license but different doctors might have different specialties.

6.5 Discussion

6.5.1 Influences on an all-PharmD policy

In the past three decades, the roles of pharmacists globally have changed dramatically. Pharmacists are now responsible not merely for compounding or dispensing medicines but in providing a professional role in patient care (Frankel et al., 2014). The main limitation to developing advanced clinical roles is a lack of clinical skills. The genesis of the 6-year PharmD programme in Thailand began from the needs of pharmacists who would like to develop themselves to provide a better standard of patient care. It was similar to the adoption of the PharmD in the USA, Canada and South Korea, that was led by the needs of clinical pharmacists who had higher competency in patient care (Dolder et al., 2008; Kishi, 2001; Raman-Wilms, 2012).

The PharmD programme is the model for the pharmaceutical care programmes employed by many other countries (Lin, 2012). It has been mentioned in many countries who have adopted, or plan to adopt, this programme to produce pharmacy graduates who have high levels of knowledge and skill in pharmaceutical care and who work well together with other health care providers (American Association of Colleges of Pharmacy, 1992; Frankel et al., 2014; Kim and Ghimire, 2013).

The strong cooperative network of PECT and the US-Thai consortium for the development of pharmacy education in Thailand appeared to be the most important influence on the development of the PharmD programme in Thailand (Keokitichai, 2014; Pongcharoensuk and Prakongpan, 2012; Sonthisombat, 2008; Srisopa et al., 2012). Another important influence is that the regulatory body that has the authority to make the policy a reality. The process of the 'all-PharmD' programme has also been mandated by the authorities in other countries including Canada, Japan and South Korea (Frankel et al., 2014; Kishi, 2001; Knapp, 2011).

6.5.2 Perceived benefits of the transition of pharmacy education to an all-PharmD programme

Interviewees in the pharmaceutical care area appeared to welcome the 6-year PharmD programme due to this new programme being a step-up process for the pharmacy profession. The new 6-year degree has the same curriculum duration as the MD or DDS degree, filling the gap left by the 5-year BPharm programme, which involved less practice and might produce a graduate who had insufficient competencies to practice on the job market today. This benefit was also mentioned in the adoption of a 6-year pharmacy programme in the US and South Korea (Janke et al., 2013; Yoo et al., 2014).

Another important benefit is that PharmD graduates are ready and able to work, with little support, following graduation and thus are becoming increasingly established and valued in the Thai health system (Aisoonphisarnkul et al., 2012; Ngorsuraches and Chaibu, 2004; Srisopa et al., 2012).

6.5.3 Concerns

6.5.3.1 Concerns about the cost of education

Thailand is among the world's middle-income countries. An average monthly income per household in Thailand in 2013 was 25,194 baht (£477 or $746) (National Statistical Office, 2013). The expenditure for one full time student at faculty of pharmacy of a public university was 140,000 baht per year (£2,700 or $4,100) (Clungsombat, 2005), which was higher than the public university tuition fee of the global sample, with a mean of $3128 (n=42) (Bates et al., 2013). The proposed increased nationwide cost to cover the additional one year in the PharmD programme was 600,000,000 baht (£11,590,000 or $17,780,000) (PharmaCafe.com, 2008).

Some respondents in this study, including parents, reported concerns about the cost of pharmacy education, which can be a major financial investment. However, they were prepared to support their sons and daughters or to seek other financial support such as grants, scholarships or government-sponsored student loans (Cain et al., 2014b; Cain et al., 2014a; Cain et al., 2014c; Ziderman, 2003).

Some academic staff were concerned that the increase of an extra year of education would limit the ability of students to start earning an income and might be a burden for students, their families and the government. This study noted the same considerations as another study (Cain et al., 2014b; Cain et al., 2014a), in that the curriculum should be designed to deliver an effective education that is able to produce competent pharmacy graduates while also saving money and time.

Some students were concerned about the fact that tuition fees have increased but salaries and available positions have not increased; a similar concern to that expressed in the USA (Cain et al., 2014b). It was suggested that it is necessary to ensure that excellent students are not deterred from pharmacy education by concerns about insurmountable costs or debt after graduation (Cain et al., 2014b).

The major cost requirements in the curriculum change or reform were identified as follows: preparatory activities, curriculum design and development, personal orientation and training, infrastructure and other facilities (General Pharmaceutical Council, 2016a).

To selectively take different benefits or outcomes and costs into account depends upon the perspectives and values of difference stakeholders (General Pharmaceutical Council, 2015a). For example:

- in patients' perspectives, the outcomes might be a decreased number of medication errors and increase in patients' quality of life
- in students' and families' perspectives, the outcome might be the investment of study, job acquired salary and job satisfaction
- in educational institutions' perspectives, they might consider outcomes about the percentage of passing the licensure examination, as well as the increased knowledge and skills of their pharmacy graduates

6.5.3.2 Concerns about a mismatch between pharmacy graduates' competencies and the requirements of the job market

This study found a mismatch between pharmacy graduates' competencies and the requirements of the job market. Competencies required for an industrial pharmacist are completely different from a pharmacist who provides pharmaceutical care in tertiary hospitals or from the community pharmacist who provides home health care and health promotion services (Chanakit et al., 2014; Sumpradit et al., 2014).

It is interesting that most pharmaceutical science track graduates appear to work in community pharmacy settings. Academics should seriously revise the content and practical experiences in the curriculum to meet the needs of graduates and Thai society (Anderson et al., 2014a; Anderson et al., 2012b; Anderson and Futter, 2009).

Faculties should coordinate with the various Thai pharmacy associations, such as the Association of Hospital Pharmacy (Thailand), Community Pharmacy Association (Thailand), Thai Industrial Pharmacist Association, and Marketing Pharmacy Association of Thailand to update the competencies required by pharmacy graduates. Faculties must adapt more quickly to support the needs of society and rapidly changing health care systems. They can do this by addressing the issues of their vision, academic workforce planning, providing facilities, preceptor co-development programme, and the legal considerations affecting pharmacists' roles and responsibilities (Anderson et al., 2012b; Babar et al., 2013; Frankel et al., 2014; Hill, 1999; Knapp, 2011).

This study might encourage faculties and policy makers to develop pharmacy curricula and national pharmacy competency standards to produce future pharmacy practitioners and pharmaceutical scientists who are ready to work to deliver high-quality services to patients and the public. They may also wish to address the concept of national pharmacy workforce planning, to propose optimal numbers of prospective pharmacy students in different specialties.

6.6 Strengths and weaknesses of this phase 3 study

6.6.1 Strengths

To this researcher's knowledge, this is the first study of its kind to highlight the issues surrounding the transition to the 6-year PharmD programme in Thailand. These findings might contribute to our understanding of the change from the bachelor degree to the 6-year PharmD programme; a move which altered the shape of Thai pharmacy education. This study might serve as an investigation of the perceived benefits and concerns, which need a plan to be produced from the cooperation of educational institutions and pharmacy professional practices.

The design of this research was also found to be a significant strength. Triangulated data were collected from different types of stakeholder categories via interviews across Central, North, North-East, and South regions to check and establish their validity (Creswell, 2013; Guion, 2002; Illing JC et al., 2013). Respondents included all types of stakeholders who were involved in the quality assurance of pharmacy education, according to the FIP definition (Rouse and Meštrovic, 2014). This study also included sub-groups of each stakeholder category that involving both administrators and non-administrators from educational institutions, to further optimise sample variation (Creswell, 2013; Hinton et al., 2015).

6.6.2 Weaknesses

1) The first limitation of this study is that the findings lie in the volunteer participants. Some potential informants who were involved in the transition process did not participate in this study. It is unclear whether there are differences in the experience and perceptions of the two groups of informants: those who decided to participate and those who did not participate in this study. The findings might be influenced by some participants' enthusiasm about this transition (Sherer et al., 2015). However, this study attempted to include a maximum variation of participants (Hinton et al., 2014), including both those who agree and those do not agree with this curriculum change.

2) The second limitation of this study is the findings were discussed in the context of an overview of curriculum change and did not discuss the differences of course-level curriculum planning among pharmacy faculties. More attention needs to be given to the issue of course-level planning and implementation (Malkki and Paatero, 2015).

3) The third limitation is that the transition to an all-PharmD programme is still at an early stage. The first cohort of "all-PharmD students" graduated in March 2015, therefore, the benefit or merit of this transition, in terms of both education and services, might not be clearly visible at the time of this study (2013). More prolonged and in-depth study is needed to determine the transition's outcomes on students' competencies, professional performance in pharmacy services and the satisfaction of employers and society (Sherer et al., 2015).

6.7 Conclusions

The transition to an all PharmD programme in Thailand was influenced by many factors; particularly the need for pharmacists to provide a better standard of patient care, and the work of the US-Thai consortium for the development of pharmacy education. Many participants perceived benefits from the new pharmacy curriculum; for example the PharmD graduates will be ready to work as pharmacists in the 'real world' immediately after graduation and will provide high quality patient care.

However, unlike the US and other countries pharmacy education in Thailand moved to a two track PharmD; this includes not only a pharmaceutical care track but also an industrial pharmacy track, with an expectation to produce specialised pharmacists in both tracks while providing the same standard of curriculum content and teaching throughout Thailand.

Some participants were concerned about the curriculum change, particularly regarding the higher costs of a longer period of time for study and the mismatch between the pharmacy graduates' competencies and the job market's needs. Perhaps the most crucial concerns relate to the insufficient quantity and varying quality of preceptors and training sites.

Most of the respondents accepted the need to go forward to the 6-year PharmD programme. However, the design of an effective curriculum, providing a sufficient number of qualified PharmD preceptors, determining certain competencies of pharmacists in different practices, and monitoring the quality of pharmacy education, are all matters needing to be addressed during this transition stage of pharmacy education in Thailand.

CHAPTER 7:

DISCUSSION AND CONCLUSION

7.1 Introduction

This final chapter explains the key findings that emerged from the three phases of this study and demonstrates how the findings relate to the wider literature. The implications of the findings for pharmacy faculties in Thailand and for national policy are discussed, as are the study's strengths and limitations. Suggestions for future research are offered and the researcher's reflections on the research are also presented.

The overall aim of this study was to explore the perceptions of Thai stakeholders regarding the introduction of a nationwide all-PharmD programme. The thesis had four objectives (see Chapter 2, Table 2.20, p. 82), which have been addressed and explained in detail in each respective chapter.

1) The first objective was to explore the status of pharmacy education in Thailand. This objective was achieved in Phase 1 with a cross-sectional survey of the status of pharmacy education in Thailand (presented in Chapter 4).

2) The second objective was to explore the perceptions of pharmacists regarding the suitability of PharmD graduates employed in practice settings (presented in Chapter 5).

3) The third objective was to explore the competency differences between BPharm and PharmD graduates. These two objectives were achieved during Phase 2 of this research with surveys of the pharmacists' perceptions (presented in Chapter 5).

3) The fourth objective was to explore the Thai stakeholders' perceptions regarding the need for, and other experiences about, the transition to an all-PharmD degree structure in Thailand. This objective was achieved in Phase 3 with a qualitative approach involving in-depth interviews (presented in Chapter 6).

The findings from surveys and interviews, together with the similarities and differences, were integrated and compared in order to provide a better understanding of the introduction of the PharmD programme in Thailand. The triangulation diagram of the findings from those three phases is presented in Figure 7.1.

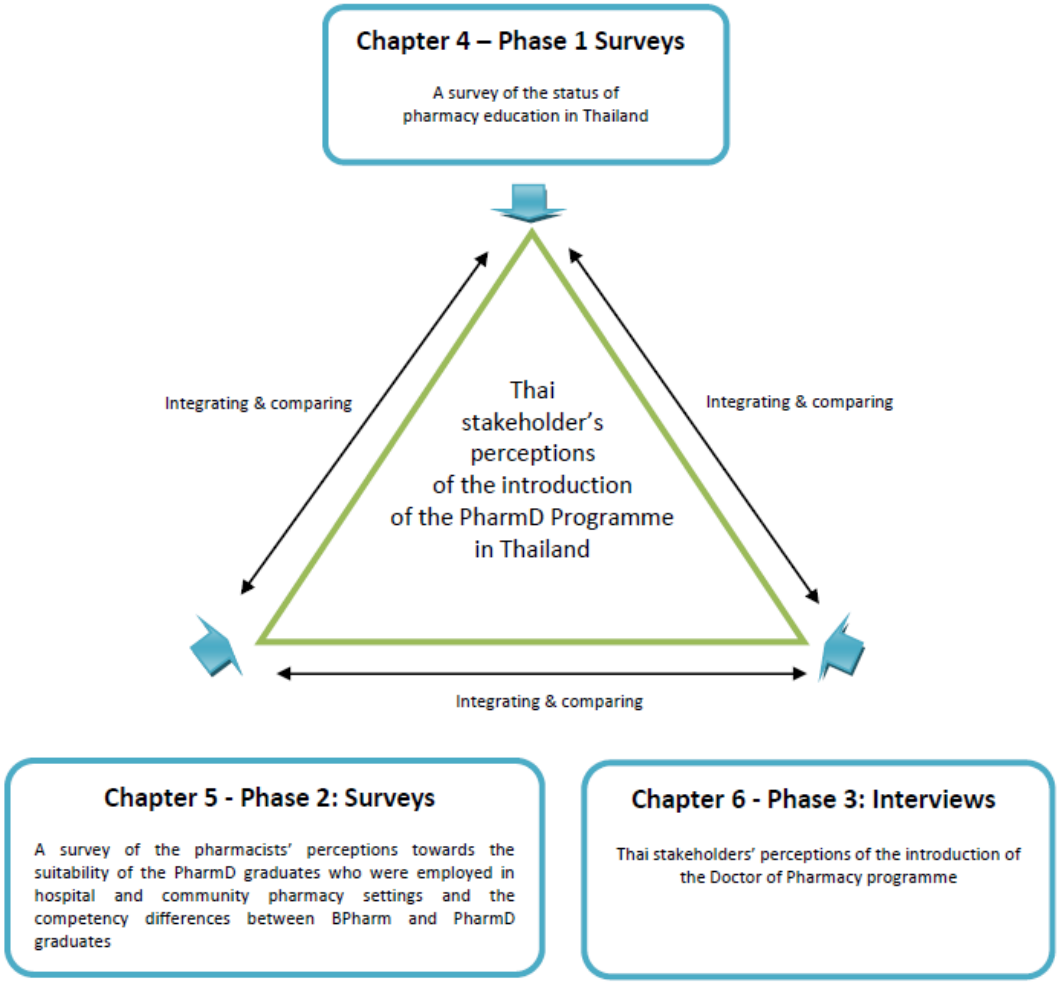


Figure 7.1 The triangulation of the key findings from three phases of this study

7.2 Discussion of the key findings

7.2.1 Capacity of production depends on supply side not demand side

The findings presented in Chapter 4 showed that the maximum capacity for new admissions in all faculties met the standard of the Pharmacy Council Accreditation Criteria (e.g., student-to faculty ratio calculated as Full Time Equivalence of Students (FTES) not more than 8:1 in each specific area) (The Pharmacy Council of Thailand, 2014; Wongpoowarak, 2013b).

However, some participants (Chapter 6) perceived the number of admissions of students in IP-PD programme might exceed the needs of the pharmaceutical industry. This perception was confirmed by Moolasarn et al. (2010), who stated that only approximately 120 pharmacists per year are required in the pharmaceutical industry (Moolasarn et al., 2010) or approximately 10% of graduates per year (Prapunwattana, 2012). Thus, the number of the 1st year IP-PD students in 2013 (n=797, 38% of all 1st year students) (Chapter 2, Table 2.13, p. 64) might exceed the needs of industry and lead those graduates to pursue career paths in other settings (e.g., community pharmacy, hospital pharmacy) for which they were not well prepared, especially for the pharmaceutical care services.

Some policy makers (Chapter 6) presented a reason for this high number of IP-PD students. They stated that it is related to the basic structure of the majority of faculties of pharmacy in Thailand, which mainly had academic staff and facilities oriented towards the pharmaceutical sciences area, with insufficient academic members in the pharmaceutical care area.

This information was reflected by the National Drug Policy (1981) in which the government emphasised the point of self-sufficiency in pharmaceutical supply. This idea encouraged the development of a pharmaceutical industry in Thailand, the usage of locally made drugs and the production of generic drugs to substitute imported medicines (Pramyothin, 2013). Therefore, during the past 30 years Thai pharmacy education has focussed on the pharmaceutical sciences area while the pharmaceutical care concept began less than 20 years ago (Pramyothin, 2013).

Some deans (Chapter 6) said they understand the situation of job market availability and realised that not all of IP-PD graduates might able to get a job in the pharmaceutical industry. Unfortunately, faculties were not able to reduce the number of IP-PD student because faculties have to consider the budget for faculties' education management.
In addition, they could not increase the number of PC-PD students, due to an insufficient number of academics in the pharmaceutical care area.

Deans and policy makers tried to solve the shortages of academic staff in the pharmaceutical care area (Tassaneeyakul et al., 2013) in order to increase the number of PC-PD students to meet the vast job market in patient care areas in both the public and private sectors (The Pharmacy Council of Thailand, 2013b). Unfortunately, the findings (Chapter 6) showed that it was difficult to recruit pharmacy graduates to work as academic staff in the pharmaceutical care area, within faculties, because the new graduates preferred to work in hospital or community pharmacy settings due to higher salaries and less stressful environments.

The findings suggest that the capacity to produce pharmacy graduates depends on the supply side and not the demand side. Therefore, faculties and policy makers need to discuss the overall picture of national workforce planning and the number of admissions which are parallel with the demand side and not the supply side (Tassaneeyakul et al., 2013). Such an initiative will be beneficial for the faculties in planning education (e.g., the number of new admissions to the first year in each special track, faculty members development plan), and for pharmacy students in the selection of majors that are appropriate for the future workforce context (The Pharmacy Council of Thailand, 2013b).

7.2.2 Mismatch of competency and market's needs within the pharmaceutical care track

The finding from the interviews (Chapter 6) and the pharmacists' perceptions surveys (Chapter 5) showed similar findings that the PC-PD programme is very hospital-centred and the skills acquired are more suited for tertiary than primary care settings. However, the largest job market is in primary care settings (e.g., primary care hospitals, community pharmacies) rather than in tertiary care hospitals.

Therefore, the Thai PharmD curriculum should include more public health subjects and the students should be more involved in practice situations. Similarly other reports have suggested that the curriculum should include content about public health and primary care services and should provide placements in primary care settings for pharmacy students (Anderson et al., 2009; Smith and Darracott, 2011; Vlasses et al., 2013).

In addition, some respondents from surveys (Chapter 5) and interviews (Chapter 6) suggested that the PharmD curriculum should increase applied knowledge (e.g., disease screening, home health care services, business management, and pharmacy marketing), which is important for future community pharmacists. These suggestions were similar to other studies that required the skills to connect between pharmacy profession and business management in the community pharmacies (Anscombe et al., 2012; Hicks et al., 2004; Moultry, 2011; Rollins et al., 2014; Royal Pharmaceutical Society, 2014; Sethabouppha et al., 2012).

Academic institutes should design the curriculum by closely following the national service plan that requires a pharmacy workforce in secondary care, primary care hospitals and community pharmacy more than in the tertiary care hospitals (Bureau of Health Administration and Office of the Permanent Secretary, 2013; National Health Security Office, 2013; Payanantana et al., 2013). In reality, only few faculties planned to produce PharmD graduates to work in primary and secondary care settings (Sookaneknun et al., 2009).

7.2.3 Barriers to providing new services in real practice settings

The majority of the stakeholders (Chapter 6) expected that the curriculum change would improve the competency of pharmacy graduates from generalist to specialist; a shift which would meet the needs of society. Also, it was hoped the pharmacy graduates would be ready to work upon graduation and pursue their career paths in their specialities.

This expectation is comparable to the report from the Pharmacy Council of Thailand (Aisoonphisarnkul et al., 2012; Ngorsuraches and Chaibu, 2004; Srisopa et al., 2012; Tassaneeyakul et al., 2013) and the transformation of pharmacy education globally that has shifted to become patient-focused, with the expectation that pharmacists will work with the wider health care team (Anderson et al., 2014a; Royal Pharmaceutical Society, 2014; The Council on Credentialing in Pharmacy, 2009; The Royal Pharmaceutical Society, 2013).

For example, in the USA, the Accreditation Council for Pharmacy Education (ACPE) "Standard 2016" needs the graduates who are "practice-ready" and "team-ready"(Accreditation Council for Pharmacy Education, 2015). The Royal Pharmaceutical Society (RPS) and the Modernising Pharmacy Careers Programme are aiming to develop pharmacists who are "fit for purpose and have the necessary knowledge and skills to provide safe and effective care from day one of practice" (Royal Pharmaceutical Society, 2014; Smith and Darracott, 2011; The Royal Pharmaceutical Society, 2013).

However, many concerns arise that even though the transition in pharmacy education has happened, the real practices might not have changed to meet the stakeholders' expectations. The PC-PD graduates might not be able to provide the new services in real practice (e.g., ward round, work with health care teams) that they have been trained to do.

This problem relates to numerous barriers in the outside world, such as pharmacy workforce shortage, high workload in routine work, insufficient recognition from healthcare teams and the need for a legislation that give the PharmD graduates a chance to practice using their full expertise (Basak and Sathyanarayana, 2010; Farris et al., 2005; Hamarneh et al., 2011; Ngorsuraches and Chaibu, 2004; Ngorsuraches and Li, 2006; Sakthong, 2007).

It is important to monitor the first cohort of PharmD graduates, in order to identify whether they work in the area of their specialty. If the graduates cannot work in their specialty, or will not be able to practice using their full expertise, this would be a vital loss to pharmacy education and the national pharmacy workforce in term of resources, cost and time of investment (Tassaneeyakul et al., 2013).

Approximately half of the survey respondents (Chapter 5) and some of experts in the interviews (Chapter 6) thought that there were no differences between BPharm and PharmD activities in workplace settings. Respondents were concerned that some PharmD graduates might struggle to start new services due to the system not encouraging the new roles of pharmaceutical care (e.g., being a clinical pharmacist on a medical ward, working with a health care team). Concern was also shared that PharmD graduates had to work mainly in traditional dispensing or other non-clinical activities. The respondents' perceptions about the barriers in workplace settings were explained as follows.

7.2.3.1 Barriers to provide the new services in hospital pharmacy settings

These barriers are consistent with several studies that noted obstacles to providing pharmaceutical care services in hospitals:

1) The lack of time;

2) High dispensing workload;

3) Shortage of pharmacy staff;

4) Lack of recognition of the pharmacy professional by other health care providers;

5) Lack of funds or a low financial incentive;

6) Lack of formal legislation that give the pharmacists a chance to practice in their full expertise;

7) Limited data on the proven value of providing pharmaceutical care;

8) Lack of employers' recognition of the pharmacists' roles and responsibilities

(Basak and Sathyanarayana, 2010; Farris et al., 2005; Hamarneh et al., 2011; Ngorsuraches and Chaibu, 2004; Ngorsuraches and Li, 2006; Sakthong, 2007).

On the contrary, some reports identified supporting systems to assist Thai pharmacists to provide pharmaceutical care; for example the Thai Hospital Accreditation Programme managed by the Healthcare Accreditation Institute (The Thai Healthcare Accreditation Institute (Public Orgnaisation), 2015). This initiative is designed to encourage pharmacists to work as part of healthcare teams in hospitals. In addition, the Ministry of Public Health developed a remuneration structure for hospital pharmacists who provide pharmaceutical care services for the high-risk activities. Examples of such services include preparing chemotherapeutic compounding and providing pharmacy counselling for HIV and TB patients (The Ministry of Public Health, 2005). This would be the ideal for the provision of pharmaceutical care in the future.

7.2.3.2 Barriers to provide the new services in community pharmacy settings

The respondents (Chapter 6) perceived barriers that prevented the PharmD graduates from providing pharmaceutical care services in community pharmacy:

1) Lack of pharmacy workforce and the remuneration that support these roles from the government;

2) Lack of opportunity to access patients' information;

3) Lack of system to integrate into health care system and inter-professional working for effective home health care;
4) Lack of content in the Thai pharmacy curricula related to the new roles of community pharmacy, particularly primary care services and home health care services.
These perceived barriers were supported by Latif et al. (2013) and Kittipibul et al. (2006).

Most stakeholder in this study, as well as stakeholders' from other countries (Mantzourani et al., 2015; Sethabouppha et al., 2012), perceived that faculties of pharmacy should revise their pharmacy curricula to provide more preparation for the graduates to fill the new roles in community pharmacies. For example:
1) The new PharmD programme should increase the applied knowledge and skills needed for working in the community pharmacy field. Attention should be focused on chronic disease screening, home health care services, pharmacy marketing, and a balance between pharmacy professional services and business management.

2) The new PharmD programme should have enough clerkship training in the community pharmacy field to ensure that the PharmD graduates will able to provide service in this area (Subcommittee on the Pharmacy Education Consortium of Thailand in Pharmaceutical Sciences track., 2013b).

3) The new PharmD programme should emphasise communication skills, in particular learning and speaking regional dialects; which is one factor that makes it easier for patients to explain symptoms and ask more about their medicines (Hughes et al., 2009). Graduates should also be comfortable with patient history taking, and the skills needed to diagnose suspicious symptoms, which might lead to early detection of serious illness.

7.2.4 Shortage of qualified academic members, qualified preceptors, and preceptor sites

Findings from the survey presented in Chapter 4, together with the perceptions of many interviewees (Chapter 6) confirmed there was a shortage of qualified academic staff, qualified preceptors, and preceptor sites; an issue that might affect the scaling up and transformation of pharmacy education (WHO, 2013). This situation is also a challenge in pharmacy education worldwide (Anderson et al., 2014a; Anderson et al., 2014b; Bates et al., 2013).

7.2.4.1 Shortage of qualified academic staff

Some academic staff and pharmacists were concerned about a shortage of academic members in patient care, especially who have a residency degree or are Board Certified, but they are scarce and are in great demand. This was confirmed by findings in Chapter 4 that the percentage of instructors who focused on patient care is 15%. This is a relatively low figure when compared with the 52% of US pharmacy faculty members in the pharmacy practice discipline (Beardsley et al., 2008). Unfortunately, it was difficult to recruit pharmacy graduates to work as academic staff because they preferred to work in other pharmacy practice areas, due to higher salaries and less stressful environments (Ngorsuraches et al., 2013).

7.2.4.2 Shortage of qualified preceptors and training sites

The findings (Chapter 4) showed that approximately 37% of faculties needed more preparation for their preceptors and trainings sites. The shortages of both preceptors and training sites were also confirmed by many stakeholders in Chapter 6. Therefore, this issue should have a close attention from the policy makers in order to ensure the quality of the PharmD student training system.

It was interesting to note that the majority of hospital pharmacy preceptors (Chapter 6) had positive professional attitudes, and perceived the role of a preceptor as a privileged responsibility to develop new graduates to be competent pharmacy practitioners. Unfortunately, the preceptors also perceived that they are not PharmD graduates and lacked knowledge and expertise to train PharmD students. The findings from Chapter 5 confirmed that approximately half of the preceptors have a BPharm degree and the other half have a PharmD degree.

The way forward for this could be empowering them by providing a transitional programme for the 5-year BPharm pharmacists to update their competencies to meet the current standard and to make them ready to work as preceptors for the PharmD students. It would also help to resolve the lack of preceptors by preparing a proper career pathway for them, as well as a reward system for their clerkship workload. The appointment of preceptors is on a voluntary basis. Practice-based facilities are required for sustainable development of trained preceptors.

7.2.5 Key points summarising the transition to an all-PharmD programme in Thailand as compared to the other countries

The findings from Chapter 6 have been compared to information from the literature review (Chapter 2: Table 2.8, p. 46) as set out in the table below. The findings showed that Thailand and Pakistan did not have regulations, like some countries have, that supported the change in scope of pharmacy practice.

Table 7.1 Key points summarising the transition to an all-PharmD in Thailand as compared to the other countries

	US	Japan	South Korea	Pakistan	Thailand
Need					
1. To have a highly skilled clinical pharmacist to provide pharmaceutical care and work with health care teams	✓	✓	✓	✓	✓
2. To improve patient and economic outcomes	✓	✓	✓	✓	✓
3. To incorporate new competencies into the pharmacy curriculum	✓	✓	✓	✓	✓
4. To cope with the regulations that changed the scope of pharmacy practice in their countries	✓	✓	✓	X	X
5. To standardise the pharmacy education system according to international education	✓	✓	✓	✓	✓
6. To cope with local practice needs	✓	✓	✓	✓	✓
7. To enable the graduates to work abroad	X	X	X	✓	X
8. To align with the global trend toward 6-year programme	X	✓	✓	✓	✓
Context					
Bachelor is a previous programme	✓	✓	✓	✓	✓
New programme (6-year PharmD)	✓	X[a]	✓[b]	X[c]	✓
Difference between the previous and the 6-year programme -Increased courses in clinical pharmacy -Expanded training period	✓	✓	✓	✓	✓
Process of transition					
Process: -New programme is eligible for the accreditation process, mandatory for registration for the license examination	✓	✓	✓	✓	✓
External drivers (e.g., regulations supporting in the new roles of pharmacists)	✓	✓	✓	X	X
Barriers					
-Lack of infrastructure (e.g., experienced academic staff, qualified preceptors)	✓	✓	✓	✓	✓
-Limitation of pharmacists' roles in clinical settings	X	✓	✓	✓	✓
Impact/outcome					
-Studies about the perceived competency of the PharmD graduates	X	X	X	X	✓
-Studies about the practice activities difference between the BPharm and the PharmD graduates	✓	X	X	X	X
-Impact to improve patient outcomes from the PharmD students	✓	x	x	x	X

[a] Japan has the 6-year Bachelor programme; [b]South Korea has the 6-year (2+4 programme);
[c]Pakistan has the 5-year PharmD programme

7.2.6 Comparison of the findings in this thesis with other studies

As already presented in Chapter 2, two studies were carried out in the US and three studies in Thailand regarding stakeholders' perspectives. These studies have some similarities and differences in their research questions and scope from this thesis, but they are the useful benchmarks to test the validity of the findings of this thesis. Important comparisons are as follows:

7.2.6.1 Comparison between the findings from this study and the US PharmD studies

Key informants of this study and Boyden (2006) had included the internal and external stakeholders in pharmacy education, while Boss & Lowther (1993) only included internal stakeholders. However, this study had wider groups of external stakeholders (e.g., parents, health care providers, patients) than Boyden's study that only referred to regulatory bodies and pharmacy organisations. From a methodological standpoint, both Boyden (2006) and Boss & Lowther (1993) are case studies, while this study aimed to explore a broader overview of Thai pharmacy education.

There were some similarities between Thailand and the US, in terms of motivations for an all-PharmD degree (e.g., uniformity, the requirement of more clinical exposure in the pharmacy programmes) and beneficiaries (e.g., opportunity to respond to the clinical needs of society). Barriers were mentioned about cost of education and the pharmacists' frustration due to the limitation to provide the highest potential of PharmD pharmacists due to their heavy dispensing workload (Boyden, 2006). However, it seemed that the US pharmacy profession received high recognition and support from the government in terms of the scope of pharmacy practice and reimbursement (Boyden, 2006) when compared to the less evident recognition of the pharmacy profession in Thailand.

Boss & Lowther (1993) presented the interesting external influences that were similar to the curriculum change in Thai pharmacy education, especially in the external influences that created a need for the new PharmD curriculum (e.g., professional association, accreditation, and licensure).

However, regarding the intra-organisational influences, Boss & Lowther (1993) mentioned the different backgrounds of faculty members that might cause a lack of understanding of the concept of pharmaceutical care in academic staff who did not have a pharmacy background. This point was not mentioned in this thesis but it is an interesting issue for further discussion due to the idea that Thai pharmacy education needed an integrated case study that required cooperation from both non-pharmacy and pharmacy background academic staff (Boss and Lowther, 1993).

7.2.6.2 Comparison between the findings from this study and the Thai stakeholders' perspectives studies

The previous three studies about Thai stakeholders' perspectives of the transition to an all PharmD programme tried to identify characteristics and proportion of stakeholders who were supporting or were not supporting the transition to an all PharmD programme.
For example, most experts from the hospital and consumer protection areas and the pharmacy graduates agreed with the transition but the experts from community pharmacy and industry preferred a 5-year programme. Academic staff have mixed views regarding the duration of the pharmacy programme in pharmaceutical science (Chaichalermpong et al., 2009; Pramyothin et al., 1999; Wongpoowarak, 2013a).

The findings from this thesis have some overlap with those three studies. For example, the stakeholders, who related to hospital pharmacy and consumer protection areas, preferred a 6-year PharmD programme; while there was concern about the 6-year PharmD in the industrial track. This thesis looks into the wider groups of stakeholders and accesses more details by using in-depth interviews, when compared to the previous studies in Thai pharmacy education that mainly used surveys.

All previous studies might have limitations about generalisability to all stakeholders' opinions in Thailand due to limited sample size. Some studies provided insufficient details about sampling strategy. This current qualitative research also has limitation about the generalisability of its findings; therefore, this study should be used as a case-to-case transfer, not generalised to the broader stakeholders in Thailand.

7.3 Strengths and weaknesses of this study

This section will summarise the overall strengths and weaknesses of drawing conclusions from the findings. A more detailed discussion about the strengths and weaknesses of each phase in this study are explained in detail in the separate chapters.

7.3.1 Strengths

To this researcher's knowledge, this is the only study of its kind that explored the issues surrounding the transition to the 6-year PharmD programme in Thailand. The findings expand upon what is currently known about the curricular changes and may contribute to an understanding of the situation; in particular, the needs of pharmacy education and pharmacy practice in Thailand. This study used a pragmatic research approach that combined both quantitative and qualitative models to best understand the research questions (Creswell, 2014; Creswell and Clark, 2011) and to enhance the credibility of the findings. The findings from the three phases in this study and other documentary data sources including government documents, meetings' minutes, and unpublished reports, were triangulated in order to provide more reliable findings, conclusions, and recommendations.

7.3.2 Weaknesses

1) The 2013-2015 study period occurred during the early stages of the transition to a 6-year PharmD programme announced in 2008, when there were no PharmD graduates from this programme. Therefore, this study cannot evaluate the effectiveness, outcomes and impact of the 2008-announced 6-year PharmD programme (Rossi et al., 2004).

2) The study used a cross sectional study design that provides descriptive information. However, in order to study the curriculum change and development over time, a longitudinal study design to evaluate the impact of a curriculum designed to develop the PharmD graduates' competencies might be more appropriate than the current research model (Hoeppner et al., 2010; Levin, 2006).

7.4 Implications

7.4.1 Implications for the Faculties of Pharmacy in Thailand

Faculties have a responsibility to produce pharmacy graduates who have competencies that enable them to deliver services that meet the national needs and people's needs within the Thai healthcare, economic, political, and regulatory systems. In order to achieve the effectiveness of pharmacy graduate production, faculties might consider the following issues.

7.4.1.1 Scaling up the quantity and quality of pharmacy academic members

Academic staff can play an important role in reforming the curriculum. Policy makers and faculty administrators should consider a long-term plan to recruit and develop sufficiently qualified academic staff, and especially the next generation of academic staff who will need to focus more on clinical pharmacy practice than the current generation is doing.

All academic staff should regard their practice as a vital part of their teaching; in particular they should keep up-to-date with the current requirements in clinical practice in order to teach their students. Therefore, they should have time in their role that is dedicated to clinical practice as well as their teaching and research duties. Career progression should be designed to support academic staff to work or provide service in real practice settings.

7.4.1.2 Developing a formal preceptor preparation programme

The 6-year PharmD curriculum requires 2,000 hours of practice training, a fourfold increase from the 5-year BPharm's training requirements. The preceptors and training sites play a vital role to enhance teaching and learning opportunities for students (Sonthisombat, 2008).

However, this study showed that there was neither sufficient quantity nor quality of preceptors and training sites. Faculties, provider sites and regulatory bodies should collaborate in order to develop a formal preceptor preparation programme, which addresses the issues of standardisation and quality assurance of clerkships, career progression as preceptors, and a reward system for their clerkship workload (Tassaneeyakul et al., 2013).

However, preparing the qualified preceptors and preceptor sites requires increased investment. Unfortunately, there has been a limit of national resources available for education. Decreasing public investment in higher education is noted in the National Education Development Plans (Kirtikara, 2001) .

7.4.1.3 More general PharmD graduates are needed for primary care and secondary care, but fewer specialised PharmD graduates are needed for tertiary care

According to the Thai health care services there is a need for highly competent pharmacy graduates in primary care hospitals (Bureau of Health Administration and Office of the Permanent Secretary, 2013) and in community pharmacies (Payanantana et al., 2013). Pharmacy faculties should produce more general PharmD graduates for primary care and secondary care settings, but produce specialised PharmD graduates for tertiary care in lower numbers. However, few faculties planned to produce PharmD graduates to provide primary and secondary care, indicating that this personnel supply problem will continue (Sookaneknun et al., 2009).

7.4.1.4 Ensure the quality of education by develop the curriculum evaluation plan

According to the measurements of quality of pharmacy education, the accreditation process is important to demonstrate accountability to stakeholders. Faculties of Pharmacy had numerous processes for their quality assurance (e.g., internal and external quality assurance, the accreditation standard for faculties and curriculum PTC and the pharmacy licensure examination)(Wongpoowarak, 2013b).

However, faculties should develop an evaluation plan in order to assess the achievements of the new PharmD programme, which are the desired outcomes of the PharmD programme. The evaluation plan should be a continuous and systematic process covering all the accreditation standards. Faculties should ensure that a feedback loop for the evaluation is included in the faculty plan that will be implemented and shared with academics and other relevant stakeholders.

7.4.1.5 Requirement to develop the pharmacy database in pharmacy education

The findings (Chapter 4) revealed that participants felt that it was very difficult, or even impossible, to access information requested by this study. Information came from various sources and various forms of material data sources, such as computer files and hard copies. This difficulty in trying to retrieve education information revealed that effective education management information systems are needed to support basic statistical information, and to inform and support future decisions at both institutional and national levels. Many countries also face a similar education information problem (Hassell et al., 2007; Moses, 2001). The tool of an efficient education management information system should be developed to support future decisions in a timely manner (Baldwin et al., 2015; Moses, 2001).

7.4.2 Implications for the Pharmacy Council of Thailand

7.4.2.1 Need for a strategic plan for future supply and requirement of pharmacy workforce

According to the mismatch in the number of admissions in each track and the job market positions available, this issue needs a clear strategic plan for the future supply and requirements of the pharmacy workforce in every subsector (Payanantana et al., 2013). The most up to date analysis of future supply and requirements for pharmacy workforce was predicted for the situation during 2009-2019 (Prapunwattana, 2012). Thus, in order to prepare for the dynamic and numerous influences on the field of pharmacy, particularly health care system reforms and new regulations, the future pharmacy workforce supply and requirements plan should be long enough (10-20 years) and regularly updated approximately every 3-5 years (Payanantana et al., 2013).

7.4.2.2 Flexibility of the 6-year PharmD curriculum

In order to solve the existing problems of mismatches of the number of admissions to each track and the job market positions available, the PCT and faculties should consider the flexibility of course and curricula especially in this transition period. Approximately 10-20% of IP-PD graduates will go on to work in Thai pharmaceutical industry as jobs become available (Tassaneeyakul et al., 2013). Therefore, approximately 70-80% of IP-PD graduates will not work in the industrial pharmacy field due to the limited pharmacists' positions available.

Therefore, this group of IP-PD graduates will work in other areas, such as hospital and community pharmacy. The IP-PD graduates might be able to provide basic pharmacy services but might not be sufficiently competent to provide new services in pharmaceutical care.

Faculties should provide extra didactic coursework and practice experience in pharmaceutical care area for the IP-PD graduates. This might help the IP-PD graduates to prepare themselves for a dynamic and uncertain future job markets during this transition of pharmacy education.

In addition, cooperation among stakeholders is necessary to fill the gaps in the graduates' competencies and the stakeholders' needs. Faculties should closely follow the National Health Service policy and global regulations that might affect the Thai pharmacy profession and pharmacy education. This might help to ensure that pharmacy education provides the necessary competencies for graduates to perform the pharmacy practice needed in the country.

7.4.2.3 Preparation for the PharmD graduates in workplace settings

Enhancing the opportunity for extending pharmacists' involvement in the health care system beyond dispensing prescription medicines, might occur only when the government mandates it (Kishi, 2001). Examples of countries that expanded pharmacy responsibility in health care system, by using regulations, are shown as follows:

1) In the US: the Medication Therapy Management (MTM) in the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 provides pharmacists with a larger opportunity to perform professional services and receive compensation for their medication expertise (Barnett et al., 2009).

2) In the UK: the National Health Service (NHS) Act (2006) and the NHS pharmaceutical and local pharmaceutical services regulations (2013) encourages opportunity for community pharmacies and pharmacists in various roles. These roles include: i) dispensing, ii) promotion health lifestyle, iii) supporting self-care for minor ailments, iv) Medication Use Reviews (MUR), v) New Medicine Service (NMS), vi) and independent prescribers (IP) for chronic diseases (General Pharmaceutical Council, 2016c).

3) In Japan: the Prescription Law (1890) separates prescribing and dispensing in Japan (Inoue et al., 2015; Seo, 1994).

4) In South Korea: the Prescription Law (2000) of the Republic of Korea (South Korea) introduced a complete separation of the prescribing and dispensing roles (Cho, 2002).

Therefore, to make changes in pharmacy practice, there still needs to be more collaboration among education, practice and regulation. The regulatory bodies should consider the supportive system that gives pharmacists the opportunity to provide advanced practice employing their full expertise (American Association of Colleges of Pharmacy, 2016a; Anderson et al., 2012b; Rouse and Meštrovic, 2014) and prepare policy for pharmacy professional administration in health care systems by addressing career structures for progression and advancement and salary revision for providing the new pharmacy services (Anderson, 2013; Babar et al., 2013; WHO, 2013).

However, the traditional health care systems in Thailand, allow physicians at private clinics to prescribe, dispense and sell medicines to patients, and community pharmacists can conduct independent evaluations of customers/ patients and dispense medications based on their assessment. This system still has benefits, especially when primary care is not widely available to the people (Cho, 2002). To make changes by legislation needs more discussion about the advantages of accessibility and disadvantages of potential drug misuse or overuse. Therefore, encouraging changes in pharmacy practice using legislation in Thailand might not be easy to do in the near future.

7.4.3 Implications for global pharmacy education

This study contributes to global pharmacy education research as a case study of the pharmacy educational transformation in Asian countries. There are numerous barriers to the delivery of quality pharmacy education, due to limited infrastructure, academic staff and preceptor capacity, and the need of support legislation to provide new services in practice.

Formal collaboration, resources sharing, and academic staff exchange for skills and capacity training, as well as ongoing consultation through the global pharmacy education network (FIP, WHO) are all still needed (Anderson et al., 2014b).

7.5 Recommendations for further research

Although this study has achieved its aims and objectives, and provided basic information and the context of the transition to the 6-year PharmD programme, there are still many questions that need answering, in order to gain further understanding of the transition. Further research should focus on the outcome, impact and an efficiency assessment of the new, countrywide 6-year PharmD programme.

7.5.1 An outcome assessment

Rossi et al., (2004) stated that "an outcome is the state of the target population or the social conditions that a programme is expected to have changed" (General Pharmaceutical Council, 2015a). Outcome monitoring could guide policy makers to improve the programme with timely and inexpensive findings (General Pharmaceutical Council, 2015a). The policy makers and stakeholders should have an opportunity to discuss clear and specific outcome measures (General Pharmaceutical Council, 2015a). The examples of the pharmacy education outcomes are described as follows:

1) The knowledge, skills, behaviours, and attitude related competencies of the PharmD graduates; explore whether the PharmD graduates' competencies meet the stakeholders' expectations and needs

2) Characteristics of the PharmD graduates' workplaces, job activities, and the job satisfaction of the PharmD graduates, in order to identify whether the PharmD graduates are working in their specialised areas

3) Satisfactions of the stakeholders (e.g., the PharmD graduates, parents, employers, health care teams, patients, customers) regarding the competencies and services provided by the PharmD graduates

Therefore, pharmacy regulatory bodies and pharmacy educators should examine what kind of curricular outcomes are required to adequately prepare pharmacists in Thailand and in other similar countries (Anderson and Futter, 2009)

7.5.2 An impact assessment

The policy makers should study the impact of the PharmD graduates' services on their practice. They should address issues such as savings in healthcare costs, impact on improving the health care quality in real practices environment judged by the significance of the PharmD graduates' intervention (Peterson and Gencel, 2013). It is also relevant to consider formal recognition of pharmacy profession's importance, as well as pharmacists' professional image as perceived by the public and government (Pharmacy Board of Australia, 2016).

7.5.3 An efficiency assessment

The policy makers should study the degree of the 6-year PharmD programme's benefits, in the context of its direct and indirect positive outcomes, or whether its effectiveness exceeds its costs in the form of inputs required to produce the PharmD graduates (General Pharmaceutical Council, 2015a). Cost-benefit and cost-effectiveness analyses are normally used to judge the efficiency of educational programmes (General Pharmaceutical Council, 2015a; General Pharmaceutical Council, 2016d).

7.6 Reflexivity

The concept of reflexivity relates to the awareness of a qualitative researcher's position, the biases, values and experiences they bring to a qualitative research study (Creswell and Clark, 2011). Therefore, a qualitative study such as this should include information about the researcher: her background characteristics, personal and professional information that may have affected data collection, data analysis and interpretation (Creswell and Clark, 2011; Patton, 2002).

I am a female Thai academic staff member at a university-based faculty of pharmacy in Thailand; a position I have held for approximately 10 years. I also practice as a community pharmacist for the university drugstore. I graduated in BPharm and MPharm (Clinical Pharmacy) from Thailand. My teaching interests focus on clinical pharmacy, drug information services, and therapeutic drug monitoring. I decided to be a lecturer because I realised that better education can produce the qualified and competent pharmacy graduates needed and this, in turn, means better things for our patients and society.

While I worked as a lecturer, I observed the changes within pharmacy education and pharmacy practice. I am interested in improving pharmacy education and wish to contribute to pharmacy education policy and pharmacy practice. However, I have had very little my involvement in this curriculum change. Like other curriculum changes, there are many levels of stakeholders' involvement. I am a lecturer who knew about the curriculum change as a puzzle piece. I am a complete outsider in the eyes of the policy makers who made the curriculum transition to an all-PharmD programme. I have been involved in the process of developing the new curriculum that followed the curriculum structure of the 2008-announced PharmD programme, in terms of the revised details of some subjects and made some comments on an overview of the curriculum structure in one faculty.

My professional background as an academic staff member and pharmacist might have shaped my data collection, analysis, and interpretation of the phenomenon in this study. To aid reflexivity, I had my personal memos within my diary and in Word documents recording my feelings, emerging themes, and the relation of each interview to other interviews. I also had regular discussions with my academic supervisors.

I went back to Thailand to conduct the qualitative research, which was challenging because I have to see the world of academic culture and pharmacy practice that I was familiar with in a new mind-set. For example, I had to try to not make any assumptions; I decided to not assume that I understand what the interviewees told me unless I clarified their meaning with them.

I am familiar with the nature of each stakeholder group, which is the main context of this study. This might have helped me to create rapport and get through gatekeepers (FIP, 2015c). However, I have to choose my 'insider-outsider' position in different situations. For example, to gain access to the academic institutions, I introduced myself as a lecturer from a faculty of pharmacy who is a PhD student. As an insider, I have privileged access to deans and academic staff and had a deeper understanding and clarity of the situation than an outsider would have. Most insiders gave me a huge support and they thought that it might be useful for pharmacy education.

Sometimes I had to declare my position as a pharmacist and a lecturer from a faculty of pharmacy to establish better rapport with pharmacy practitioners. On the other hand, when collecting data in hospitals, I introduced myself as a research student from the university who had no relationship with the hospital. This introduction to the patients made them feel comfortable; I always ensured the confidentiality of the interviews and assured each patient that their views and responses would have no effect on their treatments.

With the physicians and nurses, I introduced myself as a lecturer who is studying for a PhD and did not mention that I am a pharmacist. This deliberate withholding of information was in order to make the nurses and doctors feel free to share their opinions regarding pharmacy graduates and the pharmacy profession.

My recent interest is in exploring peoples' experiences by using a qualitative approach. Although I was an inexperienced researcher in qualitative research, I prepared myself by attending many qualitative research-training courses that covered such topics as qualitative methods, individual and group interviews and analysing qualitative data. This preparation aimed to develop various research skills in qualitative research. I practiced the interviews with two experienced qualitative researchers: an academic and nurse. In addition, before the main study started, I conducted a pilot study to test the interview process and the interview schedule. The training and experiences that I had been through, allowed me to have enough confidence to conduct the interviews.

As a qualitative researcher, I adhered strictly to the research-related ethical requirements concerning confidentiality, consequences and the researcher's role. I also acknowledged the issue of the scientific quality of research; maintaining the distances between being a researcher, a pharmacy professional and sometimes a personal friend, in order to provide a full and unbiased investigation of the phenomena of interest (FIP, 2015c). Therefore, both positive and concerned perceptions regarding the transition of pharmacy education in Thailand, from a BPharm to a PharmD model, have been presented and discussed in this thesis.

7.7 Conclusion

In this thesis, the issues surrounding the transition to an all-PharmD programme in Thailand were carefully investigated and evaluated. The mixed method approach was employed in this study in order to enhance the trustworthiness of the findings. The findings from the three phases of this study and other data sources were triangulated in order to provide a better picture of the transition of Thai pharmacy education.

To the researcher's knowledge, this is the first study of its kind that has explored the stakeholders' perceptions regarding the introduction to the 6-year PharmD programme in Thailand. This study reflects the influences and the requirements of the transition that it was initiated, in order to meet the need for higher levels of competency for the nation's pharmacists and is influenced by many factors.

The stakeholders perceived benefits from the transition. They thought that the PharmD graduates will have higher competencies and be ready to work as pharmacists compared to graduates from the previous pharmacy curriculum. This is due to the longer practice based training experiences. The most important benefit is for the Thai health-care system and the Thai population that they will be well served by the pharmacy graduates from the new PharmD programme. The findings also addressed the following issues concerning curriculum change: the higher costs of
a longer-time's study, the mismatch between the pharmacy graduates' competency and the job market's needs and the shortage of qualified preceptors.

This study highlights challenges to the transition process and should enable policy makers, pharmacy faculties, and pharmacy professional organisations to collaborate to overcome these challenges. It is exciting to observe how the Thai 6-year PharmD graduates, who are expected to have higher competencies than previous BPharm graduates and be ready to work, will influence pharmacy practice. The policy makers should consider evaluating the PharmD programme and the supportive system that give pharmacists the opportunity to provide advanced practice at their full expertise by preparing policy for pharmacy professional administration in health care systems. The transition in Thai pharmacy education has the potential to facilitate the required advancements in practice despite numerous challenges and barriers.

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APPENDICES

APPENDIX 1: Literature search strategy

Reviewing the published literature provides background data that helps researchers to become familiar with what is already known about a specific area, indicating potential pitfalls and best practices, and identifying the needs or unknowns in the particular area of study. A comprehensive literature search should be conducted to review all potentially valuable information (Poirier and Behnen, 2014). The steps of the systematic approach to searching for education literature in this study are summarised in Table A1-1.

Table A1-1 The steps of the literature search for this study

Step	Strategic used in this study
1. Define the question and scope of the question	-Research question: Information that related to "the transition to the PharmD degree" -Scope of the question: 1. Information that related to "the transition to the PharmD degree" in Thailand and other countries 2. Details of the transition: need for change/transition, characteristics of pharmacy education in such countries that transition to the PharmD degree, cooperative climate, politics (internal networking, resource allocation, relationship with the external environment), participation by the stakeholders, evaluation -I was unable to find anything on the topic of the transition to an all-PharmD degree programme. I solved the problem by breaking keywords into smaller groupings (e.g., pharmacy education, PharmD, curriculum change, specific countries)
2. Identify search terms to use	1. Medical Subject Headings (MESH): Education, Pharmacy 2. Free text searching: -Doctor of Pharmacy, PharmD -degree, curricula, programme -transition, change, reform, revise, development
3. Determine appropriate resources to search	1. The Education Resource Information Centre (ERIC) 2. EMBASE (includes all of Medline plus 2,000 additional journals and abstracts from conferences related to biomedical research) 3. Google Scholar (a web-crawler that searches online theses, books, journals) 4. International Pharmaceutical Abstracts (IPA) (indexed more than 800 journals related to pharmacy, medicine and health) 5. Medline(indexed more than 5,000 journals biomedical literature journals) 6. PsycINFO (indexes more than 2,500 journals in the areas of behavioural and mental health) 7. Scopus (indexes more than 21,000 titles related to science, medicine, and art & humanities) 8. American Association of Colleges of Pharmacy Educational Resources (includes curriculum and assessment information for pharmacy education)
4. Search/ refine search terms and strategies based on information found	-Tertiary, database resources -Articles published from 1950- April 2016 were included. However, the focus of this review is on the more recent literature.
5. Supplement the search with a manual search of key journals	Specific journal in pharmacy education: American Journal of Pharmaceutical Education, Currents in Pharmacy Teaching and Learning, Journal of Pharmacy Teaching, Pharmacy Education
6. Organise the information	Endnotes programme
7. Appraise the evidence	Using the evidence-based medicine pyramid divided into levels. Each level represents a different type of study design and corresponds to increasing rigor, quality, and reliability of the evidence. The systematic reviews and meta-analysis occupy the top of the quality and reliability of the evidence, followed by randomised control double-blind studies, cohort studies, case reports, and ideas/opinions (Rosner AL. Evidence-based medicine: revisiting the pyramid of priorities. Journal of Bodywork and Movement Therapies 2012: 16(1):42-9.)

APPENDIX 2: Key articles reporting the transition from the BPharm to the PharmD programme

The key articles concerning the four main issues (e.g., need for the transition, process, barriers, impact/outcome) in the transition from the BPharm to PharmD programme are summarised in Table A2-1.

Table A2-1 Key articles reporting the transition of the entry-level qualification from the BPharm to the PharmD degree programme in term of the global perspectives and in the specific countries

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Global perspectives					
Letter to editors	**Ahmed (2008)** The controversy of PharmD degree (Ahmed and Hassali, 2008) :US and the developing Countries	**US** 1. The PharmD programme was first introduced in the US. It aims to produce a pharmacy that had better clinical skills and is modified to match the US system. 2. The PharmD pharmacists are required in order to fulfil the requirements of the system.	**In developing countries** -In addition, the main option for pharmacy graduates is still to work in pharmaceutical industries. Therefore, their pharmacy curricula still keep the industrial pharmacy aspect as well as the clinical aspects.	**Barriers** 1. The pharmacy practice in pharmaceutical care area in the developing countries has less recognition compare to the US. Therefore, the practice in clinical area might be limited.	1. Confusing about role expectation from the PharmD graduates due to some countries had PharmD programme in both pharmaceutical care and pharmaceutical sciences. The PharmD degree should be for producing clinical pharmacists, and bachelor of pharmacy programs should be continued a basic degree programs. 2. There must be a similar definition of the PharmD degree all over the world (e.g., limit opportunity of graduates from different parts of the world to take pharmacy board registration examination in the US)
Letter to editor	**Amir (2011)** The aftereffects of implementing the PharmD degree in developing countries (Amir, 2011) :US and the developing countries	**US** -The transition of the entry-level qualification to the PharmD degree fulfils the need in practice that enhanced the role of pharmacists in providing patient pharmaceutical care.	**US** 1. The most remarkable change in pharmacy practice is the enhanced role of pharmacists in providing patient pharmaceutical care. The transition of the entry-level qualification to the PharmD degree played a vital role in these change. 2. The developments of the practice in pharmaceutical care began in the US and then the rest of the world has followed. **Other countries** The countries with developed pharmacy practice faced fewer difficulties in adopting these changes. However, countries with underdeveloped pharmacy practice are still facing hardships.	**Barriers** 1. Low quality of clinical education and low student satisfaction due to lack of clinical faculty members and low collaboration with hospital 2. Professional market demand: In many of the developing countries, pharmacy graduates are motivated to pursue careers in the pharmaceutical industry due to high salary and other practice area (e.g., community pharmacy, hospital pharmacy and teaching are still under developed and are not not great career options on a long-term basis.	**1. The title of doctor:** It is still not clear in many developed countries. There has been no regulation adapted regarding this issue. **2. Discourage the industry from hiring pharmacist** **3. Confusion about new role for pharmacists**: the changing role of pharmacist might cause the confusion for pharmacy students about which field to follow, and public might confused that how this new professional can help them. **The authors suggested as follows:** 1. There should have mutual understanding among academic associations and among councils from developed and developing countries to clarify the new role for pharmacists. The international societies also need to play a vital role to creating liaisons among all these associations and councils. 2. The 5-year BPharm should be the first pharmacy degree. Then a specialised degree (e.g., PharmD for clinical or master's degree in other area) should be offered.

[a]**Manuscript categories** of the American Journal Pharmaceutical Education (AJPE): **Letters to the Editor** means a forum for the expression of ideas or commenting on matters of interest; **Research articles** describe experimental or observational investigation that used formal methods for data collection and reporting of results of studies directly related to pharmacy education; **Reviews** are comprehensive, well-referenced descriptive papers; **Viewpoint** is focuses on a specific topic and present two opposing opinions; [b]**Need for the transition:** that refers to the needs for the transition in each country and other context (e.g., history of the transition, the cultural environment surrounding the transition); [c]**Process:** that refers to the manner of enactment of transition, process of implementing the transition, leadership, enablers, and barriers to the transition; [d]**Barriers:** that refers to refers to factors that act as barriers to the successful planning and implementation of the transition; [e]**Outcomes**: that refers to the outcomes or impact of the transition in practice

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Global perspectives					
Letter to editors	**Jamshed, et al. (2007)** The PharmD degree in developing countries) (Jamshed et al., 2007) :US, Korea and the developing countries (e.g., India, Pakistan, Iran)	-The authors wondered about the real need of the curriculum change to the PharmD degree in developing countries that 1. whether these countries are interested in a practice-base model or simply want their graduates to enrol in the US system 2. whether these countries would like to emphasis pharmaceutical care area or want to use the PharmD degree as a tool for the pharmacist to be employed internationally or as a sole instrument of professional power and status.	**In the US** -The US PharmD programme is an example of the practice-based model that moves to a more patient-focused programme. **In the Developing countries** -Clinical pharmacy in developing countries is promoted as an isolated single entity and not related to a stable population-based pharmaceutical system while in the US, the clinical pharmacy was established and stable drug distribution system and drug regulatory authorities were efficient.	1. Less an understanding of clinical pharmacy concept (India) 2. Lack of resources (e.g., experienced academic staff and practice-based facilities) and practice experiences in clinical pharmacy (Pakistan)	-The transition may ignite a conflict for power between pharmacists and physicians (Korea). -The FIP would take attention about the merit of the implementation of the PharmD degree in the developing countries.
Viewpoints	**Anderson, et al. (2009)** PharmD or needs based education: which comes first?	-There is an increasing trend in developing countries towards PharmD degree. -There is many reasons for changing to a more clinical degree: more complex drugs, increasing aging population with more diseases that requiring more complex therapies; need to improve patient outcomes and safety; need to improve cost effectiveness; pharmacists' roles move from their dispensaries into wards and clinics. -Hungary: the entry level qualification has been change to PharmD because the number of applicants to pharmacy had declined due to less attractive in pharmacy career. -Bangladesh: To shift to the PharmD, Bangladeshi pharmacists would be able to go and work in the US	N/A	-There is often no professional fee to reward pharmacists for making high-risk clinical decisions or motivate them to keep up-to-date with drug information. -There is a shortage of qualified preceptors in India. -There is a lack of readiness or competency of practitioners to be preceptors. -It may be too late for the countries that adopting the PharmD as the entry-level qualification without having infrastructure, economic resources to provide adequate pharmaceutical services and adequate internships.	-Pakistan: From the transition, there has been shift in education from traditional role industry towards clinical pharmacy. This change is facing resistance form a number of stakeholders (e.g., drug sellers, doctors). Pharmacists in Pakistan are undergoing an identity crisis and almost 90% of graduates leaving Pakistan soon after graduates. -The authors wonder what evidence would be needed to be satisfied that PharmD degree was the way to go for everyone? -It would be difficult to develop a convincing argument to support a relationship between these indicators (e.g., decline in the number of medicine-related problems, fewer prescription errors, and decline in national spending on health issues) and the introduction of the PharmD degree. There should develop a framework, a set of indicators to measure and monitor the impact of the PharmD degree to help countries who are consider introducing a PharmD programme. -The introduction of the PharmD degree should be the transformational process rather than a one-off event. The next steps could be taken to examine what kind of curricular outcomes are required to adequately prepare pharmacists in particular countries.

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Global perspectives					
Systematic review	**Babar, et al. (2013)** A bibliometric review of pharmacy education literature in the context of low-to middle-income countries (Babar et al., 2013) This review systematically identified published literature on pharmacy education in the low and middle-income countries **Aims:** 1. To systematically identify and quantify published literature on pharmacy education in the context of low-and middle-income countries 2. To explore and understand the major patterns of dialogue in this literature **Method:** a cohort of publications were quantitatively analysed to determine paper types, country context, publication by year and journal source and using document analysis to identified the major themes.	**Following the West: go local or go global** -Why switch to PharmD when BPharm is already inadequate -The notion of PharmD degree as a tag -PharmD will facilitate from industry-based pharmacy education to patient-based pharmacy education -Ways of transitioning to the PharmD degree in a needs-based fashion is called for	N/A	-The PharmD programme does not provide clinical insight trough interdisciplinary training experiences and pharmacy remains isolated from the health care team.	-Is the PharmD degree needed and what are the critical indicators to determine whether it has worked

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Canada					
Report	**Hill (1999)** The "Entry-level" Doctor of Pharmacy (PharmD) degree issue for schools of pharmacy in Canada (Hill, 1999)	1. Canadian institutions, economics, educational, cultural, are profoundly influence by US policies and practices. Canadian pharmacists an pharmacy practice will not able to have a different educational qualification once the US pharmacy schools have converted over the PharmD degree. The entry-to-practice harmonisation rationale is occasionally stated as "we don't have a choice-we just have to do it". 2. The pharmacy practice in Canada needs more highly educated graduates in order to serve society to ensure optimal use of medicine. The higher standard of profession and quality of pharmacy practice could be facilitated by the PharmD trained graduates. 3. Increase the sense of professional dignity and status of the pharmacist comparable to the other "doctor-titled" health care providers. 4. The new Pharmacy degree will offer an opportunity to gain access to new financial resources (increase intuition fee structure).	-Early 1990s the frst post BPharm PharmD programmes started at University of British Columbia and Toronto.	1. Professional or social need: the nature of pharmacy practice is well-addressed by the knowledge and competencies of the current BPharm graduate. The view does not against to improve the BPharm but does not accept the need for a major change to the entry-level PharmD. 2. The change in practice is not depend only the supply of a new type of graduates but influenced by professional and economic incentives, market structures in community pharmacy and the motivation and personal commitment of current BPharm pharmacists. There was no formal national workload or workforce panning data for pharmacist and the good studies documenting the clinical or economic impact of pharmacists' interventions of Canadian population health. 3. Implementation and resources issues: insufficient of faculty staf, quality of clerkship sites and clinical instructors in hospitals and community pharmacists; increased tuition fees,	-Hill reviewed the literature concerning the impact of the PharmD graduates on practice in the US. The findings showed that the job activities and professional satisfaction of BPharm and the PharmD pharmacists are not significant different in most practice settings.
Reviews	**Koleba, et al. (2006)** Entry-level PharmD degree programs in Canada: some facts and stakeholder opinions (Koleba et al., 2006)	N/A	-Summarised the positions and opinions of some representative national stakeholder groups on the issue of conversion to an entry level of PharmD degree in Canada. -The Association of Deans of Pharmacy of Canada and the Association of Faculty of Pharmacy of Canada support the conversion, and the development of educational outcomes and accreditation standards are started.	-The Canadian Pharmacists Association perceives that there is a need for practice change but is unsure that the PharmD degree is the answer. It is concern that supporting transition to the PharmD degree may give government the impression that the BPharm pharmacists are inadequately trained and will result in two-class professional structure.	-It is inevitable that Canada will follow the lead of the US and will eventually convert to an all-PharmD degree. -Similar to the US, there appears to have been an absence of unified support for this transition in advance of its implementation.
Reviews	**Frankel, et al. (2014)** Canadian educational approaches for the advancement of pharmacy practice (Frankel et al., 2014)	-To prepare new pharmacy graduates to address new clinical roles	-The Association of Faculties of Pharmacy of Canada has recommended entry-to practice PharmD programmes for all schools by the year 2020 -Accreditation standards have been revised to include standards for the PharmD programme effective 2013	-The need for more experiential placement for students: faculties are reporting difficulties placing students for clinical rotation	N/A

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Canada					
Position statement	**Canadian Pharmacists Association (2008)** CPhA position statement on a Doctor of Pharmacy degree as an entry-level for practice	-The changes in the legislation and regulations governing pharmacy practice granting pharmacists more authority to prescribe and monitor drug therapy. This evolution of pharmacists' role required pharmacists' skills and knowledge for provide this roles. Professional leaders have called for the pharmacy education to include more inter-professional experiences, and more practice but the four year programme had limitation to accommodate additional skills and training development.	-CPhA has a strategic goal to advance the role of the pharmacist. They have led two key research for this strategic goal; both have identified a need for curricular change 1. The Blueprint for Pharmacy: the vision for pharmacy 2. The Moving Forward: pharmacy human resources for the future	N/A	N/A
Japan					
Letter to editor	**Dolder, et al.(2008)** Changes in Japanese pharmacy education and practice (Dolder et al., 2008)	The governmental agencies and schools of pharmacy shaped the Japanese pharmacy practice.	**Japan** -The 4-year programme was emphasised on the scientific. -The 6-year programme was emphasised on pharmaceutical care and had 2.5-month rotations in hospital and community pharmacy settings, which longer than the 4-year programme that included only 2-4 week hospital pharmacy rotation.	The 6-year programme was proposed by the JPA in 1973 but it was not implemented until 2003 that the Council for Pharmaceutical Education approved the transition **Barriers** 1) the small number of academic staff in clinical pharmacy department 2) high need of pharmacist preceptors 3) most of preceptors are not have completed practice rotations or studied under pharmacist preceptors when they were students 4) the 6-year graduates will face barriers in practices (e.g., an increased prescription volume) 5) the limited scope of practice of the pharmacy assistants	N/A
Reviews	**Watanabe, et al.(2005)** The case for a shift in pharmacists' activities and pharmacy education-based on those in the English speaking Western Countries (Watanabe et al., 2005a)	To improve the effectiveness of the pharmacist and to provide high quality health care.	-The history of the introduction of pharmaceutical care concept in Japan -The Japan Pharmaceutical Association begun to consider changes to pharmacy education in 1960's. -Comparison between Japanese pharmacy practice and Western	1 The Japanese pharmacists' activities were not shifted to clinical-orientated activities. 2. A need to consider a standard curriculum for the 6-year programme 3. Poor pharmacy management due to deregulation and doubts to the role of pharmacists	-The introduction to a 6-year programme will raise the level of care and meet international standards of pharmacy practice. -However, there is a need examine pharmacy education in the future in the context of the oversupply of pharmacists and the need for expanding the scope of career choices and possible retraining.

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
Pakistan					
Reviews	**Khan (2011)** Challenges to pharmacy and pharmacy practice in Pakistan (Khan, 2011)	1. To upgrade and standardise the current pharmacy education system according to international educational and practice needs. So that, Pakistani pharmacists will have an opportunity in their higher education and applying for jobs worldwide. 2. Due to the risen job saturation in the industry, it was essential to prepare Pakistani pharmacist to play their role in clinical practice area.	The Higher Education Commission (HEC) took the initiative to develop a 5-year PharmD programme. All universities have to follow the HEC approved PharmD programme which is one of the conditions for accreditation.	1. There had many criticised in the Pakistani PharmD programme due to the high demand of pharmacy workforce in the industry. Thus, there was no need to upgrade the BPharm to the PharmD due to BPharm were suitable for the industrial requirement. 2. The deficiency in the clinical contents in the curriculum 3. Lack of experience and qualified staff 4. Challenges in Pakistani health care system: availability of hospital jobs and acceptance by the other health professionals	N/A
Reviews	**Khan (2011)** Glimpse of pharmacy education in Pakistan and current challenges to pharmacy education (Khan, 2010)	To fulfil the international standards, the 4-year BPharm was upgraded to 5-year Pharm programme. The focus of PharmD programme was to incorporate the role of pharmacist in patient care that hardly to see in hospital.	N/A	In 2010, clinical pharmacists are still struggling for their rights to practice as a part of the team.	-The minimum qualification requirement for the post in the most of pharmaceutical industries is change from BPharm to PharmD due to the industry give preference to PharmD. It is not a problem in Pakistan but India and Bangladesh are facing the same situation. There should be ensuring the job security for the BPharm graduates. -The author suggested that there should have a programme specialised for both clinical pharmacy and industry pharmacy which important for the traditional role of pharmacist in Pakistani pharmaceutical sector.
Reviews	**Madiha, et al. (2014)** Curriculum and pharmacy practice experience offered for PharmD in Pakistan: needs and possibilities (Madiha and Yang, 2014)	N/A	-PharmD programme was implemented in Pakistan since 2004. -The Pharmacy Council of Pakistan has revised PharmD curriculum in 2011 in order to improve the previous curriculum that lack of clinical content.	-Some major improvement required to be done in curriculum and clinical clerkship. -There is a lack of proper communication among different governing bodies about the new role of pharmacists in health care system. -There are some flaws in PharmD syllabi due to the limited space given to pharmacist to provide pharmaceutical care in health care sector that leading to insufficient learning or practice opportunities for undergraduate students.	-It will take time to establish proper clinical role of pharmacists in Pakistan. An effort is needed from all stakeholders to upgrade and strengthen pharmacy education and profession.

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
South Korea					
Letter to editor	Kim (2013) Career perspectives of future graduates of the newly implemented 6-year pharmacy educational system in South Korea (Kim and Ghimire, 2013)	Pharmacy practice in Korea has changed since a new prescription law was enacted in 2000. Pharmacists were required to perform drug use evaluation and medication teaching and counselling for patients prior to dispensing. However, due to the country's insufficient pharmacy education and trading system, the pharmacist have insufficiently prepare to provide these services. The new curriculum aimed to cope with the recent changes in the scope of practice of pharmacists and align with the global trend toward 6- year pharmacy programmes	There was the implementation of a pharmacy education reform programme in 2009. The 4-year BPharm was expanded to a 6-year (2+4) programme.	-Korean students are yet to get exposure to pharmacy practice experience based on experiential core curriculum. Thus, follow-up study would be beneficial.	N/A
Thailand					
Reviews	Pongcharoensuk, et al. (2012) Centennial pharmacy education in Thailand (Pongcharoensuk and Prakongpan, 2012)	-The pharmacists' role dramatically changed from compounding and dispensing to the patient care services. Pharmacists must provide professional function (e.g., participation in drug use decision, determination of dose and dosage schedule). These changes in practice needed change in education. It is expected that a 6-year programme would produce graduates for providing services in health care settings.	-In 2008, the Pharmacy Council of Thailand announced a statement that pharmacy licensures are required to have 6-year training. All pharmacy curricula moved to a 6-year PharmD in 2014 for pharmacy licenses.	-The transition has been done in a haphazard manner, without taking into consideration of the many important factors of Thai health care system and also the constrains of all pharmacy schools. -It lacks the long-term strategy for implementation. -Extending one year in schools is a costly investment.	N/A

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
The US					
Position paper	**American Association of Colleges of Pharmacy (AACP) (1992)** Commission to implement change in pharmaceutical education: entry-level education in pharmacy: a commitment to change	-The concept of pharmaceutical is revolutionary. There was the call by the profession for pharmacists prepared to deliver pharmaceutical care in any setting to help prescribers and patients make the best use of medicines.	-The commission concluded that all schools and colleges should have plans for implemented entry-level PharmD programmes by the end of the 1994-95 academic year.	-Some barriers include the sufficiency of resources (e.g., financial, faculty, training sites), the impact of these changes on related programmes (e.g., graduate education, research residencies and fellowships), and current practitioners of the change in entry-level degree. -Many barriers result from efforts to change the status quo in pharmacy practice; e.g., economic ("the public won't pay for it"); logistic ("pharmacists don't have patient data"); inter-professional ("physicians won't stand for it") and competence ("pharmacist can't do it").	-The change in education and practice must be monitored and evaluated. -The Commission urges AACP to build a variety of procedures for evaluating change.
Book chapter	**Francisco (2003)** Doctor of Pharmacy (Francisco, 2003)	-The AACP President William Miller appointed a task force, which was termed "the AACP Commission of Implement Change in Pharmacy Education", to develop recommendation to guide pharmacy education to meet the demands of the profession, the health care system and the society	-In 1972, the American Association of Colleges of Pharmacy (AACP) recommended the formation of a "Commission on Pharmacy" to study the scope of pharmacy services in health care and the educational requirements needed to train pharmacists in order to provide the clinical pharmacy services. -In 1978, the concept of pharmaceutical care rekindled the discussion of pharmacy curricula, degrees, and practice. -1989, ACPE stated its intent to accredit only PharmD degree from the year 2000.	N/A	N/A
Reviews	**Patton, et al. (2010)** AM Last Page: the Doctor of Pharmacy (PharmD) degree (Patton et al., 2010)	-The transition to the PharmD degree reflected the need for pharmacists to assure new roles and improved medication-therapy management services for increasing complex conditions.	-The BPharm degree was the primary degree conferred though the mid-1990s; however, this began to change rapidly with the implementation of the new ACPE standards 2000.	N/A	N/A

Table A2-1 (Continued)

Manuscript categories[a]	Author and title	Summary of key findings			
		Need for the transition[b]	Process[c]	Barriers[d]	Impact/outcomes[e]
The US					
Viewpoint	**Knapp (2011)** The rocky road to educational change: adopting the entry-level PharmD at Maryland, 1989-93 (Knapp, 2011)	-This viewpoint explained a case study of the transition from the BPharm to the PharmD programme at Maryland. -Needs for the change: to create pharmacists that will help to create a change, the University of Maryland School of Pharmacy should implement the all-PharmD programme.	History of the transition in the different periods: -1986-89: Prelude-continue the dual degree or move to an all-PharmD -1990: Announcing the decision and the response -1991: Chain store opposition – the current BPharm met the needs of the drug store well -1993 and beyond: The aftermath -Fast forward to 2011	The opposition testimony as follows: 1. Transition to PharmD programme is unnecessary for quality 2. Lengthening the program by a year would cost money to both tax payers and to the students 3. It will result in a reduced supply of pharmacist in Maryland	-The transition period was completed successfully with the first all-PharmD class graduating in spring 1997. -The number of applicants to the PharmD programme was substantially higher than it had been for the BPharm programme. -Transition planning and the opportunity for current and transfer BPharm students to enter the third year of the PharmD programme ensured graduates every year -The non-traditional PharmD programme was launched successfully

APPENDIX 3: Studies regarding the transition from the BPharm to the PharmD programme

There are two studies regarding the transition from the BPharm to the entry-level PharmD degree in the US countries: Boyden (2006) and Boss and Lowther (1993) are summarised in Table A3-1.

Table A3-1 Studies regarding the transition from the BPharm to the PharmD programme (Boss and Lowther, 1993; Boyden, 2006).

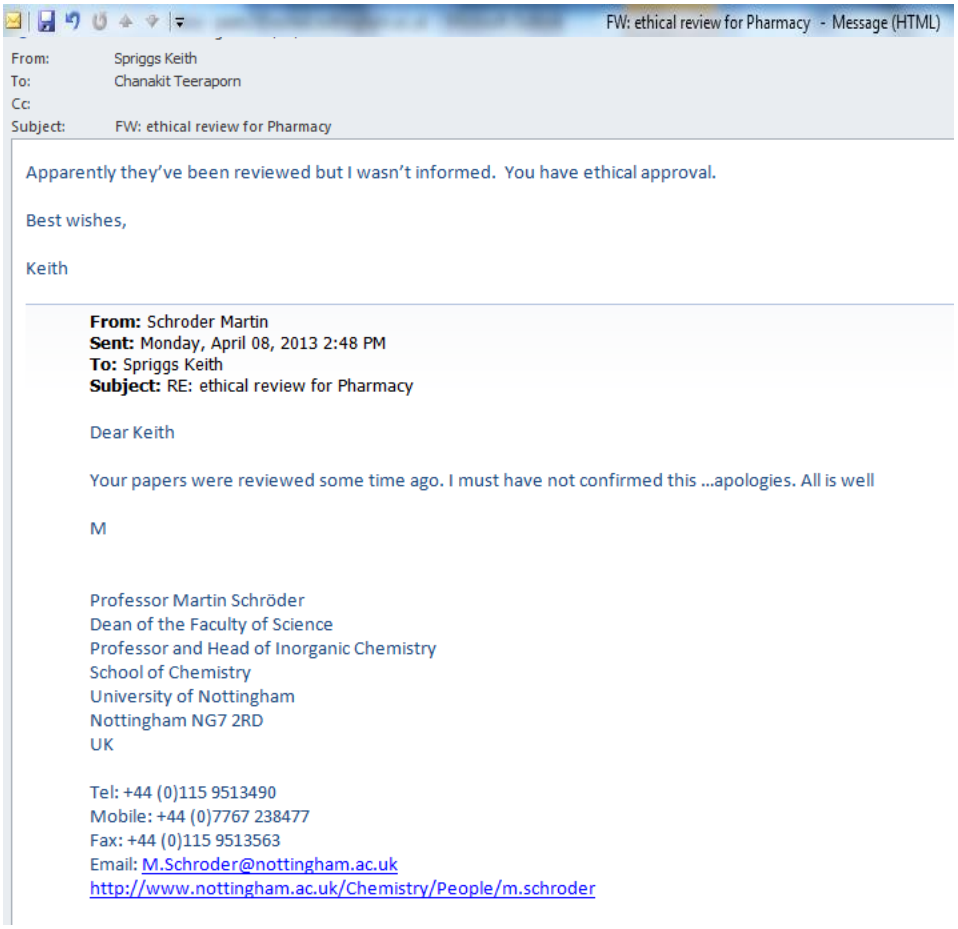
Authors	Aims/Methods	Key findings	Strengths(The Critical Appraisal Skills Programme Team, 2016)	Limitations
Boyden (2006). Generation Rx: a study of the changeover to the entry-level PharmD degree in pharmacy education. (Boyden, 2006) (PhD dissertation)	**Aims:** To investigate the development of the decision by the American pharmaceutical education to adopt the PharmD degree **Methods:** -Qualitative: case study -Data collection: interviews and document collection -Data analysis: thematic analysis	-Interviews were conducted with 37 key participants at two schools of pharmacy (the University of California, San Francisco (UCSF)-the first institutions to adopt the PharmD, and Philadelphia College of Pharmacy-the college that abandon its successful post-baccalaureate PharmD and replace it with the PharmD). -Participants were the witnesses during or after the changeover (e.g., deans, academic staff) and the leaders of professional associations, and accrediting agencies. **-The UCSF** responded to move from the Bachelor of Science in Pharmacy (BS) degree to the recommended 6-year PharmD. It serves as an example of a leader pharmacy school to improve professional education for the US pharmacist. It advanced so successfully because it had an effective base of power and influence (e.g., leadership, collaboration with hospital). **-The Philadelphia College of Pharmacy (PCP)** offered the 5-year BS pharmacy graduates and post-BS PharmD and expressed preference not to shift to the entry level PharmD degree. However, to avoid the losing accreditation and going out of business, PCP abandoned its dual-degree system and change to the PharmD programme. **-The changeover to the entry-level PharmD degree** **Motivations to an all-PharmD degree:** degree uniformity, to gain in prestige with the title of doctor, particularly for highly trained drug-therapy managers with the healthcare team, the requirement of more clinical exposure and advanced therapeutics in the nation's pharmacy programmes **Beneficiaries:** The PharmD degree decision has benefited both pharmacy practitioners (e.g., opportunity to respond to the clinical needs of society, raise the pharmacists' salaries), and education (e.g., increasing number of applicants, increase state support, have raised tuition). However, recent graduates who worked as community pharmacists have encountered much frustration with their limited chance to use the skill sets they acquired in the areas of drug-therapy management. The entry-level PharmD degree would be costly to acquiring new clinical faculty and training sites. Some professional associations had expressed opposition based on the increase salary expense for a doctorate credentialed drug dispenser. However, the government and insurance companies recognise the value of pharmacist and the reimbursement system will see a cost reduction to the overall healthcare system. **Future of pharmacy:** -The PharmD degree changeover has improved both the wider perception of and the self-confidence in today's PharmD pharmacists. The licensed pharmacist has a knowledge base to meet the needs in the health-care system. **Conclusion:** -The main motivation factors for the the adoption of the entry-level PharmD degree are as follows; the requirement of more clinical exposure and advanced therapeutics in the pharmacy programmes that the PharmD was needed and deserved.	1. Data analysis: Interview were triangulated with other document (e.g., historical documents, organisational records, meeting minutes). A transcript was provided to participants requested it for review. 2. Reflexivity: the researcher declared about who he is and the influence that may have on the data (e.g., he was employed as vice president at PCP for encompass institution advancement and fundraising but no direct role in pharmacy curriculum changeover decisions). 4. Transparency: All findings, recording, and transcripts will be preserved for future inspection by any interested party.	-The author did not mention about data saturation. -Ethical issues: the author did not mention about ethical approval and there might be an issue related the confidentiality of participants that they were acknowledged by name -Generalisability: Case study design might represent only of the specific institutions with the same characteristics.

Table A3-1 (continued)

Authors	Aims/Methods	Key findings	Strengths(The Critical Appraisal Skills Programme Team, 2016)	Limitations
Boss et al. (1993). Factors influencing curriculum change in professional programs (Paper presented at the Annual Meeting of the Association for the Study of Higher Education (ASHE))	**Aims:** To identify the influences and factors concerning curriculum change **Methods:** -Qualitative: case study -Data collection: semi-structured interviews and document collection	-This study conducted 10 interviews in the business school, 10 interviews in accounting school and 11 interviews in the pharmacy school (College of Pharmacy: 6 curriculum committee members, 2 faculty members-not on committee, 1 administration, 1 staff, 1 student) -The college of pharmacy in this study is a small college (e.g., admits 55 new students per year). The college went through its major curriculum to discontinue its BS in pharmacy and only offer the PharmD degree about 10 years ago. -The influences were identified as follows; **1) External influences:** the strong influences spear to be the needs of a changing profession that need for a new knowledge base and skill. -**Professional association** (e.g., AACP activities and the availability of the literature that mainly discussed about educational philosophies (e.g., critical thinking, problem solving, life-long learning) that convinced some faculty for the incorporate the new learning experiences into their curriculum. **-Accreditation and licensure:** the accreditation standards for all colleges that necessary to include the entry level PharmD degree. **-The profession, technology and knowledge base**: the over-qualification, dissatisfaction and fear of replacement by technological development influenced the need for pharmacy profession to redefine their role and prove their value to health care and society with the new role of pharmaceutical care. **-The reward system:** if pharmacists provide pharmaceutical care services to the customer, the reward system would adjust. **-Reputation:** the faculty requires the change to remain the leader position for the pharmacy education. **2) Intra-organisation influences:** The mission of the university played an important role in the change due to it focused on the research rather than the curriculum change. Therefore, research focus created barriers to achieving the ideal curriculum change. **3) Internal factors:** faculty mix and background (e.g., pharmacy and non-pharmacy academic staff) that results in a lack of understanding among basic science staff what the students need to learn in pharmacy practice. The consistent communication from the curriculum committee to faculty made a strong impact and bridged the gap between pharmacy and non-pharmacy background academic staff. **Conclusion:** Many external influences created a need for the new PharmD curriculum while intra-organisation and internal factors tend to restrain attempts to focus on the new curriculum. However, the internal characteristics of each school suggest individual design for their success curriculum change.	-This study addressed the issues concerning curriculum change in pharmacy programme (e.g., degree influence by external and internal factors) which will help program administrators to understand the forces that shape the process of curriculum change. -Case study design is appropriate for an exploratory study that addresses the issues of a current phenomenon. It was used to maximise the understanding of interrelationships and influences on the specific programmes. -Interview were triangulated with other document.	-The author did not mention about the data saturation (which the number of participant might too small for the data collection), data analysis, trustworthiness (e.g., bias of authors, transparency, and validity of the findings) and ethical approval. -However, the author mentioned that the paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerns with the research of higher education. -Generalisability: Case study design might represent only of the specific institutions with the same characteristics.

APPENDIX 4: Ethical approval

1. Ethical approval from the Faculty of Sciences, University of Nottingham (08 April 2013)



FW: ethical review for Pharmacy - Message (HTML)

From: Spriggs Keith
To: Chanakit Teeraporn
Cc:
Subject: FW: ethical review for Pharmacy

Apparently they've been reviewed but I wasn't informed. You have ethical approval.

Best wishes,

Keith

From: Schroder Martin
Sent: Monday, April 08, 2013 2:48 PM
To: Spriggs Keith
Subject: RE: ethical review for Pharmacy

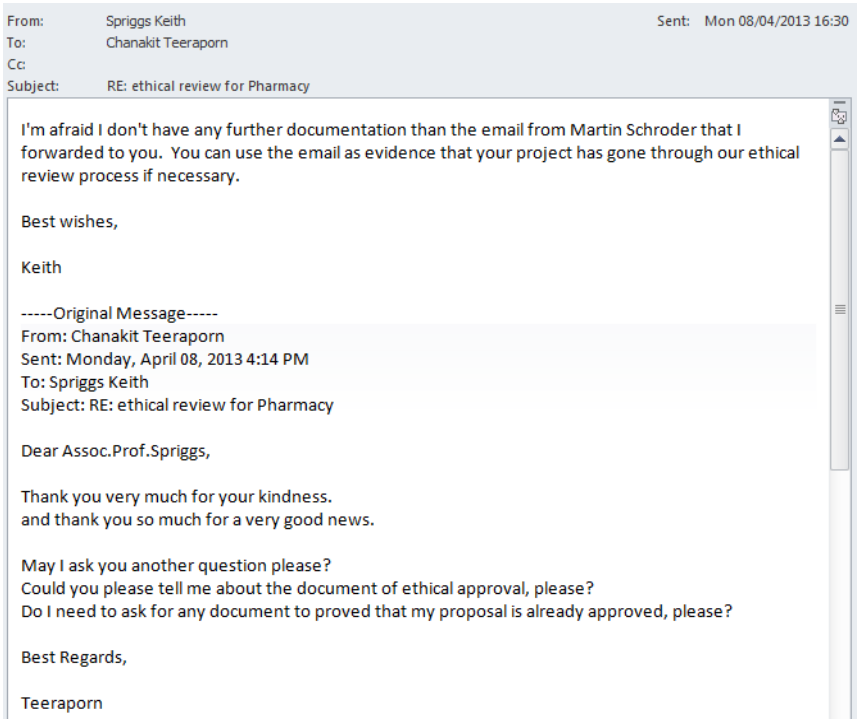
Dear Keith

Your papers were reviewed some time ago. I must have not confirmed this ...apologies. All is well

M

Professor Martin Schröder
Dean of the Faculty of Science
Professor and Head of Inorganic Chemistry
School of Chemistry
University of Nottingham
Nottingham NG7 2RD
UK

Tel: +44 (0)115 9513490
Mobile: +44 (0)7767 238477
Fax: +44 (0)115 9513563
Email: M.Schroder@nottingham.ac.uk
http://www.nottingham.ac.uk/Chemistry/People/m.schroder



From: Spriggs Keith
To: Chanakit Teeraporn
Cc:
Subject: RE: ethical review for Pharmacy
Sent: Mon 08/04/2013 16:30

I'm afraid I don't have any further documentation than the email from Martin Schroder that I forwarded to you. You can use the email as evidence that your project has gone through our ethical review process if necessary.

Best wishes,

Keith

-----Original Message-----
From: Chanakit Teeraporn
Sent: Monday, April 08, 2013 4:14 PM
To: Spriggs Keith
Subject: RE: ethical review for Pharmacy

Dear Assoc.Prof.Spriggs,

Thank you very much for your kindness.
and thank you so much for a very good news.

May I ask you another question please?
Could you please tell me about the document of ethical approval, please?
Do I need to ask for any document to proved that my proposal is already approved, please?

Best Regards,

Teeraporn

2. Ethical approval from the Research Ethics Committee of Ubon Ratchathani University, Thailand (26 July 2013) (See Figure A4-)

มหาวิทยาลัยอุบลราชธานี
หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า

โครงการวิจัยเรื่อง : การศึกษามุมมองของผู้มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตร์บัณฑิตในประเทศไทย

ผู้วิจัย : นางธีราพร ชนะกิจ

หน่วยงานที่สังกัด : คณะเภสัชศาสตร์ มหาวิทยาลัยอุบลราชธานี

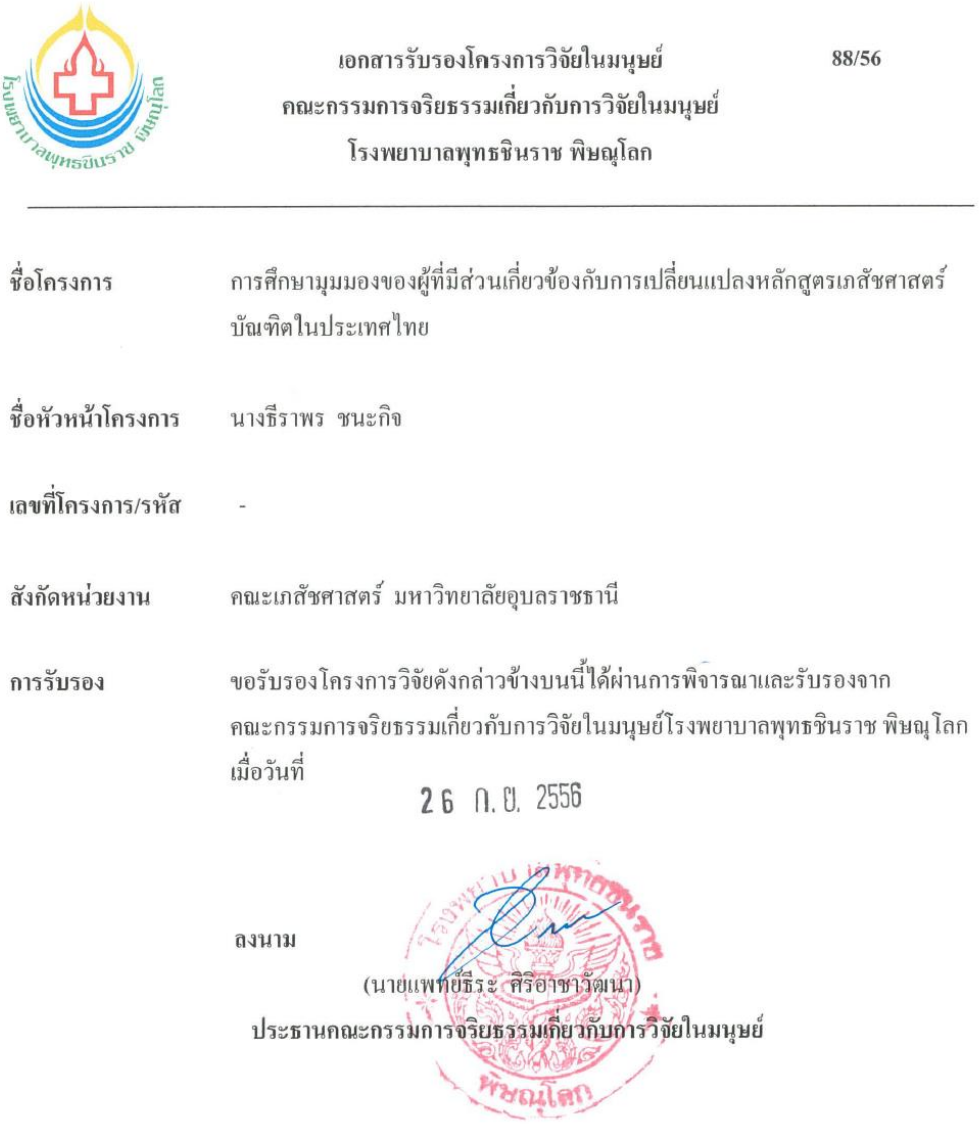
ได้ผ่านการพิจารณาของคณะกรรมการจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยอุบลราชธานี แล้ว โดยยึดหลักเกณฑ์ตามคำประกาศเฮลซิงกิ (Declaration of Helsinki)

ให้ไว้ ณ วันที่ ๒๖ กรกฎาคม ๒๕๕๖

(ผู้ช่วยศาสตราจารย์น้องเล็ก คุณวราดิศัย)
ประธานคณะกรรมการจริยธรรมการวิจัยในมนุษย์
มหาวิทยาลัยอุบลราชธานี

Figure A4-1 Ethical approval from the Research Ethics Committee of Ubon RatchathaniUniversity, Thailand (26 July 2013)

3. Ethical approval from the Research Ethics Committee of Buddhachinaraj Hospital, Thailand (No. 88/56, 26 September 2013) (See Figure A4-2)



เอกสารรับรองโครงการวิจัยในมนุษย์ 88/56
คณะกรรมการจริยธรรมเกี่ยวกับการวิจัยในมนุษย์
โรงพยาบาลพุทธชินราช พิษณุโลก

ชื่อโครงการ การศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตร์บัณฑิตในประเทศไทย

ชื่อหัวหน้าโครงการ นางธีราพร ชนะกิจ

เลขที่โครงการ/รหัส -

สังกัดหน่วยงาน คณะเภสัชศาสตร์ มหาวิทยาลัยอุบลราชธานี

การรับรอง ขอรับรองโครงการวิจัยดังกล่าวข้างบนนี้ได้ผ่านการพิจารณาและรับรองจากคณะกรรมการจริยธรรมเกี่ยวกับการวิจัยในมนุษย์โรงพยาบาลพุทธชินราช พิษณุโลก เมื่อวันที่ 26 ก.ย. 2556

ลงนาม
(นายแพทย์ธีระ ศิริอาชาวัฒนา)
ประธานคณะกรรมการจริยธรรมเกี่ยวกับการวิจัยในมนุษย์

Figure A4-2 Ethical approval from the Research Ethics Committee of Buddhachinaraj Hospital, Thailand (No. 88/56, 26 September 2013)

APPENDIX 5: Phase 1 The original FIP-WHO global survey of pharmacy school

FIP-WHO Global Survey of Pharmacy Schools | Country

This global survey aims to collect information to ascertain the educational background of the pharmacy workforce as well as the quality assurance accreditation mechanisms and processes. The data will be used to identify gaps, shortages and cooperation opportunities, and will provide the evidence-based information needed for investment policies that will reduce existing gaps and increase pharmacy education capacity.

Please reply to this questionnaire on behalf of your country.

Country and contact information

Country information		
1.	State the country	
Contact completing this questionnaire		
2.	Title	
3.	First name	
4.	Last name	
5.	Job title	
6.	Organisation/Agency	
7.	Email address (the email format is xxxx@yyyy.zzz)	
8.	Website (the URL format is http://xxxxx)	http://
9.	Phone number	
10.	Fax number	
11.	Address	

Production of pharmacists

Definition: A "pharmacy degree" refers to the degree related to pharmacy, which leads to the registration as a pharmacist in your country.

The number of pharmacy graduates (at National level)			
		Number	Year of data
12.	a) Total number of pharmacy graduates per year		
	b) Total number of FEMALE pharmacy graduates per year		
The number of faculties, schools or departments of pharmacy			
		Number	Year of data
13.	Total number of faculties, schools or departments of pharmacy that currently provide a pharmacy degree		
Usual starting age for university study			
		Age	Year of data
14.	What is the age of university entry level to study pharmacy?	years	

What is the OWNERSHIP of the faculties, schools or departments of pharmacy?				
	Faculty Owned by:			Number of faculties/schools/departments
15.	a) Ministry of Health	☐ Yes ☐ No		N=
	b) Ministry of Higher Education	☐ Yes ☐ No		N=
	c) Public state/government owned	☐ Yes ☐ No		N=
	d) Private not for profit	☐ Yes ☐ No		N=
	e) Private for profit	☐ Yes ☐ No		N=
	f) Public/private mix (Please provide details in the space provided on the right)	☐ Yes ☐ No	Details:	N=
	g) Others (Please provide details in the space provided on the right)	☐ Yes ☐ No	Details:	N=

COST of education

Definition: "Tuition fee" refers to any fee directly paid by students, and "per capita or capitation provision from public funds" here means the per capita proportion of funding from taxes or government.

(Please note that the responses added in 16a), 16b) and 16c), or 17a) and 17c) should sum up to a total of 100%)

Cost for educating pharmacy students					
		Amount (please response in numbers e.g. 1000)	Currency	Proportion of the total student funding (%)	Year of data
16. Domestic students	a) Tuition fee for domestic (HOME) students per year			%	
	b) Per capita or capitation provision from public funds per year (e.g. taxes, government)			%	
	c) Others (please specify:)			%	
17. Overseas/ international students	a) Tuition fee for an OVERSEAS student per year			%	
	b) Others (please specify:)			%	

Academic programmes

Definition: An "academic programme" is a combination of courses or learning modules that give access to a degree, diploma, certificate or other credential, which is recognised in society outside the educational institution such as a Diploma, Baccalaureate Degree, Masters Degree, Professional Doctorate, and PhD.

The "National Higher Education Qualification Framework" here refers to a national, formal description of types of degree qualification (e.g. Bachelor, Master, Diploma, PhD, etc.).

What ACADEMIC PROGRAMMES lead to registration as a pharmacist?				
		Formal Name of Academic Programme (please spell out name in full and do not use abbreviations)	Title of Qualifications Awarded	Minimum duration of Programme (Years)
18.	(i) Academic programme 01			years
	(ii) Academic programme 02			years

National Higher Education Qualification Framework		
19.	Is there any NATIONAL HIGHER EDUCATION QUALIFICATION FRAMEWORK in operation in your country?	☐ Yes ☐ No

Is the internship or pre-registration training integrated in the main academic programme leading to the registration/licensure as a pharmacist?				
			The kind of practice	Length of training
20.	a) Integrated	☐ Yes ☐ No	☐ Community ☐ Hospital ☐ Industry ☐ Other (please specify:)	months months months months
	b) Separated	☐ Yes ☐ No	☐ Community ☐ Hospital ☐ Industry ☐ Other (please specify:)	months months months months
	c) No internship/pre-registration training for a registration as a pharmacist	☐ Yes ☐ No		

The registration/licensure of pharmacy graduates		
21.	a) Do pharmacy students GRADUATE and REGISTER/are licensed as a pharmacist at the same time?	☐ Yes ☐ No (please specify in the Q21b)
	b) If NO above, please specify what the requirements are to register/become licensed as a pharmacist after graduation	

MINIMUM requirement for admission to a pharmacy degree programme

Definition: A "pharmacy degree" refers to the degree related to pharmacy, which leads to the registration as a pharmacist in your country.

Which of the following are required for admission to university to study pharmacy?			
22.	a) Secondary school leaving exam	☐ Yes ☐ No	Additional information:
	b) A special branch of secondary school *(please specify which branch in the space provided on the right)*	☐ Yes ☐ No	Additional information:
	c) Diploma, degree or certificate *(please specify what type in the space provided on the right)*	☐ Yes ☐ No	Additional information:
	d) A special course *(please specify what course in the space provided on the right)*	☐ Yes ☐ No	Additional information:
	e) Entrance examination (national or supra-national)	☐ Yes ☐ No	Additional information:
	f) Entrance examination of the faculty or school	☐ Yes ☐ No	Additional information:
	g) Interview	☐ Yes ☐ No	Additional information:
	h) Others *(please provide details in the space provided on the right)*	☐ Yes ☐ No	Additional information:

Core curriculum or syllabus for pharmacy degree

Definition: "Core curriculum or syllabus" here refers to a common, standardised, or indicative curriculum for qualification. A "pharmacy degree" is the degree related to pharmacy, which leads to registration as a pharmacist in your country.

Use of core curriculum or syllabus		
23.	a) Does your country use any nationally agreed core curriculum or syllabus for pharmacy degree?	☐ Yes (please specify in the Q23b) ☐ No
	b) If YES in above, please provide the related documents for the core curriculum or integrated curriculum	☐ Attached ☐ No
MINIMUM proportion of time for practice in science-based laboratories in the core curriculum or syllabus		
24.	What proportion of time is dedicated to LABORATORY PRACTICE in the core curriculum or syllabus? *(Please respond as an approximate percentage, and enter a value between 0 and 100)*	%
Curriculum in the EARLY year(s) of the pharmacy degree		
25.	For the EARLY years of the university curriculum, which of the following best describes the content/expectations in general?	☐ Wholly general science, with very little pharmacy practice component ☐ Mostly general science orientation, with small/moderate pharmacy practice components ☐ A mix of general science and pharmacy practice

Licensure of practice

To practice pharmacy in your country			
26.	Do pharmacy graduates require a LICENSE, registration or other authorization to practice pharmacy?	☐ Yes ☐ No	
How do students from the main academic pharmacy programme obtain a LICENSE, registration or other authorisation to practice pharmacy?			
27.	a) Immediately upon graduation	☐ Yes ☐ No	
	b) After passing a further examination after graduation	☐ Yes ☐ No	
	c) After a period of practical experience after graduation *(if yes, please specify length of time)*	☐ Yes ☐ No	Please specify:
	d) Others *(If yes, please specify in the provided space on the right)*	☐ Yes ☐ No	Please specify:
Licensing authority			
28.	Which authority awards graduates with a LICENSE, registration or other authorisation to practice?		

Quality assurance

Quality assurance mechanisms and processes			
29.	Are the faculties or schools subject to PERIODIC ACCREDITATION or similar process by an external body in your country? (*This is usually an evaluation conducted by an organisation or agency outside of the faculty or school).*	☐ Yes ☐ No (if NO, skip to the Q33)	
How frequently is accreditation conducted?			
30.	a) Requires to be accredited only once after the establishment of the faculty/school	☐ Yes ☐ No	
	b) More than once a year	☐ Yes ☐ No	
	c) Once a year	☐ Yes ☐ No	
	d) Once every 2 years	☐ Yes ☐ No	
	e) Once every 3 years	☐ Yes ☐ No	
	f) Once every 5 years	☐ Yes ☐ No	
	g) Other frequency *(please provide details in the space provided on the right)*	☐ Yes ☐ No	Please specify:

What is accredited?			
31.	a) The educational institution/university	☐ Yes ☐ No	
	b) The faculty or school (e.g. school of pharmacy)	☐ Yes ☐ No	
	c) The academic programme *(please provide details in the space provided on the right)*	☐ Yes ☐ No	Please specify:
Who is the ACCREDITING BODY?			
32.	a) Ministry of Health	☐ Yes ☐ No	
	b) Ministry of Education	☐ Yes ☐ No	
	c) Other governmental agency	☐ Yes ☐ No	Please specify:
	d) National professional organisation	☐ Yes ☐ No	Please specify:
	e) Private accrediting body	☐ Yes ☐ No	Please specify:
	f) Other	☐ Yes ☐ No	Please specify:
Other Quality assurance mechanisms or processes			
33.	a) Are there any other internal or external QUALITY ASSURANCE mechanisms or processes used by higher education institutions?	☐ Yes (please specify in the Q33b)) ☐ No	
	b) If YES in the Q33a), please provide additional information		

Related document

34.	Please include any relevant document (report, research, article references) related to pharmacy education and the academic programmes in your school/country with the submission of this survey.	☐ Attached ☐ No

Your participation in this survey is vital to provide a better understanding of current pharmacy education issues, and will assist in the development of global pharmacy education policy recommendations.

Please save the completed form and return to education@fip.org

Thank you for your participation

APPENDIX 6: Phase 1 Thai version of FIP-WHO global survey of pharmacy school

6.1 Dean's invitation letter

Dear Dean of .....

My name is Teeraporn Chanakit. I am a lecturer at Faculty of Pharmaceutical Sciences, Ubon Ratchathani University and I am currently enrolled to complete doctoral studies at School of Pharmacy, University of Nottingham in United Kingdom.

This survey is a part of FIP-WHO Global Survey of Pharmacy Schools mandated by an international coalition, namely the WHO-UNESCO-FIP Pharmacy Education Taskforce. The objective of this project is to contribute to the understanding of Thailand academic workforce and quality assurance accreditation at an institution level. Additional, this questionnaire has been developed as part of my PhD research project.

I would like to request permission to collect data in your institution as shown in attached questionnaire. Your reply will be treated as confidential, and all information you provide will be analysed as anonymous data. Research records will be stored securely and only researchers will have access to these records. Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. This research proposal will be reviewed and approved by University of Nottingham (UK).

If there are any questions you have related to this research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk

Sincerely yours,

Teeraporn Chanakit, PhD Student

Prof. Claire Anderson and Dr. Bee Yean Low, Supervisor
School of Pharmacy, University of Nottingham, Nottingham NG7 2RD, UK

DEAN'S PERMISSION

I have read this permission form. I have had the opportunity to ask questions and have received answers. I understand the intent of this study.
( ) I give permission for your process to use the Institution-level Schools of Pharmacy Survey to collect data of my institution.
( ) I do not give permission for your process to use the Institution-level Schools of Pharmacy Survey to collect data of my institution.

Signature.....Dean of .....Date.....

6.2 Dean's invitation letter (Thai version)

จดหมายขอความอนุเคราะห์ในการตอบแบบสอบถาม

เรียน ท่านคณบดี คณะเภสัชศาสตร์ มหาวิทยาลัย.....

ด้วยข้าพเจ้า นางธีราพร ชนะกิจ อาจารย์คณะเภสัชศาสตร์ มหาวิทยาลัยอุบลราชธานี ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ การศึกษาในครั้งนี้เป็นการศึกษาส่วนหนึ่งของสหพันธ์เภสัชกรรมนานาชาติด้านการศึกษา โดยความร่วมมือกับองค์การอนามัยโลกและยูเนสโก (WHO-UNESCO-FIP Pharmacy Education Taskforce)

วัตถุประสงค์ของการศึกษาในครั้งนี้ คือ เพื่อสำรวจข้อมูลพื้นฐานทางการศึกษาของคณะเภสัชศาสตร์ในประเทศไทยในด้านข้อมูลอัตรากำลัง และการประกันคุณภาพการศึกษา และเป็นส่วนหนึ่งของวิทยานิพนธ์ หลักสูตรปริญญาเอก ของข้าพเจ้า ในการนี้ ข้าพเจ้าใคร่ขอความอนุเคราะห์เก็บข้อมูลโดยใช้แบบสอบถาม ที่แนบมาด้วยในครั้งนี้ และหากท่านมีคำถามที่เกี่ยวข้องกับการศึกษานี้หรือข้อเสนอแนะเพิ่มเติม กรุณาติดต่อผู้ทำการศึกษาได้ที่ e-mail paxtc2@nottingham.ac.uk

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ในการตอบแบบสอบถามดังกล่าว จักขอบพระคุณยิ่ง

ขอแสดงความนับถือ

(นางธีราพร ชนะกิจ) นักศึกษาปริญญาเอก

Prof. Claire Anderson and Dr. Bee Yean Low, Supervisor
School of Pharmacy, University of Nottingham, Nottingham NG7 2RD, UK

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัยโดยได้อ่านรายละเอียดในเอกสารชี้แจงจนเข้าใจเป็นอย่างดีแล้ว

( ) ข้าพเจ้ายินยอมให้ใช้แบบสอบถาม เรื่อง สำรวจข้อมูลพื้นฐานทางการศึกษาของคณะเภสัชศาสตร์ในประเทศไทย ในการเก็บข้อมูลของคณะเภสัชศาสตร์ มหาวิทยาลัย.....

( ) ข้าพเจ้าไม่ยินยอมให้ใช้แบบสอบถาม เรื่อง สำรวจข้อมูลพื้นฐานทางการศึกษาของคณะเภสัชศาสตร์ในประเทศไทย ในการเก็บข้อมูลของคณะเภสัชศาสตร์ มหาวิทยาลัย.....

ลายมือชื่อ.....คณบดีคณะเภสัชศาสตร์ มหาวิทยาลัย.....วันที่.....

6.3 Thai version of FIP-WHO global survey of pharmacy school

แบบสอบถาม

เรื่อง การสำรวจข้อมูลพื้นฐานทางการศึกษาของคณะเภสัชศาสตร์ในประเทศไทย

- การศึกษาในครั้งนี้เป็นส่วนหนึ่งของการศึกษาของสหพันธ์เภสัชกรรมนานาชาติด้านการศึกษา โดยความร่วมมือกับองค์การอนามัยโลกและยูเนสโก (WHO-UNESCO-FIP Pharmacy Education Taskforce) และเป็นส่วนหนึ่งของวิทยานิพนธ์ ของข้าพเจ้าในหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ
- วัตถุประสงค์ของการศึกษาในครั้งนี้ คือ เพื่อสำรวจข้อมูลพื้นฐานทางการศึกษาของคณะเภสัชศาสตร์ในประเทศไทยในด้านข้อมูลอัตรากำลังและการประกันคุณภาพการศึกษา
- แบบสอบถามนี้ในชุดภาษาอังกฤษจัดทำโดยสหพันธ์เภสัชกรรมนานาชาติด้านการศึกษาโดยความร่วมมือกับองค์การอนามัยโลกและยูเนสโก และได้ทำการปรับเป็นภาษาไทยโดยผู้วิจัยและผ่านการตรวจสอบคุณภาพเครื่องมือวิจัยเป็นที่เรียบร้อยแล้ว
- แบบสอบถาม ประกอบด้วย 4 ส่วนดังนี้
    - ส่วนที่ 1 ข้อมูลทั่วไปของคณะเภสัชศาสตร์
        - หลักสูตร
        - จำนวนคณาจารย์และคุณวุฒิการศึกษา
        - จำนวนนักศึกษาระดับปริญญาตรี
        - การรับเข้าศึกษาคณะเภสัชศาสตร์
        - การจัดการศึกษาต่อเนื่องสำหรับเภสัชกร
    - ส่วนที่ 2 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม
    - ส่วนที่ 3 แหล่งฝึกปฏิบัติงานวิชาชีพ
    - ส่วนที่ 4 กลไกและขั้นตอนในการประกันคุณภาพการศึกษา
- ในการตอบแบบสอบถามจะใช้เวลาประมาณ 3 ชั่วโมง
- ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวม เพื่อใช้ให้เกิดประโยชน์ในการพัฒนาการศึกษาด้านเภสัชศาสตร์ในประเทศไทยต่อไป ข้อมูลดังกล่าวจะถูกเก็บเป็นความลับ ไม่เจาะจงว่าเป็นสถานศึกษาใด
- หากท่านมีคำถามที่เกี่ยวข้องกับการศึกษานี้ หรือข้อเสนอแนะเพิ่มเติมในการที่จะทำให้การศึกษามีความสมบูรณ์ยิ่งขึ้น กรุณาติดต่อผู้ทำการศึกษา E-mail: paxtc2@nottingham.ac.uk
- ขอความกรุณาส่งแบบสอบถามคืนเมื่อท่านกรอกข้อมูลเรียบร้อยแล้ว <u>ภายในวันที่ 31 พฤษภาคม พ.ศ. 2556</u>

ผู้วิจัย ขอขอบพระคุณท่านเป็นอย่างสูง ที่ให้ความร่วมมือในการกรอกแบบสอบถาม
ข้อมูลของท่านมีความสำคัญยิ่ง ในการทำให้การศึกษาครั้งนี้ประสบความสำเร็จ

ภญ. ธีราพร ขนะกิจ
ผู้ทำการศึกษาและนักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

ส่วนที่ 1: ข้อมูลทั่วไปของคณะเภสัชศาสตร์

1. ชื่อเต็มของสถาบัน

ชื่อภาษาไทย	คณะเภสัชศาสตร์ มหาวิทยาลัย
ชื่อภาษาอังฤษ	

2. ที่อยู่ที่สามารถติดต่อได้

ที่อยู่	
เว็บไซต์	

3. ปีที่ก่อตั้งคณะเภสัชศาสตร์ ...พ.ศ.....
4. สังกัด

( ) มหาวิทยาลัยของรัฐ สังกัดทบวงมหาวิทยาลัย

( ) มหาวิทยาลัยเอกชน

( ) อื่น ๆ โปรดระบุ

ส่วนที่ 2: ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

ชื่อผู้ที่สามารถติดต่อได้/ ผู้ตอบแบบสอบถาม

ชื่อ-สกุล .....

ตำแหน่ง .....

E-mail .....

หมายเลขโทรศัพท์ติดต่อ .....

5. **หลักสูตรที่เปิดสอนในระดับปริญญาตรี โท เอก**

ลำดับที่	ชื่อหลักสูตร	ชื่อปริญญา	ระยะเวลาเรียน ขั้นต่ำในหลักสูตร (ปี)	ปีที่เปิดสอน				
				2552	2553	2554	2555	2556
ระดับปริญญาตรี								
1	หลักสูตรเภสัชศาสตรบัณฑิต Doctor of Pharmacy (หลักสูตรปรับปรุง พ.ศ.)	เภสัชศาสตรบัณฑิต (ภ.บ.) Doctor of Pharmacy (Pharm.D.)	6					
2	หลักสูตรเภสัชศาสตรบัณฑิต Bachelor of Pharmacy (หลักสูตรใหม่ พ.ศ.)	เภสัชศาสตรบัณฑิต (ภ.บ.) Bachelor of Pharmacy (B.Pharm.)	5					
3								
ระดับปริญญาโท								
1								
2								
3								
ระดับปริญญาเอก								
1								
2								
3								
หลักสูตรอื่น ๆ								

6. **ข้อมูลคณาจารย์***

ประเภท	ปีการศึกษา 2555			ปีการศึกษา 2554			ปีการศึกษา 2553			ปีการศึกษา 2552		
	จำนวนรวม (คน)	เพศหญิง (คน)	อาจารย์ชาวต่างประเทศ** (คน)	จำนวนรวม (คน)	เพศหญิง (คน)	อาจารย์ชาวต่างประเทศ** (คน)	จำนวนรวม (คน)	เพศหญิง (คน)	อาจารย์ชาวต่างประเทศ** (คน)	จำนวนรวม (คน)	เพศหญิง (คน)	อาจารย์ชาวต่างประเทศ** (คน)
ปฏิบัติงานเต็มเวลา												
ปฏิบัติงานไม่เต็มเวลา***												
คุณวุฒิปริญญาเอก												
เภสัชกรประจำแหล่งฝึกที่ไม่ได้สังกัดคณะเภสัชศาสตร์ ที่มีหน้าที่ดูแลนักศึกษาฝึกปฏิบัติงาน (สามารถใช้ตัวเลขโดยประมาณ)												

*คณาจารย์ หมายถึง ข้าราชการ พนักงานมหาวิทยาลัย พนักงานมหาวิทยาลัย (เงินรายได้) ผู้มีความรู้ความสามารถพิเศษ; **คณาจารย์ชาวต่างประเทศ หมายถึง อาจารย์ที่ปฏิบัติงานโดยใช้คุณวุฒิที่รับรองจากต่างประเทศ (นอกเหนือจากคุณวุฒิที่ได้รับรองหลักสูตรจากสำนักงานคณะกรรมการอุดมศึกษา)
***ปฏิบัติงานไม่เต็มเวลา หมายถึง มีระยะเวลาปฏิบัติงาน ระหว่างร้อยละ 10-90 ของผู้ปฏิบัติงานเต็มเวลา

7. **จำนวนคณาจารย์ที่ปฏิบัติหน้าที่ด้านต่าง ๆ ด้านใดด้านหนึ่ง มากกว่าร้อยละ 50 ของภาระงานทั้งหมด**

ภาระหน้าที่หลัก	จำนวนคณาจารย์ (คน)							
	ปีการศึกษา 2555		ปีการศึกษา 2554		ปีการศึกษา 2553		ปีการศึกษา 2552	
	คณาจารย์ที่ปฏิบัติหน้าที่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่ไม่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่ไม่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่ไม่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่เต็มเวลา	คณาจารย์ที่ปฏิบัติหน้าที่ไม่เต็มเวลา
เน้นด้านงานวิจัย								
เน้นด้านการดูแลผู้ป่วย								
เน้นด้านการสอนในชั้นเรียน								
เน้นด้านอื่น ๆ โปรดระบุ								
รวม								

8. **คณาจารย์ผู้สอนที่มีคุณวุฒิหรือคุณสมบัติในการด้านการจัดการเรียนการสอน**

	มี	ไม่มี
หน่วยงานของท่านในระดับคณะหรือมหาวิทยาลัยมีการสนับสนุนหรือมีระบบในการพัฒนาอาจารย์ด้านกระบวนการสอนหรือไม่		

	จำนวน (คน) (ท่านสามารถใช้ตัวเลขโดยประมาณ)
นอกเหนือจากคุณวุฒิระดับปริญญาเอก (Ph.D.) มีอาจารย์ที่มีคุณวุฒิทางด้านการจัดการเรียนการสอน (เช่น ได้รับประกาศนียบัตร หรือคุณวุฒิในด้านการจัดการเรียนการสอน หรือ ได้เข้ารับการอบรมด้านการเรียนการสอนจากหน่วยงานต่าง ๆ เป็นต้น)	

9. **ข้อมูลนักศึกษาในหลักสูตรระดับปริญญาตรี หลักสูตร 6 ปี ระหว่างปีการศึกษา 2552-2555**

ปีการศึกษา 2555

ชั้นปี	จำนวนนักศึกษา ภาคปกติ			จำนวนนักศึกษา ภาคพิเศษ (ถ้ามี)			รวม
	ชาย (คน)	หญิง (คน)	รวม	ชาย (คน)	หญิง (คน)	รวม	
1 (รหัส 55)							
2 (รหัส 54)							
3 (รหัส 53)							
4 (รหัส 52)							
5 (รหัส 51)							
6 (รหัส 50)							
	จำนวนนักศึกษา ภาคปกติ			จำนวนนักศึกษา ภาคพิเศษ (ถ้ามี)			รวม
	ชาย (คน)	หญิง (คน)		ชาย (คน)	หญิง (คน)	รวม	
นศ.ออกกลางคัน							

10. **จำนวนนักศึกษาที่สำเร็จการศึกษาในแต่ละปีการศึกษา**

ปีการศึกษา	จำนวนบัณฑิตที่จบการศึกษา				แหล่งข้อมูล
	ชาย	หญิง	ชาวต่างชาติ	รวม	
2555				หลักสูตร 5 ปี ..... คน หลักสูตร 6 ปี .....คน	
2554				หลักสูตร 5 ปี ..... คน หลักสูตร 6 ปี .....คน	
2553				หลักสูตร 5 ปี ..... คน หลักสูตร 6 ปี .....คน	
2552				หลักสูตร 5 ปี ..... คน หลักสูตร 6 ปี .....คน	

11. จำนวนนักศึกษาใหม่ (ปี 1) ที่สามารถรับได้มากที่สุดในแต่ละปีการศึกษา

ประมาณ.....คน

12. วิธีการรับนักศึกษาเข้าศึกษา ในปีการศึกษา 2556

ประเภทการรับเข้า	กรุณาเลือก		รายละเอียดอื่น ๆ
	ใช้	ไม่ใช้	
รับตรง			
ระบบกลาง			
สัมภาษณ์			

13. โครงสร้างหลักสูตรเภสัชศาสตรบัณฑิต หลักสูตร 6 ปี

(ที่ผ่านการรับรองจากสภาเภสัชกรรมเพื่อใช้ในการรับนักศึกษาตั้งแต่ปีการศึกษา 2556 เป็นต้นไป หรือใช้ก่อนปีการศึกษา 2556)

	จำนวนหน่วยกิต	คิดเป็นร้อยละของหลักสูตร
การสอนภาคทฤษฎี		
การสอนภาคปฏิบัติการ ได้แก่ ปฏิบัติการ การฝึกปฏิบัติงาน		
การสอนภาคทฤษฎี+ปฏิบัติการ		
การทำวิจัย เช่น สารนิพนธ์		
จำนวนหน่วยกิตรวม		

14. คณะเภสัชศาสตร์มีหลักสูตรการศึกษาต่อเนื่องสำหรับเภสัชกรหรือไม่

( ) ไม่มี ( ) มี โปรดระบุหลักสูตร

1. .....

2. .....

ส่วนที่ 3 แหล่งฝึกปฏิบัติงานวิชาชีพ

15. **แหล่งฝึกปฏิบัติงานวิชาชีพสำหรับนักศึกษา Pharm D ณ ปี พ.ศ. 2556**

ประเภทแหล่งฝึก ณ ปี พ.ศ. 2556	กรุณาเลือก	
	มี	ไม่มี
แหล่งฝึกที่เป็นของคณะหรือมหาวิทยาลัย		
1.โรงพยาบาลและสถานบริการสุขภาพ		
1.1 การฝึกปฏิบัติงานวิชาชีพการจัดการระบบยา		
1.2 การฝึกปฏิบัติงานวิชาชีพ ผู้ป่วยใน/อายุรกรรม		
1.3 การฝึกปฏิบัติงานวิชาชีพ ผู้ป่วยนอก		
1.4 การฝึกปฏิบัติวิชาชีพโรงพยาบาลที่เน้นเฉพาะกลุ่ม หรือต่อยอด เช่น การเตรียมยาปราศจากเชื้อ การเตรียมยาเคมีบำบัด		
2. ร้านยา/สถานปฏิบัติการเภสัชกรรมชุมชน และสถานบริการปฐมภูมิ		
3. แหล่งฝึกด้านเภสัชศาสตร์สังคมและการบริหาร		
4. ด้านวิทยาศาสตร์เภสัชกรรมและด้านเภสัชกรรมไทย เช่น สถานที่ผลิตยา		
แหล่งฝึกอื่น ๆ		
1.โรงพยาบาลและสถานบริการสุขภาพ		
1.1 การฝึกปฏิบัติงานวิชาชีพการจัดการระบบยา		
1.2 การฝึกปฏิบัติงานวิชาชีพ ผู้ป่วยใน/อายุรกรรม		
1.3 การฝึกปฏิบัติงานวิชาชีพ ผู้ป่วยนอก		
1.4 การฝึกปฏิบัติวิชาชีพโรงพยาบาลที่เน้นเฉพาะกลุ่ม หรือต่อยอด เช่น การเตรียมยาปราศจากเชื้อ การเตรียมยาเคมีบำบัด		
2. ร้านยา/สถานปฏิบัติการเภสัชกรรมชุมชน และสถานบริการปฐมภูมิ		
3. แหล่งฝึกด้านเภสัชศาสตร์สังคมและการบริหาร เช่น สำนักงานคณะกรรมการอาหารและยา สำนักงานสาธารณสุขจังหวัด กรมวิทยาศาสตร์การแพทย์ ศูนย์วิทยาศาสตร์การแพทย์		
4. ด้านวิทยาศาสตร์เภสัชกรรมและด้านเภสัชกรรมไทย เช่น สถานที่ผลิตยา		
5. ด้านอื่น ๆ โปรดระบุ		

ส่วนที่ 4 กลไกและขั้นตอนในการประกันคุณภาพการศึกษา

16. ระบบการประกันคุณภาพการศึกษา

	มี	ไม่มี	ความถี่ในการประเมิน	หมายเหตุ
1. การประกันคุณภาพการศึกษาภายใน				
2. การประกันคุณภาพการศึกษาภายนอก				

17. ขอความอนุเคราะห์ท่าน ในการส่งเอกสารที่ท่านใช้เป็นข้อมูลประกอบในการตอบแบบสอบถามนี้
(โปรดระบุเอกสารที่ท่านใช้และโปรดส่งให้แก่ผู้วิจัยพร้อมกับแบบสอบถามนี้ จักขอบพระคุณยิ่ง)

	ใช้	ไม่ใช้
หลักสูตรเภสัชศาสตรบัณฑิต 6 ปี		
รายงานประจำปี คณะเภสัชศาสตร์		
คู่มือการประกันคุณภาพการศึกษา		
รายงานการประชุม เรื่อง แหล่งฝึกปฏิบัติงานวิชาชีพ		
อื่น ๆ โปรดระบุ		

ผู้วิจัย ขอขอบพระคุณท่านเป็นอย่างสูง ที่ให้ความร่วมมือในการกรอกแบบสอบถาม
ข้อมูลของท่านมีความสำคัญยิ่ง ในการทำให้การศึกษาครั้งนี้ประสบความสำเร็จ

APPENDIX 7: Phase 1 Submission documentary

The submission documentary that have been send with the submission of the faculties survey in Phase 1 are presented in Table A7-1.

Table A7-1 Submission documentary related to pharmacy education and the academic programmes that the faculties send to the researcher with the submission of the survey.

University	Reply letter (Informant)	Curriculum	Annual report	QA report	SAR	Name list			Incentive
						Academic staff	Non-academic staff	Student	
1	Y (Deputy dean)	Y	Y	Y	Y	Y	N	Y	N[b]
2	Y (Deputy dean)	Y	N	N	N	Y	N	N	N[b]
3	Y (Deputy dean)	Y	Y	Y	Y	Y	N	N	Y
4	Y (Dean)	Y	Y	Y	Y	N	N	N	Y
5	Y (Dean)	Y	Y	Y	Y	Y	Y	Y	Y
6	Y (Dean)	Y	Y	Y	N	Y	Y	N	Y
7	Y (Deputy dean)[a]	Y	Y	N	N	Y	Y	Y	Y
8	Y (Deputy dean)	Y	Y	Y	Y	Y	N	N	Y
9	Y (Deputy dean)	Y	Y	Y	Y	N	N	N	N[b]
10	-	-	-	-	-	-	-	-	-
11	Y (Dean)	Y	N	Y	Y	Y	N	N	N[b]
12	Y (Deputy dean)	Y	Y	Y	Y	Y	N	N	N[b]
13	-	-	-	-	-	-	-	-	-
14	Y (Dean)	Y	Y	Y	Y	Y	Y	N	
15	Y (Deputy dean)	Y	N	Y	N	Y	N	N	Y
16	Y (Deputy dean)	Y	Y	Y	Y	Y	Y	Y	Y
17	-	-	-	-	-	-	-	-	-
18	Y (Dean)	Y	Y	Y	Y	Y	N	N	Y
19	Y (Deputy dean)	Y	N	N	N	Y	N	N	Y

[a] This university send other document (e.g., documentary of faculty project about teaching skill development for academic staff, documentary of faculty project about how to be a great academic consultants for students). [b] Preferred not to receive an intensive.

APPENDIX 8: Phase 2 Hospital pharmacists' perceptions survey

8.1 Hospital pharmacist's invitation letter

Dear .....

My name is Teeraporn Chanakit. I am a lecturer at Faculty of Pharmaceutical Sciences, Ubon Ratchathani University and I am currently enrolled to complete doctoral studies at School of Pharmacy, University of Nottingham in United Kingdom.

- The objective of this study is to explore Thai pharmacists' perceptions regarding the suitability of the PharmD graduates employed in hospital and community pharmacy settings and the competency differences between the BPharm and PharmD graduates.
- The results from this study will help to reveal the actual situation and may help policy makers to develop more effective strategies in the future.
- I invite you to participate in this study, which will be conducted using the closes-ended and open-ended questionnaire. The survey should take you about 10 minutes to complete.
- Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. However, your reply will be treated as confidential, and all information you provide will be analysed as anonymous data.
- Research records will be stored securely and only researchers will have access to these records.
- If there are any questions you have related to this research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk. Thank you very much for your participation

Sincerely yours,
Teeraporn Chanakit, PhD Student
Prof. Claire Anderson and Dr. Bee Yean Low, Supervisor
School of Pharmacy, University of Nottingham, Nottingham NG7 2RD, UK

Participant's consent

I,....., have read the above information.

- I have the opportunity to ask questions and have received answers.
- I understand the intent of the study.
- I have received a copy of the consent form.
- I hereby give permission to be answering this questionnaire.
- I participate in this research as volunteer and may withdraw my consent at any time without any penalty.
- I consent to participate in this study.

Signature..... Participant Date.....
Signature..... Researcher Date.....

8.2 Hospital pharmacist's invitation letter (Thai version)

เรียน ท่านเภสัชกรโรงพยาบาล

สวัสดีค่ะ ดิฉันชื่อ นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ การศึกษาในครั้งนี้เป็นการศึกษาส่วนหนึ่งของวิทยานิพนธ์เอกของข้าพเจ้า

แบบสอบถามนี้มีวัตถุประสงค์เพื่อสอบถามความคิดเห็นของเภสัชกรโรงพยาบาลเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมโรงพยาบาลของเภสัชกรหลักสูตรหกปีและความคิดเห็นเกี่ยวกับความความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกรหลักสูตรห้าปีและหลักสูตรหกปี ข้อมูลดังกล่าวไปใช้ในเกิดประโยชน์แก่ส่วนรวมในการพัฒนาด้านการศึกษาเภสัชศาสตร์ต่อไป ในการตอบแบบสอบถามจะใช้เวลาประมาณ 10 นาที ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวมจะไม่ระบุชื่อผู้ให้ข้อมูลแต่อย่างใด

หากท่านมีข้อสงสัยหรือข้อแนะนำ โปรดติดต่อ email: paxtc2@nottingham.ac.uk
ผู้วิจัยขอขอบพระคุณทุกท่านมา ณ โอกาสนี้

ขอแสดงความนับถือ

ภญ. ธีราพร ชนะกิจ
นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ
Prof. Claire Anderson and Dr. Bee Yean Low
อาจารย์ที่ปรึกษา

ส่วนของผู้ยินยอมเข้าร่วมในการตอบแบบสอบถาม

ข้าพเจ้า .....
ได้อ่านและทำความเข้าใจเกี่ยวกับการศึกษานี้โดยละเอียด ข้าพเจ้าได้เข้าร่วมการศึกษาครั้งนี้โดยสมัครใจ และทราบว่าสามารถถอนตัวได้ทุกเวลาหากข้าพเจ้าไม่ปรารถนาจะเข้าร่วมในการศึกษา
ลงชื่อ.....ผู้เข้าร่วมการศึกษา วันที่.....
ลงชื่อ.....ผู้ทำการศึกษา วันที่.....

8.3 Questionnaire for the hospital pharmacist (English version)

Questionnaire for hospital pharmacist

Title of Project:

Hospital pharmacists' perceptions of the suitability of PharmD graduates in hospital setting and the competency differences between the BPharm and PharmD graduates

Name of main researcher:

Mrs.Teeraporn Chanakit, PhD Student, School of Pharmacy, University of Nottingham, UK

Name of academic supervisors:

1. Assoc.Prof.Dr. Bee Yean Low, School of Pharmacy, University of Nottingham Malaysia Campus, Malaysia
2. Prof. Claire Anderson, School of Pharmacy, University of Nottingham, UK

- The objective of this study is to explore Thai pharmacists' perceptions regarding the suitability of the PharmD graduates employed in hospital and community pharmacy settings and the competency differences between the BPharm and PharmD graduates
- The results from this study will help to reveal the actual situation and may help policy makers to develop more effective strategies in the future.
- I invite you to participate in this study, which will be conducted using the closes-ended and open-ended questionnaire. The survey should take you about 10 minutes to complete.
- Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. However, your reply will be treated as confidential, and all information you provide will be analysed as anonymous data.
- Research records will be stored securely and only researchers will have access to these records.
- If there are any questions you have related to this research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk. Thank you very much for your participation

Participant's consent

I,....., have read the above information.

- I have the opportunity to ask questions and have received answers.
- I understand the intent of the study.
- I have received a copy of the consent form.
- I hereby give permission to be answering this questionnaire.
- I participate in this research as volunteer and may withdraw my consent at any time without any penalty.
- I consent to participate in this study.

Signature..... Participant Date.....
Signature..... Researcher Date.....

Part 1: General information

Gender ☐ Male ☐ Female

Age ☐ < 25 ☐ 25-35 ☐ 36-45 ☐ 46-55 ☐ > 55

Highest academic degree

☐ Bachelor degree in Pharmacy (5 year programme) no track
☐ Bachelor degree in Pharmacy: clinical track
☐ Bachelor degree in Pharmacy: non-clinical track
☐ PharmD programme
☐ MPharm in ..... ☐ PhD in ..... ☐ Residency in.....

Experience working with PharmD graduates ☐ Yes ☐ No

Training preceptor ☐ Yes ☐ No

Year at current experiences ☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ >20

Workplace

☐ MoPH, Sub-district health promoting hospital
☐ MoPH, Community hospital
☐ MoPH, General/regional hospital
☐ MoPH, Other institute
☐ Other Ministry
☐ Private hospital

Setting region ☐Bangkok ☐ Central (not include Bangkok)
☐ Northeast ☐ North ☐ South ☐East

Area of practice

☐ Hospital service
☐ Family/ community pharmacist service
☐ Consumer protection ☐ Others (please specify)

Part 2: Questions

- This questionnaire contains closed-ended questions and open-ended questions.
- Please feel free to share your opinion.

1. Do you think PharmD graduates are suitable to be employed at your workplace setting?

"Suitability" means the quality of knowledge, skills, and competencies for specific purposes / responsibilities/ activities of pharmacy practices in your hospital setting.

☐ Yes, they are suitable. ☐ No, they are not suitable.

Please explain, why

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2. Do you think there are any differences in pharmacy competency between the 5-year BPharm and a 6-year PharmD graduates?

☐Yes, there have been the differences. ☐ No, there have not been the differences.

Please explain, why.

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Your Participation is highly appreciated

8.4 Questionnaire for the hospital pharmacist (Thai version)

แบบสอบถามเภสัชกรโรงพยาบาล

ชื่อการศึกษา:

แบบสอบถามความคิดเห็นของเภสัชกรโรงพยาบาลเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมโรงพยาบาลของเภสัชกรหลักสูตรหกปี และความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกรหลักสูตรหกปีและหลักสูตรห้าปี

ผู้วิจัยหลัก:

ภญ. ธีราพร ชนะกิจ นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

อาจารย์ที่ปรึกษา:

1. Assoc.Prof.Dr. Bee Yean Low, School of Pharmacy, University of Nottingham Malaysia Campus, Malaysia
2. Prof. Claire Anderson, School of Pharmacy, University of Nottingham, UK

☐คำชี้แจง ด้วยข้าพเจ้า นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ การศึกษาในครั้งนี้เป็นการศึกษาส่วนหนึ่งของวิทยานิพนธ์เอกของข้าพเจ้า

☐วัตถุประสงค์ เพื่อสำรวจความคิดเห็นของเภสัชกรโรงพยาบาลเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมโรงพยาบาลของเภสัชกรหลักสูตรหกปี และความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกรหลักสูตรห้าปีและหลักสูตรหกปี และจะนำข้อมูลดังกล่าวไปใช้ในเกิดประโยชน์แก่ส่วนรวมในการพัฒนาด้านการศึกษาเภสัชศาสตร์ต่อไป

☐ในการตอบแบบสอบถามจะใช้เวลาประมาณ 10 นาที ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวม จะไม่ระบุชื่อผู้ให้ข้อมูลแต่อย่างใด

☐หากท่านมีข้อสงสัยหรือข้อแนะนำโปรดติดต่อ email: paxtc2@nottingham.ac.uk

ภญ. ธีราพร ชนะกิจ นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

ขอความกรุณาท่านส่งคืนแบบสอบถามได้ที่กล่องรับแบบสอบถามหน้างาน

ส่วนของผู้ยินยอมเข้าร่วมในการตอบแบบสอบถาม

ข้าพเจ้า

.....

ได้อ่านและทำความเข้าใจเกี่ยวกับการศึกษานี้โดยละเอียด ข้าพเจ้าได้เข้าร่วมการศึกษาครั้งนี้โดยสมัครใจ และทราบว่าสามารถถอนตัวได้ทุกเวลาหากข้าพเจ้าไม่ปรารถนาจะเข้าร่วมในการศึกษา

ลงชื่อ.....ผู้เข้าร่วมการศึกษา วันที่.....

ลงชื่อ.....ผู้ทำการศึกษา วันที่.....

ส่วนที่ 1 ข้อมูลทั่วไป

เพศ ☐ ชาย ☐ หญิง

อายุ ☐ ต่ำกว่า 25 ปี ☐ 25-35 ปี ☐ 36-45 ปี ☐ 46-55 ปี ☐ มากกว่า 55 ปี

วุฒิการศึกษา ☐ ปริญญาตรี หลักสูตร 5 ปี สาขา.....

☐ ปริญญาตรี หลักสูตร 6 ปี สาขา.....

☐ ปริญญาโท สาขา..... ☐ ปริญญาเอกหรือสูงกว่า สาขา.....

มีประสบการณ์การทำงานกับเภสัชกรหลักสูตรหกปี ☐ มี ☐ ไม่มี

เป็นเภสัชกรแหล่งฝึกและรับฝึกงานนักศึกษาเภสัชศาสตร์ ☐ เป็น ☐ ไม่ได้เป็น

อายุงาน ☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 20 ปีขึ้นไป

สังกัด ☐ กระทรวงสาธารณสุข (โปรดระบุ ☐ รพ.สต. ☐ รพช/รพร. ☐ รพท./รพศ.) ☐ กระทรวงอื่น ๆ

☐ รัฐวิสาหกิจ ☐ หน่วยราชการอิสระ ☐ เทศบาล ☐ มหาวิทยาลัยของรัฐ ☐ มหาวิทยาลัยเอกชน

☐ โรงพยาบาลเอกชน ☐ ร้านยาที่เป็นเจ้าของกิจการเอง ☐ ร้านยา chain drugstore

สถานที่ปฏิบัติงาน ☐ กรุงเทพฯ ☐ ภาคกลาง (ไม่รวม กทม.) ☐ ภาคตะวันออกเฉียงเหนือ ☐ ภาคเหนือ ☐ ภาคใต้

สาขางานปัจจุบัน ☐ เภสัชกรรมชุมชน ☐ เภสัชกรรมโรงพยาบาล ☐ เภสัชศาสตรศึกษา

☐ เภสัชอุตสาหกรรม ☐ การคุ้มครองผู้บริโภค ☐ การบริหารเภสัชกิจและการตลาด

☐ อื่น ๆ (โปรดระบุ) .....

ส่วนที่ 2 ความคิดเห็นของท่านไม่มีถูกหรือผิด โปรดแสดงความคิดเห็นอย่างเป็นอิสระ

ความคิดเห็นของท่านจะเป็นประโยชน์อย่างยิ่งในการปรับปรุงการศึกษาเภสัชศาสตร์

1.ท่านคิดว่าเภสัชกรที่จบจากหลักสูตรเภสัชศาสตรบัณฑิต 6 ปี <u>เหมาะสมกับลักษณะการทำงานในโรงพยาบาล/หน่วยงานของท่านหรือไม่</u> ถ้าไม่ โปรดแสดงความคิดเห็น

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2.ท่านคิดว่าระหว่าง เภสัชกรที่จบในหลักสูตร 5 และ 6 ปี <u>มีสมรรถนะในการปฏิบัติงาน</u>แตกต่างกันหรือไม่

☐ไม่แตกต่าง ☐ แตกต่าง

โปรดให้ข้อคิดเห็น.....

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ผู้วิจัย ขอขอบพระคุณท่านเป็นอย่างสูง ที่ให้ความร่วมมือในการกรอกแบบสอบถาม

ข้อมูลของท่านมีความสำคัญยิ่ง ในการทำให้การศึกษาครั้งนี้ประสบความสำเร็จ

APPENDIX 9: Phase 2 Community pharmacists' perceptions survey

9.1 Community pharmacist's invitation letter

Dear .....

My name is Teeraporn Chanakit. I am a lecturer at Faculty of Pharmaceutical Sciences, Ubon Ratchathani University and I am currently enrolled to complete doctoral studies at School of Pharmacy, University of Nottingham in United Kingdom.

- This questionnaire "Community pharmacists' perception of the pharmacy education" has been developed as part of my PhD research project.
- The objective of this study is to explore Thai pharmacists' perceptions regarding the suitability of the PharmD graduates employed in hospital and community pharmacy settings and the competency differences between the BPharm and PharmD graduates.
- The results from this study will help to reveal the actual situation and may help policy makers to develop more effective strategies in the future.
- I invite you to participate in this study, which will be conducted using the closes-ended and open-ended questionnaire. The survey should take you about 10 minutes to complete.
- Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. However, your reply will be treated as confidential, and all information you provide will be analysed as anonymous data.
- Research records will be stored securely and only researchers will have access to these records.
- If there are any questions you have related to this research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk. Thank you very much for your participation

Sincerely yours,
Teeraporn Chanakit, PhD Student
Prof. Claire Anderson and Dr. Bee Yean Low, Supervisor
School of Pharmacy, University of Nottingham, Nottingham NG7 2RD, UK

Participant's consent

I,....., have read the above information.

- I have the opportunity to ask questions and have received answers.
- I understand the intent of the study.
- I have received a copy of the consent form.
- I hereby give permission to be answering this questionnaire.
- I participate in this research as volunteer and may withdraw my consent at any time without any penalty.
- I consent to participate in this study.

Signature..... Participant Date.....
Signature..... Researcher Date.....

9.2 Community pharmacist's invitation letter (Thai version)

เรียน ท่านเภสัชกรร้านยา

สวัสดีค่ะ ดิฉันชื่อ นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ การศึกษาในครั้งนี้เป็นการศึกษาส่วนหนึ่งของวิทยานิพนธ์เอกของดิฉัน

แบบสอบถามนี้มีวัตถุประสงค์เพื่อสอบถามความคิดเห็นของเภสัชกรร้านยาเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมชุมชนของเภสัชกรหลักสูตรหกปี และความคิดเห็นเกี่ยวกับความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกร หลักสูตรห้าปีและหลักสูตรหกปี

ข้อมูลดังกล่าวไปใช้ในเกิดประโยชน์แก่ส่วนรวมในการพัฒนาด้านการศึกษาเภสัชศาสตร์ต่อไป ในการตอบแบบสอบถามจะใช้เวลาประมาณ 10 นาที ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวม จะไม่ระบุชื่อผู้ให้ข้อมูลแต่อย่างใด หากท่านมีข้อสงสัยหรือข้อแนะนำ โปรดติดต่อ email: paxtc2@nottingham.ac.uk ผู้วิจัยขอขอบพระคุณทุกท่านมา ณ โอกาสนี้

ขอแสดงความนับถือ

ภญ. ธีราพร ชนะกิจ
นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ
Prof. Claire Anderson and Dr. Bee Yean Low
อาจารย์ที่ปรึกษา

ส่วนของผู้ยินยอมเข้าร่วมในการตอบแบบสอบถาม

ข้าพเจ้า .....
ได้อ่านและทำความเข้าใจเกี่ยวกับการศึกษานี้โดยละเอียด ข้าพเจ้าได้เข้าร่วมการศึกษาครั้งนี้โดยสมัครใจ และทราบว่าสามารถถอนตัวได้ทุกเวลาหากข้าพเจ้าไม่ปรารถนาจะเข้าร่วมในการศึกษา
ลงชื่อ.....ผู้เข้าร่วมการศึกษา วันที่.....
ลงชื่อ.....ผู้ทำการศึกษา วันที่.....

9.3 Questionnaire for the community pharmacist (English version)

Questionnaire for community pharmacist

Title of Project:

Community pharmacists' perceptions of the suitability of PharmD graduates in community pharmacies and the competency differences between the BPharm and PharmD graduates

Name of main researcher:

Mrs.Teeraporn Chanakit, PhD Student, School of Pharmacy, University of Nottingham, UK

Name of academic supervisors:

1. Assoc.Prof.Dr. Bee Yean Low, School of Pharmacy, University of Nottingham Malaysia Campus, Malaysia
2. Prof. Claire Anderson, School of Pharmacy, University of Nottingham, UK

- The objective of this study is to explore Thai pharmacists' perceptions regarding the suitability of the PharmD graduates employed in community pharmacies and the competency differences between the BPharm and PharmD graduates.
- The results from this study will help to reveal the actual situation and may help policy makers to develop more effective strategies in the future.
- I invite you to participate in this study, which will be conducted using the closes-ended and open-ended questionnaire. The survey should take you about 10 minutes to complete.
- Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. However, your reply will be treated as confidential, and all information you provide will be analysed as anonymous data.
- Research records will be stored securely and only researchers will have access to these records.
- If there are any questions you have related to this research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk. Thank you very much for your participation

Participant's consent

I,....., have read the above information.

- I have the opportunity to ask questions and have received answers.
- I understand the intent of the study.
- I have received a copy of the consent form.
- I hereby give permission to be answering this questionnaire.
- I participate in this research as volunteer and may withdraw my consent at any time without any penalty.
- I consent to participate in this study.

Signature..... Participant Date.....
Signature..... Researcher Date.....

Part 1: General information

Gender ☐ Male ☐ Female

Age ☐ < 25 ☐ 25-35 ☐ 36-45 ☐ 46-55 ☐ > 55

Highest academic degree

☐ Bachelor degree in Pharmacy (5 year programme) no track
☐ Bachelor degree in Pharmacy: clinical track
☐ Bachelor degree in Pharmacy: non-clinical track
☐ PharmD programme
☐ MPharm in ..... ☐ PhD in ..... ☐ Residency in.....

Experience working with PharmD graduates ☐ Yes ☐ No

Training preceptor ☐ Yes ☐ No

Year at current experiences ☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ >20

Workplace

☐ Community Pharmacy, owner, full time
☐ Community Pharmacy, chain, employer, full time
☐ Community Pharmacy, part time (If you work part time at community pharmacy, please specify your full time workplace)
☐ MoPH, hospital ☐ Pharmaceutical manufacturer
☐ Private hospital ☐ Others

Setting region ☐ Bangkok ☐ Central (not include Bangkok)
☐ Northeast ☐ North ☐ South ☐ East

Part 2: Questions

- This questionnaire contains closed-ended questions and open-ended questions.
- Please feel free to share your opinion.

1. Do you think PharmD graduates are suitable to be employed at your workplace settings?

"Suitability" means the quality of knowledge, skills and competencies for specific purposes / responsibilities/ activities of pharmacy practices in your community pharmacy.

☐Yes, they are suitable. ☐ No, they are not suitable.

Please explain, why

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2. Do you think there are any differences in pharmacy competency between the 5-year BPharm and the 6-year PharmD graduates?

☐Yes, there have been the differences. ☐ No, there have not been the differences.

Please explain, why.

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Your Participation is highly appreciated

9.4 Questionnaire for the community pharmacist (Thai version)

แบบสอบถามเภสัชกรร้านยา

ชื่อการศึกษา:

แบบสอบถามความคิดเห็นของเภสัชกรร้านยาเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมชุมชนของเภสัชกรหลักสูตรหกปี และความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกรหลักสูตรห้าปีและหลักสูตรหกปี

ผู้วิจัยหลัก:

ภญ. ธีราพร ชนะกิจ นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

อาจารย์ที่ปรึกษา:

1. Assoc.Prof.Dr. Bee Yean Low, School of Pharmacy, University of Nottingham Malaysia Campus, Malaysia
2. Prof. Claire Anderson, School of Pharmacy, University of Nottingham, UK

☐คำชี้แจง ด้วยข้าพเจ้า นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ การศึกษาในครั้งนี้เป็นการศึกษาส่วนหนึ่งของวิทยานิพนธ์เอกของข้าพเจ้า

☐วัตถุประสงค์ เพื่อสำรวจความคิดเห็นของเภสัชกรร้านยาเกี่ยวกับความเหมาะสมในการปฏิบัติงานเภสัชกรรมชุมชนของเภสัชกรหลักสูตรหกปี และความแตกต่างด้านสมรรถนะวิชาชีพเภสัชกรรมของเภสัชกรหลักสูตรห้าปีและหลักสูตรหกปี และจะนำข้อมูลดังกล่าวไปใช้ในเกิดประโยชน์แก่ส่วนรวมในการพัฒนาด้านการศึกษาเภสัชศาสตร์ต่อไป

☐ในการตอบแบบสอบถามจะใช้เวลาประมาณ 10 นาที ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวม จะไม่ระบุชื่อผู้ให้ข้อมูลแต่อย่างใด

☐หากท่านมีข้อสงสัยหรือข้อแนะนำโปรดติดต่อ email: paxtc2@nottingham.ac.uk

ภญ. ธีราพร ชนะกิจ นักศึกษาปริญญาเอกคณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

ขอความกรุณาท่านส่งคืนแบบสอบถามได้ที่กล่องรับแบบสอบถามหน้างาน

ส่วนของผู้ยินยอมเข้าร่วมในการตอบแบบสอบถาม

ข้าพเจ้า .....

ได้อ่านและทำความเข้าใจเกี่ยวกับการศึกษานี้โดยละเอียด ข้าพเจ้าได้เข้าร่วมการศึกษาครั้งนี้โดยสมัครใจ และทราบว่าสามารถถอนตัวได้ทุกเวลาหากข้าพเจ้าไม่ปรารถนาจะเข้าร่วมในการศึกษา

ลงชื่อ.....ผู้เข้าร่วมการศึกษา วันที่.....

ลงชื่อ.....ผู้ทำการศึกษา วันที่.....

ส่วนที่ 1 ข้อมูลทั่วไป

เพศ ☐ ชาย ☐ หญิง

อายุ ☐ ต่ำกว่า 25 ปี ☐ 25-35 ปี ☐ 36-45 ปี ☐ 46-55 ปี ☐ มากกว่า 55 ปี

วุฒิการศึกษา ☐ ปริญญาตรี หลักสูตร 5 ปี สาขา.....

☐ ปริญญาตรี หลักสูตร 6 ปี สาขา.....

☐ ปริญญาโท สาขา..... ☐ ปริญญาเอกหรือสูงกว่า สาขา.....

มีประสบการณ์การทำงานกับเภสัชกรหลักสูตรหกปี ☐ มี ☐ ไม่มี

เป็นเภสัชกรแหล่งฝึกและรับฝึกงานนักศึกษาเภสัชศาสตร์ ☐ เป็น ☐ ไม่ได้เป็น

อายุงาน ☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 20 ปีขึ้นไป

ลักษณะการปฏิบัติงาน ☐ อยู่ร้านยาที่เป็นเจ้าของกิจการเองแบบเต็มเวลา

☐ อยู่ร้านยา chain store ที่เป็นเจ้าของกิจการเองแบบเต็มเวลา

☐ อยู่ร้านยา แบบไม่เต็มเวลา

โดยมีงานประจำอื่น โปรดระบุ.....

สถานที่ปฏิบัติงาน ☐ กรุงเทพฯ ☐ ภาคกลาง (ไม่รวม กทม.) ☐ ภาคตะวันออกเฉียงเหนือ

☐ ภาคเหนือ ☐ ภาคใต้

ส่วนที่ 2 ความคิดเห็นของท่านไม่มีถูกหรือผิด โปรดแสดงความคิดเห็นอย่างเป็นอิสระ

ความคิดเห็นของท่านจะเป็นประโยชน์อย่างยิ่งในการปรับปรุงการศึกษาเภสัชศาสตร์

1.ท่านคิดว่าเภสัชกรที่จบจากหลักสูตรเภสัชศาสตรบัณฑิต 6 ปี เหมาะสมกับลักษณะการทำงานในหน่วยงานของท่านหรือไม่ ถ้าไม่ โปรดแสดงความคิดเห็น

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2.ท่านคิดว่าระหว่าง เภสัชกรที่จบในหลักสูตร 5 และ 6 ปี มีสมรรถนะในการปฏิบัติงานแตกต่างกันหรือไม่

☐ไม่แตกต่าง ☐ แตกต่าง

โปรดให้ข้อคิดเห็น.....

.....

.....

.....

ผู้วิจัย ขอขอบพระคุณท่านเป็นอย่างสูง ที่ให้ความร่วมมือในการกรอกแบบสอบถาม
ข้อมูลของท่านมีความสำคัญยิ่ง ในการทำให้การศึกษาครั้งนี้ประสบความสำเร็จ

APPENDIX 10: Phase 3 Personal information and interview guide

Table A10-1: Personal information & key components

Name:	Institution:
Stakeholders ID: Example AC1_PSc_U1	
AC_PSc = Academic member in pharmaceutical sciences area, AC_PC=Academic member in pharmaceutical care area, AC_SAP = Academic member in social and administrative pharmacy), AC_D = Dean	
EXP_HOS = Expert in hospital pharmacy, EXP_COM = community pharmacy, EXP_PSc = Expert in industrial pharmacy, EXP_PB = Expert in public health and consumer protection, EXP_MP = Expert in marketing pharmacy	
N = Nurse	
PH_HOS = Hospital pharmacist, PH_COM = community pharmacist, PH_IP = Industrial pharmacist, PH_PB = Pharmacist in public health and consumer protection, PH_MP = Pharmacist in marketing pharmacy, PH_RD = Pharmacist in Research and development, PHY = Physician, PM = Policy maker, PTECH = Pharmacy technician PT = PT_IPD = Patient in In-Patient Department, PT_OPD = Patient in Out-Patient Department PUB = Public/general population, ST = Student, PR = Parent	
U1 = University1, U2 = University2, U3 = University3 U4 = University4 U5 = University5	
Personal information	
Gender	☐ Male ☐ Female
Age group (years)	☐ 20-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ More than 60
Work experience (years)	☐ less than 5 ☐ 5-10 ☐ 11-15 ☐ 16-20 ☐ more than 20
Working area ☐ Hospital pharmacy (tertiary care hospital, public) ☐ Hospital pharmacy (community hospital, public) ☐ Hospital pharmacy (private) ☐ Community pharmacy ☐ Industrial pharmacy	☐ Public health and consumer protection ☐ Marketing pharmacy ☐ Research and development ☐ Academic (pharmaceutical care) ☐ Academic (Pharmaceutical technology ☐ Academic (Social and administrative pharmacy)
Highest education	
1. Physician: ☐ Doctor of Medicine (MD) ☐ MD, Diploma ☐ MD, Specialist	**4. Pharmacy technician:** ☐ Diploma of public health (Pharmacy Technique) ☐ Bachelor
2. Nurse: ☐ Bachelor of Nursing Science ☐ Master of Nursing Science	**5. Patient, parent, public:** ☐ Less than secondary education ☐ Secondary education/ vocational education ☐ Bachelor ☐ Higher than bachelor
3. Pharmacist: ☐ BPharm ☐ MPharm/ MSc ☐ PharmD ☐ PhD ☐ PharmD, Pharmacy residency ☐ PharmD, Board specialties	

Introduction Key Components [433]: • Thank you • Researchers' name • Purpose • Confidentiality • Duration • How interview will be conducted • Opportunity for questions • Signature of consent	• I want to thank you for taking the time to meet me today. • My name is Mrs.Teeraporn Chanakit. I would like to talk to you about your experiences participating in Thai pharmacy curriculum changing to 6-year PharmD programme in order to capture lessons that can be used in future interventions. • The interview should take 1 hours. I will be taping the session because I don't want to miss any of your comments. • Although I will be taking some notes during the session, I can't possibly write fast enough to get it all down. Because we're on tape, please be sure to speak up so that we don't miss your comments. • All responses will be kept confidential. This means that your interview responses will only be shared with research team members and we will ensure that any information we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time. • Are there any questions about what I have just explained? • Are you willing to participate in this interview?
Closing Key Components: • Additional comments • Next steps • Thank you	• Is there anything more you would like to add? • I will be analysing the information that you and others gave me, and submitting a draft report within 1-3 months. I will be happy to send you a copy to review at that time, if you are interested. • Thank you for your time.

Table A10-2 Interview guide

	Questions
General/background information	Personal information: education, work experience, age, area of expertise, year of current work experience.
Feelings and attitude towards a 6-year PharmD programme	How do you feel about the all-PharmD policy in Thailand?
Impact of curriculum change	What will be the impact of the curriculum change on education, pharmacy practice and the health care system?
Policy makers, pharmacy experts and academic staff	
Historical series or process	Please tell me about the history of PharmD curriculum development in Thailand.
Reason for changing	Why do Thai pharmacy education have to change to a 6-year PharmD curriculum? Who/which other organisations support this policy and why? How does the PharmD curriculum value/suit the context of Thailand? (Probes: health care system, quality of patient care, pharmacists' roles, law and regulation)
Involvement	Please tell me about your role and responsibility in changing the curriculum policy. Please tell me about the influence or motivation (in general/for your contribution) for this change.
Process of changing policy	What are the differences between the new PharmD programme and previous programme (e.g., BPharm, a traditional PharmD programme)? How will the new curriculum change? Manner of enacting of change: policy/real practice Process in which you are involved Readiness, preparedness for this change Key learning, key enablers, significant challenges/ barriers What do you need in terms of support?
Pharmacy students	Motivating factors to study pharmacy Choice of faculty of pharmacy Perceptions of the 6-year PharmD programme Experience as a final year student in the new PharmD programme Impact of curriculum change (on student and family/ pharmacy profession/ career image) Future career ambitions and views of career development
Parents	Perceptions of the 6-year PharmD programme Parental support for their children's education Experience as a parent of a PharmD student Impact of curriculum change (on student and family/ pharmacy profession/ career image) Future career ambitions and views of career development
Employers	Perceptions of the 6-year PharmD programme General expectation of PharmD graduates Differences in competencies/duties between BPharm and PharmD pharmacists? Satisfaction with BPharm and PharmD pharmacists in terms of competencies and pharmacy services Expectations from pharmacists' roles Expectations from pharmacy education institutions/pharmacy curriculum Impact of curriculum change (on student and family/ pharmacy profession/ career image)

Table A10-2 (Continued)

	Questions
Pharmacists	Perceptions of an all-PharmD programme What are the differences in terms of about competencies/duties between BPharm and PharmD pharmacists? Expectations of into the new curriculum and real work situation How do you perceive about PharmD pharmacists in your workplace settings? Are there any differences in competencies between PharmD and BPharm pharmacists? What makes a PharmD pharmacist different from a BPharm pharmacist? What is the barrier to move from the traditional pharmacy to advanced pharmacy practice? How to across the barrier? What do you expect from a PharmD pharmacist? Preceptor roles **Specific questions for PharmD pharmacists** How often/ how many days a week do you intervene regarding patients' medications? How do PharmD pharmacists add value to patient care? How do you think your patients think about you? Are there any differences in competencies between PharmD and BPharm pharmacists?
Health care providers	How often do you contact a PharmD pharmacist regarding patients' medications? How do you perceive PharmD pharmacists in your workplace settings? Are there any differences in competencies between PharmD and BPharm pharmacists? Are you satisfies with the pharmaceutical care services from PharmD pharmacists? What is the barrier to move from traditional pharmacy to advanced pharmacy practice? What do you want to suggest to improve PharmD services? Perceptions of pharmacy curriculum change to a 6-year PharmD programme Expectations of the new curriculum and pharmacy practices in real workplace situation Suggestions about multidisciplinary education
Patients/ general public	Please explain the services that you receive from your pharmacists? How do you think about your pharmacist? Are you satisfied with the pharmaceutical care services? What do you want to suggest about improving pharmacy services? Do you know how long the pharmacy programme is? How do you think that pharmacy education changes with a 6-year programme?
Closing questions	Is there anything you would like to add about an all-PharmD programme? Is there anything that concerns you about the interviews or that you would like to ask me before we finish? Would you like to check your transcript after the interview?

APPENDIX 11: Phase 3 Invitation letter

11.1 Participant invitation letter (English version)

Dear .....

My name is Teeraporn Chanakit. This letter is an invitation to consider participating in a study I am conducting as part of my Ph.D. degree in the School of Pharmacy, University of Nottingham in the United Kingdom. I would like to provide you with more information about my project. This study entitled" Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy (PharmD) programme". I propose to explore information about perceptions of the stakeholders regards the introduction to the PharmD programme in Thailand.

I would like to request your permission to participate in this study. I believe that because you are a key informant involved in the pharmacy education in Thailand especially in curriculum changing process, you are the best suited to speak to these important issues.

Participation in this study is voluntary. I will need to interview you for approximately 60 minutes in Thai which will take place in a mutually agree upon location (Duration of process is between ..... 2013). You may decline to answer any of the interview questions if you wish. Further, you may choose to withdraw from this study at any time without any consequences. With your permission the interview will be audio recorded to facilitate collection of information, and later transcribed for analysis. I can send you a copy of the transcript to give you an opportunity to confirm the accuracy of our interview and to clarify any points as you wish.

Some quotes may be used in my Ph.D. thesis or may be published in appropriate scientific journals. However, your information will be treated as confidential, and all information you provide will be analysed as anonymous data. Research records will be stored securely and only researchers will have access to these records. This research was approved by the ethical committee, School of Pharmacy, University of Nottingham, UK.

Should you have any questions regarding this letter or my research, please do not hesitate to contact me at e-mail paxtc2@nottingham.ac.uk. You may also want to contact Prof.Claire Anderson, my supervisor, at Claire.Anderson@nottingham.ac.uk. or Dr. Bee Yean Low (BeeYean.Low@nottingham.edu.my) or Assoc.Prof.Dr.Payom Wongpoowarak (payom.w@psu.ac.th)

I hope that the findings of my research will be benefit to pharmacy education in Thailand, as well as to broader research community. I am look forward to speaking with you and thank you in advance for your kindness in this project.

Sincerely yours,

Teeraporn Chanakit
PhD Student

Prof. Claire Anderson
Supervisor

School of Pharmacy
University of Nottingham, Nottingham NG7 2RD, United Kingdom

11.2 Participant invitation letter (Thai version)

วันที่ .....

เรื่อง ขอความอนุเคราะห์ให้สัมภาษณ์ข้อมูลเพื่อการวิจัย

เรียน .....

เนื่องด้วยข้าพเจ้า นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ ได้รับอนุมัติให้ทำวิทยานิพนธ์ เรื่อง การศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย

ในการนี้ ข้าพเจ้าใคร่ขอสัมภาษณ์ข้อมูลเพื่อการวิจัยจากท่าน เนื่องด้วยท่านเป็นผู้ทรงคุณวุฒิ มีความรู้และประสบการณ์ที่มีค่ายิ่งเกี่ยวกับการศึกษาเภสัชศาสตร์ในประเทศไทย เนื่องด้วยท่านเป็นเภสัชกรที่ประสบความสำเร็จอย่างยิ่งและเป็นแบบอย่างที่ดีของวิชาชีพ

การศึกษาครั้งนี้ต้องการศึกษาในด้านความคิดเห็นที่มีต่อการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิต 6 ปี (Doctor of Pharmacy, PharmD) นี้โดยผู้วิจัยมีความประสงค์จะขอสัมภาษณ์ท่านให้ลึกซึ้งยิ่งขึ้น เพื่อนำความรู้และประสบการณ์ที่ทรงคุณค่าของท่าน เป็นข้อมูลในการพัฒนาด้านเภสัชศาสตร์ศึกษาต่อไป โดยข้อมูลจากโครงการจะถูกนำเสนอในรูปที่เป็นผลสรุปโครงการ เพื่อประโยชน์ทางวิชาการโดยไม่เปิดเผยชื่อ-นามสกุล ที่อยู่ของผู้เข้าร่วมโครงการทั้งในระดับสถาบันและระดับรายบุคคล และมีมาตรการในการเก็บรักษาข้อมูลทั้งส่วนตัวและข้อมูลที่ได้จากโครงการ การเปิดเผยข้อมูลต่อหน่วยงานต่าง ๆ ที่เกี่ยวข้อง หรือตีพิมพ์ในวารสารทางวิชาการจะกระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้นและโครงการวิจัยนี้ ได้ผ่านขั้นตอนการพิจารณา ทางจริยธรรมการวิจัยของมหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ เป็นที่เรียบร้อยแล้ว

จึงเรียนมาเพื่อขอความอนุเคราะห์จากท่านในการอนุญาตให้ข้าพเจ้าดำเนินการสัมภาษณ์ข้อมูลเพื่อการวิจัยจากท่านในวันและเวลาที่ท่านจะกรุณา ในวันที่..... หรือในวันอื่น ๆ แล้วแต่ท่านจะกรุณา โดยผู้วิจัยจะขออนุญาตนัดวัน เวลาและสถานที่ที่เหมาะสมต่อไป หวังว่าจะได้รับความกรุณาจากท่านและขอขอบพระคุณมา ณ โอกาสนี้ และหากท่านมีคำถามที่เกี่ยวข้องกับการศึกษานี้หรือข้อเสนอแนะเพิ่มเติม กรุณาติดต่อผู้ทำการศึกษาได้ที่ e-mail paxtc2@nottingham.ac.uk หรือติดต่ออาจารย์ที่ปรึกษาของข้าพเจ้า ได้ที่ Prof.Claire Anderson (Claire.Anderson@nottingham.ac.uk.) หรือ Dr. Bee Yean Low (BeeYean.Low@nottingham.edu.my) หรือ รศ.ดร.โพยม วงศ์ภูวรักษ์ (payom.w@psu.ac.th)

ในการนี้จึงขอความอนุเคราะห์จากท่านได้โปรดกรุณาอนุญาตให้ข้าพเจ้าได้ทำการสัมภาษณ์เพื่อการวิจัยและกรุณาตอบแบบตอบรับการสัมภาษณ์ ตามสิ่งที่แนบมานี้

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

Teeraporn Chanakit
นักศึกษาปริญญาเอก

Prof. Claire Anderson
อาจารย์ที่ปรึกษา
คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

APPENDIX 12: Phase 3 Participant information sheet and consent form

12.1 Participant information sheet (English version)

Participant information sheet

Project title

Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy (PharmD) programme

Name of researcher

Teeraporn Chanakit, Ph.D. research student, Division of Social Research in Medicines and Health, School of Pharmacy, University Of Nottingham, e-mail paxtc2@nottingham.ac.uk.

"You are being invited to take part in this study. Before you decide, it is essential for you to understand why the research is being done and what it would involve to you. Please take time to read the following information. You have the opportunity to ask any question if you wish."

Hello, my name is Teeraporn Chanakit. I am currently enrolled to complete doctoral studies at School of Pharmacy, University of Nottingham, United Kingdom.

What is the purpose of this study?

Pharmacy education in Thailand has just had a significant change. However, there is very little prior research in this area. The purpose of this study is to determine the perceptions of stakeholders about the introduction to an all-PharmD programme by using in-depth-interview.

Why have I been asked to participate in this study?

You are one of the stakeholders for the Thai pharmacy education. I am interested to listen to your opinions about Thai pharmacy education.

Do I have to take part?

No. It is up to you to decide whether or not to participate. If you do want to take part, you will be given this information sheet to keep and be asked to sign a consent form. You are still free to withdraw at any time, without giving any reason. A decision to withdraw at any time, or a decision not to participate, will not affect you. Any data collected from you will be destroyed if you would like to withdraw from this study.

What will happen to me if I take part?

If you decide to take part, a researcher will arrange a convenient time with you so that they can come and ask you some questions about what you think about pharmacy education. The interview will take approximately 1-2 hours. The interview will be audiotaped so that what you say is recorded accurately.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal practice and all information collected from you will be treated confidentially. It will be number coded with your name removed so that you cannot be recognized from it. Any names that you use in the interview will also be removed. You will also not be identified by name in any subsequent report of publication. However, although every attempt will be made to safeguard confidentiality, this cannot be guaranteed. If you tell us something worrying during the interview (about something that suggests you are at risk of harm), it may be our duty to act upon what you tell us. The information you provide us with will be held on secure password protected computers and in a locked and secure drawer cabinet.

What are the possible benefits of taking part?

It is hoped that the information that we get from this study can contribute to an accurate, up-to-date picture of the pharmacy education in Thailand, and may help policy makers to develop suitable improvement strategies.

What are the possible disadvantages of taking part?

It is hoped that taking part in the interview will not be stressful for you. It is up to you exactly what you share in the interview. However, if you feel upset by what you have shared, the interview can be stopped straight away.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by the Research Committee, Faculties of Sciences, the University of Nottingham, and the research committee, Ubon Ratchathani, University Thailand.

What if there is a problem?

If you have any concern about any aspect of this study, you should ask to speak with the researcher who will do their best to answer your questions. Alternatively please contact the academic supervisors: Prof. Claire Anderson (claire.anderson@nottingham.ac.uk) or Assoc.Prof.Dr.Payom Wongpoowarak (payom.w@psu.ac.th)

Who should I contact for further information?

If you need further information about this study, please feel free to contact us on the details below;

Name of researcher:	Teeraporn Chanakit (paxtc2@nottingham.ac.uk)
Name of supervisors:	Prof. Cliare Anderson (claire.anderson@nottingham.ac.uk)
	Assoc.Prof.Dr.Bee Yean Low (BeeYean.Low@nottingham.edu.my)
Name of Thai advisors:	Assoc.Prof.Dr.Payom Wongpoowarak (payom.w@psu.ac.th)
	Assoc.Prof.Dr.Summana Moolasarn (summana@hotmail.com)

Thank you for reading this participant information sheet.

Please do not hesitate to contact me any question if you need to.

12.2 Participant information sheet (Thai version)

แบบคำชี้แจงสำหรับอาสาสมัครที่ร่วมโครงการวิจัย

ชื่อโครงการ

การศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย

ชื่อผู้รับผิดชอบโครงการ

นางธีราพร ชนะกิจ นักศึกษาปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ email paxtc2@nottingham.ac.uk

"ท่านได้รับการเชิญชวนให้เข้าร่วมโครงการนี้ แต่ก่อนที่ท่านจะตกลงใจเข้าร่วมโครงการ โปรดอ่านข้อความในเอกสารนี้ทั้งหมด และหากมีข้อความใดในเอกสารที่ท่านอ่านแล้วไม่เข้าใจ โปรดสอบถามจากผู้รับผิดชอบโครงการ"

สวัสดีค่ะ ดิฉันชื่อ นางธีราพร ชนะกิจ ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

วัตถุประสงค์ของงานวิจัย

ปัจจุบันหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทยได้มีการพัฒนาเป็นหลักสูตร 6 ปี แต่ยังไม่มีงานวิจัยที่ศึกษาเกี่ยวกับการเปลี่ยนแปลงดังกล่าว งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย โดยใช้วิธีการสัมภาษณ์เชิงลึก

ท่านได้รับเชิญเข้าร่วมโครงการเพราะคุณสมบัติต่อไปนี้

ท่านเป็นผู้ที่มีความรู้และประสบการณ์อันมีค่ายิ่ง ที่เกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย โดยผู้วิจัยใคร่ขอสัมภาษณ์เกี่ยวกับ ความคิดเห็นที่มีต่อการเปลี่ยนแปลงหลักสูตรดังกล่าว

ความสมัครใจในการร่วมให้ข้อมูล

การให้ข้อมูลของท่านในการวิจัยนี้ เป็นไปโดยความสมัครใจ ท่านมีสิทธิ์ถอนตัวจากการวิจัยหรือปฏิเสธการให้ข้อมูล (ที่ส่งผลกระทบต่อตัวท่านในช่วงระหว่างการให้สัมภาษณ์ข้อมูล) และข้อมูลนั้นจะถูกทำลายในกรณีที่ท่านถอนตัวจากการให้สัมภาษณ์

ขั้นตอนการสัมภาษณ์

ในการศึกษานี้ต้องการขอความอนุเคราะห์จากท่านในการสัมภาษณ์เชิงลึก ณ สถานที่ทำงานของผู้ถูกสัมภาษณ์ การสัมภาษณ์จะใช้เวลาประมาณ 1 ชั่วโมง ขึ้นอยู่กับการสนทนา จะมีการบันทึกการสนทนาที่เกิดขึ้นด้วยเครื่องบันทึกเสียง

การเก็บรักษาความลับของข้อมูลส่วนบุคคล

ข้อมูลที่ได้จะถูกนำไปวิเคราะห์และนำเสนอในภาพรวมข้อความในการสนทนาบางตอน อาจถูกอ้างอิงในรายงาน แต่จะไม่ระบุชื่อของผู้ให้สัมภาษณ์แต่อย่างใดข้อความและเทปที่บันทึกในการสนทนาจะไม่ถูกเผยแพร่ ผู้วิจัยและทีมวิจัยที่เกี่ยวข้องกับงานวิจัยนี้เท่านั้นที่จะทำการวิเคราะห์ข้อมูลโดยจะนำเสนอในภาพรวม โดยไม่มีข้อมูลใด ๆ ที่จะนำไปสู่การระบุตัวผู้เข้าร่วมการวิจัย ข้อมูลจากโครงการจะถูกนำเสนอในรูปที่เป็นผลสรุปโครงการเพื่อประโยชน์ทางวิชาการหรือผลงานเผยแพร่ทางวิชาการ หรืองานตีพิมพ์ โดยไม่เปิดเผยชื่อ-นามสกุล ที่อยู่ของผู้เข้าร่วมโครงการเป็นรายบุคคลและมีมาตรการในการเก็บรักษาข้อมูลทั้งส่วนตัวและข้อมูลที่ได้จากโครงการ การเปิดเผยข้อมูลต่อหน่วยงานต่าง ๆ ที่เกี่ยวข้องจะกระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ประโยชน์ที่จะได้รับจากโครงการ

เพื่อสนับสนุนข้อมูลด้านวิชาการที่เป็นประโยชน์ในการศึกษาเภสัชศาสตร์ของประเทศ

ผลเสียที่อาจได้รับจากโครงการ อาจใช้เวลาในการให้ข้อมูลประมาณ 1 ชั่วโมง ในแต่ละครั้ง

แหล่งให้ข้อมูลหากมีข้อสงสัยเกี่ยวกับสิทธิอาสาสมัคร

งานวิจัยนี้ได้ผ่านการพิจารณาจากคณะกรรมการจริยธรรม Faculty of Sciences, University of Nottingham, UK และ สำนักงานคณะกรรมการจริยธรรมการวิจัยในมนุษย์ มหาวิทยาลัยอุบลราชธานี

หากท่านเกิดปัญหาใด ๆ จากการวิจัยจะสอบถามได้จากใคร

ท่านสามารถสอบถามข้อสงสัยที่เกี่ยวข้องกับโครงการได้จากอาจารย์ที่ปรึกษาโครงการวิจัย Professor Claire Anderson (Pazcwa@exmail.nottingham.ac.uk) หรือ รศ.ดร.โพยม วงศ์ภูวรักษ์ (payom.w@psu.ac.th)

คำถามที่เกี่ยวข้องกับโครงการจะสอบถามได้จากใคร

หากท่านมีข้อคำถามที่เกี่ยวข้องกับการศึกษาหรือข้อเสนอเสนอแนะเพิ่มเติมในอันที่จะทำให้การศึกษาในครั้งนี้มีความสมบูรณ์ยิ่งขึ้น กรุณาติดต่อผู้ทำการศึกษาได้ตลอดเวลาที่

ผู้วิจัย: นางธีราพร ชนะกิจ (paxtc2@nottingham.ac.uk)
อาจารย์ที่ปรึกษา: Prof. Cliare Anderson (claire.anderson@nottingham.ac.uk)ม
Assoc.Prof.Dr.Bee Yean Low (BeeYean.Low@nottingham.edu.my)
อาจารย์ที่ปรึกษา(ไทย): รศ.ดร.โพยม วงศ์ภูวรักษ์ (payom.w@psu.ac.th)
รศ.ดร.สัมมนา มูลสาร (summana@hotmail.com)

ขอขอบพระคุณในความร่วมมือของท่านมา ณ ที่นี้

12.3 Consent form (English version)

PROJECT TITLE

Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy programme

PARTICIPANT CONSENT FORM

Participant identification number:.....Name of researcher: Teeraporn Chanakit

Please initial box

1. I confirm that I have read and understand the information sheet dated (22/07/13) for the study above. I have had the opportunity to consider the information and ask questions hand have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐
3. I understand that relevant data collected during the study may be looked at by responsible individuals from the University of Nottingham where it is relevant to my taking part in this research. I give permission for these individuals to have access to this data. ☐
4. I give my consent for the audio-taping of the interview that will take place between me and the researcher. ☐
5. I give my consent for anonymised direct quotes to be used in reports and publications. ☐
6. When completed, 1 for participant and 1 for researcher site file ☐
7. I agree to take part in the above study. ☐

_____	_____	_____
Name of participant	**Date**	**Signature**
_____	_____	_____
Name of researcher	**Date**	**Signature**

(Participant Consent Form-22/07/2013)

12.4 Consent form (Thai version)

ชื่องานวิจัย

การศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย

หนังสือยินยอมเข้าร่วมโครงการด้วยความสมัครใจ (Participant Consent Form)

เลขที่ ผู้เข้าร่วมการวิจัย:..... ชื่อนักวิจัย: นางธีราพร ชนะกิจ

กรุณาทำเครื่องหมาย ✓ในช่อง ☐

1. ข้าพเจ้า ได้รับทราบรายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย ☐
   โดยได้อ่านรายละเอียดในเอกสารชี้แจงผู้เข้าร่วมการวิจัย (ฉบับวันที่ 22/07/2013) โดยตลอด
   และได้รับคำอธิบายจากผู้วิจัยจนเข้าใจเป็นอย่างดีแล้ว
2. ข้าพเจ้ายินยอมเข้าร่วมโครงการวิจัยนี้ด้วยความสมัครใจ ☐
   ข้าพเจ้ามีสิทธิจะบอกเลิกการร่วมโครงการวิจัยนี้เมื่อใดก็ได้
   และการบอกเลิกการร่วมโครงการวิจัยจะไม่มีผลกระทบใด ๆ ทุกประการ
3. ข้าพเจ้าได้รับการรับรองจากผู้วิจัยว่าจะเก็บข้อมูลส่วนตัวของข้าพเจ้าเป็นความลับ ☐
   และข้อมูลจากการสัมภาษณ์จะถูกนำไปวิเคราะห์โดยผู้วิจัยและทีมวิจัยที่เกี่ยวข้องกับงานวิจัยนี้เท่านั้น
   โดยไม่มีข้อมูลใด ๆ ที่จะนำไปสู่การระบุตัวข้าพเจ้า
4. ข้าพเจ้ายินยอมให้มีการบันทึกการสนทนาที่เกิดขึ้นด้วยเครื่องบันทึกเสียง ☐
5. ข้าพเจ้าได้รับทราบว่า ☐
   ข้อความในการสนทนาบางตอนอาจถูกอ้างอิงในรายงานวิทยานิพนธ์หรือผลงานเผยแพร่ทางวิชาการ
   โดยจะนำเสนอในภาพรวมโดยไม่ระบุชื่อของผู้ให้สัมภาษณ์แต่อย่างใด และไม่มีข้อมูลใด ๆ
   ที่จะนำไปสู่การระบุตัวข้าพเจ้า
6. ข้าพเจ้าจะได้รับเอกสารชี้แจงและหนังสือยินยอมที่มีข้อความเดียวกันกับที่นักวิจัยเก็บไว้ ☐
   เป็นส่วนตัวข้าพเจ้าเอง 1 ชุด
7. ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว มีความเข้าใจดีทุกประการ และลงนามยินยอมด้วยความเต็มใจ ☐

_____	_____	_____
ผู้เข้าร่วมโครงการวิจัย	**วันที่**	**ลายมือชื่อ**
_____	_____	_____
ผู้ดำเนินโครงการวิจัย	**วันที่**	**ลายมือชื่อ**

(Participant Consent Form-22/07/2013)

APPENDIX 13: Invitation letter to invite as a member checking

13.1 An invitation letter to invite as a member checking (English version)

Dated: .....

An invitation letter to invite you as a member checking of the findings

Dear .....

I am deeply grateful for the time you have given me to interview you on ..... and also provide me your invaluable suggestions. I have studied closely and analysed my data accordingly.

I have the pleasure to tell you that I have the preliminary findings. This piece of work entitles "Does a transition in education equate to a transition in practice? Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy programme".

As you are an expert in pharmacy education and being my participant, I would like to invite you to be a "member checking" to share your views on the accuracy and credibility of the findings, please. Member checking is the most critical technique to establishing credibility in qualitative research. In this triangulation process, I would like to send you my preliminary analyse consisting of description and themes, for you to consider about the accuracy and credibility of the findings.

The guide for a member checking for each theme is as follows;
- Please criticise the findings and comment on them
- Please affirm the findings as it accurate and complete as your perceptions and experiences

If you perceived that the researcher had incorrect data or incorrect interpretations, please suggest the errors for me.
This would be honoured if you would accept this invitation to share your view on the creditability of the findings and interpretation. Please let me know at your convenience if you will be able to accept to be my "member checking", and please do not hesitate to contact me if you have any questions about this letter.

I am looking forward to hearing from you. Thank you very much for your time and consideration.
Hope you have a nice day.

Best Regards,

Teeraporn Chanakit
PhD research student
School of Pharmacy, University of Nottingham

13.2 An invitation letter to invite as a member checking (Thai version)

วันที่ .....

เรื่อง ขอความอนุเคราะห์ในการตรวจสอบความถูกต้องของข้อมูลโดยผู้ถูกสัมภาษณ์ (Member checking)

เรียน .....

เนื่องด้วยข้าพเจ้า นางธีราพร ชนะกิจ อาจารย์คณะเภสัชศาสตร์ มหาวิทยาลัยอุบลราชธานี ขณะนี้กำลังศึกษาต่อหลักสูตรปริญญาเอก สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์ มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษได้รับอนุมัติให้ทำวิทยานิพนธ์ เรื่อง "การศึกษามุมมองของผู้ที่มีส่วนเกี่ยวข้องกับการเปลี่ยนแปลงหลักสูตรเภสัชศาสตรบัณฑิตในประเทศไทย" ข้าพเจ้าใคร่ขอขอบพระคุณท่านเป็นอย่างสูงที่ท่านกรุณาให้สัมภาษณ์ข้อมูลเพื่อการวิจัย บัดนี้ข้าพเจ้าได้ทำการวิเคราะห์ข้อมูลและได้ผลการวิจัยในเบื้องต้นเป็นที่เรียบร้อยแล้ว

ในการนี้ข้าพเจ้าใคร่ขอความอนุเคราะห์จากท่านอีกครั้ง ในการเป็นผู้พิจารณาความถูกต้องของข้อมูล (Member checking) ในภาพรวมของงานวิจัยนี้ โดยขั้นตอนการตรวจสอบนี้ **ผู้วิจัยจะนำเรียนข้อมูลที่ได้จากการวิเคราะห์กลับไปให้ผู้ถูกสัมภาษณ์ยืนยันความถูกต้องของข้อมูลในภาพรวมว่า ข้อมูลเป็นจริงตรงกับประสบการณ์และความรู้สึกของผู้ถูกสัมภาษณ์หรือไม่**

ข้าพเจ้าหวังว่าจะได้รับความกรุณาจากท่านในการยืนยันความถูกต้องของข้อมูลในภาพรวมและ ขอขอบพระคุณมาณ โอกาสนี้ และหากท่านมีคำถามที่เกี่ยวข้องกับการศึกษานี้หรือข้อเสนอแนะเพิ่มเติม กรุณาติดต่อผู้ทำการศึกษาได้ที่ e-mail paxtc2@nottingham.ac.uk

ในการนี้จึงขอความอนุเคราะห์จากท่านได้โปรดกรุณาตรวจสอบข้อมูลที่ได้จากการวิเคราะห์ ตามสิ่งที่แนบมานี้ จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ด้วย จักเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

ธีราพร ชนะกิจ
นักศึกษาปริญญาเอก
สาขาเภสัชศาสตร์ คณะเภสัชศาสตร์
มหาวิทยาลัยน็อตติ้งแฮม ประเทศอังกฤษ

APPENDIX 14: Timetable for Phase 3 qualitative study

Table A14-1 Timetable for the data collection process in the fieldwork in Thailand

Process	2013											
	May		Jun		Jul		Aug		Sept		Oct	
1. Contacted the key informants (e.g., policy makers, pharmacy experts, faculty of pharmacy) via emails												
2. Contacted the hospital directors for permission to collect data												
3. Contacted the local ethical committees from each hospital												
4. Recruited the key informants												
4.1 North-East -Faculty: internal stakeholders -General publics -Hospital: health care professionals, patients -Policy makers -Pharmacy experts -Pharmacy practice settings (e.g., community pharmacies, consumer protection) : pharmacists												
4.2 South -Faculty: internal stakeholders -General publics -Policy makers -Pharmacy practice settings (e.g., community pharmacies) : pharmacists												
4.3 North -Faculty: internal stakeholders -Hospital: health care professionals, patients -Policy makers												
4.4 Central -Faculty: internal stakeholders -General publics -Policy makers -Pharmacy experts -Pharmacy practice settings (e.g., community pharmacies, consumer protection, pharmaceutical industrials, marketing): pharmacists												

Table A14-2 Timetable for the transcribing, translation and data analysis

Process	2013		2014												2015		
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1. Transcribing, translation (20-25 recordings/month) & accuracy checking																	
2. Transcripts were sent back to 10 interviewees																	
3. Thematic analysis																	
4. Member checking																	