DEVELOPING A GLOBAL TYPOLOGY OF EDUCATION AND TRAINING PATHWAYS FOR GENERAL PRACTITIONERS

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature: ……

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LIST OF ACRONYMS

GPs - General practitioners

FP - Family physician

FM- Family medicine

PHC - Primary health care

RCGP- Royal College of General Practitioners

UK – The United Kingdom

USA – The United State

WONCA - The World Organization of Family Doctors

WHO – World Health Organisation

AUPMC - The Academic Unit of Primary Medical Care

GEP - Graduate-entry program

ERIC - Education Resources Information Centre

WFME - World Federation for Medical Education

GMC – General Medical Council

LCME - Liaison Committee on Medical Education

CASP - Critical Appraisal Skill Programme

BERA - the British Educational Research Association

CESR - certificate of eligibility for specialist registration

CEGPR - a certificate of eligibility for general practice registration

CCT - Certificate of Completion of Training

RCPSC - Royal College of Physicians and Surgeons of Canada

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ABSTRACT

Introduction

General practitioners (GPs) play a crucial role in delivering primary care; however, there is a shortage of GPs and a recruitment crisis in many parts of the world. Additionally, GPs often work under high pressure due to increasing societal demand for their services, resulting from the aging population, increasingly complex patient cases, climate change, pandemics, and other factors. Initiatives such as changes in medical technology, new ways of treating patients, and increasing allied healthcare professionals' involvement are attempting to address these challenges. Therefore, the role of GPs is changing, and new approaches to recruitment and training are required. This thesis explores different typologies of education and training pathways for GPs and their characteristics.

Methods

The study consisted of two sequential phases. In phase 1, a scoping review used search terms such as ‘General practice’ or ‘Family medicine’ and ‘medical education or training’ in Ovid Medline, EmBase, and ERIC. It identified studies published in English since 2010, describing education and training pathways for GPs. Three typologies based on GPs’ roles in healthcare systems were developed. In phase 2, semi-structured interviews with 28 stakeholders in the training process for GPs helped to extend understanding of the three typologies. The stakeholders were located in three countries (Vietnam, UK, and the USA) selected as representative of each typology.

Results

In phase 1, 90 articles were included in the scoping review, of which 47 discussed both undergraduate and postgraduate programmes. The different roles of GPs within the health care system were reflected in distinct education and training pathways. Three typologies were developed: 'Gatekeeper' (where patients cannot access secondary or tertiary services without GP referral), 'Doctor of Choice' (where patients can choose to see a GP or specialist and can access secondary or tertiary care directly), and 'Team member' (where patients can access a network of health professionals in the community).

In phase 2, three main themes related to the typologies emerged: (i) characteristics of training pathways, (ii) influencing factors, and (iii) stages of the training pathway. Training pathways were diverse and changed over time. Five influencing factors to GP training were: programme design (curriculum, pedagogy, assessment), culturally and historically established structures (e.g., duration and training settings), changing role of GPs, changing expectations of patients and society, and changing health needs. There were three main stages of training pathways: entering the pathway as medical students, continuing the pathway as trainees, and exiting the pathway as GPs. The significant distinctions of the three stages between the typologies were reflected.

Discussion

The study offers a provisional typology with typical characteristics and factors influencing GP training. These findings highlight: (1) diversity and complexity in education and training for GPs; (2) a strong connection between training pathways with practice settings and types of primary care provision in countries; (3) that a 'one size fits all' approach is not appropriate in designing and developing GP training programmes; (4) that barriers exist to the mobility of GPs between countries. Therefore, the typology provides a reference for medical educators and policymakers. Conceptualising the diversity in education and training pathways can inform the implementation of educational and training transformation for GPs in different countries.

CHAPTER 1: INTRODUCTION

1.1 What is the problem under study?

General practitioners (GPs) worldwide play a crucial role in delivering primary health care (PHC), treating common diseases, and referring patients to hospitals and other medical services for urgent and specialist treatment. However, there is a shortage of GPs and a recruitment crisis in general practice in many parts of the world (Majeed, 2017). GPs are often working under pressure due to increasing and changing societal demand for their services, resulting from factors such as the ageing population, increasing number of people with complex conditions, climate change, and pandemics (Baird, Charles, Honeyman, Maguire, & Das, 2016; Costello et al., 2009; Markit, 2017; Shanafelt, Ripp, & Trockel, 2020; Verhoeven, Tsakitzidis, Philips, & Van Royen, 2020; Walker, 2009; Watts et al., 2015; WHO, 2008). Additionally, changes in medical technology, new ways of treating patients, and changes in healthcare services such as community nursing, mental health provision, and care homes are also changing healthcare systems (Casey, 2013; Fennell, 2008; Ham, Dixon, & Brooke, 2012). New and effective approaches to recruiting and training prospective GPs will be required to address these current and future challenges, and this is a major focus for medical educators and policymakers.

1.2 What is known and what gaps in knowledge exist

To support this development work, medical educators and policymakers need to be able to understand, compare and contrast the different models of GP education and training in different countries across the world. This would enable an evidence-based approach to consider whether a common international education and training pathway is warranted or whether training must be contextualised to different country's healthcare needs, geography, and available resources. Several studies have been conducted to discover the medical doctor training worldwide, including a narrative review of medical education systems worldwide (Nara, Suzuki, & Tohda, 2011) and a survey to categorise medical training formats worldwide (Wijnen-Meijer, Burdick, Alofs, Burgers, & ten Cate,

2013). However, to the best of my knowledge, no studies have developed a typology of education and training pathways worldwide specifically for GPs.

1.3 How this study adds to the debate

Therefore, this thesis explores different typologies of education and training pathways for GPs and identifies their characteristics. In the first research stage, a scoping review was adopted to synthesise existing evidence. This allowed me to compare and classify different training pathways in order to establish a provisional typology of education and training pathways for GPs. Subsequently, a qualitative study was conducted to explore stakeholder's perspectives about their training pathways. In particular, the qualitative study includes interviews with key stakeholders in the GP training process from different countries who are representatives for provisional typologies. Exploring international perspectives about the education and training pathways for GPs can reflect the reality of training GPs and distinctions or similarities between nations. This can help to reach a keen understanding of provisional typologies established from the scoping review. The thesis, therefore, provides a global typology of education and training pathways for GPs as a reference for medical educators and policymakers in curriculum development and training transformation.

1.4 Structure of the thesis

The thesis consists of 6 chapters. In Chapter 1, I first present the brief introduction of the thesis structure, including the summary of each chapter. Then, I highlight emerging problems in education and training for GPs, a gap in the existing knowledge about these issues, and articulate how the study can contribute to narrow this gap. At the end of the chapter, I present my background in Vietnam and clarify my motivation, aims, and objectives for conducting the research. In Chapter 2, I first define key terms used in the study to clarify the research context. Then, the literature review is structured with six main themes: (1) the role of general practice in healthcare systems, (2) the development of GP training, (3) development of primary care in Vietnam, (4) challenges for primary care and GP training, (5) medical education reform, and (6) key research related to the study. The research aim and objectives are reiterated at the end of the chapter.

Following this, Chapter 3 explicates the methodology, research approach, methods, and the appropriateness of methods used. At the end of the chapter, I consider research quality and ethical issues during the research process. Chapter 4 demonstrates the findings of the scoping review. Subsequently, Chapter 5 illustrates the results of the qualitative research. In Chapter 6, I start by summarising the core findings, then compare and discuss them with existing literature. Ultimately, I present the strengths, limitations of the study, and the recommendations for practice, policy, future research from the findings at the end of the chapter.

1.5 Motivation for my research from a personal perspective

In order to understand my motivation for undertaking this research, it is important to consider my background. I was born and brought up in Vietnam and studied epidemiology at medical school. These studies helped me to obtain a comprehensive understanding of background analysis, policymaking, and issues relating to the quality of healthcare services and the community's health needs. Then, I worked as a research assistant at the Centre for Development of Curriculum and Human Resources in Health. While working as a researcher in the research centre, I completed a master's degree in Epidemiology. Therefore, both my previous work experience and the findings of my master's project contributed to my interest in medical education and my wish to study a doctoral programme.

Whilst working as a researcher at the Centre for Development of Curriculum and Human Resources in Health, I undertook several key studies for the Ministry of Health about developing competency frameworks for training of GPs, dentists, surgeons, obstetricians and gynaecologist. This helped me learn how to conduct in-depth interviews, make research questionnaires and select appropriate study designs. After that, I also participated directly as a research assistant in implementing several studies for the Ministry of Health about training GPs, dentists, and surgeons. Therefore, I have learned and improved my knowledge about medical education systems and training models worldwide. By doing so, I

gained an awareness of current issues related to primary healthcare needs and the quality of training doctors in Vietnam.

Currently, Vietnam is facing a severe shortage of general doctors, with nearly 8.6 doctors per 10,000 inhabitants, which is much lower than Thailand, Singapore, Malaysia, and the Philippines where there are 15 to 20 doctors per 10,000 inhabitants (General Statistics Office, 2014). In addition, several researchers have indicated that the medical curriculum outcomes do not yet respond to societal primary care needs (Bộ Y tế, 2012, 2013; Fields B and Nghiêm Xuân Đức; 2008; Hạnh, 2013a, 2013b). The situation has been further negatively impacted by the top-down approach adopted in curriculum development (Hạnh, 2013a, 2013b; Hạnh, Quyên, & Vương, 2014). Training content is based on potentially biased previous experiences of specialists, lecturers, and policymakers rather than focusing on societal primary care needs. Indeed, medical educators have warned about a range of emerging issues in medical training models, including inappropriate evaluation programs and assessment methods for the clinical learning context (Hạnh et al., 2014; NỘI & HIỂN, 2016). Thus, the Vietnamese Ministry of Health has identified the need to prioritise reform in medical education and training needs for general doctors rather than focusing on increasing the number of future doctors (Bộ Y tế & WHO, 2007). For five years, the Ministry of Health has implemented several schemes to develop solutions to improve human resources quality in health care. These schemes focus on the innovation of training models and education programs available in the world.

The findings of my Masters project motivated me to conduct further research into GP training. The Masters project included three research objectives: (i) developing the disease model including a description of the types of diseases and their distribution in Phu Tho province that allows identification of local healthcare needs, (ii) comparing the disease model established to the content of the GP training programme of Hanoi Medical University to evaluate the appropriateness of the training programme with local healthcare demand. (iii) comparing the content of the GP training programme to the list of compulsory techniques for general practitioners at local hospitals developed by the Ministry of Health to

evaluate the appropriateness of the GP training programme with the functional requirements for GPs at local hospitals. The first objective was addressed by analysing secondary data (within 5 years) from Phu Tho Department of Health such as annual reports from local hospitals about status of medical examination and treatment in hospitals. The second and third research objectives were addressed through employing mixed methods, including questionnaires and semi-structured interviews. This research project highlighted a mismatch between the content of the GP training programme of Hanoi Medical University with local healthcare needs and the functional requirements for GPs at local hospitals.

Through this research, I developed a further research proposal for my doctoral study with the initial intention to develop a new training model for GPs that can respond to local healthcare need, working requirements for GPs at hospitals and future challenges for primary care. At the beginning, I wondered “how many different training programmes for GPs in the world”, “what is the best GP training programme like an international training programme for GPs” and whether or not can apply for Vietnam setting. So, I started looking for opportunities to conduct my doctoral research with experts from developed countries with highly effective primary care health systems

After several discussions with both my supervisors, we agreed on the necessity of exploring different training pathways for GPs in the world as a foundational step for developing and reforming training models. In particular, I felt that a study that explores different typologies of education and training pathways for GPs could be useful and a foundational step toward developing an appropriate training model for GPs in Vietnam in the future. I am interested in exploring potential training models that can respond to increasing primary health care needs and end the overload at hospitals in Vietnam. I thus began to investigate the existing training models for GPs in the world, how they are different, and their advantages and disadvantages.

My reflections: motivation for conducting a doctoral research

The starting point in my education pathway was studying public health, which helped me obtain knowledge of protecting and improving the health of people and their communities. Generally, public health is focused on protecting the health of entire populations. Particularly, the principal objective of public health is finding preventative solutions to address health problems for communities, such as promoting healthy lifestyles, researching disease and injury prevention, and detecting, preventing, and responding to infectious diseases. Then, I decided to specialise in epidemiology in my education pathway where my expertise in investigating patterns and causes of disease and injury to discover the causes of health outcomes and diseases in populations and reduce the risk and occurrence of negative health outcomes through research community education and health policy. While studying for a Master of Science in epidemiology, I was appointed a researcher position in medical education at the Centre for Development of Curriculum and Human Resources in Health at Hanoi Medical University, which was a significant milestone in my career pathway. This milestone can explain why my research interest was directed to medical education and education for primary care. The first stage of my master's project was exploring disease patterns and the causes of health outcomes in populations. Combined with my working experience in medical education, the quality of GP training programmes was considered a potential influencing factor to the health outcomes in communities. Therefore, the second stage of my master's project concentrated on assessing the appropriateness of the GP training content with disease patterns (community healthcare needs). The findings of this stage highlighted the mismatch between GP education and training programmes with local healthcare needs. Hence, at the starting point of my doctoral study, I was looking for solutions to reform GP education and training programmes to respond to changing local healthcare needs. Initially, I looked at the health care system performance rankings, and the majority of western nations had been placed on the top of the rankings, namely the UK, Australia, Netherland, Norway, New Zealand, Switzerland, Sweden, Germany, Canada, France, and the USA. In other words, the systems of primary care provision in these nations had been considered ideal systems in the world.

Additionally, the standards of medical education prevailing in advanced industrial countries have been applied to underdeveloped and developing countries, including Vietnam, to exporting professionalism and medical modernization from Western nations over the world. My notion at the beginning of my doctoral studies was to look for an ideal or good training programme based on Western programmes that could be imported to Vietnam. Thus, I was looking for opportunities to conduct my doctoral research in the UK based on the reputation of the NHS and the effective GP system for primary care. However, through my doctoral research, I came to recognise that this "Westernizing trend" or "one size fits all" was problematic and perhaps not an appropriate approach in designing, developing, and reforming the GP training programme for Vietnam. Each country has its own identities in culture, economics, politics, society, and history of formation and development that shapes its healthcare settings or practice contexts.

1.6 Aim and Objectives

This thesis aims to explore different typologies of education and training pathways for GPs and identify their characteristics. The study is aimed at helping medical educators and policymakers to reach a better understanding of the distinctive characteristics of current education and training pathways for GPs. Furthermore, the study could be instrumental in informing researchers, medical educators, and policymakers to identify priorities for study and promote innovation of future education and training for GPs.

Two specific objectives determined from the research aim and the current scope are given below:

1. Undertake a scoping review to explore *'What are the different types of education and training pathways for GPs represented in literature?'*

2. Undertake a qualitative study to explore *'What are the stakeholders' perceptions of education and training pathways in their own country?'*

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction to the chapter

This chapter provides background information to explain the context in which the research was conducted. Additionally, the literature review also identified relevant gaps and emerging challenges to expound how the literature has led to establishing the research questions. The literature consists of eight separate sections related to education and training pathways for GPs:

· Research context: education and training for GPs

· The role of general practice in healthcare systems

· The development of GP training

· Development of primary healthcare in Vietnam

· Challenges for primary healthcare and training for GP

· Medical education reform

· Key studies related to education and training pathways for GPs

· Aim and objectives

2.2 Research Context: Education and Training for GPs

Key terms used throughout this thesis will be defined before presenting the literature. The two key terms will be education and training pathway and general practice.

2.2.1 Education and training pathway

Firstly, John Clement described that a pathway would provide both a theory of instruction and a guideline for teachers and curriculum developers (Clement, 2000). According to Minnesota State career and education resources, the teaching and training pathway includes occupations that lead or assist in delivering instructional materials or lessons in classrooms, workshops, or online and distance technology. In the scope of this research, the general practice training pathway is an integrated collection of programs, courses, and continuous education intended to develop professional competencies, namely core academic, technical, and employability skills for medical students to become general practitioners (GPs).

A training pathway is likely to comprise of a syllabus and curriculum. A syllabus is an outline or other brief statement of the main points of a discourse, the subjects of a course of lectures, the contents of a curriculum. A syllabus serves seven purposes: sets the tone for a course; motivates students to set high but achievable goals; serves as a planning tool for faculty; structures students' work over the semester; helps faculty plan and meet course goals promptly; serves as a contract between faculty and students about what students can expect from faculty and vice versa; and is a portfolio artefact for tenure, promotion, or job applications (Littlefield, 1999). The syllabus is therefore important to provide details on the overarching curriculum.

Kerr defines curriculum as all the learning planned and guided by the school, whether it is carried on in groups or individually, inside or outside the school (Kelly, 2009). In the Oxford dictionary, a curriculum is a number of subjects in the course of study in a school or college (Stevenson, 2010). According to the Glossary of Education Reform (Ravitch, 2010), depending on how broadly educators define or employ the term, curriculum typically refers to the knowledge and skills students are expected to learn, which includes the learning standards or learning objectives they are expected to meet; the units and lessons that teachers teach; the assignments and projects are given to students; the books,

materials, videos, presentations, and readings used in a course; and the tests, assessments, and other methods used to evaluate student learning. In the research scope, the definition of the Glossary of Education Reform will be applied.

2.2.2 General practice (GP), Family medicine and Primary care

General Practice

Basic definitions of general practice are available in dictionaries. In the Cambridge dictionary, general practice is the work of a GP (a doctor) who treats the people who live in the local area and treats conditions that do not need a hospital visit (Walter, 2008). Another definition from Collins dictionary states that when a doctor is in general practice, he or she treats sick people at a surgery or office, or visits them at home, and does not specialise in a particular type of medicine (Collins English Dictionary, 2014). The Royal College of General Practitioners defined a GP as a doctor who deals with patients regarding their physical, social, and mental well-being.

However, in 2000, Olesen expanded upon the need to take account of the context in which the GP works and the relevant social responsibilities (Olesen, Dickinson, & Hjortdahl, 2000):

> *"The general practitioner is a specialist trained to work in the front line of a healthcare system and to take the initial steps to provide care for any health problem(s) that patients may have. The general practitioner takes care of individuals in a society, irrespective of the patient's type of disease or other personal and social characteristics and organises the resources available in the healthcare system to the best advantage of the patients. The general practitioner engages with autonomous individuals across the fields of prevention, diagnosis, cure, care, and palliation, using and integrating the sciences of biomedicine, medical psychology, and medical sociology." (p.355)*

Contact with the patient in the social context is defined as being at the core of general practice. A report by the King's Fund in 2011 emphasises this (Goodwin,

Dixon, Poole, Raleigh, & Gao, 2011). It suggests that General Practice maintains a fundamental commitment to centralism which manifests itself in two elements: patient-centredness and holism. Patient centredness means that patients' individual priorities are identified and respected, with services organised based on these needs. Holism refers to a system of care where decisions made on the diagnosis and management of a patient reflect the entirety of that person's needs. More recently, the RCGP and the Heath Foundation commissioned a report on 'generalism' (Finaly, 2011) which emphasised that the medical generalist should concentrate on wellbeing; the primary focus is the patient, not the illness.

In the UK, general practice is the first point of contact with health care services for most people. Recent Scottish workforce data suggest that contacts with a GP account for most encounters with primary care services, with an increasing number of patients contacting general practice services (Baird et al., 2016).

Family Medicine

According to the 2019 Congress of Delegates of the American Academy of Family Physicians, family medicine is determined as the medical specialty which provides continuing, comprehensive health care for the individual and family. It is a specialty in scope that combines the biological, clinical, and behavioural sciences (Phillips et al., 2014). Family medicine encompasses all ages, all genders, each organ system, and every disease entity. The distinction between GP and FP is that FM concentrates on the relationship with patients and consulting in the context of their family (closest family members or relevant others) and their wider society.

In fact, similar terms are used across the world such as general practitioner (UK), '*hausart*' (Germany), '*huisarts'* (Netherlands), '*médecin général'* and '*médecin de famille'* (France), and family physician (US) (Jamoulle et al., 2017). The WONCA dictionary expresses: *"Many medical practitioners in the primary health care prefer the terms family physician and family medicine to emphasise the recognition of their branch of medical practice as a specialty in its own right"*

(Bentzen, 2003). Therefore, WONCA has always employed the pair of terms general practice /family medicine to manifest and debate the primary care providers. According to European definition, general practice / family medicine is an academic and scientific discipline, with its educational content, research, evidence base, clinical activity, and a clinical specialty orientated to primary care. Characteristics of general practice are detailed below (WONCA Europe, 2002):

WHO 1998	**WONCA 2002**	**"Principles" as described by Gay (Allen, Gay, Crebolder, Heyrman, Svab, Ram, et al., 2002)**
General		Diseases at early stage Unselected and complex health problems
Continuous	Orientation to the patient	Patient centred approach
Comprehensive	Comprehensive care	Field of activities determined by patient needs and requests
Co-ordinated	Co-ordination with other services	Coordinated care
Collaborative	Doctor/patient relationship	
Family orientated	Family focus	Orientation on family and community context
Community orientated	Accessibility and resource management.	Simultaneous management of multiple complaints and pathologies
	Advocacy	Continuing management
		Low incidence of serious diseases
		Efficiency

Primary Health Care (PHC)

The definition of PHC, confirmed by the WHO in 1978 at Alma-Ata, is an organisational concept. In particular, WHO has defined primary health care as a whole-of-society approach to health and wellbeing concentrated on the needs and preferences of individuals, families, and communes. It covers the broader determinants of health and concentrates on the comprehensive and interrelated aspects of physical, mental, and social health and wellbeing (American Academy of Family Physicians; Brouwer & Marušič, 2014; Care, 1996; Dmytraczenko &

Couttolenc, 2013; Donaldson, Yordy, Lohr, & Vanselow, 1996; Macinko, Montenegro, & Etienne, 2007).

There are many different definitions of general practice/ family medicine (Allen, Gay, Crebolder, Heyrman, Svab, & Ram, 2002; Bentzen, 2004; Phillips et al., 2014; Physicians; Urquiza, Copolillo, & Jure, 2014; WONCA Europe, 2002) and PHC (American Academy of Family Physicians; Brouwer & Marušič, 2014; Care, 1996; Dmytraczenko & Couttolenc, 2013; Donaldson et al., 1996; Macinko et al., 2007) from different organisations. Therefore, confusion between concepts of general practice/ family medicine and PHC might occur. Thanks to a terminological analysis of definitions of general practice, family medicine, and primary health care in 2017 (Jamoulle et al., 2017), ten definitions related to general practice or family medicine were identified and ranged from 1974 to 2016 The research also indicated that general practitioners and family physicians worldwide are assigned to comprehensiveness, personal and patient-centred care, and universal accessibility, which provide and sometimes organise primary care in PHC settings (Jamoulle et al., 2017). Both GP/FM and PHC use the terms continuity of care, patient centredness, community health, and shared decision making. However, the findings of the terminological analysis indicated a distinction in content (Jamoulle et al., 2017). In particular, GP/FM is identified by such terms as medicine, responsibility, individual, problem, disease, and peculiarity. Meanwhile, PHC is quite service-oriented with added home, team, promotion, collaborator, engagement, neighbourhood, and medical centre services.

2.3. The Role of General Practice in Healthcare System

General practice is an academic discipline, with its training curriculum, scientific research, evidence base, clinical work, and a medical specialty orientated to primary care. It is recognised to be the central discipline in medicine because it is a unique bridge in linking multiple different disciplines in medicine, namely family care, preventive care, public health, social care, and continuity of care (Marshall M, 2016). Firstly, generalist doctors provide primary care for people

with common diseases with simultaneous occurrences of multiple conditions and maintain continuous and whole-person care for individual patients. The second primary responsibility of general practice is serving all communities with easily accessible medical services, namely prevention and health education alongside clinical treatment. Furthermore, at a health-system level, generalist doctors effectively mitigate clinical risks and seek to reduce the risk of overmedicalisation and the increasing rate of morbidity (Marshall, 2015). From an economic perspective, general practice has achieved the most cost-effectiveness compared to distinct specialties for the health care system (D. P. Gray, 2017). The critical role of general practice has been confirmed by the General Household Survey result which indicated that 86% of health problems of patients are managed exclusively in primary care and noted the potential for lifesaving treatment in general practice (Statistics, 1998; M. Thomas, 1998).

There are two critical components of generalist medicine, including the population-based opportunity to improve specific populations' health and a personal form of medicine. Firstly, generalists deal with an interplay of physical, psychological, and social factors in providing personal healthcare. Additionally, they are committed to taking preventative measures to avoid diseases developing instead of treating them. Their aim is also to continuously improve the health of specific communities, which is the principal function of general practice (D. J. P. Gray, 1982). Furthermore, the WONCA European Council has outlined the characteristics, roles, and core competencies of general practitioners. Six core competencies are covered, namely, primary care management, person-centred care, specific problem-solving skills, comprehensive approach, community orientation, and holistic modelling (Allen et al., 2005). Meanwhile, Moore, a Chair of Ambulatory Medicine at Harvard University, USA, viewed preventive medicine as more crucial than remedial medicine and recommended that the future of health services be supplied with the principal aim of providing evidence-based preventative care (D. P. Gray, 2002). This means that the importance of general practice today is becoming even more critical. On the other hand, a recruitment crisis among GPs has been reported (Fletcher et al., 2017; Marchand &

Peckham, 2017) with medical students tending not to choose to train as a GP (Goldacre, Davidson, & Lambert, 1999). Furthermore, professional pressures on generalists are growing rapidly due to dramatic innovations in science, high patient demand, new burdens from clinical governance, and revalidation (Harrison, Innes, & Van Zwanenberg, 2018; Marshall, 2000). A census survey in UK (Fletcher et al., 2017), carried out between April and June 2016, to examine GPs' career intentions to quit their career, indicated that a substantial majority of GPs in South West England report low morale and considered quitting their career. This finding highlighted potential adverse impacts to GP workforce capacity in the UK. Meanwhile, generalists' professional benefits are significantly less than clinical specialists (Leigh, Tancredi, Jerant, & Kravitz, 2010) such as remuneration between primary care and other physician specialties. Consequently, the imbalance between primary and secondary care is increasingly widening (Pereira Gray, 2003).

2.4 The Development of General Practice Training

The variation in GP training is well known between distinct countries (Arya et al., 2017; Haq et al., 1996). The development in the general practice first occurred in United Kingdom in the nineteenth century and the early decades of the twentieth because of a progressive separation of the role of GPs from that of physicians and surgeons (Howie, 2011). In particular, consultant physicians and surgeons managed appointments, scientific and technical facilities at hospitals from which GPs were excluded. This division led to the GPs becoming personal physicians working in the local community. In addition, there were other fundamental reasons for the significant growth of general practice in Britain including the introduction of the National Insurance Act of 1911, the creation of the National Health Service (1948), and tradition of partnership between the medical profession and the government (D. J. P. Gray, 1982). GPs thus became responsible for the primary care provision with a national system funded by the national budget. In 1952, the foundation of the College of General Practitioners in the United Kingdom was developed and until 1995 all medical schools in UK have a department of GP. The organisations and structures of GP in UK have

experienced a significant change by encouraging group practices and cooperative interdisciplinary and clerical staffing. Currently, the GP services are provided by a team including GPs and other medical staff at community health centres instead of a personal doctor. From a singlehanded, untrained service, working from home, currently, general practice is recognised as a university discipline including a unique body of knowledge, specific clinical skills, and the ability to support original research.

GP training has largely owed its development to the collaboration of teaching hospitals in the immediate vicinity that addressed the need for clinical practice space, funding, and academic clinical staff for training programmes. GP training was organised into two models: practice-based and practice linked. In the practice-based model, academic clinical staff were partnered with a university teaching practice. In contrast, the practice-linked model had university staff with clinical appointments in different practices (D. J. P. Gray, 1982; Howie, 2011). Although, the practice-based model was effective, it faced struggles in continuing development due to stringent requirements of partnerships from the NHS and pressure from the universities (Howie, 2011). In addition, several barriers became prevalent in developing GP including unavailable clinical spaces, lack of local doctors, the complexity and environmental health issues associated with ancient medical school buildings, and inadequate budget.

In regard to the limitation of funding, an interesting idea involving recruiting teachers using a structure of “hub and spoke” geographically linked to groups of general practice teachers was proposed (Howie, 2011). The model had several advantages such as no need for fixed office and no money for appointments of a cluster group of general practitioners (Howie, 2011). Regarding the education program, the curriculum was built based on a top-down approach setting a series of local trainer meetings united in comradeship. For instance, St Thomas’s, Guy’s, and King’s College Hospital recognised the importance of general practice presence and organised a range of meetings at Cambridge colleges to develop a new curriculum between 1976 and 1978. At that period, a general practice curriculum was developed based on a behavioural model relating to why patients

consult their doctors. Moreover, there was a priority to change undergraduate teaching with a new GP curriculum at that time (Howie, 2011). For instance, between 1989 and 1992, the University of Sheffield introduced a reformed curriculum included first aid, a family attachment scheme linked to medical sociology in the first year, a short course on communication skills in the third year, and five-week module in the final year incorporating self-directed learning and continuous assessment. GMC reviewed the curriculum and now accounts for one-fifth of the undergraduate curriculum (Howie, 2011). The Acheson Report on primary care in inner London of London Health Planning Consortium in 1981 stimulated the shift (Acheson, 1981). In particular, the report indicated the high percentage of single-handed and elderly GPs, the shortage of primary care teams at health centres, and the deficiency of quality practice premises (Acheson, 1981). Thus, four of the 114 recommendations in the report referred to the importance of London teaching hospitals developing academic department of GP and promoting primary care (Jarman & Bosanquet, 1992). Additionally, some successful projects contributed considerably to the evolution of GP in the UK, namely the Community Based Medical Education in North Thames project, the Educational Research Project (Howie, 2011).

In the late 20th century, there was a considerable shift in organising general practice operation in the UK. For instance, the department of general practice at the University of Sheffield became the Institute of General Practice and Primary Care in 1997. But, in 2006 the Institute returned to the medical school as the Academic Unit of Primary Medical Care (AUPMC). The reason for the continuous change is caused by conflict between the research and teaching components of general practice, even though both are mutually dependent. Additionally, there was the historical discontinuity in undergraduate and postgraduate training due to different funding resources for the two stages. Hence, AUPMC developed and ran a new research and teaching strategy to have a better balance between clinical and non-clinical components, in which it focussed on translational research (translating evidence into practice) and translational teaching (putting teaching theory into practice). Nowadays, according to GMC, to become an

independent GP in the UK, medical students need to follow a specific training pathway including a 5-year undergraduate programme recognised by the General Medical Council, 2-year foundation course of general training, and 3-year specialist training course in general practice. The three years of GP Specialty Training (GPST), normally includes 18 months in an approved training practice with a further 18 months in approved hospital posts.

Noticeably, the transformation of general practice to a university and academic discipline originated from a UK viewpoint (Howie, 2011). Subsequently, the second place in the world that conducted this transformation is Utrecht, Netherlands in 1966, followed by the North Atlantic countries as a process of 'simultaneity' (Loudon, Horder, & Webster, 1998). The International Society of General Practice was established in Europe in 1962, and then WONCA was established in 1972. The European bodies were integrated as WONCA Europe in 1996. However, there was a limited amount of GP-based research. Hence, the shift in training general practice into specific postgraduate programs was challenging in the UK, Europe and globally. Postgraduate GP training in Holland, Denmark, Germany, and in other European countries has become a university discipline, with many similar features in comparison with the UK. Similar developments have been implemented in Australia, Canada, New Zealand, and the United States, for much the same reasons (D. J. P. Gray, 1982).

2.5 Development of Primary Health Care in Vietnam

Having grown up in Vietnam and moved to the UK to undertake my Ph.D., it is perhaps inevitable to compare GP training pathways in the UK and Vietnam. Vietnam is in South East Asia and the 15th most populated country globally, with roughly 97 million people in 2020 (Worldometer, 2020). The growing primary health and social care needs are becoming a considerable challenge for the health system and medical education in Vietnam in recent years (Bộ Y tế, 2009; Bộ Y tế & WHO, 2007; Hạnh et al., 2014). In 1986 the Ministry of Health in Vietnam made it a first priority to establish and incorporate a primary health care approach focusing on ten particular areas based on the declaration of Alma-ta

(WHO, 2002), namely: health education; establishment of health care services in local communities; establishment of adequate clean drinking water supplies for the total population, and of effective sanitation services; achievement of high uptake of immunisation against diphtheria, tetanus, whooping cough, poliomyelitis, measles, and tuberculosis; prevention and control of local epidemics; adequate nutrition, the establishment of an adequate supply of essential drugs including traditional medicines, because of the increasing use of traditional therapies such as acupuncture and massage; promotion of home treatment of illness; improved systems of health care management (Birt, 1990). By 2012, 11,121 health centres were established which provided PHC services for local communities both in the urban and rural areas. Today this means that nearly all communities have a health centre in their commune, and most people in Vietnam can access PHC services conveniently throughout the nation. Nevertheless, under 50 percent of health centres achieved the national standards and qualified human resources during essential fundamental infrastructure requirements. This indicates that existing issues in PHC relate far more to quality rather than quantity, pointing to a direct relationship with concerns around medical education (General Statistics Office, 2014).

In general, medical students who graduate from a six-year program are expected to work at local community health centres or district hospitals which are part of the primary health care system. Nevertheless, they must enter a vocational training stage that entails taking a post for at least 12 months in one of four specialties, namely internal medicine, surgery, obstetrics and gynaecology, and paediatrics at clinical organisations such as hospitals, health centres, and private clinics. At the end of this, they will graduate and receive a practising certificate.

It is noticeable that the term ‘general practitioners’ or ‘family physicians’ in Vietnam does not conform clearly to function, mission, occupational position, and practice scope in legal documents or national regulations like in other countries. This might be one key reason for merely around 30% of medical students after graduation deciding to go into general practice and work at local health centres and hospitals, and 70% of them deciding to specialise and preferring to work at

national or provincial hospitals (Viện Chiến lược và Chính sách Y tế, 2011). Noticeably, the rate is like the UK in 2018 with 31.8% but lower than that of the USA with over 40%. There is also confusion in understanding and translating the terms GPs in Vietnam (who study six years at medical schools) with other nations due to the distinction of the medical curriculum, the role, and the professional practice scope of GPs in health systems. Recently, there has been a controversial discussion on developing and expanding family medicine in Vietnam (Hạnh, 2013a; Hạnh et al., 2014; NỘI & HIỂN, 2016).

Meanwhile, the contribution of family medicine to improving the quality of health services in local communities has been clarified. The training programmes of family medicine started in 2002 at Hanoi Medical University in a postgraduate program lasting two years named 'specialised level 1'. Then, the program was replicated throughout all medical schools across the nation, and in 2013 graduated 546 level 1 specialists graduated in family medicine. However, there were multiple existing issues in the training program related to various essential curricular contents accompanied by the lack of practical places and specialised lecturers offered during the short training period (Tran Khanh Toan, Nguyen Hoang Long, & Pham Le Tuan, 2013).

A tendency of specialisation in medicine has occurred in Vietnam (An, 2017; Bộ Y tế, 2009; WHO, 2016), which has impacted the foundation of various specialised hospitals that were separated from general hospitals at both provincial and national levels. This leads to an imbalance between primary and secondary health care (Bộ Y tế, 2013; Tran, Van Nguyen, Nong, & Tran, 2017). Most people prefer direct access to general or specialised hospitals at the national level for any health issues and skip PHC services at local health centres (Tran et al., 2017). Consequently, a severe overload of specialised national hospitals and general hospitals occurred for Vietnam's health system. To illustrate this, 60 percent of outpatients at national hospitals such as Bach Mai and Cho Ray hospitals (Le Quang Cuong, 2011) did not have an introduction letter from local hospitals. This fluctuated between 90 to 95 percent at national hospitals of obstetrics and gynaecology, and paediatrics (Le Quang Cuong,

2011), meaning that the percentage of patients who went directly to the national hospitals was remarkably high. More significantly, the percentage of patients hospitalised was reported to exceed 165 to 200 percent compared to the number of beds in hospitals (Le Quang Cuong, Ly Ngoc Kinh, Khuong Anh Tuan, & Tran Thi Oanh, 2011). However, many other factors can cause this imbalance, for example, the loss of control in using antibiotics, leading to super antibiotic resistance in communities (Le Quang Cuong, 2011). Several studies asserted that the lack of comprehensive awareness and society's beliefs about the importance, position, and tasks of general doctors at local communities was mainly responsible for the situation. The overload phenomena of secondary care result from the poor operation of PHC networks: local health centres or district hospitals (Bộ Y tế, 2013; Hạnh, 2013a, 2013b; NỘI & HIỂN, 2016).

2.6 Challenges for primary health care and training for GPs

Meeting societal demand for GP services

General Practitioners (GPs) have a principal role in providing primary health care (PHC) in every country. Everyone has access to a good health system, from prosperous communities to those more vulnerable groups. Nonetheless, the shortage of GPs is emerging both in developing and developed nations in delivering PHC, while health care needs have risen in recent years (Australian Medical Workforce Advisory Committee, 2005; D. P. Gray, 2002; Taskforce, 2014). There are approximately 57 countries with under 25 medical staff per 10,000, which is the lowest quantity essential to provide PHC services (Jenkins-Clarke & Carr-Hill, 2001). According to Health Education England's GP Taskforce in 2014, UK has a GP workforce crisis in certain areas with 59.5 per 100,000 head of population across England (Taskforce, 2014). This shortage is similarly occurring amongst different developed countries in Europe and America. In contrast, according to Eurostat Statistics Explained, countries like Germany, France, and Italy have a higher number of GPs than the UK, with 139.6, 102.4, and 61.46 per 100,000 head of population correspondingly in 2014. Similarly, developing countries in Africa and Asia are undergoing a shortage of GPs and

inequalities in the distribution between the public and the private sector, as well as between rural and urban areas (WHO, 2006).

Ensuring high quality of GP services

Recently, emerging global issues such as population explosion, climate change, environmental pollution, globalisation, and pandemics are seriously impacting on healthcare demands in general and primary care needs in particular. The Royal Society reported that the global population experienced a significant increase of 4.8 billion from 1930 to 2010, with an estimated peak of 9 billion by 2050 (Cleland, 1994, 2013). This means that medical education is facing challenges of increasing primary care and medical staffing demands to meet the current population size (Economic, Affairs, & Division, 2015). Additionally, climate change is becoming the top concern over the world by triggering several shifts in disease patterns and outbreaks of new infectious diseases such as Ebola and coronavirus. A research report regarding the impact of climate change on human health by McMichael, Woodward, & Hales confirms the influence caused by alterations to the immensity scale and incidence of severe phenomena could appear through more different routes like a shift of disease vectors (McMichael, Woodruff, & Hales, 2006). Likewise, climate change has led to variations in temperature and rainfall models; consequently, it has altered infectious disease's natural transmission routes (Boko et al., 2007). These influences of climate change are likely to cause increasingly complex patient cases and high pressure on primary care. Therefore, new requirements for medical education systems in training GPs will be required. Moreover, globalisation implications like increased immigration, interconnectedness, and interdependence on a worldwide scale (Knight, 2008) are increasingly commonplace in the health sector. A research study indicated that factors affecting health, such as health services or living conditions, are impacted by globalisation (Huynen, Martens, & Hilderink, 2005). The dramatic growth of immigration has triggered a worldwide spread of infectious diseases such as the Severe Acute Respiratory Syndrome (SARS) (Huynen et al., 2005). As a result, GPs could be faced with complicated practice settings such as an increased prevalence of different diseases as well as greater

diversity in international patients with different cultures and languages (Houpt, Pearson, & Hall, 2007). Therefore, a GP training reform is needed to address the universal challenges, including population explosion, climate change, environmental pollution, and globalisation.

2.7 Medical Education Reform

In recent years, the trend towards globalisation in medical education has been a significant implication of Western medicine spread in the world (Horton, 2003). Notably, the export of Western curricula, educational approaches, and teaching technologies to developing countries as a business approach can lead to the potential for problematic medical education colonialism (Bleakley, Brice, & Bligh, 2008). Therefore, medical education reform is becoming an increasing concern amongst society and medical academics in the UK and worldwide.

There have been numerous studies aimed at identifying the competencies/skills necessary and challenges in the professional practice for GPs in the 21st century. The World Health Organisation attempted to achieve an international consensus on a new notion of quality educational research on transformation in medical education. In the same period, Charles Boelen, University of New Mexico School of Medicine, analysed the need for global action in medical education reform. He insisted on the necessity of a change about competencies of GPs with social involvement in the future and highlighted that resistance to change should be viewed negatively (Boelen, 1992). Indeed, medical education reform is a continuous and unrelenting process. Returning to 1904, Flexner started studying medical education to improve the quality of physicians (Flexner A, 1910). In 1909 with the Carnegie Foundation's support, a study was conducted across 155 medical schools in the USA and Canada toward the transformation of North American medical education by Flexner and his colleges. Even in the 21st century, the Carnegie Foundation continues to call for US medical education reform (Irby, Cooke, & O'Brien, 2010). The phenomenon is similar to European countries since the mid-20th century. For example, the Tuning project was an initial medical education reform in developing learning outcomes/ competencies for harmonisation in Higher Education in Europe (Cumming, Cumming, & Ross, 2007). As for Asian countries, the process of medical education reform also began after World War II and continues today. Countries such as Japan, Vietnam

and China have found the need to change their medical training systems to move into medical globalisation.

In general, the process of medical education transformation has been a success story so far in providing a greater variety of innovative teaching and effective learning methods as well as clear standards for quality accreditation. For example, medical education frameworks are developed as CanMeds of RCPSC, Tomorrow's Doctors by GMC, and standards for quality accreditation as LCME accreditation standards by AAMC (Frank, 2005; GMC, 2010; LCME, 2016). Initiatives to implement learning theories and curriculum models have also been applied in medical education, such as the SPICES model of educational strategies (Harden, Sowden, & Dunn, 1984). The concept of an objective-based curriculum was first proposed by Tyler in the mid- 20th century (Tyler, 2013), which had its limitations in focusing on teacher's roles instead of students. In the following period, Stenhouse created a process model which concentrated on obtaining, applying, and evaluating knowledge (L Stenhouse, 1967; Lawrence Stenhouse, 1970, 1971, 1980). A competency-based curriculum has been introduced widely, applying student-centred learning theory to medical curriculum design. Despite its significant advantages, the model also has certain constraints such as difficulties in defining competences that describe professional skills. In 2013, Mehta published proposals for a new paradigm for medical education. He highlighted common problems in the current medical education system in the United States, such as inequality in distribution, long-term training issues, and cost efficiencies (Mehta, Hull, Young, & Stoller, 2013).

At present, there are many different recommended frameworks or forms of guidance for curriculum design. However, there are few explicit and comprehensive standards for developing curricula, namely the specific standards of GMC (GMC, 2010) and accreditation standards of the Liaison Committee on Medical Education in the USA (LCME, 2016). Furthermore, the World Federation for Medical Education has set general standards for quality improvement in medical education (WFME, 2012) for each educational level. Debate has recently focused on curriculum design methods because of their importance in matching

local healthcare needs and maintaining productive and professional health human resources for health systems.

In the late twentieth century, Kern's curriculum model was conceptualised and applied in developing curricula, which comprised six steps: problem identification, needs assessment for targeted learners, goals and objectives, educational strategies, implementation, and evaluation and feedback (Kern, Thomas, Howard, & Bass, 2006). However, the question "what will the medical curriculum look like in the future?" also arose due to the huge variation in approaches within the sector to both the teaching and learning process (Bligh, Prideaux, & Parsell, 2001). At that time, Bligh suggested a symbiotic curriculum known as the PRISMS model with six elements namely: product-focused (emphasis clinical practice); relevant to communities and students; interprofessional character; shorter courses and smaller units; based in multisite locations;, and symbiotic (Bligh et al., 2001). More recently, J. Grant (2014) advocated for a theoretical and contextual approach to structuring the curriculum. She also recommended six steps of the design process: character of the course; statement of the overall purpose of the curriculum; specifically intended achievements; curriculum organisation; educational experiences; and curriculum evaluation, which received the consensus of many academics (J. Grant, Abdelrahmen, & Zachariah, 2013). There have been numerous modern trends in curriculum development for general practice such as outcome-based education, competency-based education, professionalism in education, assessment tailored to curriculum needs, selection of students tailored to curriculum needs (Burke, 2008). Nevertheless, evidence-based approaches in designing a medical curriculum have not always been given sufficient prominence (J. Grant, 2014).

2.8 Key studies related to education and training pathways for GPs

Variation in medical training between nations in the world is well known. Despite this, there has not been an abundance of syntheses addressing the growing literature in medical education systems which analyse the specificity and differences of current medical education systems/curriculum models in the world. Several studies have nonetheless been conducted to gain a broader and deeper understanding of the diversity of the medical education system internationally, including a narrative review (Nara et al., 2011) and a survey (Wijnen-Meijer et al., 2013). Nobuo Nara et al. from Tokyo Medical and Dental University conducted a narrative review to search for the optimal medical education system applicable to physicians for Japan. After observing 35 medical schools and five institutes in 12 countries worldwide, the research team classified medical education into three types of education course based on types of the entry-level medical student, namely non-graduate-entry program, graduate-entry program (GEP), and mixed program of non-GEP and GEP. It indicated the coexistence of the types in the same country. Similarly, Wijnen-Meijer et al. from University Medical Centre Utrecht categorised medical training formats worldwide into six models based on the results of a qualitative questionnaire across 40 countries. The research also provided a list of degrees granted after medical school and explained frequently used terminology in different countries. Additionally, Margot and his colleagues from University Medical Center Utrecht, the Netherlands, conducted an international comparison about the postgraduate medical education pathway amongst six countries: Germany, the USA, Canada, the UK, Australia, and the Netherlands. The report offered a detailed overview of distinct routes to specialty licenses (Weggemans, Van Dijk, Van Dooijeweert, Veenendaal, & Ten Cate, 2017).

Likewise, there have been multiple studies on GP/FM training, but only some focused on comparing their differences globally. In 2011, Richard B Hays and Simon Morgan evaluated the state of GP training in Australia, comparing it with several countries and regions: the UK, Ireland, New Zealand, Hong Kong, Philippines, Malaysia, Singapore, northern, central and southern EU, Canada,

and the USA. The study compared the details of the training programmes: mandatory, entry, duration, defined curriculum, formal assessment, regional; and their governance: university affiliation, funding source, assessment independent (Hays & Morgan, 2011). Similarly, Roberts et al. (2011) reported an article in 2011 about their international experience with family medicine training that included six themes: challenges, new models of practice, new models of training, student interest, vocational training, and continuing professional development.

Gaining an overall picture, in 2013 John Parks et al. at the American Academy of Family Physicians and the Robert Graham Center carried out a thorough investigation and formed a global family medicine map (Robert Graham Center, 2013). Pinpointing more specific areas among four chosen countries, in 2015, Robert Mash et al. from Stellenbosch University compared the roles and training of primary care doctors of China, India, Brazil, and South Africa; each was committed to improving their primary care systems (Mash, Almeida, Wong, Kumar, & Von Pressentin, 2015). The five main themes were used to compare differences amongst the four nations: country profiles, current policy position on universal coverage and commitment to PHC, current delivery system for PHC, roles of the primary care doctor, and approach to the training of primary care doctors.

To fill the gap in terms of comprehensive global comparative studies, between 2015 and 2017, the Besrour Centre and Canadian Family Physician issued a sequence of papers on family medicine development and provided a geographic overview of family medicine's evolution in each continent (Arya et al., 2017; Gibson, Arya, Ponka, Rouleau, & Woollard, 2016; Gibson, Woollard, Kapoor, & Ponka, 2017; Ponka, 2017; Ponka et al., 2015; Rouleau et al., 2015). In the Besrour Papers, there was a literature review conducted by Neil Arya et al. to *"demonstrate how family medicine has been recognised and integrated into PHC systems in contrasting contexts worldwide and provide an overview of how family physicians are trained and certified"*. The research described family medicine in six regions: (1) North America, Western Europe, and Oceania, (2) Latin America, (3) Sub-Saharan Africa, (4) the Middle East and North Africa, (5) Russia and

Central and Eastern Europe, and (6) Asia, with four main themes: system, role, and history of family medicine, family medicine training, future challenges, and opportunities. The Besrour Papers also included a narrative project to discover the evolution of family medicine postgraduate training in different nations by a consultation process (consultative meetings). The university partners participating in the study originated from lower-middle-income countries: Uganda, Kenya, Ethiopia, Mali, the Aga Khan University of East Africa, Palestine, Tunisia, Indonesia, Nepal, Laos, China, The Caribbean island group, Haiti, Brazil, and Chile (Gibson et al., 2017). The research highlighted the successes in the evolving process of family medicine on a global scale. Moreover, Chirk Jenn Ng and his colleagues from the Department of Primary Care Medicine, the University of Malaya, conducted a cross-sectional online survey to examine the state of family medicine training at both undergraduate and postgraduate levels of 25 countries in the Asia Pacific. The investigation reflected a current status and a significant growth of family medicine training in the region (C. H. Wong & Phoa, 2016). All these studies above aimed to survey and compare family medicine status in specific areas with a descriptive approach. Nevertheless, no studies focused on the classification of GP training pathways globally with analysis on specificity and significant distinction.

Over time, the GPs' role has been changing, and new approaches to recruitment and training are required. It is widely acknowledged that GPs increasingly work under high levels of pressure due to growing societal demand for their services, resulting from the aging population, increasingly complex patient cases, climate change, pandemics, and other factors. In this context, the requirements of curriculum development are becoming complex. Therefore, this thesis explores different typologies of education and training pathways for GPs and their characteristics. This will enable medical educators and policymakers to understand the education and training of GPs better, identify priorities for study, and promote innovation in the future.

2.9 Aim and objectives

Having outlined relevant literature in the field, the overall aim and objectives of this study to address the perceived gap will now be presented. The aim of this doctoral study is to explore different typologies of education and training pathways for GPs and identify their characteristics.

The two main specific objectives determined from the research aim are as follows:

1. Undertake a scoping review to explore '*What are the different types of education and training pathways for GPs represented in literature?'.*

2. Undertake a qualitative study to explore *'what are stakeholders' perceptions of education and training pathways in their country?'.*

Next, it will be important to explicate the overarching methodology and methods chosen in order to reach the stated aim and objectives.

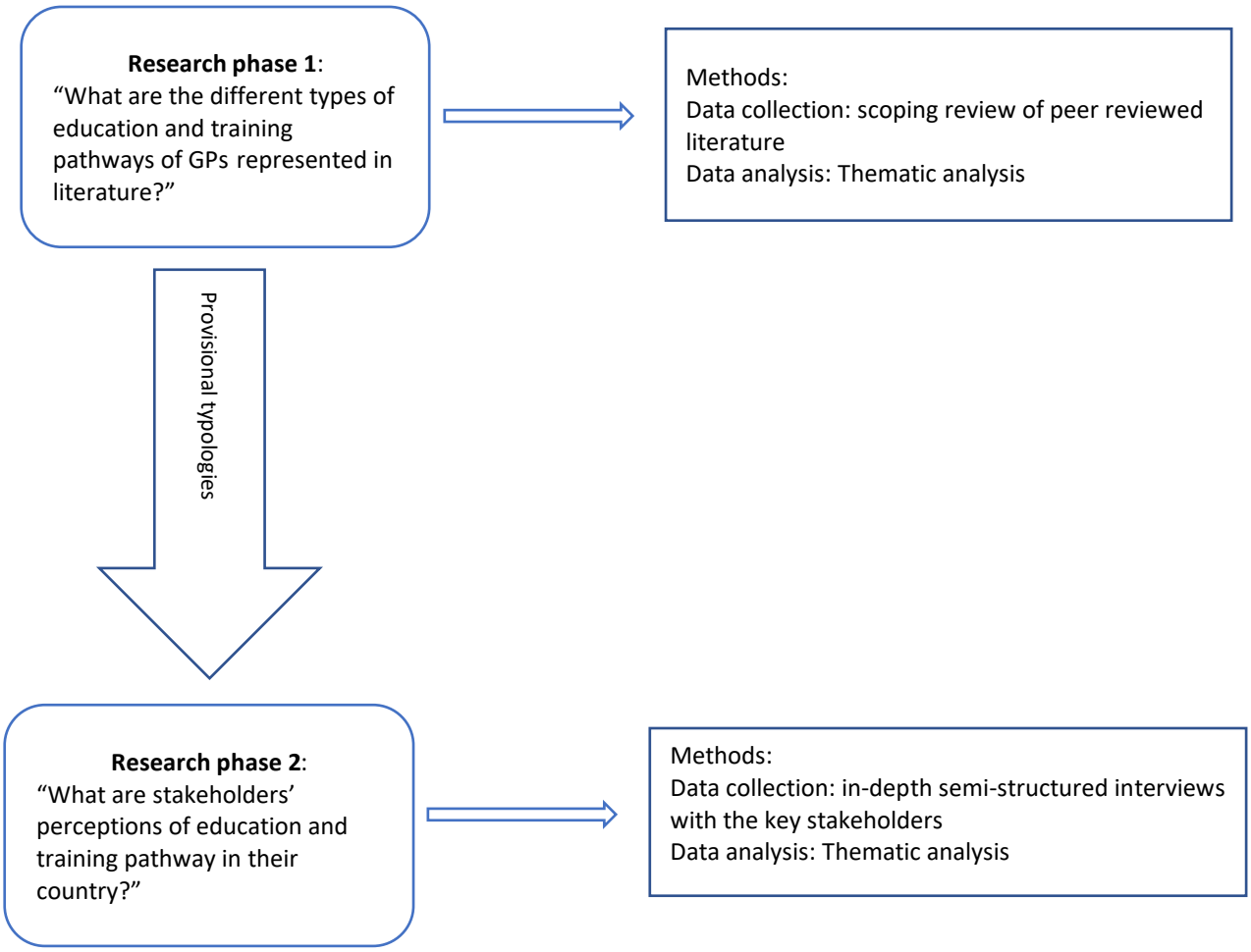
CHAPTER 3: METHODOLOGY AND METHOD

3.1 Introduction to the chapter

The chapter expounds the research methodology and methods applied in my doctoral research. This begins with an account of my own ontological position and how it may have informed the study (3.2, 3.3). Then, the chapter demonstrates the research design, and explains the rationale for method selections to address the research questions (3.4). Additionally, the chapter describes approaches undertaken and explains how to ensure the trustworthiness of the study (3.5). The final part of the chapter demonstrates the detailed methods undertaken (3.6). Ethical issues and the analytical approach are considered as well as the actions taken to enhance the quality of the research.

Overall, this doctoral research employed a mixed methods approach to explore different typologies of education and training pathways for GPs and identify their characteristics (see Figure 1). In the phase 1, a scoping review was adopted to synthesise existing evidence which allows a provisional typology of education and training pathways for GPs to be established. Subsequently, a qualitative study on discovering stakeholders' perceptions of education and training pathway for GPs in their countries was conducted by using a semi-structured in-depth interview method.

Figure 1: Flow Chart of Research Stages of full thesis



3.2 Methodology and research approach: pragmatism approach

In literature, three stances about qualitative–quantitative mixing were introduced by Rossman and Wilson (1985): *"purism: they cannot be combined and one is favoured; situationalism: both are valuable, maybe in one study, but only in their place; pragmatism: both are valuable, especially combined, whether in study design, data collection, or analysis" (Maudsley, 2011).* These philosophical perspectives can influence assumptions about the real world and the ways of knowledge constructed. This doctoral study is formed by a pragmatic stance that concentrates on the research questions and facilitates the application of various measures to deal with the issue.

Before understanding pragmatism as a paradigm, I will consider two different research paradigms which follow the corresponding trajectories of Crotty in 1998 and Grix in 2004.

Firstly, positivism is viewing knowledge in the objectivist tradition which became the most prevalent research paradigm of the past century. There is an independent existence of the world with our knowledge of it in which structures and components of the social world are also in the natural world. Thus, conducting research with a positivist approach will need standardised protocols for data collection and randomly selected participants with minimising research bias. This allows results to be deduced with objectivity and can generalise in a wide range of settings and circumstances (Crotty & Crotty, 1998; Morgan, 2007). In contrast, the second universal research paradigm is interpretivism which covers various different approaches to social research such as relativism, phenomenology, hermeneutics, idealism, symbolic interactionism and constructionism. The world is socially constructed through the interaction of individuals. Thus, interpretivist research will be induced findings through purposively interpreting selected participants' viewpoints base on researcher's experiences. Therefore, the results will be subjective and contextual (Morgan, 2007, 2013) so that they are singularly appropriate to particular settings and circumstances. In comparison with the two paradigms above, pragmatism is philosophically exclusive because it emphasises the nature of experiences in

place of reality, and outcomes of actions in place of questions about nature of truth, evaluating shared perspectives instead of concentrating on individual views (Morgan, 2013). As a result, the pragmatism paradigm provides a number of opportunities in a connection of theory and data that is based on abduction. The connection of the researcher to the research process includes inter-subjectivity, through communication of shared meaning and transferability, finding implications relevant to other settings without need for generalizing findings (Morgan, 2007).

3.3 My own theoretical perspective position and how it may have informed the study

My research background in public health and epidemiology commenced with a positivist approach, focusing on objectivity, generalised causation and value free investigation (Paley & Lilford, 2011). Initially, I used quantitative methods to describe disease burdens and predict seasonal and annual epidemic trends in different provinces or nations. I have since moved in the direction of a mixed methods approach when I conducted my Master's-level project. In that project, I developed a third research phase for interviewing that allowed me to understand why the issues identified from previous quantitative studies occurred. Then, I conducted several educational projects of Ministry of Health as a research assistant and junior researcher in which my research work focused on developing learning outcomes for general doctors, traditional medical doctors, dentists, and establishment of competence standards for surgeons, obstetricians and gynaecologists. The projects were purely qualitative studies, influencing my view on selecting research methods, data collection and analysis. In particular, the experience improves my full recognition of how people approach understandings, behaviour and management of their daily circumstances in specific contexts. Since this is beneficial to identify types of data and appreciate research methods in answering research questions. Likewise, the experience of exploring social interactions, systems, and processes might have impacted my interpretation of data in the doctoral study.

At the beginning of the PhD, this transfer was quite difficult for me but over time I became familiar with qualitative research. Therefore, my research assumptions shifted from a more 'objective' to 'subjective' perspective of the problem. This led me to become a pragmatist, in which I chose a duality and rejected both positivist and interpretivist paradigm by their rigidity in the establishment of the knowledge. I believe both in the perception of reality, i.e. it may be an independent existence of the world with human experience, and that it can be formed through human experience (Shaw, Dixon, & Jones III, 2010). The concentration is on mutual appropriateness, as all knowledge in this reality is socially constructed, and a specific form of it is possible to link individual experiences (Fortes, 2013). Therefore, no matter what our beliefs are, some of them might be linked to others to meet our aims and demands.

From a pragmatism stance, my epistemological position is that all knowledge of the world is based on experience (Fortes, 2013) which combines both objective and social knowledge. This means that an individual's knowledge is exclusive and established from individual's experiences, but it is socially shared as it comes from shared experiences with others. Thus, individuals are presumed to behave similarly and designate shared meanings to the outcomes of those actions (Fortes, 2013).

In terms of methodology, a pragmatist approach focuses on reflection on methods of conducting research (why this way and not the other) and type of knowledge to be produced (type of outcome) (Fortes, 2013). I believe in justifying the plausibility of using any methods to achieve the goals and meet the needs (Fortes, 2013). Thus, for pragmatists, research does not limit viewpoints to the existence of an external independent reality, nor does it mean observation of participants whilst wholly rejecting positivist notions of objectivity.

Abduction

The question remains as to how the study will analyse data. There are three forms of analysis namely deduction, induction, and abduction. Abduction continued quite unnoticed for approximately three centuries from the first introduction in

1597 by Julius Pacius to translate the Aristotelian concept apagoge (Reichertz, 2004). Then, Peirce (1839-1914) first adopted it to represent the only truly knowledge-extending means of inferencing that would be doubtless different from the normal types of logical conclusion, namely deduction and induction (Reichertz, 2007). Several decades later, Peirce's ideas were systematically recognised and adopted. Abduction is considered as a means of inferencing formed from assembling or discovering, on the grounds of collected data. Therefore, the abductive approach would be beneficial in the complex connection of theory and data in practice. Study design, data collection and analysis are likely neither completely induced by data nor deduced by theory (Morgan, 2007). A pragmatist approach allows researchers to commute back and forth between induction and deduction (Morgan, 2007) so that researchers can employ the potential of both approaches in a single study (Morgan, 2007). For example, in the phase 1 of this doctoral project I carried out a scoping review to induce a typology of education and training pathways. Then, I applied the typology as a framework to implement a purposive sampling for interviews in the second phase. However, the data from the phase 2 induced more empirical characteristics for the typology established in the scoping review.

Inter-subjectivity

In pragmatism, researchers acknowledge both the single reality and the unique individual interpretations as an inter-subjective approach of social life. In addition, pragmatists consider the likelihood of 'complete objectivity' or 'complete subjectivity' to exist theoretically (Morgan, 2007). Inter-subjectivity seeks an interface between these two opposites and—as an outcome—the related research seeks co-construction of knowledge, understandings and experience.

Transferability

Pragmatists refuse the extreme perspective about knowledge being general or context independent. Pragmatists defend that in fact it is unlikely for research findings to be exclusive with no implications for those in other settings nor is it

certainly generalisable to different cultural backgrounds. Rather, knowledge from both positivist and interpretivist approaches can be potentially applicable in a range of circumstances (Morgan, 2007). However, there is a need to investigate the factors affecting the transferability of findings to other settings. For example, a study can reach an understanding of the learning conditions from a course that influenced behavioural changes and examine which findings are transferrable to other contexts (Morgan, 2007).

3.4 Methods

3.4.1 Mixed methods

This doctoral research adopted a combination between a scoping review in phase 1 and a large, international qualitative study in the phase 2 (see Table 1). In phase 1, the doctoral research aims to explore the following: '*What are the different types of education and training pathways for GPs represented in literature?'.* A scoping review has been selected to synthesise and analyse data from the store of knowledge that already exists in literature to explore typologies of education and training pathways for GPs in the world. In phase 2, a qualitative study was carried out through use of semi-structured interviews to discover the following: *'What are stakeholders' perceptions of education and training pathway in their country?'.* The combination of two different research methods was beneficial in answering research questions identified.

A mixed methods approach was considered as an appropriate method for this doctoral research because of benefits of integrating both quantitative and qualitative approaches. This integration is possible to apply in the philosophical framework(s), measures of data collection and analysis, general study design, and discussion of research conclusions. Additionally, this research aimed to reach a comprehensive understand of training typologies for GPs in the world that is particularly broad and complex. This research aim could be challenging to achieve, particularly with a single method. Indeed, the intention of mixed methods research is to provide a more complex understanding of a phenomenon that

would not have been reachable by using one single approach (Creswell & Clark, 2017; Morse & Niehaus, 2009).

However, there was a significant difference of design between this doctoral research and mixed methods research. Even though the term of 'mixed methods' research was defined as an intentional mixture of both qualitative and quantitative approaches in a single research, this doctoral study used a scoping review for which is unequivocally distinct to quantitative research. Whilst quantitative research is based on a deductive inference throughout quantifying data to test theories, a scoping review is a type of research synthesis to provide an overview of the available research evidence and identify key concepts or gaps in the research on a particular topic or research area.

Existing textbooks illustrate designs ranging from four models with 10 variants (Creswell & Clark, 2017) to over 20 typologies of mixed methods research designs (Teddlie & Tashakkori, 2003). According to Schifferdecker's a review of mixed methods studies in medical and nursing education research, four underlying design models were employed persistently namely instrument development, explanatory, triangulation and longitudinal transformation (Karen E Schifferdecker & Virginia A Reed, 2009). In particular, the definition of explanatory model was given as '*one in which results or questions arising from quantitative data are explored qualitatively, producing data that are used to complement or clarify the original findings*' (K. E. Schifferdecker & V. A. Reed, 2009). This model is similar to the research process of this doctoral research in which a qualitative study has been designed to reach the sphere of deep insight of typologies established from the scoping review. In other words, the results of the scoping review led to a further qualitative exploration.

To research broad, complex issues or conduct research in complex contexts, researchers should not shy away from applying multiple divergent methods. From my perspective, the definition of a mixed methods study as solely focused on the integration of quantitative and qualitative approaches in a single study might lead to the limitation in applicability, flexibility and creativity for researchers.

3.4.2 Research Phase 1: A scoping review.

3.4.2.1 Research Question

This review aims to address the following question: ‘What are the different types of education and training pathways of GPs represented in the literature?’

3.4.2.2 Study Design

In recent years, scoping reviews have become progressively more common in synthesising preliminary research evidence that might contribute to identifying new issues or current gaps in specific research areas. At the beginning, in 2002, the concept of scoping reviews was not adequately defined, yet its purpose was described as ‘both to map a wide range of literature, and to envisage where gaps and innovative approaches may lie’ (Ehrich, Freeman, Richards, Robinson, & Shepperd, 2002). In a similar vein in 2005, Arksey and O’Malley defined the primary purpose of scoping studies as mapping quickly the main concepts to establish a foundation for a research area, especially research fields which have not yet been completely understood or reviewed before (Arksey & O'Malley, 2005). Building on these descriptions, Canadian Institutes of Health Research proposed a detailed definition in 2010 (Levac, Colquhoun, & O'Brien, 2010):

> *“Scoping reviews are exploratory projects that systematically map the literature available on a topic, identifying the key concepts, theories, sources of evidence, and gaps in the research. They are often preliminary to full syntheses, undertaken when feasibility is a concern – either because the potentially relevant literature is thought to be especially vast and diverse (varying by method, theoretical orientation or discipline) or there is suspicion that not enough literature exists. These entail the systematic selection, collection and summary of existing knowledge in a broad thematic area for the purpose of identifying whether there is sufficient evidence to conduct a full synthesis or not, and further primary research is necessary.” (Canadian Institutes of Health Research)*

Finally, in 2013, Daudt et al. rightly noted additional functions of scoping research in providing current issues or evidence to inform practice, policymaking, and research (Daudt, van Mossel, & Scott, 2013b).

There may be several reasons for conducting a scoping review. According to Arksey and O'Malley, there are four types of scoping review which were classified by research aims including (Arksey & O'Malley, 2005):

- To examine the extent, range and nature of research activity (type 1): this type of rapid review might not describe research findings in any detail but is a useful way of mapping fields of study where it is difficult to visualise the range of material that might be available.
- To determine the value of undertaking systematic review (type 2): in these cases, a preliminary mapping of the literature might be undertaken to identify whether a full systematic review is feasible or relevant and to estimate the potential costs of conducting a full systematic review.
- To summarise and disseminate research findings (type 3): this kind of scoping study might describe in more detail the findings and range of research areas of study, thereby providing a mechanism for summarising and disseminating research findings to policy makers, practitioners and consumers.
- To identify research gaps in the existing literature (type 4): this type of scoping study takes the process of dissemination one step further by drawing conclusions from existing literature regarding the overall state of research activity. Specially designed to identify gaps in the evidence base where no research has been conducted, the study may also summarise and disseminate research findings as well as identify the relevance of full systematic review in specific areas of inquiry.

The scoping review in this thesis did not fit neatly into any the four types above; rather, it was combined elements of type 3 and type 4. It concentrates on searching existing training pathways for GPs and describing them in more detail, summarising and developing a provisional typology. Specifically, the scoping review conducted mapping studies by countries, undergraduate and

postgraduate to identify a mechanism for summarising data. Then, results and the range of existing research were summarised to pinpoint any noticeable gaps in the literature.

Specifically, this scoping review was used to synthesise and analyse a range of research material to provide provisional concepts about typologies of the education and training pathways in the world (Daudt, van Mossel, & Scott, 2013a; Levac et al., 2010). The framework of Arksey and O'Malley (2005), and Levac et al., (2010) were used to guide the process, involving the following five key stages: (i) identifying the research question, (ii) identifying relevant studies, (iii) study selection, (iv) charting the data and (v) collating, summarising and reporting the results.

3.4.2.3 Identifying relevant studies

Ovid Medline, Embase, and ERIC (Education Resources Information Centre) were searched. The research applied the same terms to the three databases related to general practitioners namely family medicine/ primary health care doctor/ generalists/ family practice/ family physicians, combined with terms related to undergraduate or postgraduate training for GPs namely medical education/ medical programs/ medical curriculum/ medical training/ medical school/ medical undergraduate/ medical postgraduate (see Table 1). The Ovid MEDLINE search strategy is demonstrated in Figure 1.

Table 1: Search strategy

General practice		Medical education
"General practi*" OR "medical practi*" OR "family practi*" OR "family medicine" OR "family physician*" OR "primary health care"	**AND**	"medic* school*" OR "Medic* education" OR "medic* college*" OR "medic* program*" OR "medic* training" OR "medic* curricul*" OR "medic* undergraduate*" OR "medic* postgraduate*"

Figure 2: MEDLINE (Ovid) search strategy for scoping review

Database: MEDLINE

Host: Ovid

Data Parameters: 1946 to May week 4 2018

Date Searched: 25/05/2018

Searcher: JH

Hits: 2939

Search Strategy:

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1. "General practi*".mp. (82695)

2. ("family practic*" or "family medicine" or "family physician*" or "primary care").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (163832)

3. "medic* school*".mp. (30367)

4. ("Medic* education" or "medic* college*" or "medic* program*" or "medic* training" or "medic* curricul*" or "medic* undergraduate*" or "medic* postgraduate*").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (81629)

5. 1 or 2 (210082)

6. 3 or 4 (101507)

7. 5 and 6 (9242)

8. limit 7 to english language (8536)

9. limit 8 to yr="2010 - 2019" (2939)

3.4.2.4 Study selection

All citations were imported into EndNote X8 software, and duplicate citations were removed automatically with further duplicates removed when they were found later in the process. Subsequently, I scrutinised titles and abstracts, and then collected full-text copies. Studies were included if they were written in English or Vietnamese language, were about GP/ family medicine training, were about education and training pathways, were relevant to the research question, were peer-reviewed articles, reports and were published from 2010 onwards (see Table 2). Full text screening was implemented to validate the final selection based on the same inclusion criteria used for screening the titles and abstracts. Thus, each article or report was reviewed at least twice to ensure the quality of inclusion decision before analysis. If any papers identified were unable to be categorised,

these were reviewed and discussed with my supervisors in the regular supervision meetings.

Table 2: Description for inclusive criteria

Criteria	Description
Must be written in English or Vietnamese	The study will collect only articles in English or Vietnamese because the author can only use English and Vietnamese. If articles are related to research questions but they are written in other languages such as French, German, Spanish, Chinese, they will be excluded in the scoping review. For example, this article as "Análisis de la formación y el ámbito de práctica de los médicos de atención primaria en Inglaterra, Alemania y España" was not selected.
Must be about general practice/ family medicine training	Based on the first objective of the study, the research will only focus on general practice/family medicine training. Thus, all articles about other specialties namely surgery, emergency, internal medicine…etc will be excluded. For example, the article named as "Undergraduate Clinical Teaching in Orthopaedic Surgery: A Randomised Control Trial Comparing the Effect of Case-Based Teaching and Bedside Teaching on Musculoskeletal OSCE Performance" was excluded.
Must be about education and training pathway	Some articles or reports about the education and training for GPs will be excluded if they do not illustrate pathways of education and training. There are several articles that are very specific about subdomains in education and training but do not mention overall pathways for GPs. For example, the article as "Community-based education for registrars in family medicine at Walter Sisulu University" was excluded.
Must contribute to the research question	Articles must contribute to answer the research question: "What are the different types of the education and training pathways of general practitioners over the world? For example, "Preparing the Next Generation of Family Physicians to Improve Population Health: A CERA Study" will not be included in the study.
Must be peer review articles, reports	Peer-reviewed articles that are accepted for publication exemplify the best research practices in a field. Thus, the study only selects peer-reviewed articles or reports to ensure the informational quality in research. For example, "Time for a national undergraduate curriculum for primary care" is an eLetter article, thereby excluded from the study.
Must be published from 2010 onwards	There is a plethora of articles about the education and training for GPs. Thus, to manage and reduce the quantity of articles from the three database resources, the study will only include articles or reports from 2010 onwards.

My reflections: screening for the scoping review

When starting my searches, I found 11,571 citations after deduplication and this made me felt daunted by this large number. However, I conducted my search on only the three electronic databases, and so also wondered whether the number of electronic databases was sufficient. I had three consultation discussions with librarians who had experience in medical and education searches at the University of Exeter, as well as conversations with both my supervisors, which supported my decisions about the approach taken. When starting title and abstract screening, any articles that were irrelevant and could not contribute to addressing the research question were excluded. For example, the article "Entry of US Medical School Graduates Into Family Medicine Residencies: 2015-2016" was excluded because, although it included search terms such as family medicine, medical school, or graduates, the title and abstract focussed on entry to residency programmes instead of describing education and training pathways for Family Physicians. Thus, this paper's content would not help address the research question (inclusion criterion 4). Similarly, the article "Undergraduate medical education in the US and Israel: contrasts and common challenges" was excluded because, although it included the relevant search terms, it only considered undergraduate medical education in general and is not specific for general practice or family medicine to match my research question. If there was any doubt in my mind at the title/abstract screening stage, then I put them through to the second stage of screening. During the selection of papers at the full-text screening stage, there were several challenges, namely using multiple terminologies of general practice ('community,' 'family medicine,' 'ambulatory care' or 'primary care') and a wide variety of general practice work and staff across the world (GPs, nurses, home helps, physiotherapists and occupational therapists….). The study focus the on education and training pathways for only general practitioners or family physicians. Therefore, several articles related to the education and training programmes of other types of primary care staff were excluded. For example, the article "Residency Training in Primary Care Internal Medicine" described the primary care program at the Massachusetts General Hospital, which is designed to develop competence in the full range of problems encountered by general internists delivering primary care. In some nations, specialists also provide primary care as a part of their role in their healthcare systems. However, the article was excluded because general internists were not GPs or FPs, even though they are a part of primary care staff. Secondly, the term 'general practice' is used quite consistently within the UK literature but the terms' family medicine' or 'primary care' are also used commonly in many other parts of the world when referring to primary care but not always with the same meaning for the term.

Hence, the distinctions between these terms were clarified in the research context section of the literature review and identifying articles required careful examination through repeated reading of the articles. At the full-text screening, I constructed a set of documents as a data archive for the scoping review and I periodically reflected on the papers included in my archive. During the full text selection process, I brought any articles I was uncertain about to supervision meetings to discuss with my supervisors. We reached a consensus about the selection process for these articles by working through each one in turn, and our discussion focused on clarifying specific reasons for including or excluding each paper based on the inclusion criteria.

By discussing the process with my supervisors, I learned how to ensure transparency and validity throughout the collecting data process and the value of researching with a diverse team.

3.4.2.6 Charting Data

I created a data charting template using Microsoft Excel with basic content including authors, publication year, study design, countries, and key focus. All articles included were coded, and then grouped by similar characteristics. My supervisors reviewed the data extraction to examine completeness and accuracy and any disagreements were debated at supervision meetings. Citations were then classified throughout by screening titles and abstracting data characterisation of full articles.

3.4.2.7 Piloting

Three principal approaches were applied in exploring the potential to characterise or typify education and training pathways of GPs. Initially, the most apparent, and least acceptable, was summarising articles included by their geographic locations. However, the abundant variation in training GPs in each country, area and continent with both overlap and the difficulty in distinguishing between typologies of education and training, make such an approach unreasonable. A second approach consisted of demonstrating characteristics of existing different typologies with a new framework developed based on the synthesis from global standards and accreditation in Medical Education of WFME, GMC (GMC, 2010) and LCME (LCME, 2016a). Like the first approach, this was not considered appropriate in the development of the typology presented in this research because of having insufficient information from all articles included to be able to match aspects of the framework. The final approach relies neither on geographic distribution nor on standards but, considers the settings of healthcare systems and builds a thematic framework from the content of included papers. This approach was adopted and is explained in the next section.

3.4.2.8 Collating, summarising and reporting results

I analysed the included papers using thematic analysis. Themes were identified by reading and analysing entire content of articles three times. Then, I compared differences of GP training pathways within themes identified to search a foundation for classifying distinct training pathways. A theme was selected as one of key factors in creating distinctions amongst training pathways. Thus, the provisional typology was established based the key theme chosen. All findings were reviewed and refined by discussing with my supervisors to ensure the research questions were addressed.

3.4.3 Research Phase 2: Interviews

3.4.3.1 Research Question

In Phase 1, the scoping review generated a provisional typology of education and training pathway for GPs with three different types, namely, “Gatekeeper”, “Doctor of choice” and “Team member”. To reach a keen understanding of the provisional typology, a qualitative study was designed to discover perceptions of stakeholders who are from representative countries of the three typologies of training pathways. The purpose of the qualitative research was to answer the question, *‘what are stakeholders’ perceptions of education and training pathway for GPs as prepared for practice in their countries?* There were three different groups of participants from UK, USA and Vietnam that were represented for the three provisional typologies in the scoping review.

3.4.3.2 Justification

To gain the reflections of stakeholders' perception, in-depth semi-structured interviews were chosen as an appropriate research instrument because they provide an exploratory area for individual stakeholders. In this section, I will demonstrate the rationale for adopting in-depth semi-structured interviews in pursuit of the research question. The semi-structured interview necessitates a level of open-mindedness due to open-ended question use, through which flexibility and exploration can be exploited by researchers. Meanwhile, structured interviewing has limitations of flexibility, explanation, assessment of interviewees' emotions, and overall exploration owing to its set of pre-established questions. Indeed, semi-structured interviews have been effectively employed in research with general practitioners or family physician in previous studies exploring the experiences of medical staff. For instance, MacDougal and Drummond (2005) applied them with experienced clinicians and Sharon Wiener-Ogilvie (2013) used them with a range of stakeholders who are related to the training environment in general practice; namely, lectures, GPs and foundation programme trainees. Noticeably, previous studies have applied the in-depth interview approach to develop guidelines such as those found in Milewski and Parra's study (Milewski & Parra, 2011; Miller Jr, Latulipe, Melius, Quandt, & Arcury, 2016), in which in-depth interviews were carried out to explore how people use health information to manage chronic illness.

In-depth interviews can also be employed to understand barriers in a case. For example, Miller et al. (Miller Jr et al., 2016) conducted in-depth interviews to investigate reasons behind the barriers to adopting patient portals among older adults in rural populations. In addition, in-depth interviews can be deployed for exploring a research idea, for deep analysis, and for providing prototyping guidelines. Solomon et al. adopted in-depth interviews as a method to obtain detailed responds on the proposed prototypes for better representation of test results in online portals (Solomon et al., 2016). This approach was shown to be an appropriate measure to gather requirements based on user experience, as suggested by Mannonen et al. (Mannonen, Aikala, Koskinen, & Savioja, 2014).

In-depth interviews were conducted to understand the challenges that different stakeholders face in using electronic medical records (Terry et al., 2014).

3.4.3.3 Study Design

To answer my research question above, in-depth, individual, semi-structured interviews were undertaken in this study. These included interviews, either in-person or by telephone via different telecommunications applications namely Skype, Room, Zalo, Facetime. The interview formats were based on the selection of the most convenient method for participants in their circumstances. Additionally, a short personal details form providing demographic and education-related details (in order to define the characteristics of our sample) was given at the beginning of each interview. I conducted two pilot interviews on 12th September 2019 prior to commencing the principal study. The anticipated interview duration was 45 to 60 minutes per interview.

3.4.3.4 Study population

The population of the study included different stakeholders who are key players in education and training process for GPs including trainers, trainees, medical educators, policy makers and also patient representatives. To warrant the trustworthiness of my sample, I recruited participants who were considered as being a good source of information due to their experience and knowledge (Miller Jr et al., 2016) diverse geographical positions (both urban and rural settings); stage of career; and of gender. In addition, this qualitative research recruited participants from different countries and networks. There were three different groups of participants from the UK, the USA and Vietnam that represented three provisional typologies in the scoping review. Vietnam and the UK were selected for convenience and professional interest given that my doctoral programme is based in the UK and my home country is Vietnam. Therefore, two main languages were used in interviewing namely English and Vietnamese. The networks used in recruiting were medical universities, associations of family medicine/ general

practice, colleagues from international conferences. This ensured a degree of diversity in the research sample.

3.4.3.5 Sampling strategy

There are seven different types of samples with a sharp difference of intentions (see Table 3) namely including maximum variation, homogeneous, typical case sampling, extreme sampling, critical case sampling, total population sampling, and expert sampling. However, based on the research question, this research applied a maximum variation model of purposive sampling for the participant recruitment process in order to explore perceptions from varied key players in the training process for GPs. Thus, this method sets out what needs to be known and seeks to meet people who are willing and able to supply the information by virtue of knowledge or experience. It is typically used in qualitative research to identify and select the information-rich cases for the most appropriate use of available resources. This involves identification and selection of individuals or groups of individuals that are proficient and well-informed with a phenomenon of interest.

Table 3: Types of Purposive Samples

No.	Types	Definitions
1	maximum variation	provide a diverse range of cases relevant to a particular phenomenon or event
2	Homogeneous	is selected for having a shared characteristic or set of characteristics
3	typical case sampling	wants to study a phenomenon or trend as it relates to what are considered "typical" or "average" members of the effected population
4	extreme sampling	wants to study the outliers that diverge from the norm as regards a particular phenomenon, issue, or trend
5	critical case sampling	just one case is chosen for study because the researcher expects that studying it will reveal insights that can be applied to other like cases
6	total population sampling	to examine the entire population that has one or more shared characteristics
7	expert sampling	requires one to capture knowledge rooted in a particular form of expertise

3.4.3.6 Recruitment

Participants were recruited through: (1) sending emails (medical schools, associations of family medicine or general practice, international conferences) and (2) an advertisement on social networks namely Twitter, LinkedIn and Facebook. Recruitment was by means of written invitations to participate delivered to stakeholders. Individuals consented to participation via reply emails.

The number of research subjects was 28 participants in total. It was planned to recruit 9 participants for each typology. Participants were formally approached by sending invitation emails with a participant information sheet, and a consent form (Appendix 4 and 5). A scheme was built including time and location for interviews at the participants' convenience. Interviews were conducted in private rooms to ensure interviewees' privacy and confidentiality. Participants can decline to participate with minimal professional discomfort. If some participants request more information about the content of interviews, I could provide further information by emails.

Table 4: Eligibility criteria for research subjects in the phase 2

Stakeholders	Specialty	Workplace	Experience in years	Each typology	Total number of three typologies
Trainers	GP/ Family Medicine	Medical schools and healthcare centre	From 5 years	3	9
Trainees	GP/ Family Medicine	Medical schools	From 1 or 2 years	2	6
Medical educators	Medical education	Professional Associations, Universities or Hospitals	From 5 years	2	6
Policy makers	Medical Education or Education or Health Professionals	Minister of Health, Department of Education, Professional Associations	From 5 years	1	3
Patient representatives	Any	Any		1	3
Total				9	27

Definitions

- Trainers: Lecturers or Doctors who are involving in teaching and training GPs and have been working for 5 years as a 5-year post-PhD
- Trainees who are attending in the GP training
- Medical educators might be professors, senior lecturers, educators who have been working for 5 years as a consultant
- Policymakers who create ideas and plans for education and training GPs, especially those carried out by a healthcare system or government
- Patient Representatives are patients from three different typologies of training GPs

3.4.3.7 Verification

According to Kvale (1996), verification is a process of quality assurance for the interview. At the beginning, I conducted two pilot interviews with participants and requested feedback on process and content of the interview. My selection of two pilot participants was arranged at an early stage after informal conversations about my PhD thesis.

3.4.3.8 Interview

I organised the interviews by using an interview protocol (Appendix 2) which included mainly open-ended questions. The open-ended questions were expressed in such a way that the study participants were able to talk without limits about their experiences and perspectives. I designed the interview protocol in three parts. A set of open questions for in-depth semi-structured interviews were designed, reviewed by my supervisors and piloted before officially applying in the research. The particular questions provided opportunities for participants to subjectively assess issues related to the education and training pathways.

Questions about the background of the participants: In the first part of the interview, I asked to know more about the participants and their background by

asking questions about their employer, job title, and years of experience, previous projects, and roles in these projects.

Questions about education and training pathways GPs and the challenges and advantages of training pathways, and suggestions for improvement (open-ended questions): The second part aimed to collect different perspectives and experiences of training pathways for GPs and the effects of training pathways with healthcare systems. I firstly asked the participants about the pathway to become a GP from their context, whether they find it to be an effective way to systematically address the needs of their working context or not. I posed the questions without providing any examples and did not limit the participants in their conversation to obtain their perspective on the topic. I asked them about experiences about training pathways with which they are prepared or unprepared for professional practice. Following up on this part, I asked the participants about perspectives about challenges and advantages of training pathways and potential measures and solutions to improve existing issues.

In the pilot stage, I recruited a family medicine specialty trainee from Hanoi Medical University in Vietnam where I used to work for 3 years before starting my PhD program. He completed a general doctor degree for 6 years and now is a second-year trainee in family medicine. I undertook a video interview by Skype with him in my office which lasted about 90 minutes in Vietnamese. I also performed another pilot interview with a patient in Bournemouth, UK. She used to work at NHS for 10 years in a senior administrative role in the ledger department. I also conducted this interview by Skype in my office, lasting about 80 minutes in English.

From two pilot interviews, I recognised that my interview protocol and questions were reasonable to evoke a conversation around experiences related to training GPs/family physicians or healthcare systems. I started with some familiar topics about how to become a GP, or how to meet a GP in their context, which seemed to permit a logical development in interviewing process. Then, I moved on to more in-depth questions of their own experiences and cognition about education and

training pathways for GPs. These questions contributed effectively to create an exploratory discussion. Therefore, the pilot interview protocol will be applied for official interviews with several amendments such as changing the order of some questions and modifying some words in questions. This can help participants quickly appreciate questions and contexts. However, I noted that the first 'warm-up' question might lead to some different current issues of healthcare systems. Hence, I might need to establish a way of avoiding digression and maintaining focus on my research questions. Initially, I proposed drawing a picture to describe their knowledge and perception about training programs and health care systems might be an effective approach. However, this was discounted in the interview protocol due to time constraints. Additionally, I developed a questionnaire for background questions of participants instead of asking each question at the beginning of interviews to reduce interview time to 45 minutes from 60 minutes.

3.4.3.9 Data Analysis

Interviews were treated as giving 'direct access' to the reflections of stakeholders' perception of education and training pathways. The analytical position was therefore 'descriptive and interpretive'. All interviews were digitally recorded and saved to Dropbox, a secure server. The data were gathered and analysed specifically for the purposes of this research and will not be made available to anyone else other than myself and my supervisors. Regarding the anonymity and confidentiality, the personal information of all participants was confidential. I ensured that no output provided information which might allow any participant to be identified from names, data, contextual information, or a combination of these. The data were stored and anonymised in such a way as to make participants untraceable unless they give permission for it to be otherwise. The data were anonymised through the use of pseudonyms in the written dissertation. Thus, the confidentiality of the recordings and participants' information were preserved. A check list and a short summary for each interview were designed.

I adopted thematic analysis as described by (Caelli, Ray, & Mill, 2003), drawing on frameworks described by Gibbs and Creswell (Creswell & Poth, 2016; Gibbs,

2007). Thematic analysis is an inductive process in which parts of the texts capturing the data are grouped under themes which represent ideas or concepts. Such themes can be inducted directed from the written text, but their formation can also be influenced by prior reading of the literature.

Nvivo software was used throughout the data analysis to manage data and to create codes, themes and memos. This was a useful way of managing the large amount of text generated in this study. All tapes were processed by following stages namely transcription, coding, adding comments/reflections to write memos, identifying patterns/ themes/ relationships/ sequences/ differences, and finally elaborating small generalisations before linking them together. In addition, the study utilises several forms of software such as Microsoft Word, Microsoft Excel and Nvivo 12 to assist with the analysis.

1) Initial coding

Initially, three transcripts of representative participants from three typologies were selected based on data richness. Then, these transcripts were analysed, and I developed four main themes namely GPs, education and training, professional settings, and healthcare systems. The four themes were organised in four layer including individual, microsystem, mesosystem and exosystem correspondingly based on Urie Bronfenbrenner's Ecological Framework for Human Development (Härkönen, 2001). This approach was chosen because of its usefulness in comprehensively understanding relationships and interactions around GPs and education and training pathways for GPs. However, the approach entails certain drawbacks as it can lead to the misunderstanding that the thematic framework is solely based on the GPs' standpoint. Meanwhile, the data were obtained from a variety of participants' views; namely, medical educators, trainees, patients and policy makers.

To address this concern, I recommenced initial coding by applying word-by-word and line-by-line coding. The coding process started with coding each question's answer of 10 transcripts. This were accomplished by trying to assign simple and

analytic codes to best describe the parts. There were 373 single nodes and then they were categorised into 21 different groups. To deal with a vast number of initial nodes, I grouped the nodes according to their main contents and used several nodes to name for main themes established. 373 single nodes were divided into 21 main themes developed, then links and relationships between 21 main themes were analysed and dissimilarities amongst these main themes were clarified. 21 main themes were grouped into 3 main themes. The list, which resulted from the initial coding, was revised a second time to rename, merge and classify codes according to the links between them. The revision resulted in reducing the number of initial codes and establishing umbrella themes (see in the result below).

2) Focused or Selective

Charmaz (Charmaz, 2014) stated that "*focused coding means using the most significant and/or frequent earlier codes to sift through large amounts of data … [and that it] requires decisions about which initial codes make the most analytic sense to categorise data incisively and completely*". At this stage, I used conceptual selection for the resulting initial codes according to their frequency and reference to the aspects from the thematising phase. Unlike the initial coding, I had to reread the interviews and the codes several times before finalising the code categories. This was a complex situation, as we had instances where more than one code is relevant to different groups. So, we had to reread them and then assign them to the most relevant category.

My reflections: use of theory

Using a pragmatic stance provides an opportunity to connect the theory and data based on abduction that allows study design, data collection, and analysis is likely neither completely induced by data nor deduced from theory. Initially, at the intermediate stage in the analysis, three transcripts of representative participants from three typologies were selected based on data richness. Then, my first supervisor and I analysed these transcripts independently using an inductive approach. Afterward, we discussed together our initial themes, including comparing themes found. There were four similar main themes, namely GPs, education and training, professional settings, and healthcare systems, among themes that we both found. We raised the question of relations between the four themes and how they link together. Then, I started looking at using theory to interpret findings because theory can be a guide or a tool that explains something, helping us make sense of the world. Theories create different lenses for researchers to see different things in the world. Hence, theory can help to make sense for the interpretation of findings.

My key reason for using Urie Bronfenbrenner's Ecological Framework to inform the thematic analysis is that ecological systems theory is commonly referred to as a complex system of relationships affected by multiple levels of the surrounding environment. It identifies five environmental systems with which an individual interacts: the microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem. This helped me to interpret the data and informed the structure of the main themes and made me think about the relationships and interactions around GPs and education and training settings. However, when I presented a first attempt at a thematic framework based on Bronfenbrenner's theory to my supervisors, they felt this didn't align well with the stated aim of the research, so although this theory informed my thinking it wasn't used as the framework for coding the data.

3.5 Quality

Research quality assurance serves a vital role in the whole research process and has attracted the attention of scholars. Meanwhile, research methods play a vital role in ensuring quality in research. This doctoral research applied a combination of both criteria sets for qualitative and scoping review. I will now succinctly discuss some primary measures selected to increase the quality and believability for this doctoral research.

3.5.1 Scoping review

Scoping reviews and systematic reviews take a similar approach in that they synthesise evidence and assess the scope of literature on a topic. Therefore, this doctoral study applied questions from a critical appraisal tools checklist of Critical Appraisal Skill Programme (CASP) for systematic reviews to assure the quality of the scoping review that can provide valid and reliable research results (see Table 5).

Table 5: Quality Assurance for Scoping Review

Critical Appraisal Questions	Where are covered in the research
Did the review address a clearly focused question?	The research question focused on exploring different typologies of education and training pathways for GPs which are appropriate to the function of a scoping review.
Did the authors look for the right type of papers?	The scoping review included international peer-reviewed literature to assure that only high quality, valid and relevant research was included.
Do you think all the important, relevant studies were included?	To identify relevant studies, a search was conducted on three main databases namely Ovid Medline, Embase, and ERIC which are bibliographic databases with authoritative, peer-reviewed, and complete information. Additionally, the search strategy was structured by relevant key words to reach all potentially relevant research.
Did the review's authors do enough to assess quality of the included studies?	For a scoping review, quality assessment of included studies is not required (M. J. Grant & Booth, 2009).

3.5.2 Qualitative Research

To reach trustworthiness in qualitative studies, Lincoln and Guba provided the definition of the quality criteria in 1985 that include namely credibility, transferability, dependability, confirmability and reflexivity (Korstjens & Moser, 2018). Reflexivity is an integral part of ensuring the transparency and quality of qualitative research. Then, in 2010 the article by Sarah J Tracy highlighted eight key markers of quality in qualitative research including (a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence (Tracy, 2010). Furthermore, a critical appraisal tools checklist of CASP has been designed to assess the quality of qualitative studies in which also covers all quality criteria mentioned by the two studies mentioned above. This doctoral study applied the CASP checklist to clarify how the qualitative study has been fixed with these quality criteria (see Table 6).

Table 6: Quality Assurance for Qualitative Study

Critical Appraisal Questions	Where are covered in the research
Was there a clear statement of the aims of the research? *(a) Worthy topic*	The aim of the research was illustrated transparently to explore 'what are stakeholders' perceptions of education and training pathways in their country?'. This is beneficial to the discovery of more empirical characteristics for the typology established in the scoping review in the phase 1 that have not been investigated.
Is a qualitative methodology appropriate? *(b) Rich rigour*	The qualitative approach permits an exploration of human experiences about a phenomenon so that opinions and in-depth reasons can be understood to explain why or how a phenomenon is perceived. Therefore, this approach is applicable with the research question of this doctoral study to interpret subjective experiences of research participants and reach a keen understanding of the provisional typologies.
Was the research design appropriate to address the aims of the research? *(b) Rich rigour* *(d) Credibility* *(h) Meaningful coherence*	*The research design*: in-depth, individual, semi-structured interviews were undertaken to uncover perceptions. Additionally, the research included interviews, either in-person or by telephone via different telecommunications applications, namely, Skype, Room, Zalo and Facetime. Therefore, this study was able to reach international participants from three different countries. Pilot interviews were designed and conducted to assure the quality of semi-structured questions.

Was the recruitment strategy appropriate to the aims of the research? *(b) Rich rigor* *(c) Sincerity* *(d) Credibility* (*g) Ethics, and (h) Meaningful coherence*	*The recruitment strategy*: This was the selection process based on the most convenient method for participants in their circumstances. A diverse number of participants was selected in each study to enhance the methodological precision, permitting an exploration of the similarities and differences, and capturing unique and diverse experiences. Advantages and limitations of research design were considered to select an appropriate method for the study. Every decision was comprehensively discussed with two supervisors before following actions, providing researcher triangulation.
Was the data collected in a way that addressed the research issue? *(b) Rich rigour* *(e) Resonance* *(g) Ethics, and (h) Meaningful coherence*	The data collection instruments have been demonstrated in detail and a copy has been added to the appendices. An adjustment between philosophical assumptions, methods and methodology provides internal coherence, and this makes the results strong, justifiable and trustworthy (Rees and Monrouxe, 2010). Informed consent along with frequent engagements with the participants helped to build sympathy and trust (Dicicco-Bloom and Crabtree, 2006). A repeated measurement was used towards data collection and the analysis. The context and numerous factors impacting the outcomes have been sufficiently discussed in each chapter to build up the transferability or applicability of findings from this study (Kitto et al., 2008, Rees and Monrouxe, 2010). Mailing transcripts and results of data analysis to the participants for their comments were carried out to guarantee face validity as suggested in the literature (Cote and Turgeon, 2005). The results of data analysis were sent to the participants because member checking assumes a fixed truth of reality that can be confirmed by a participant, meanwhile there is a shift over time of the positions and aims of the participants and the researcher (Kitto et al., 2008). The author may view the data in new approaches or may come across a potential phenomenon, which the participants may or may not recognise and as busy research subjects may not have sufficient time to devote to time-consuming predictions.
Has the relationship between researcher and participants been adequately considered? *(c) Sincerity* *(d) Credibility* *(g) Ethics*	Professional background and relationship of supervisors and the researcher with the participants along with any effects have been debated in the ethical application and following chapters. I also kept a research diary to take notes from my personal reflections in the research process. This reflexive process also contributes to the identification of my training and supervision needs.

3.6 Ethical consideration

Research ethics are a crucial consideration in every step of research process in social science. There are several principal areas where ethical issues are likely to emerge in research namely harm, consent, deception, privacy, and confidentiality. Before, during and after the implementation study, it is essential to examine ethical issues as well as weighing up the benefits and drawbacks of research on subjects (Israel & Hay, 2006; Kimmel, 1988). Therefore, the research will be based on the guidelines of the British Educational Research Association (BERA) throughout this study process. All study subjects selected will be informed fully about the research as well as their role and rights in consent forms from the researchers.

Table 7: The ethical principles of the British Educational Research Association (BERA)

Principles by BERA	Description	Where are covered in the research
Responsibilities to participants	It will require several compulsory contents below: ▪ Consent ▪ Transparency ▪ Right to withdraw ▪ Incentives ▪ Harm arising from participation in research ▪ Privacy and data storage ▪ Disclosure	An information sheet for participants of this research was designed and covered all these contents. A consent form was also designed and will be obtained before conducting interviews
Responsibilities to sponsors, clients and stakeholders in research	This principle will consider relations to interests of sponsors, stakeholders and researchers and determine their responsibilities to each other in the scope of cooperation.	Responsibilities to wider research team (including supervisors).
Responsibilities to the community of educational researchers	This aims to protect integrity and reputation of educational research through maintaining a healthy research culture, constructive criticism, reporting malpractice, plagiarism, etc.	References were used and cited fully. All stages of methodology were designed carefully and described transparently to ensure the research quality.
Responsibilities for publication and dissemination	This covers communication of research findings including contents, languages, accessibility, potential impact and constraints of research findings. Besides, researchers	All transcripts of interviews will be sent to participants if they would like to read again. The results of interviews will be shared at seminars, or conferences.

	have a responsibility to share their findings with participants and communities.	The results of interviews might be published in English and Vietnamese including recommendations for future researchers.
Responsibilities for researchers' wellbeing and development	Employing institutions, sponsors and researchers themselves are responsible for both the physical and psychological wellbeing of researchers.	All risks in the research process for researcher that require careful consideration.

The study will now proceed to present the results the research, starting with the scoping review in the next chapter.

My reflections: ethical dimensions of the research

Ethical dilemmas were considered and discussed with both my supervisors while conducting the international qualitative study, particularly the potential for coercion for recruitment, and the importance of confidentiality and data protection.
The first dilemma was to maximise recruitment whilst ensuring I did not pressurise potential participants or coerce them in any way. Invitations were e-mailed just once, and I approached only those participants who chose to reply. All participants were aware of my role as a Ph.D. student at the University of Exeter and, not having met me before, were not influenced by personal acquaintanceship in deciding whether or not to participate. Overall, I felt that not being a doctor myself was beneficial in the context of the study as interviewees viewed me as taking a more neutral or impartial stance to their stories as a researcher – and perhaps they also explained things more fully rather than assuming prior knowledge.
The second dilemma was about on confidentiality and data protection – for example including sufficient contextual information to make sense of the data and sharing with wider team to guarantee a rigorous analysis process, whilst minimising risk of harm to participants. I also considered a potential for an ethical dilemma if participants disclosed any issues concerning professional misconduct (of themselves or others) during the interview discussion, especially if related to patient care. In research phase 2, one-to-one, semi-structured in-depth interviews were conducted, and there was the potential for disclosing sensitive information (for example, concerning patient safety or professional misconduct). To protect the participants from potential harm such as reputation, career or psychological harm such as embarrassment or social harms such as loss of employment or damage to one's financial standing, it was crucial to ensure the anonymity of all those taking part and the security of the information given. Furthermore, there was an involvement of a person who assisted in transcribing, and the participation of both my supervisors in reviewing data analysis. Data leaks might lead to participants being identified and leading to harms, as discussed above. Therefore, measures of data protection were taken to ensure the security of the data gathered: (a) recorded interviews did not include any personal information about participants, such as full names or locations; (b) once transcribed, all identifiable information was removed from transcripts (names and locations); (c) finally, all files were kept in password protected folders. I coded names of participants, generalised their personal information to ensure they cannot be identified.

CHAPTER 4: SCOPING REVIEW RESULTS

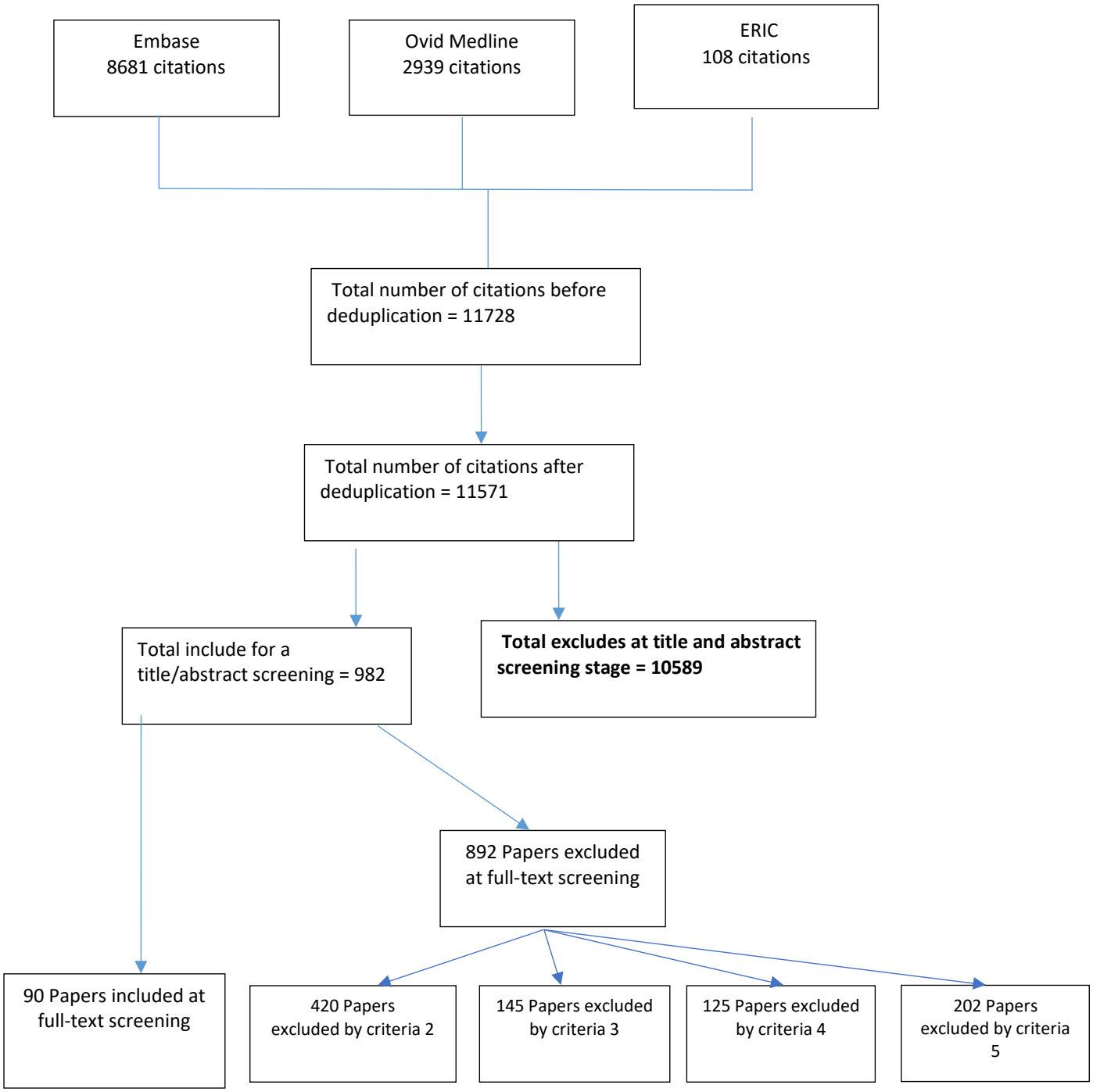
4.1 Introduction to the chapter

As previously indicated, the aim of the scoping review was to explore the following: ***'What are the different types of education and training pathways of GPs represented in literature: A scoping review?'***. This chapter illustrates the result of the scoping review, namely, the papers identified by the search, the data extracted from them, the thematic analysis and the provisional typologies of education and training pathways for GPs.

4.2 Scoping literature search and indicator databases

A search in May 2018 retrieved 11,571 independent records. After screening titles and abstracts, 982 papers were selected for full-text retrieval. Following full-text screening, a total of 90 papers were included in the review (see Figure 3).

Figure 3: Flowchart of papers in the scoping review.



4.3 Included studies

A summary of the 90 papers included in this review, and how they contributed to the results, is shown in Table 8. The 90 included papers came from over 27 countries in five continents (see Table 10). The United States had the largest number of articles with 15 papers (17%), followed by Canada with 9 papers (10 %). Australia, India, United Kingdom and South Africa each contributed 4 to 6 papers (4% to 7%). The volume of articles published in 2017, 2016, and 2015 accounted for the highest rate in the years searched (2010 -2019). This showed an increasing number of publications on this topic in recent years. There were several main types of study design in the 90 included papers: 44 % literature review, 32% quantitative study, 12% qualitative study, and 8% report. Of the 90 papers which were included, 52% described both undergraduate and postgraduate programmes, 8% of papers described specific postgraduate curriculum, 6% of papers described specific undergraduate curriculum, 11% of papers presented innovative models that introduced new education and training programs/paradigms and compared with current programmes, and 23% of papers described learning outcomes or competencies, assessment, pedagogy, and principles in curriculum development (see Table 9). The eight themes identified were roles, training context, duration, curriculum content, curriculum principles, assessment, pedagogy, and challenges (see Table 10). These themes emerged as fundamental curricular components of training pathways and revealed differences amongst and diversity within countries.

Table 8: Summary of Included Publication and Key Characteristics

No.	Authors	Year of Publication	Study Design	Country[1]	Key Focus	
					Education and training stages	Sub-programme elements
1	Abu Zuhairah et al.	2015	Quantitative Study	Saudi Arabia	• Undergraduate and Postgraduate	• Duration • Contents of Curriculum
2	Arya, N et al.	2017	Clinical Review	Around the world	• Undergraduate and Postgraduate	• Duration • Challenges
3	Akoojee et al.	2017	Quantitative Study	South Africa	• Postgraduate	• Context of Training; • Principles of Constructing and Developing Curriculum, • Assessment
4	Bayley, S. A. et al.	2011	Qualitative Study	Australia	• Postgraduate	• Duration • Contents of Curriculum
5	Besigye, I., et al.	2017	Conference Report	Sub-Saharan Africa	• Undergraduate and Postgraduate	• Context of Training • Assessment
6	Lewis Sigmon Jr, et al.	2012	Qualitative Study	USA	• Postgraduate	• Context of Training, • Duration, • Contents of Curriculum, • Principles of Constructing and Developing Curriculum
7	Blasco et al.	2018	Literature Review (Descriptive)	Brazil	• Undergraduate and Postgraduate	• Context of Training, • Contents of Curriculum, • Principles of Constructing and Developing Curriculum
8	Boon, V., et al.	2017	Quantitative Study	UK	• Undergraduate	• Context of Training, • Duration, • Contents of Curriculum, • Principles of Constructing and Developing Curriculum
9	Brekke et al.	2013	Quantitative Study	Europe	• Undergraduate	• Context of Training

[1] This information was typically indicated in the manuscript titles or abstracts. The authors' affiliation was not used.

10	Carney, P. A. et al.	2012	Quantitative Study	USA	• Postgraduate and CPD	• Context of Training
11	Colon-Gonzalez et al.	2015	A Comprehensive Literature Review	USA	• Undergraduate and Postgraduate	• Context of Training • Duration • Challenges
12	Convened by National Health System Resource Centre National Health Mission,	2016	Report and Recommendations	India	• Undergraduate and Postgraduate	• Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Assessment
13	Dai, H. et al.	2013	Literature Review (Descriptive)	China	• Undergraduate and Postgraduate	• Context of Training • Duration • Assessment • Pedagogy
14	de Villiers et al.	2010	Literature Review (Descriptive)	South Africa	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Pedagogy
15	Dickson et al.	2013	A paper-based survey	USA	• Postgraduate	• Context of Training
16	Emery et al.	2011	Literature Review (Descriptive)	Australia	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Challenges
17	Essuman et al.	2017	Quantitative Study	Ghana	• Undergraduate and Postgraduate	• Context of Training
18	Fletcher et al.	2014	Qualitative Study	Canada	• Postgraduate	• Context of Training • Principles of Constructing and Developing Curriculum
19	Flinkenflogel et al.	2014	Qualitative Study	Sub-Saharan Africa	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Challenges

20	Gossa et al.	2016	Qualitative Study	Ethiopia	• Undergraduate and Postgraduate	• Context of Training • Principles of Constructing and Developing Curriculum • Challenges
21	Gouveia et al.	2016	Quantitative Study	Brazil	• Undergraduate	• Context of Training • Contents of Curriculum • Principles of Constructing and Developing Curriculum
22	Grainge Biggs et al.	2016	Literature Review (Descriptive)	Pakistan	• Undergraduate and Postgraduate	• Context of Training • Contents of Curriculum • Assessment
23	Gupta et al.	2016	Literature Review (Descriptive)	Australia	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum
24	Hughes et al.	2015	Literature Review (Descriptive)	USA	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum
25	Iglar et al.	2013	Literature Review (Descriptive)	Canada	• Postgraduate	• Contents of Curriculum • Assessment
26	Jerčić et al.	2012	Literature Review (Descriptive)	Croatia	• Undergraduate and Postgraduate	• Duration • Contents of Curriculum
27	Keegan et al.	2017	Literature Review (Descriptive)	Canada	• Undergraduate	• Contents of Curriculum • Assessment
28	Kolesnyk et al.	2013	Literature Review (Descriptive)	Ukraine	• Undergraduate and Postgraduate and CPD (continuous professional development)	• Duration • Contents of Curriculum • Assessment • Pedagogy
29	Kung et al.	2011	Qualitative Study	Hong Kong	• Postgraduate	• Challenges • Pedagogy
30	Longenecker et al.	2018	Quantitative Study	USA	• Undergraduate and Postgraduate and CPD (continuous professional development)	• Context of Training • Contents of Curriculum • Principles of Constructing and Developing Curriculum

31	Maharaj et al.	2016	Literature Review (Descriptive)	India	• Postgraduate	• Duration • Challenges • Assessment
32	Mash et al.	2015	Literature Review (Descriptive)	South Africa	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Challenges • Assessment • Pedagogy
33	Mbuka et al.	2016	Quantitative and Qualitative Study	Botswana	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Challenges
34	Sanders et al.	2016	Literature Review (Descriptive)	Zambia	• Postgraduate	• Context of Training • Duration • Contents of Curriculum
35	O'Keefe et al.	2016	Literature Review (Descriptive)	Canada	• Undergraduate and Postgraduate and CPD (continuous professional development)	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum
36	Organek et al.	2012	Literature Review (Descriptive)	Canada	• Postgraduate	• Duration • Principles of Constructing and Developing Curriculum
37	Osman et al.	2011	Quantitative Study	Arab countries	• Postgraduate	• Context of Training
38	Pal et al.	2017	Literature Review (Descriptive)	India	• Undergraduate and Postgraduate	• Contents of Curriculum • Principles of Constructing and Developing Curriculum
39	Pal, R. et al.	2014	Literature Review (Descriptive)	India	• Undergraduate and Postgraduate	• Contents of Curriculum
40	Pati et al.	2015	Overview	India	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum

41	Paul George MD et al.	2015	Literature Review (Descriptive)	USA	• Undergraduate and Postgraduate	• Duration • Contents of Curriculum
42	Philpott et al.	2012	Literature Review (Descriptive)	Ethiopia	• No Postgraduate	• Principles of Constructing and Developing Curriculum • Challenges
43	Raji et al.	2014	Literature Review (Descriptive)	India	• Postgraduate	• Context of Training • Assessment • Pedagogy
44	Rees et al.	2014	Quantitative Study	UK	• Undergraduate and Postgraduate	• Challenges
45	Roberts et al.	2011	Literature Review (Descriptive)	Many countries	• Undergraduate and Postgraduate and CPD (continuous professional development)	• Principles of Constructing and Developing Curriculum • Assessment
46	Sabzwari et al.	2015	Literature Review (Descriptive)	Pakistan	• Postgraduate	• Duration • Principles of Constructing and Developing Curriculum • Challenges
47	Sairenji et al.	2017	Quantitative Study	USA	• Postgraduate	• Context of Training • Contents of Curriculum
48	Schultz et al.	2016	Innovation Report	Canada	• Postgraduate	• Context of Training • Principles of Constructing and Developing Curriculum
49	Schwill et al.	2017	Project description	Germany	• Postgraduate	• Contents of Curriculum • Principles of Constructing and Developing Curriculum • Assessment • Pedagogy
50	Shah et al.	2012	Quantitative Study	Pakistan	• Postgraduate and CPD (continuous professional development)	• Context of Training • Challenges
51	Slade et al.	2016	Quantitative Study	Canada	•	• Principles of Constructing and Developing Curriculum
52	Sururu et al.	2017	Qualitative Study	Zimbabwe	• Undergraduate and Postgraduate	• Context of Training • Contents of Curriculum • Challenges

53	Takamura et al.	2016	Overview	Japan	• Postgraduate	• Context of Training • Duration • Contents of Curriculum • Challenges • Principles of Constructing and Developing Curriculum
54	Tandeter et al.	2011	Quantitative Study	Europe	• Postgraduate	• Contents of Curriculum • Challenges
55	Taniguchi et al.	2017	Literature Review (Descriptive)	Japan	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Assessment
56	Thomas, S et al.	2013	Literature Review (Descriptive)	Singapore	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Pedagogy
57	Tkachenko et al.	2017	Literature Review (Descriptive)	Ukraine	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Assessment • Pedagogy
58	VanNieuwenborg et al.	2016	Literature Review (Descriptive)	Belgium	• Continuing medical education for general practitioners	• Pedagogy
59	Vrcić Keglević et al.	2014	Literature Review (Descriptive)	Croatia	• Postgraduate	• Duration • Principles of Constructing and Developing Curriculum • Assessment • Pedagogy
60	Weggemans et al.	2017	Literature Review (Descriptive)	Many countries	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Assessment
61	White et al.	2017	Report	USA	• Postgraduate	• Challenges

62	Jenn Ng et al.	2016	Qualitative Study	Asia Pacific	• Undergraduate and Postgraduate	• Duration • Assessment • Pedagogy
63	Wong et al.	2012	Literature Review	Singapore	• Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Challenges • Assessment • Pedagogy
64	Wun et al.	2011	Quantitative Study	Hong Kong	• Undergraduate and Postgraduate	• Duration • Assessment
65	Buddeberg-Fischer et al.	2011	Quantitative Study	Switzerland	• Postgraduate and CPD (continuous professional development)	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Pedagogy
66	Butterworth et al.	2010	Quantitative Study	Nepal	• Undergraduate	• Context of Training • Contents of Curriculum
67	Chandran et al.	2015	Report	USA	• Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Pedagogy
68	Drislane et al.	2014	Report	Ghana	• Undergraduate and Postgraduate	• Context of Training • Duration • Contents of Curriculum • Pedagogy
69	Du Plessis et al.	2016	Quantitative Study	South Africa	• Postgraduate	• Context of Training • Duration • Contents of Curriculum • Pedagogy
70	Fazio et al.	2016	Literature Review (Descriptive)	USA	• Undergraduate	• Contents of Curriculum • Principles of Constructing and Developing Curriculum

71	Hays et al.	2017	Quantitative Study	Australia	• Postgraduate	• Context of Training • Duration
72	Orda et al.	2017	Report	Australia	• Postgraduate	• Context of Training • Duration • Contents of Curriculum
73	Gibson et al.	2017	Qualitative Study	Many countries	• Postgraduate	• Principles of Constructing and Developing Curriculum
74	Vrcić Keglević et al.	2014	Quantitative Study	Croatia	• Postgraduate	• Challenges
75	Terry et al.	2011	Quantitative Study	USA	• Postgraduate	• Assessment
76	Ponka et al.	2015	A scoping review	Many countries	• Postgraduate	• Principles of Constructing and Developing Curriculum
77	Pensa et al.	2013	Quantitative Study	USA	• Postgraduate	• Context of Training • Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum • Pedagogy
78	Magin et al.	2017	Quantitative Study	Australia	• Postgraduate	• Context of Training • Duration • Assessment
79	MacCarthy et al.	2012	Quantitative Study	Canada	• CPD (continuous professional development)	• Contents of Curriculum • Principles of Constructing and Developing Curriculum • Pedagogy
80	Hoekzema et al.	2014	Quantitative Study	USA	• Postgraduate	• Context of Training
81	Evensen et al.	2017	Qualitative Study	Ethiopia	• Postgraduate and CPD	• Context of Training • Principles of Constructing and Developing Curriculum
82	Delavari et al.	2016	Qualitative Study	Iran	• Postgraduate	• Context of Training • Principles of Constructing and Developing Curriculum • Challenges
83	Derbyshire et al.	2014	Quantitative Study	UK	• Undergraduate and Postgraduate	• Context of Training

84	Chew et al.	2016	Overview	Singapore	• Undergraduate and Postgraduate	• Context of Training
85	Mash et al.	2015	Literature Review	China, India, Brazil and South Africa	• Undergraduate and Postgraduate	• Context of Training • Duration • Principles of Constructing and Developing Curriculum • Assessment
86	Lawson et al.	2016	Literature Review (Descriptive)	Ghana	• Undergraduate and Postgraduate and CPD (continuous professional development)	• Context of Training • Duration
87	Fuglestad et al.	2017	Quantitative Study	USA	• Postgraduate	• Duration • Contents of Curriculum • Principles of Constructing and Developing Curriculum
88	Hays et al.	2011	Overview	Many countries	• Undergraduate and Postgraduate	• Duration • Challenges • Assessment
89	Huang et al.	2011	Quantitative Study	China	• Undergraduate and Postgraduate	• Challenges
90	Lee et al.	2011	Combined Qualitative and Quantitative	Canada	• Postgraduate	• Context of Training • Principles of Constructing and Developing Curriculum

Table 9: Data relating to the 90 studies included in the scoping review

Research areas	Frequency	Percentage
GPs education and training pathway	47	52%
Specific postgraduate curriculum	7	8%
Specific undergraduate curriculum of GP/Family Medicine	5	6%
Innovative education and training model for GPs	10	11%
Learning outcomes or competencies, assessment, pedagogy, and principles in curriculum development	21	23%
Total	90	100%

Table 10: Descriptions of eight themes identified in scoping review by thematic analysis

No.	Themes	Descriptions
1	Roles	Information related to GPs' positions or purposes in health care system and professional responsibilities
2	Training contexts	Information related to situations in which knowledge and competences are learned or trained, a situation that can impact how something is learned or what is taught
3	Duration	Information related to the length of time that a medical student must study to become a GP
4	Curriculum Content	Information related to the intended aims and objectives, context, experiences, outcomes and processes of an educational programme.
5	Curriculum Principles	Information related to foundational theories for building up and developing curriculums.
6	Assessment	Information related to principles, standards, instruments, and forms namely written, formative or workplace-based assessment.
7	Pedagogy	Information related to methods and practice of teaching that are being applied in medical schools such as small group learning, large group teaching, e-learning, simulation-based medical education, and simulated patients in medical education, study skills and work-based learning.
8	Challenges	Information related to what might be potential obstacles for education and training general practice/family medicine.

4.4 Typologies of Education and Training GPs/Family doctors

The typologies in worldwide medical schools varied within and between countries. Throughout the thematic analysis, the eight themes were identified and then used in comparing distinctions between training pathways from different countries to create a typology of GP training. The comparison process resulted that the role of GPs in the health care system was a prerequisite factor in creating diversity in education and training for GPs. Therefore, categorisation and development of the typologies was based on the role of GPs in the healthcare system. The typologies were divided into 3 groups namely *"Gatekeeper", "Doctor of Choice", "Team member"*.

Typology 1 – Gatekeeper

Patients cannot access secondary or tertiary service without GPs' referrals for specialist care. In this typology, the term 'general practitioner' is most commonly applied and was identified in several developed countries namely United Kingdom, Denmark, the Netherlands, Canada and Australia. In United Kingdom, Denmark, the Netherlands, Canada and Australia, the term general practitioner refers to one who has completed postgraduate training in general practice and works in PHC. In these settings, GPs typically play a gatekeeper role for the healthcare system and cover almost all common health issues. Firstly, the training process is continuous and mandatory throughout undergraduate, internship, postgraduate and continuing medical education levels. Thus, duration is relatively long in comparison with the other two typologies. Secondly, curricula are frequently established and developed based on a specific and comprehensive competence framework. Hence, the contents of these curricula are holistic, integrating research domain in which postgraduate levels concentrate on developing clinical and research skills in a particular speciality. Furthermore, the methods for pedagogy and assessment are typically diverse and constantly improved.

Typology 2 – Doctor of choice

Patients can access directly to secondary or tertiary service and make decisions whether they should see GPs or Specialists. The term 'family physician' (FP) is most predominantly used in this typology. Although FPs in the typology are not 'gatekeepers' for the healthcare system, they are recognised as of significant importance in providing PHC as well as increasing the quality, equality and cost effectiveness of healthcare services. Thus, there are several distinct features in its training process. Firstly, there are multiple training pathways for medical students including one formal and some optional pathways. The formal pathway is quite similar to the pathway of Typology 1 that contains learning experiences in both undergraduate education, residency training and continuing medical education levels. The optional pathways were formed to respond to the urgent PHC needs. For example, to address the shortage of PHC providers in rural areas of central and western regions, the Development and Reform Commission of China provided a free 5-year family medicine training program with free accommodation and discounted meal plans for medical students who must commit to work in underserved regions for at least 6 years after graduation (Dai et al., 2013). These pathways exist simultaneously so that creates diversity and flexibility in medical education and provides multiple choices for medical students. Additionally, postgraduate training is typically not seen as mandatory, so duration of the education and training pathway varies from 5 years to 13 years. Furthermore, curriculum content and principles have been formed based on family medicine issues. Multiple methods for pedagogy and assessment are applied in which traditional methods are more dominant.

Typology 3 – Team member

Patients can access a much wider network delivers care and support to people in their homes and communities. In this typology, family medicine is a relatively new specialty in health care systems and was established at the beginning of the 21st century based on training programs from developed countries. Thus, there is limited training information and progress in comparison with typology 1 and typology 2. This typology was found commonly in low- and middle-income countries, for instance, Uganda, Kenya and Botswana. Noticeably, FPs play a vital role in providing a myriad of care in small rural health centres or hospitals like preventative care and primary care services within the community, including the diagnosis, treatment, and management of accident and emergency; rehabilitation support; and end of life care. Curriculum contents and principles mainly focus on community health, family-centred healthcare and cost-effectiveness, emphasising surgical and emergency skills. Nonetheless, family medicine has not been included in undergraduate programmes and almost half of doctors practice without any specialist education in family medicine. Assessment methods typically apply traditional approaches instead of using standards frameworks. Duration of postgraduate training varies with multiple training forms that also shape diversity and flexibility.

Characteristics, strengths, weaknesses and challenges associated with each typology were written in the included papers and shown in Table 11. Additionally, a description of each of the three typologies with the eight themes presented previously created to compare different characteristics between the typologies. Illustrative quotes were taken from the original included paper to make the comparison more transparent, recognisable and provide an audit trail (see Table 12).

Table 11: Typologies' Strengths, Weaknesses and Challenges from authors' perspectives of the included papers

Typologies	***Typology 1 "Gatekeeper"***	***Typology 2 "Doctor of choice"***	***Typology 3 "Team member"***
Strengths	• Provide a certain and clear career future (Barber, Brettell, Perera-Salazar, Greenhalgh, & Harrington, 2018) • Health systems are more oriented towards PHC with more cost-effective and clinically effective care (Blasco et al., 2018). • More GPs to population, less hospitalisation rates.	• Respond quickly to high demand for quantity and quality of GPs in underserved regions. *(Colon-Gonzalez, Rayess, Guevara, & Anandarajah, 2015; Dai et al., 2013; Sairenji, Wilson, D'Amico, & Peterson, 2017)* • More flexibility in obtaining a GP degree. *(Colon-Gonzalez et al., 2015; Dai et al., 2013; Sairenji et al., 2017)* • Reduce training cost and time compared to typology 1*(Colon-Gonzalez et al., 2015; Dai et al., 2013; Sairenji et al., 2017).*	Development directions of education and training GPs are reasonable and explicit. • Shorter education and training for GP than Typology 1 and not as flexible as Typology 2 • Applying multiple training methods from developed countries *(Flinkenflögel, Essuman, Chege, Ayankogbe, & De Maeseneer, 2014; Gossa, Wondimagegn, Demeke Mekonnen, Abebe, & Fetters, 2016).*
Weaknesses	• High demand for highly skilled GPs (Gossa et al., 2016). • Inflexible, long and expensive training pathway progression.	• A difficulty in managing quality of GP. • Unclear career paths and lack of opportunities for continuing professional development (CPD) *(Colon-Gonzalez et al., 2015; Kung et al., 2011).*	• Provide unclear career path and lack of opportunities for CPD. • Nonconformity between training pathways with healthcare needs and healthcare systems. • Public have no widespread awareness of family physicians responsibilities.*(Flinkenflögel et al., 2014; Gossa et al., 2016).*
Challenges	• Increasingly complex health care needs from ageing population. • Initiatives to move care from hospitals to communities. • Rising public expectations and a growing requirement for GPs (Hays & Morgan, 2011).	• Diverse training types: how to ensure the credentials and quality of GPs. • A recruitment crisis for residency programs. • FPs are less recognisable by patients and other physicians *(Colon-Gonzalez et al., 2015; Kung et al., 2011)*.	• Lack of facilities and qualified faculties for training. • Limitation of financial and human resource to deal with the ageing population, initiatives to move care from hospitals to communities *(Flinkenflögel et al., 2014; Gossa et al., 2016).*

Table 12: Characteristics of typologies with supporting quotes

No.	Themes	Typology 1 "Gatekeeper"	Typology 2 "Doctor of choice"	Typology 3 "Team member"
1	**Roles: examples of health care systems**	•NHS (UK), Medicare (Australia and Canada)	•China, USA and Brazil	•Ethiopia, Iran, and Pakistan
2	**Training Context**	•***The bulk of training positions located in Urban Settings*** *"… medical schools, hospital settings and community health services or outpatient clinics" (Weggemans et al., 2017)*	•***An incorporation of three settings namely Urban, Suburban, and Rural*** "*Students experience family medicine by seeing patients …. in a range of practice settings such as: different hospital facilities, family medicine clinics, ambulatory treatment units, palliative care scenarios, home visiting programs and elderly and disabled homes" (Blasco et al., 2018)*	•***Most training positions located in Rural Settings*** *"… training occurs in community-based settings…" (Besigye, Mash, Essuman, & Flinkenflögel, 2017)*
3	**Duration**	•***Mandatory, Continuous and Long*** *"In Australia and the UK, medical school is followed by an internship that is obligatory for all medical graduates before entering postgraduate training" (Weggemans et al., 2017)* *"Almost half of the five year medical courses that provided handbooks taught primary care in the medical undergraduate curriculum…"(Boon, Ridd, & Blythe, 2017)* *"What constitutes an appropriate duration for general practice training… a 3-year model is inadequate to produce doctors who are sufficiently competent and confident to enter practice" (Emery, Skinner, Morgan, Guest, & Vickery, 2011)*	•***Optional, Interrupted and Long*** *"Current models of family medicine education in China including three models namely free training for medical students serving underserved areas (a 5-year medical degree), Family doctor retraining for practicing physicians and physician assistants (1 year full-time and 2 years part-time), and Standardized family medicine residency training (generally from 5-year programs, may enter into a 3-year residency training program)" (Dai et al., 2013)*	•***Varied*** "*The College of Physicians and Surgeons (CPS), the postgraduate licensing body of Pakistan, lists four accredited postgraduate training programmes for Family Medicine in Pakistan. This includes a formal residency programme of four-year duration, providing similar formal clinical experiences as programmes in the West. Other postgraduate training varies in duration and specialty from dedicated Family Medicine training of one year vs. diplomas in other specialties like obstetrics and gynaecology, self-study etc." (Sabzwari, 2015)*

4	**Curriculum Contents**	•***Holistic*** *"The Australian General Practice Training (AGPT) program currently involves a minimum 3-year full-time equivalent commitment. In broad terms, the first year involves hospital rotations, which, when combined with intern experience, must cover the mandatory terms of internal medicine, surgery, emergency medicine and paediatrics. The following 2 years entail three 6-month terms in general practice, based in two practices. The final 6-month extended skills term provides some choice to develop skills in a particular domain. For those intending a career in rural and remote medicine, the program includes an additional fourth year of advanced skills training" (Emery et al., 2011)*	•***Family Healthcare*** *"The curriculum of Diplomate of National Board Family Medicine (FM) comprises: (1) Medicine and allied sciences, (2) surgery and allied sciences, (3) maternal and child health, and (4) basic sciences and community health." (Pati, Sharma, Pati, & Zodpey, 2015)*	•***Community and Public Health*** *"… deal with most health conditions in the district hospital and the associated PHC clinics, with emphasis on surgical and emergency skills" (Sururu & Mash, 2017)*
5	**Curriculum Principles**	•***Accountability – Systematic –Business & Management*** *"… each family medicine residency program in Canada is to establish a competency-based curriculum that is comprehensive, focused on continuity, and centred in family medicine—the Triple C Competency-based Curriculum." (Organek et al., 2012)*	•***Health care need*** "*…to address a shortage of well-trained family physicians and other primary care providers in rural areas and a lack of easily accessible continuing medical education…*" (Dai et al., 2013)	• ***The needs of the communities and cost-effective*** "*Due to the low number of trained doctors per capita and the high burden of disease, African family physicians work in their specific context, mainly in district hospitals with outreach to health centres, in PHC teams that address the problems of the community in a comprehensive, holistic and patient-centred way whereby specific skills like surgery and district management often are essential due to the lack of other specialists" (Flinkenflögel et al., 2014)*
6	**Assessment**	•***The large number of assessment methods have been applied widely including both traditional and new measures*** "*For example, Denmark established a new general practice training scheme in 2003, which includes 119 competencies to be demonstrated over 5 years of training. Standardised patients, in-training*	•***Multiple methods of assessment have been used but traditional measures accounted for the superior number*** •Evaluation methods base on national learning outcomes and requirement skills *"Assessment is through the traditional means: an objective standardised clinical examination, short*	•***Some traditional assessment methods have just applied namely formative assessment, case report and a final examination*** •Lack of standards for training and examinations. *"Standardization of training and examinations between*

		examinations, 360-degree evaluations (in which trainees also evaluate trainers), and the compilation of educational portfolios are becoming commonplace tools to assess and document trainees' competence" (Roberts et al., 2011)	*answer questions and extended matching questions. A compulsory portfolio allows reflection on personal learning and professional growth" (Maharaj et al., 2016)*	*faculties and countries is presently not existing …" (Flinkenflögel et al., 2014)*
7	**Pedagogy**	• ***diverse pedagogical methods, but interactive/ dialogic teaching*** (Lectures in small groups, interactive case presentation and discussion of patients) ***and student-centred learning*** *(*small - group discussion, role playing, simulation training and demonstrations of procedures) ***are more common than others***	• ***A significant development of distance-learning*** • There is also a widespread application of interactive teaching and student-centred learning "*a formal 3-year vocational training programme consists of distance learning programmes and workshops, hospital postings and a 2-week advanced FM course" (T. Y. Wong, Chong, Chng, & Tay, 2012)*	
8	**Challenges**	• An ageing population and a domination of hospital-based care. (Hays & Morgan, 2011) • Increasing burdens of chronic disease and comorbidities, and workforce shortages, particularly in rural areas. (Hays & Morgan, 2011)	• The shortage of family doctors and facilities are mostly in practices planned for the rural communities (Vrcić Keglević, Balint, Cvetković, & Gaćina, 2014) • Almost half of the doctors are without specialist education in family medicine (Vrcić Keglević et al., 2014) • A lack of continuous growth of family medicine teaching in medical schools, mismatch with local need, greater need for practice sessions in the curriculum (Huang & Guo, 2011) • limited understanding of the contribution of Family Medicine and the patient-centred approach and the principles of family medicine; (De Villiers & De Villiers, 1999) • no assigned FM supervisor, no protected time and lack of structured, ongoing, and formative assessment to allow trainees to monitor their own progress (T. Y. Wong et al., 2012)	• Most family physicians are practicing without any formal training in Family Medicine with unstructured training in different clinical specialise (Shah et al., 2012) • The ambiguous roles of the family physician in the health care system, adaptation of the curriculum to address local needs, expansion of the training programs to procedure larger numbers of family physicians (Philpott et al., 2014) • Main challenges including student selection, medical student's perception about Family Medicine, education setting and approach setting and approach, curriculum of medical education (Delavari, Arab, Rashidian, Nedjat, & Souteh, 2016) • Severe economic environment, lack of human resource and infrastructure (Sururu & Mash, 2017)

Overall, this chapter focuses on illustrating a provisional typology of education and training pathways for GPs as a core finding of the scoping review. The three distinct types were classified based on the role of GPs in healthcare systems: *Gatekeeper, Doctor of Choice, Team member*. The different characteristics between typologies are compared and demonstrated in detail with the eight themes from the thematic analysis and examples.

CHAPTER 5: QUALITATIVE STUDY RESULTS

5.1 Introduction to the chapter

This chapter demonstrates the results of the qualitative study addressing the research question in phase 2:

> '*What are stakeholders' perceptions of education and training pathways in their country?'*

Initial analysis of the interview transcripts of stakeholders about their education and training pathways for GPs generated 301 individual codes (see Appendix 8). Three major themes and ten sub-themes related to the identified typologies emerged: (i) characteristics of training pathways; (ii) influencing factors; and (iii) stages of the training pathway. A summary of themes and subthemes from the analysis with example quotations is illustrated in Table 13 (see below). In this table, participants' names were constructed with 8 or 9 characters starting by an uppercase letter from the original names of the participants, followed by 4 digits selected randomly, and the remaining two or three uppercase letters demonstrate the nationality of participants. There were three nations included in this phase of the research; therefore, the codes are VN (Vietnam), UK and USA, respectively. The remaining part of this chapter will describe in detail the themes and subthemes.

Table 13: Example quotes for sub-themes

Themes	Sub-themes	Example Quotes
1. Characteristics of training pathways	1.1 Diversity Classifying	*"There are several ways to become a family doctor in Vietnam. The most beneficial thing is that after pursuing a general doctor's degree (six years) you then do a three-month family medicine training course. Then you are already eligible to become a family doctor."* **A249-VN**
	1.2. Changes over time	*"I look back at my training now and realise that actually and it is different now but I think it was really, really good when I did it and I have less experience of what it's like now because obviously, it's a long time since I trained."* **M2012-UK**
2.Influencing factors	2.1 Programme design (curriculum, pedagogy, assessment)	*"We supervise them, we give them tutorials. I do exam preparation with them. We immerse them with everything that is going on in the practice, so any meetings that are taking part in the practice, do career mentoring depending on what they want to do."* **I000-UK**
	2.2 Culturally and historically established structures (e.g., duration, and training settings)	*"The US doctor training is pretty well standardised. The US training curriculum does pretty well against the balance of in-patient and outpatients, good sense of all of the things that a family doctor can do."* **N0601-USA**
	2.3 Changing role of GPs	*"I think there are issues related to the changing workload models with their practices, that different people are now doing, different roles within the practice, so, sometimes the training models haven't evolved to reflect that. I just think trying to keep up to date with all the changes that are going on in practices. Say, for example, there are lots of tasks now that the pharmacist does in the practice that I would have done five years ago."* **I000-UK** *"I think there are other doctors in primary care, So, internal medicines and paediatrics, they also do some of the work that family doctors do, and then of course we now have nurse practitioners and physician's assistants who are also doing some primary care work. So that space is getting more crowded."* **C1511-USA**
	2.4 Changing expectations of patients and society	*"The second thing is about changing patients' expectations. Patients now are encouraged to see themselves as customers and consumers rather than compliant, and passive patients. I think that is a challenge for GPs as they come through the system now because patients' expectations are higher. And I think in particular, patients' expectations about access to care are much higher than they used to be."* **A0601-UK**
	2.5 Changing health needs	*"The local people do not trust the quality of healthcare services and treatments of the local hospitals and community healthcare centres. Additionally, owing to people's increasing demand and more diverse complex needs, people want to go to national hospitals."* **U2410-VN**
3.Stages of the training pathway	3.1 Entering training pathway as medical students commitments of medical	*"We could not fully understand what future jobs for us are. We cannot fully comprehend what we have to do or the meaning behind that. We are confused."* **A249-VN**
	3.2 Continue training pathway as trainees training programme	*"It's a short period where you have to grapple with a lot of knowledge, a lot of experience, a lot of skills. So, it's, it could be daunting in terms of how you're expected to know everything about general practice within a very short period."* **J0701-UK**
	3.3 Exiting the training pathway as GPs	*"I was unprepared about the difficult conversations we have in medicines. Particularly, in my ICU rotations, sometimes, I felt a little bit less prepared. But I also think that it is difficult to prepare for those types of situations— how to have difficult conversations in an appropriate way to patients and families."* ***(A0701-USA)***

5.2 Theme 1: Characteristics of training pathways

5.2.1 Sub-theme 1: Diversity

In describing their training pathways, interviewees across the three typologies talked about multiple training pathways to become a GP. Therefore, 'diversity' emerged as a distinctive characteristic of education and training for GPs. The term 'diversity' originated directly from the word 'different' or 'a lot' or 'many' in the raw data.

Table 14: Example quotes related to 'diversity'.

Country	Explanation and illustrative quotations
Vietnam	*"There are several ways to become a family doctor in Vietnam. The most beneficial thing is that after pursuing a general doctor's degree (six years) and then doing three months of family medicine training course, then you are already eligible to become a family doctor." (A249-VN)*
UK	*"I'm aware of other training routes for GPs in different countries. In places like Cuba, they have a very different model." (R3012-UK)*
USA	*"My understanding is that the authority of the GP is less here in the US. And then it actually varies also from city to city, from state to state like for example, New York City you don't have family physicians there. So that it's a point, there are large universities. However,* at *Johns Hopkins University, they don't have family medicine physicians that tell you how problematic the situation is. You have prestigious places and they train primarily internal medicine or paediatrics, but they don't have …. family medicine physicians." (M1211-USA)*

It is significant to note that the last participant (M1211-USA), a medical educator, from the USA refers to 'prestigious places' when considering hospital specialisms. The participant gave a particular example that Johns Hopkins University is a prestigious medial training provider in the USA and does not provide family medicine training. Besides reflecting the diversity of family medicine training within the United States, the comment also reflects that the role of family medicine there may be perceived as less important compared to other specialties. Additionally, several participants cited different terminology related to general practice across the world. Several participants identified that even when countries are using similar terms (e.g., GP), there are still significant differences regarding GPs' responsibilities and training pathways:

> *"I know there's variance in how countries use the term general practitioner… I think South Africa makes a distinction between general practitioners and family physicians, but I wouldn't consider that to be as general practitioners in a way that you understand that in the UK context." (I000-UK)*

> *"Outpatients end up being at the hospital, and when people are more acutely unwell, first of all, they go to a western medicine doctor. Because they would [sic] be treated by their doctors within their community, who are not medically qualified. But doctors who will provide the first level; they're not doctors actually…we need to be careful what we define as general practice." (R3012-UK)*

This participant (R3012) continued to explain how some people assume that general practice might equally be applied to a family doctor in Africa or in central London, even though they are vastly different. Several participants stated that the main reason for using the same term 'general practitioner' is that it is an agreed term used and widely known amongst professionals and communities across the world. It can sometimes be problematic for patients and professionals to understand a GP's specific role and responsibilities if GP training provides try to rename the term 'GP'. Therefore, although GPs come from different countries with various training pathways and practice settings, they are generally all referred to by the same term.

> *"Just because people are using the same term, they're not necessarily meaning the same thing by it. So perhaps, a benefit would be if there was an agreed terminology but it's quite difficult to get that. Even my friends in Scotland want to re-brand GPs as an expert medical generalist but most people won't know what that term means…patients.… and other parts of the health care system might not know what that term means…. Therefore, other countries, definitely won't know what that term means." (I000-UK)*

> *"Medicine is so different in different places. One of the challenges is figuring out what is needed in each society or culture…family medicine and general practice are so different in that they all are overlapping. But the whole philosophy of family medicine is to take care of people in the context of their family and community. It isn't just the actual medicine. It's the thing of learning about the family, learning about society." (N0601- USA)*

The majority of participants expressed the view that there is a significant difference in GPs' roles and models of healthcare systems between countries. From several participants, there was a sense that a diversity of provision in education and training for GPs has been created in part, by GPs' diverse responsibilities in distinct healthcare systems. Additionally, several participants expressed how professional practice contexts are different amongst countries through a comparison with the UK context.

"In the UK, most of the illnesses are being treated firstly by GPs. In Vietnam, all outpatients get treatments from hospitals due mainly to our affordable hospital fee, which can be covered by healthcare insurance. Currently, family doctors are jobless." (U2410-VN)

"There are many different contexts in which you can be a GP. And there is more than one way to deliver the general practice service. And there are many different ways to be an effective GP. It would be nice and helpful for them to see at least one other setting." (J2911-UK)

It is noticeable that R3012-UK expressed a wider experience of the diversity of GPs' roles and models of healthcare systems between countries. In particular, R3012 stated that the role of GPs in the UK serves a vital role as gatekeepers in managing resources for the UK healthcare system. Meanwhile, he also compared it with the healthcare systems of four other places with specific examples: Germany, Cuba, South Africa and the rural areas of Africa to reflect the distinctions of the GPs' roles and models of these systems.

"GP in the UK is a good thing for keeping the cost down and limiting the access to specialist care as the gatekeepers." (R3012- UK)

"If you want to see a cardiologist in Germany, you can see a community-based cardiologist. For example, if you got angina, you would be referred to an angiogram 24/48 hours, and then you see an operating cardiologist and decide if you need to have a stent inserted or all sorts of stuff. It would be done much quicker than in the UK, and the outcome is going to be much better…" (R3012- UK)

"In places like Cuba, they have a community-based model. They don't have the hierarchical teaching hospitals that we have in the UK where we work our way up through training practices…. But in South Africa, GP does not exist." (R3012- UK)

"The rural areas of Africa have level 1 hospitals and low resources, and all merge into one. You don't go and see a GP in the traditional sense because outpatients would be treated by their doctors in the community." (R3012- UK)

R3012- UK expressed that there are community-based specialists in the healthcare system of Germany. This allows for quicker access to medical services and better healthcare outcomes in comparison with the UK. He also described a community-based healthcare system in Cuba which does not have 'hierarchical teaching hospitals' like in the UK. Similarly, outpatients in the rural areas of Africa are treated in the community instead of firstly seeing a general practitioner like in the UK. All these distinctions of primary care provision reflected the diversity in education and training for GPs across the world.

5.2.2 Sub-theme 2: Changes over time

'Changes over time' was another characteristic of education and training for GPs. Interviewees talked about the changes that have been made in current training pathways in comparison to their training.

Table 15: Example quotes related to 'changes over time'

Country	Explanation and illustrative quotations
Vietnam	*"Medical Schools have changed their curriculum and still are continuing to do so. The new training programs have been implemented since 2014." (O1910-VN)*
UK	*"I think it changed a lot over the years…. Nowadays, things have changed, and doctors are much more focused on the patient and have a much more developed understanding of a holistic view of the patients." (A0601-UK)*
USA	*"Well, here in the US doctor training is pretty well standardised. The one set of guidelines and rules that we have developed." (N0601-USA)*

An example quote of how the training pathway for GPs has been changed over ten years in the UK by M2012-UK described that the GP training pathway was the easiest way to enter the medicine sector if medical students could not study any other specialist training. The main reason was that there were no exams and fewer requirements. However, since GPs have been increasingly recognised as having one of the most important roles in healthcare system; so, the training pathway became more structured with additional requirements like exams.

> *"Probably, only ten years or so before I qualified, general practice was definitely seen as the route you would go into medicine if you couldn't' do any other training. So, if you couldn't be a specialist surgeon or you couldn't be a specialist physician, then people chose to go into general practice because there were no exams, less structure and you could practice immediately. And then it was realised that actually it was a very important role and there needed to be some structure. So, the Royal College in the United Kingdom started to define a model." (M2012-UK)*

From practical experience, all participants from three countries reflected on how training content has been changed; based on their previous training. *'Changes over time'* was distinct amongst the three countries. Particularly, participants from Vietnam mentioned a mismatch between their training content and their practice requirements.

"There is a big difference between the training program and the demands of patients. This is because when we work at clinic practices in communities, we do not encounter serious illnesses taught in the residency program at specialised hospitals. For example, at community health centres, the diseases of internal medicine are mainly musculoskeletal, digestive, and high blood pressure. But we rarely let patients with hypertension stay in the hospital, and the part of gastritis is uncommon, and inpatients usually have gastric ulcers, bleeding stomach, or other complications. Outpatients only see inflammation. I was not exposed to those in my course. I only encountered mild illness in the workplace, so then I have to read and do my research." (D111-VN)

Meanwhile, participants from USA described the high degree of relevance between the curriculum and the reality of what they had to practise after graduation. This was reflected through the GPs' practice confidence level after graduation.

"*I was trained in the city, but we did rural rotations in small towns. We did a lot of emergency medicine and I also delivered a lot of babies, in medical school and residency. So, I felt very confident in delivering babies and practice. So, I feel like I had everything really broad training and I feel like I used all of it in practice." (N0601- USA)*

Furthermore, the patient-centred approach in curriculum development was mentioned as a typical change of training content in the UK in which the training curriculum was very academic and less practical in comparison with the current training. This change was expressed as a positive change.

"When I first started in the NHS, it was very academic, and possibly it still is. I think it was a lot of science and based around a lot of ethological, anatomical, and biochemical techniques. Nowadays, things have changed, and doctors are much more focused on the patient and have a much more developed understanding of a holistic view of the patients." (A0601- UK)

Conversely, some controversy around changes to training has been revealed. A medical educator (M2012-UK) stated his view that there had been an unreasonable change in training duration in UK at the Royal College. He indicated that this was implemented despite insufficient evidence of benefits in changing training duration. Regarding the old system, he noted that a longer training duration brought more benefits for trainees in gaining more clinical experience and knowledge. Throughout a longer exposure to specialties, he believed that he learnt more from his training programme. Noticeably, M2012 stated that reducing the training duration can lead to a deterioration in the quality of training content. In this scenario, trainers need to consider and select cautiously a limited number of necessary specialities for general practice:

"*Each of those foundations jobs is only four months instead of the old system where the jobs were six months. …so, in four months you might not really get quite the level of experience in a job… If you leave the job after four months you missed that really crucial period of time when*

you become a real expert…. Clearly, we'll have to pick fewer specialties to train in. But longer exposure might mean that by the time you got into general practice, you have more knowledge and more experience of those specific specialties that are useful in general practice such as gynaecology, mental health, health care of the elderly and accident and emergency." (M2012-UK)

5.3 Theme 2: Influencing factors

5.3.1 Sub-theme 1: Programme design (curriculum, pedagogy, assessment)

Interviewees described their training pathways in which programme design was mentioned as a foundational constituent, creating 'diversity' of education and training for GPs among countries. The majority of participants expressed their opinions about 'programme design' including curriculum, pedagogy and assessment. Thus, this area merits consideration as a key influencing factor.

Firstly, curriculum was described as a holistic training content by participants from UK and USA. However, the majority of participants from Vietnam emphasised the imbalance between inpatient and outpatient training in their curriculum. Indeed, comments on the irrationality of providing irrelevant training content in curriculum were prominent among most Vietnamese participants, who confirmed that their roles focused solely on outpatients. Meanwhile, most of participants from USA appeared to have confidence in their standardised training system for family physicians. Regarding the UK, although participants expressed positive comments about their training content, there were still arguments about whether or not the curriculum offers enough experience for GPs to be able to practise independently.

Table 16: Example quotes related to 'curriculum'

Country	Explanation and illustrative quotations
Vietnam	*"I found that the teaching was not appropriate due to its content of general and inpatient treatments. Outpatient on first aid and internal medicine need more focus in the curriculum." (D111-VN)*
UK	*"Challenges would be giving any form of unified curriculum because you never know what you're going to get. One rural area might have three years of awful malaria, and another area might not. And then you have a very different clinical experience, for instance. It's not unified. That would probably be the main thing because it's not centrally. The overseeing of it isn't curriculum-based, and you need to see this, and you need to see that and see the other. It's more experiential so you could get gaps in training." (I031-UK)* *"It's possible for a doctor to graduate, do FY1 and 2, do three years of GP training, so within five years of graduating from medical school and practising independently as a GP. And for me, that curriculum doesn't allow that doctor to get enough experience of working in clinical medicine." (H2711-UK)*
USA	*"The US doctor training is pretty well standardised. The US training curriculum does pretty well against the balance of in-patient and outpatients; [you get a] good sense of all of the things that a family doctor can do." (N0601-USA)*

There was a significant distinction in pedagogical approach among three training pathways in UK, USA and Vietnam. The majority of participants from UK and USA reflected on how the teaching methods were based on individual learning needs such as tutorials, personal supervision or mentoring. Furthermore, participants from USA described the well-supported training supervision system for trainees including both indirect and direct observation with modern techniques. Meanwhile, the majority of participants from Vietnam described traditional teaching methods as the main pedagogical approach in their training programmes with knowledge transmission through recitation and memorisation techniques rather than interaction, or student-centred teaching. They emphasised the universality of self-study among trainees with both theoretical and clinical content. In particular, participants raised that lectures were often organised for trainees from different disciplines, not just family medicine orientated. Therefore, the individual learning needs were insufficiently addressed as pedagogical methods in the UK and USA. To achieve personal learning needs, most of the trainees in Vietnam mentioned that they had to practise and apply self-study with real patients in real situations without any guidelines about developing the self-study competences referenced in their training curriculum.

Table 17: Example quotes related to 'pedagogy'

Country	Explanation and illustrative quotations
Vietnam	*"We are taught using a traditional pedagogy such as lectures. We have previous learning goals but no handouts or learning materials. The material is usually given after the lecture." (G299-VN)* *"The theories are taught in briefings. For clinical teaching, these are combined with different students from other disciplines and never taught separately." (H120-VN)* *"Everything is self-study from theory to clinical … For the clinical lectures, we have to prepare a medical record of a specific disease on a real patient, our diagnosis, and handling plans. Then the teachers will provide feedback on whether the diagnosis and handling are correct or not, how much correctness, those are, what to change, and what should be carefully considered." (A249-VN)*
UK	*"We very much tailor to the individual learning needs that we have from the deanery. We have things to cover [such as] induction and learning needs assessment working with the trainees to plan what things do they have to do to meet the criteria of their workplace assessment."* *"We supervise them, we give them tutorials. I do exam preparation with them. We immerse them with everything that is going on in the practice, so any meetings that are taking place in the practice, doing career mentoring depending on what they want to do." (I000-UK)*
USA	*"We use video systems, we observe in residence seeing the patients, with some direct supervision, when we go directly into the room with the resident. A lot of indirect supervision in the clinic where residence have to staff every patient that they see with a supervisor." (C3012-USA)*

The typical pedagogical approach in UK and USA is largely based on the individual learning needs of trainees. Thus, most of the participants' described assessment methods were conducted by individual supervisors, mentioning a competency-based evaluation approach. While the majority of participants from USA stated that the competency- based and milestone-based approach are more objective, and easy for employers to understand trainees' competences, participants from UK expressed critical views on this evaluative approach. Specifically, they considered that graduation time varies depending on individual progress with the competency-based assessment approach rather than a standard duration for all trainees. Additionally, they indicated that evaluation conducted by personal supervisors fell short of meeting trainee needs throughout the three years of GP training. Similarly, the majority of participants from Vietnam judged that the evaluation approach in their training pathway—namely clinical tests, multiple choice questions, writing exams or clinical oral examination—did not reflect their entire learning process.

Table 18: Example quotes related to 'assessment'

Country	Explanation and illustrative quotations
Vietnam	*"The evaluation to grade a subject cannot evaluate an entire learning process. Because when we do clinical tests, we will pick a disease, create a disease profile and diagnose. The clinical lecturers will ask a specific patient, and we will have to diagnose him or her. But to be frank, you cannot evaluate all you have learned. There is still lots of potential for errors in the evaluating system." (A249-VN)*
UK	*"Throughout the three years of GP training, you have an educational supervisor and workplace-based assessment that is focused on the end goal of being a GP, where are you might if you did do the stand-alone postgraduate like as I described before, it's very easy to do without adequate reflection on those cases in relation to your learning to becoming a GP at the end." (H2711-UK)* *"I think to complete the competencies-based assessment, you could do it quicker or slower. You don't have to have everybody doing the mandatory five-year postgraduate study onwards from your primary medical qualifications." (R3012-UK)*
USA	*"The assessments are competency-based and milestone-based methods. So, we become a lot more objective, and so an employer knows when someone graduates from residency." (C3012-USA)* *"So, in most programs, residents have an adviser, so it's a faculty member assigned to them. That kind of compiles all their evaluations from each of their rotations. So, each month, or each block whoever supervises the resident on that rotation is supposed to fill out an evaluation form and then twice a year the faculty—it's called the clinical competency committee, which is a subgroup committee—puts all the evaluation together and reads where the resident is on their milestones. There are five levels on their milestones, and they are supposed to work all their way through those five levels before graduating. Also, they are all supposed to be on level four on those when they graduate. So, we give them feedback every six months about where they are, how far they are moving along, and getting close to being ready to be declared to be competent at the end." (N0601-USA)*

5.3.2 Sub-theme 2: Culturally and historically established structures (e.g., duration, and training settings)

In general, there was the noticeable distinction in structures of training pathways such as duration and training settings, from three countries by comparing interviewees' descriptions. For the undergraduate stage, medical students in Vietnam are required to study for six years, similar to 5 or 6 years in the UK. However, for American medical students, training consists of four years for an undergraduate degree followed by a further four years at medical schools. While Vietnamese and British students are able to enter the training pathway when they finished their high school education, American students need to obtain an undergraduate degree before attending medical schools. Additionally, participants revealed that the UK undergraduate programme is more flexible for students in final years where students can choose to study a master's degree or other qualifications. More interestingly, at the postgraduate stage, there is a significant difference in structures and training distribution in different training settings among the three countries. Interviewees from Vietnam talked about the flexibility in becoming a family physician whereby medical students can study one of three options namely attending residency, specialised or Master's programmes. Participants from UK confirmed that newly qualified doctors are required to study the two-year foundation programme in hospitals before entering the three-year residency programme to become a GP. Meanwhile, students in USA can enter directly to the residency programme after graduation from medical schools. The primary resemblance among three countries is the three-year duration for residency programmes; nonetheless, there is a noticeable variation in the detail of its structures. The majority of participants in USA described that their residency programmes spend more time in community training settings namely small-town rural areas. A balance of hospital and community training settings in residency programmes was reflected from interviewees from UK.

On the contrary, interviewees from Vietnam reflected that the main distribution of their training is in hospital settings, with a few months in the community.

Therefore, there is a typical distinction in structures including duration and training settings of training pathways. This distinction might be explained by the influence of the cultural and historical contexts among the three countries.

Table 19: Example quotes related to 'culturally and historically established structures'

Country	Explanation and illustrative quotations
Vietnam	*"In Vietnam, after a six-year undergraduate program, there will be three options: joining a three-year family medicine residency, two-year specialised I, or two-year master programs. After graduation, you need to obtain a practising license before working as a family physician." (O910-VN)* *"Our residency program lasts for three years. For the first six months, we will study only theories such as politics, information technology, research methods, psychology, the principles of family medicine; then the internal medicine and surgery, paediatric, and obstetric training will take approximately one year. Then we will have to obtain a variety of specialties certifications. Each certificate takes about three weeks. After that, there will be a few months for us to practise in the community." (G229-VN)*
UK	*"In the UK, the training pathway for doctors is that they go to medical school (typically 5- or 6-years) and they have to do two years of foundation programs in a hospital, then they either have a gap time or go overseas or whatever they do. Then they join a three-year specialty program. Of which, 18 months are spent in a hospital and 18 months in the community in general practice and then they have to pass exams before they take up independent practice in the UK." (R3012-UK)*
USA	*"In the USA, physicians usually do four years of undergraduate and four years of medical school, and the family medicine residency is for most of the three-year training program. And the first year tends to be fairly hospital based, with lots of in-patient's obstetrics and things. In the second and third year, they're out more in the community." (N0601-USA)*

5.3.3 Sub-theme 3: Changing role of GPs

‘Changing role of GPs’ is one of the primary factors contributing to the ‘diversity’ of training pathways for GPs across the three countries. Interestingly, most participants from Vietnam stated that the role of family doctors is similar to specialist doctors in their healthcare system. This is because it is not compulsory to see family doctors and they can directly see specialists at hospitals including both national and local hospitals. Therefore, the role of family doctors in Vietnam has not been consolidated into one discipline and overlaps with specialists’ roles. Noteworthily, participants from USA revealed that there are a team of primary health care providers not only family physicians in their systems. Although the role of family physicians in USA are more transparent than in Vietnam, there is still an overlap between functions of family physicians and specialists in USA. The primary reason is that there are community-based specialists in USA. Additionally, the team of primary health care providers is becoming a larger group with new providers such as general practice nurses or physician assistants. Meanwhile, participants in UK pointed to the role of a GP as a gatekeeper for the healthcare system (see also 5.2.1); patients cannot see specialists without GPs’ referrals. Nevertheless, this role is changing and facing an overload with healthcare demands due to changes in modern medicine, healthcare needs and expectations of patients and society. Therefore, GPs require extensive knowledge in a wide variety of areas of medicine.

When participants revealed a noticeable difference of GPs’ roles among these countries, this also reflected the variation of healthcare systems. Meanwhile, GPs’ roles can influence on the ‘diversity’ of training pathways. Therefore, strong interactions among training pathways, GPs’ roles, and healthcare systems were reflected on in interviews.

Table 20: Example quotes related to 'changing role of GPs'

Country	Explanation and illustrative quotations
Vietnam	*"In Vietnam, specialists' roles are similar to family doctors in the healthcare system already. It is not compulsory to see family doctors first. Meanwhile, societal awareness about their roles is limited. Thus, Vietnam is currently trying to build up the role of family doctors gradually." (H120-VN)*
UK	*"I think, historically, general practice has always been the ugly system. You went into general practice if you couldn't hack it or if you couldn't make it as a consultant. Historically, in this country, people always looked slightly down their nose at GPs. They think they're not as clever as consultants and they don't have the skills." (A0601-UK)* *"I just keep thinking of the generalist who knows everything about everything that is simply not sustainable anymore. Medical knowledge has just got too big and broad for you to be competent, and you know, to be able to do a proper job of people walking in to see you about various things." (A1911-UK)*
USA	*"But generally, a general practitioner often means an outpatient provider. Who either a comes from family medicine or from internal medicine." (M1211-USA)* *"I think there are other doctors in primary care, so, internal medicines and paediatrics, they also do some of the work that family doctors do. And then of course we now have nurse practitioners and physician's assistants who are also doing some primary care work. So that space is getting more crowded." (C1511-USA)* *"There is less of a gatekeeper role in the US. Mm, it depends on insurance but in general, people feel less obligated to go to their GP." (C3012-USA)*

5.3.4 Sub-theme 4: Changing expectations of patients and society

Most of the interviewees from the three countries described 'changing expectations of patients and society' as a common trend in healthcare sectors. Interestingly, a resemblance of perceptions in all three participant groups is that they revealed a degree of commercialisation in the provision of medical care services. This means that patients are becoming active customers with higher requirements rather than passive patients only following medical staff instructions and advice. For example, participants in Vietnam and USA stated that selecting specialists now can be patients' decision rather than GPs' referrals: patients can even require that any parts of their body be examined without GPs' allocations. This works according to the trend of exchanging goods between supply and demand. Similarly, participants in UK revealed that patients now have a higher demand in accessing health care systems. This trend can lead to higher requirements for the outcomes of training pathways to meet social healthcare needs.

Table 21: Example quotes related to 'changing expectations of patients and society'

Country	Explanation and illustrative quotations
Vietnam	*"That's the other challenge about patient expectations again. They're not prepared to wait, and they want access now' (U2410-VN)* *'The receptionist will ask you what medical examination you want to take. The choice for a specific illness to be examined is my own choice, not from family doctors. I will decide and then must get assigned to a specialist." (N511-VN)*
UK	*"The second thing is about changing patients' expectations. Patients are encouraged to see themselves more as customers rather than compliant, passive patients. Patients' expectations are higher especially about access to care is much higher than it used to be." (A0601-UK)*
USA	*"It's so market-orientated, and we treat health care like any other commodity services where consumers should have some level of knowledge about their service. And that's very unrealistic in the health care market because we don't understand health that well as consumers. So, in that sense, you know it's mm that is a real problem that needs to be overcome." (D1212-USA)*

5.3.5 Sub-theme 5: Changing health needs

Interviewees in all three groups reflected on how 'changing health needs' can also influence the training pathways for GPs. Each country is facing different problems in changing healthcare needs. Participants in Vietnam identified the increasing demand in the treatment for more complex health issues in parallel with the loss of patients' faith in quality of local and community healthcare services. Thus, Vietnam is facing an overload of patients in national hospitals, where the function of these hospitals should be to provide acute and complex health services. Participants in UK also mentioned the increasing demand of complex health care needs due to the phenomenon of an ageing population. Meanwhile, participants in USA revealed the high pressure of patients in a diverse market of medical services with a plethora of options and information. This means that these American patients require more knowledge about medical services to select appropriate treatments accordingly, which is particularly challenging for them. All changes in health care needs in any countries can impact directly to increase the requirements for outcomes on training pathways. However, to meet changes in

health needs, training transformation should be combined with reforms of relevant policies.

Table 22: Example quotes related to 'changing health needs'

Country	Explanation and illustrative quotations
Vietnam	*"The local people do not trust the quality of healthcare services and treatments of the local hospitals and community healthcare centres. Additionally, owing to people's increasing demand and more diverse complex needs, people want to go to national hospitals." (U2410-VN)*
UK	*"I guess the challenge nowadays for British health care (mm) … I know much more about an increase in the numbers of elderly people with multiple health problems. So, patients don't just turn up with one set of symptoms or one health issue but with half a dozen. The related challenge is how medical education can give GPs the skills to deal with patients with complex, interrelated needs rather than just responding to someone with a sore throat." (A0601-UK)*
USA	*"I think patients find it difficult in the sense that there is so much burden on consumers of care because of too many healthcare services on the market. A lot of burden is on the consumers to figure out what the best treatment is. They have to go almost bargain with providers sometimes to get the appropriate service. The consumers should have a level of knowledge about services. And that's very unrealistic in the health care market because the general public don't understand health that well as medical professionals." (D1212-USA)*

5.4 Theme 3: Stages of the training pathway

5.4.1 Sub-theme 1: Entering training pathway as medical students

The majority of interviewees in the three participant groups revealed the uncertainty about their career pathways. The main reason related to a lack of a specific career goal or comprehensive knowledge of how their work would impact their career if they selected to study family medicine. This is reasonable to understand because it would be exceedingly difficult to select their specialities without practical experience. In fact, medical students can change their career selection at any time before entering residency programmes.

Table 23: Example quotes related to 'undergraduate stage'

Country	Explanation and illustrative quotations
Vietnam	*"At the undergraduate stage, I didn't know anything about family medicine. After studying family medicine in the final year of the six-year undergraduate programme, I found it more interesting than other professions." (G229-VN)* *"During their university years, residents did not have a specific goal for their future workplaces." (H120-VN)* *"We could not fully understand what future jobs for us are. We cannot fully comprehend what we have to do or the meaning behind that. We are confused." (A249-VN)*
UK	*"At the beginning as a medical student, I was not sure what my career plan would be." (I031-UK)*
USA	*"Well, I thought it will be a long pathway, with a lot of pressures and difficulties in pursuing family medicines." (L1401-USA)*

5.4.2 Sub-theme 2: Continue training pathway as trainees

At the continue stage, the majority of interviewees from Vietnam and UK expressed difficulties in obtaining a large amount of clinical knowledge and skills. Specifically, Vietnamese participants revealed that they struggled with the heavy schedule of training programmes which was reported as a huge hindrance to their learning progress. Additionally, participants from UK described their difficulties at the beginning stage of learning clinical practice at hospitals. In contrast, participants from USA reflected their pleasure about training content and schedules in which they expressed their preference with more community training settings.

Table 24: Example quotes related to 'postgraduate stage'

Country	Explanation and illustrative quotations
Vietnam	*"We have to go to so many clinical lessons, but it doesn't mean our skills are actually improved. But we have to do such things, or otherwise, we cannot pursue our study. We are exhausted after going to clinical lessons that we don't have time for reading. It is a hindrance to us." (A249-VN)*
UK	*"It's a short period where you have to grapple with a lot of knowledge, a lot of experience, a lot of skills. So, it could be daunting in terms of being expected to know everything about general practice within a very short period." (J0701-UK)* *"I think it's always difficult to do your hospital jobs at the beginning. But I think that they do give you a good experience that you need going forward. So, it is difficult to say that's not valuable. But it is very hard. The beginning bit, the first year and a half at the hospital. The hardest bit when you've chosen to do general practice as a career (mm) whether that could, you know, be spread through your training so that you are always based on general practice." (I031-UK)*
USA	*"I think the balance that we have between the hospital and the community is good. I'd like to strip that down, though, to be more community based." (N0601-USA)*

5.4.3 Sub-theme 3: Exiting the training pathway as Gps

At the exiting stage of the training pathway, the 'payroll' issue was the problem mentioned in the three participant groups. Interviewees from Vietnam and USA expressed their dissatisfaction with payment mechanisms. They insisted that there remains a significant pay gap between GPs and specialists, whereby GPs' workload is as heavy and pressurised as specialist work. Similarly, interviewees in UK expressed their argument with pension schemes that can impact their salary. In addition, interviewees revealed several different issues at the exiting stage. In Vietnam, participants mentioned unreasonable training content in their training programmes, especially when the future working environment was not included. This can increase the uncertainty for trainees after graduation. They also reflected the noticeable issue of fewer job opportunities because family medicine is still a new discipline characterised by a low social awareness. By contrast, the majority of participants from UK and USA expressed satisfaction with their training in general. Nonetheless, participants in UK also revealed some areas that they were unprepared for, namely managing heavy workloads, dealing with uncertainty in practice, or how to keep their engagement, focus and interest with a long career. Meanwhile, participants in USA revealed that they were unprepared in dealing with difficult conversations with patients. To summarise,

there are multiple issues at the exiting stage of training pathways in which job availability and salary were mentioned by the most participants across the three countries. In particular, participants from Vietnam reflected the highest level of uncertainty about their career in comparison with UK and USA.

Table 25: Example quotes related to 'exiting the training pathway'

Country	Explanation and illustrative quotations
Vietnam	*"No one taught me about the working environment after graduation…" (G229-VN)* *"Personally, I feel that it is not suitable. There are some unreasonable points. There are subjects which we believe are necessary, but those weren't taught." (A249-VN)* *''[Issues include] Difficulty with the lack of job availability and the low wage for family doctors. There are places where people do not understand what family medicine is." (O1910-VN)*
UK	*"I feel very well prepared. I have had access to very good training… For me, I just personally asked lots of questions about career planning. So, career planning has been something that is not on the curriculum. So, it's for you to work out. I think that's OK." (I031-UK)* *"I was not so well prepared for the task of continually remaining engaged, focused, and energised in general practice. So, I think a little bit about GPs have quite a long career, and during that time, they need to find ways to keep fresh, keep interested and keep enthusiastic." (J2911-UK)* *"In terms of feeling unprepared, independently practising can be quite difficult to manage. There are a huge number of prescriptions queries in your lunch break between two full clinics and how to deal with the uncertainty that you can't possibly know everything as a GP registrar." (H2711-UK)* *"I think you may have heard about pension schemes, and so on. Basically, it's come to a point where if you earn beyond a certain level, you get taxed a lot more, and there have been incidences of where for example, if you do four more hours, you end up paying back money for like doing an extra 6 hours. So, it doesn't make sense. It's particularly affected the hospital doctors, and it has affected GPs as well. So, I think they have got to look at the financial side. There is no point in saying if you earn over a certain amount, we tax you double. We're not stupid. We need to say: well, I don't want to do the extra work." (A1911-UK)*
USA	*"I am very satisfied with my medical school training that I have received. But I was unprepared about the difficult conversation in medicines we have. Particularly, in my ICU rotations, sometimes, I felt a little bit less prepared. But I also think that it is difficult to prepare for those types of situations. how to have difficult conversations in an appropriate way to patients, families." (A0701-USA)* *"I think that shifting the training to the place of authentic performance. So, people are going to be mostly working in clinics in their outpatients' settings, most of their training should be in that setting. I think that would be more helpful." (C3012-USA)* *"We don't get paid as some specialist doctors. Meanwhile, this work takes a lot of time, energy and attention." (C1512-USA)*

Overall, this chapter has focused on illustrating the emergent themes and subthemes related to the identified typologies as a core finding of the international qualitative study. Three major themes and ten sub-themes emerged: (i) characteristics of training pathways; (ii) influencing factors; and (iii) stages of the training pathway. The distinctive characteristics between typologies have been reflected transparently throughout the key stakeholders' perspectives and experience in GP training amongst three countries.

CHAPTER 6: DISCUSSION

6.1 Introduction to the chapter

This research has addressed two research questions:

1. *What are the different types of education and training pathways for general practitioners (GPs) represented in the literature?*

2. *What are the stakeholders' perceptions of education and training pathways in their own country?*

This chapter summarises the key research findings from both the scoping review and international interviews about the education and training pathways for GPs in three countries, namely the USA, Vietnam, and the UK. Additionally, the findings are also linked to relevant published literature on education and training pathways for GPs.

This chapter discusses the implications of the study's findings for policy and offers recommendations for future research. The strengths and limitations of this doctoral study are outlined. Recommendations are provided as to the way the findings can be used to inform policy and practice on education and training for GPs.

6.2 Summary of main findings

The scoping review aimed to explore different types of education and training pathways for GPs. We screened, analysed and synthesised the 90 included articles and sorted them thematically according to their key focuses (Appendix 1). The scoping review identified three main typologies of education and training pathways for GPs based on GPs' roles in healthcare systems namely 'Gatekeeper', 'Doctor of choice', 'Team member'. Additionally, the characteristics of these typologies was identified based on a thematic analysis in which eight themes were established and used to compare within three typologies. These eight themes are roles, training contexts, duration, curriculum contents, curriculum principles, assessment, pedagogy and challenges.

In phase 2, the international qualitative study intended to explore stakeholders' perceptions of education and training pathways in their countries. 28 participants from three countries were interviewed, namely UK, USA and Vietnam. All participants were selected by the maximum variation model of purposive sampling with detailed selection criteria established. After a thematic analysis, three major themes emerged namely, '*characteristics of training pathways*', '*influencing factors*', and '*stages of the training pathway*'. The three primary themes were established as principal topics that participants expressed their perspectives on. Firstly, all participants expressed *'characteristics of training pathway'* in their countries in which *'diversity'* and *'changes over time'* were reflected as general characteristics amongst three countries. Secondly, *'influencing factors'* to training pathways for GPs were reflected from all participants in which there are five principal factors namely '*programme design*', *'culturally and historically established structures'*, *'changing role of GPs'*, *'changing expectations of patients and society'*, *'changing health needs'.* Thirdly, the final theme described *'stages of the training pathway'*. Three sub-themes were related to this theme, namely, 'entering training pathway as medical students', 'continue training pathway as trainees', and 'exiting the training pathway as GPs'. There was evidence that interviewees described their perceptions, feelings, experiences or challenges when they had been at three stages of their training, especially as interviewees reflected on how their feelings, choices, commitments about career plans when entering training pathways as medical students. Additionally, experiences gained from training pathways were described in which interviewees revealed how it was challenging to study and work under high pressure by their roles, working network and healthcare needs as trainees or newly qualified GPs.

6.3 How main findings linked to the prior studies

Diversity and Complexity in GP training

Firstly, the doctoral study identifies the diversity and complexity of provision in education and training for GPs across the world. The findings are consistent with several prior studies and reports describing and comparing family medicine training in distinct regions (Arya et al., 2017; Gibson et al., 2016; Gibson et al., 2017; Haq et al., 1996; Mash et al., 2015; Ponka, 2017; Ponka et al., 2015; Robert Graham Center, 2013; Roberts et al., 2011; Rouleau et al., 2015; C. H. Wong & Phoa, 2016). In particular, the survey in sixty-six countries from all continents about family practice development in 1996 by Haq and colleagues (Haq et al., 1996) reported the variation in training for family medicine. Until 2017, a report of family medicine over the world in a series of the Besrour Papers by Neil Arya et al.(Arya et al., 2017) reaffirmed that the extent and the nature of family medicine training differs substantially on a global scope. Moreover, a scoping review of the evidentiary foundation for family medicine by David Ponka et al. (Ponka et al., 2015) and a comparison study of roles and training of primary care physicians by Robert Mash et al. Stellenbosch University (Mash et al., 2015) also highlighted the differences in the role of GPs in health systems worldwide. Overall, these prior studies compared GP training based on geographic location to provide a geographic demographic overview. Nevertheless, comparison between variations in training GPs on a geographical level has represented a challenge for medical educators and policymakers due to confusion caused by insufficient resources of information, which prevents a comprehensive understanding. Hence, the doctoral study eliminated the geographic approach in classifying typologies of education and training for GPs worldwide. Instead, the distinct roles of GPs between countries and healthcare systems were categorised, examining various GP training pathways. The categorising approach helps medical educators and policymakers easily recognise varied types of GP education and training pathways with typical examples of healthcare systems and countries.

The connection between training pathways and practice settings

The second finding of the study indicates a strong connection between training pathways with practice settings and types of primary care provision in countries. In particular, the distinct roles of GPs in healthcare systems reflect the varied categories of primary care supply. Meanwhile, the different roles of GPs within the health care system were reflected by various education and training pathways for GPs. Thus, the study is based on the role of GPs as an appropriate approach in categorising GP training internationally.

The provisional typology also reflects distinct types of general practice contexts across countries. A similar finding was reported in the synthesis of international experience in family medicine training by Richard G Roberts and his colleagues (Roberts et al., 2011). Specifically, the prior study discovered that family doctors' training reflects the variety of their health care systems and localities. Thus, there is a constant interaction and a logical relation between training pathways and practice contexts.

Characteristics of GP training

Thirdly, the qualitative finding of this thesis implies the two significant characteristics and five influencing factors to the GP training pathways. In particular, training pathways were diverse and changed over time, which lead to barriers in the classification. The two characteristics reflect the variability of education and training for GPs in term of geography, space and timeline. In fact, variations in terminology around general practice exist across the world. Even when countries are using similar terms (e.g., GP), significant differences in responsibilities can be found. Thus, it is undoubtedly challenging to classify education and training pathways internationally, which was also reported in prior studies (Arya et al., 2017; Gibson et al., 2016; Gibson et al., 2017; Haq et al., 1996; Mash et al., 2015; Ponka, 2017; Ponka et al., 2015; Robert Graham Center,

2013; Roberts et al., 2011; Rouleau et al., 2015; C. H. Wong & Phoa, 2016). In addition, the qualitative result indicated influencing factors of GP training: programme design (curriculum, pedagogy, assessment), culturally and historically established structures (e.g., duration, and training settings), changing role of GPs, changing expectations of patients and society, and changing health needs. The finding is in line with that of prior studies (Arya et al., 2017; Gibson et al., 2016; Gibson et al., 2017; Haq et al., 1996; Mash et al., 2015; Ponka, 2017; Ponka et al., 2015; Robert Graham Center, 2013; Roberts et al., 2011; Rouleau et al., 2015; C. H. Wong & Phoa, 2016), which highlighted the irrationality of duplicating ideas and curriculum from more resource-rich contexts in other countries. The finding has been explained by prior studies in that the GP training curriculum needs to respond to local society's health needs and be appropriate with the regional practice settings and healthcare systems. Hence, a 'one size fits all' approach is not appropriate in designing and developing GP training programmes. Several elements from practice contexts should be considered in developing training for GPs, namely, local healthcare needs, working requirements, and socio-cultural contexts.

Challenges of international employment for GPs

Fourthly, the findings highlighted that barriers exist to the mobility of GPs between countries because of considerable distinctions in training. In particular, the characteristic *'diversity'* was reaffirmed by significant differences amongst three typologies about duration, training contexts, curriculum contents, curriculum principles, assessment, and pedagogy. The barriers to GPs' overseas employment have also been indicated in prior studies (Fletcher et al., 2019).

Nevertheless, the GP shortage and recruitment crisis in many countries has led to foreign recruitment of GPs. For instance, since 2017 there has been an altered goal from NHS England to recruit an extra 5000 GPs, with 2000 of these to come from foreign countries. To work in the UK, foreign doctors are required to enter the medical register by gaining a certificate of eligibility for specialist registration

(CESR) or a certificate of eligibility for general practice registration (CEGPR). The CEGPR application process requests applicants to clarify that their knowledge, skills, and experience correspond to those of doctors who have graduated from an approved training programme and who have acquired a Certificate of Completion of Training (CCT) in the UK (Jaques, 2012). Guidelines propose that applications comprise approximately 500–800 pages of evidence ("General Medical Council Specialty specific guidance on documents to be supplied in evidence for an application for entry onto the Specialist Register with a Certificate of Eligibility for General Practice Registration (CEGPR),"), but most surpass this.

To reduce the burden of the existing CEGPR criteria to review assessment processes, Emily Fletcher and her colleagues conducted desk-based research and stakeholder interviews to develop a methodology to map postgraduate GP training and healthcare contextual data from an overseas country to the UK (Fletcher et al., 2019). The study created a mapping framework for comparing GP training between countries, including healthcare context, training pathway, curriculum, assessment, and continuing professional development and revalidation. This doctoral study also highlighted the obstacles for GPs' overseas employment.

6.4 Influencing factors on training GPs and their relations

Prior studies focused on how to develop competences for GPs in which the majority of these studies have concentrated on educational strategies and assessment (Cote, 1993; Patterson et al., 2013; Plint & Patterson, 2010; H. Thomas, Best, & Mitchell, 2020). Several noticeable domains of educational strategies have been most frequently studied, namely, problem-based learning (Clark, 2006; Dammers, Spencer, & Thomas, 2001; Foldevi, Sommansson, & Trell, 1994), work-based learning (Burton & Jackson, 2003; Jackson & Burton, 2009), interprofessional education (Oeseburg et al., 2013; Sippli, Rieger, & Huettig, 2017; Walsh, 2007), teaching and leading small groups (Mattsson, 1999), e-learning (Mattsson, 1999), portfolios in personal and professional development

(Dagley & Berrington, 2005), self-regulated learning and patient involvement (Sagasser, Kramer, Van Weel, & van der Vleuten, 2015). Likewise, an increasing number of studies about assessment methods for training GPs have seen in specific topics namely workplace assessment (Murphy, Bruce, & Eva, 2008; Swanwick & Chana, 2005), structured assessment of clinical competence (Norman et al., 1993) or formative assessment (Wiener-Ogilvie & Begg, 2012).

The majority of studies concentrated on only specific medical schools or areas. However, there a limited volume of international studies which focus on general influencing factors to education and training for GPs. Interviewees reflected on why the training pathways were changed or need to change in the future when they described about the training pathways for GPs in their countries. Influencing factors to training pathways were demonstrated by programme design such as curriculum, pedagogy and assessment as a factor in creating the shape of each training pathway. Especially, there is a rigid incorporation between programme design with culturally and historically established structures in the establishment of duration and training settings. Additionally, interviewees mentioned impacts of changes from expectations of patients and society, health needs and role of GPs in health care systems on training pathways. Interviewees from three different countries reflected on why their training pathways have different durations or time distribution on subjects. The primary sub-themes emerging from their reflections were distinctions in GPs' roles in health care systems, health care needs and expectations of patients and society. More importantly, all three factors have shifted over time because of the growth of economy, society, population and globalisation.

6.6 Strengths and limitations

6.6.1 Strengths

The first strength of this doctoral study lies in its combination of two different research methods. This combination benefits from maximising the discovery of rich data sources to answer the research questions given. First, the scoping review guided by the framework of Arksey and O'Malley (2005), and Levac et al., (2010). The search was conducted on three international scientific databases in the field of health sciences and philosophy. The search terms and strategy adopted in this review were broad in extent. This method strengthened the process of synthetic mapping to the depth and breadth of the existing literature. For instance, the study integrated studies with a diversity of research designs. Hence, the study design was consistent with the broad, exploratory research question given. Second, the strengths of the qualitative study incorporate a maximum variation model of purposive sampling, the variation in participant demographics, and participant diversity in training processes for GPs. The purposive sampling is beneficial in order to identify and select proficient and well-informed participants within the phenomenon of interest. Additionally, participants of the qualitative study were varied principal players including trainers, trainees, qualified-GPs, policymakers and patient representatives from three different countries, reaching rich, abundant and international data. Thus, the research provides insight into the varied perspectives related to education and training pathways for GP between countries and strengthens the transferability of findings.

The verification process was conducted throughout two pilot interviews to ensure quality assurance for the interview. Credibility and originality were ensured by constructing the data collection and analysis on an inductive process of thematic analysis as recommended by Caelli (2003), drawing on frameworks described by Gibbs and Creswell (2007). Moreover, a critical appraisal tools checklist of CASP was applied clarify how the qualitative study has been fixed with eight key markers of quality in qualitative research including (a) worthy topic, (b) rich rigour, (c)

sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence.

The second strength of this study is the incorporation of diverse perspectives from our research team, including two supervisors with broad research specialisms. Specifically, my first supervisor specialises in clinical microbiology, medical education, and my second supervisor's expertise are in politics, religion and professional learning. During the research process, the two supervisors were involved in peer-reviewing every stage of the study, interpreting data analysis, and giving critical comments on the writing process. This research process allowed us to combine different specialisms which can generate creative and high-impact research. Moreover, credibility was also enhanced by the diverse research team. Resonance was ensured by employing a descriptive approach to being intimate with the data, and by three different views during the analysis process.

The third strength is the inclusion of external stakeholders during the research process. The initial findings were presented in several local and international medical education conferences. In the beginning, the research proposal was shared at the National Primary Care Conference at the University of Warwick in 2017 and the ASME conference in 2018. In 2019, the initial result of the scoping was presented at the Annual Research Conference of Irish Network of Medical Educators, Rogano Meeting, and the Annual Research Conference of Graduate School of Education. This process benefited from valuable opportunities to receive critical comments widely from external stakeholders in the education sector on the findings. This has been identified as a beneficial component of high-quality, high-impact research.

6.6.2 Limitations

For the scoping review, the search was conducted on only three databases and limited by inclusion criteria. In particular, the search limited the inclusion criteria to peer-reviewed articles or reports in English and Vietnamese from 2010 onwards. The study may have unknowingly (or inadvertently) missed heterogeneous works such as grey literature, perspective articles, opinion pieces and innovations in different languages. Likewise, additional databases may have identified more articles and insights from non-English articles might have been missed. These factors might lead to limitations in understanding the research area. Nonetheless, there may be some confusion regarding inclusion of various forms of knowledge and/or evidence (an issue that has been debated by Thomas et al.) (A. Thomas, Lubarsky, Varpio, Durning, & Young, 2020). Quality assessment was not necessary for this review type and this research aim (M. J. Grant & Booth, 2009; Peters et al., 2015). Our scoping review did not apply the optional sixth step of the framework of Arksey and O'Malley (2005) that employs involvement of key informants to reach insights beyond those in literature. Nevertheless, the initial finding was presented in several conferences to reach external experts' comments. Moreover, further qualitative research should be conducted to achieve a comprehensive understanding about the typology. Finally, our scoping search strategy investigated a period of eight years and that limited time interval limits our ability to generalise results across time or comment on temporal changes.

For the qualitative study, the qualitative study recruited participants from only three countries, which is not fully representative of the typical characteristic of the typology— *'diversity'*. Therefore, the participants might not be representative for three typologies found from the scoping review. However, characteristics and influencing factors identified from the international qualitative are not unique to training settings. Therefore, the transferability of our findings is extensive in different contexts. In general, this study employed a combination of a scoping

review and a qualitative study that limited the data integration from the two methods. This can lead to discrepancies in comparing the results.

6.7 Recommendations

6.7.1 Recommendation for practice

Benefits of learning from other countries/ typologies: Diversity in education and training for GPs around the world can provide valuable opportunities for learning, sharing and exchanging experiences, achievements, failure or difficulties from different contexts. This can lead to increased creativity, higher innovation, faster problem-solving and better decision making for medical educators and policy makers who act as key stakeholders in designing, developing and conducting education and training for GPs.

Reaching a keen understanding about contexts: The model 'the education and training for GPs in context' illustrates what factors can impact education and training pathways for GPs. This might help to identify potential interventions, solutions or reform directions for effectively improving education and training for GPs with different contexts. Noticeably, the research indicated that prioritising healthcare needs or health resources in local settings needs to be considered as one of important steps in designing and developing training pathways. The education and training for GPs should be contextual in which its structure is decided on the basis of local needs, resources and settings.

6.7.2 Recommendations for policy

Providing GPs with favourable career options: comprehensive support for students and trainees through pathways: A shortage of GPs and recruitment crisis in general practice is occurring in both developing and developed countries because of unprecedented healthcare demand. Career choices and commitments from students within medicine is a difficult decision, depending on both personal

and social influences. Preferences can shift at different stages of life and of training. Therefore, medical educators and policy makers need to scrupulously consider how to provide positive career destinations for students when they develop and reform the education and training pathways for GPs. This step is vital to improve recruitment for the next generation of GPs. Meanwhile, undergraduate experience plays a key influencing factor in selecting eventual career. To increase positivity towards general practice, several recent studies suggested that medical schools must create high quality placements in general practice and provide academic role models, whilst underlining to policymakers the nexus between the current challenges in general practice and the recruitment crisis (Barber et al., 2018; McDonald, Jackson, Alberti, & Rosenthal, 2016). A payment mechanism that recognises the true value of GP practices in teaching medical students has been suggested as a vital step to ensure a primary care workforce for the future.

6.7.3 Recommendation for future research

This doctoral research aimed to develop a global typology of education and training pathways for GPs internationally to enhance understanding of variation and complexity in education and training for GPs and identified three main typologies. The findings now offer the provisional typology with its characteristics and influencing factors to support discussions about future innovation of education and training for GPs and to help researchers, medical educators and policy makers identify priorities for study. In the future, further studies should be conducted to explore the variation of health care systems, practice settings and policies or legislation related to primary care across the world. In particular, these further studies might need to focus on measuring the degree of rationality and effectiveness of health care systems and legislation with local practice settings. These studies can more comprehensively examine influencing factors of GP training pathways and the correlation between them. Furthermore, a diverse combination of research methods, interdisciplinary research groups and international collaboration should be applied in conducting these further studies. These three elements can maximise the potential of creativity and a multi-

dimensional perspective in conducting comparative studies between multiple distinctive settings.

Additionally, future studies should be conducted to discover differences in professional identity formation of GPs between the three typologies and varied countries. The international qualitative findings highlighted that three stages of transition in education and training pathways for GPs are very distinctive between the three countries. Therefore, a further study in comparing professional identity formation of GPs from different training pathways can be greatly beneficial in development of professionalism teaching for medical students and trainees.

CHAPTER 7: CONCLUSION

7.1 Introduction to the chapter

This chapter draws together the core findings and my personal thoughts throughout the research process. Implications of core findings in predicting the potentially applicable pathway in Vietnam or the contexts of developing countries will also be presented.

7.2 Conclusion and final thoughts

Firstly, the doctoral study offers a global typology of education and training pathways for GPs, including three types of GP training *'Gatekeeper', 'Doctor of choice' and 'Team member'.* The classification was based on the distinct roles of GPs in healthcare systems between countries because of a strong connection between training pathways with practice settings and types of primary care provision in countries. Second, the study indicates two typical characteristics, five influencing factors and three main stages of GP training pathways. Therefore, medical educators and policymakers can use the typology as a reference to gain an overview of variation and complexity in education and training for GPs and identify priorities for future study. Conceptualising the diversity in education and training pathways can inform the implementation of educational and training transformation for GPs in different contexts.

Some final thoughts

Throughout this study, there was evidence that the education and training were diverse and changed over time. The diversity of GP training reflects varied roles of GPs in the healthcare systems across different countries. Several research questions have come to my mind for possible future research:

(i) How do medical educators and policymakers employ strength of diversity in education and training pathways for GPs to improve the training quality?

(ii) How can the diverse characteristics in GP training be preserved faced with globalisation trends and a new wave of imperialism through the overwhelming export of Western curricula, educational approaches and teaching technologies which assume that 'metropolitan West is best'?

(iii) What are the advantages and disadvantages of overseas GP recruitment and effective solutions for healthcare systems in the world to conduct this.

(iv) What are implications of the 'one-size-fits-all' phenomenon in education and training for GPs on the global scale?

Finally, I learned that a 'one-size-fits-all' approach is not appropriate in designing and developing GP training programs. Each country has its own identities in culture, economics, politics, society, and history of formation and development that shapes its healthcare settings or practice contexts. In addition, combining the findings of scoping review and the international qualitative study can provide insights into what the potentially applicable pathway in Vietnam context is. The development of a new training model for family physicians in Vietnam or other developing countries should be conducted throughout several key steps: (1) defining the role of GPs in their healthcare systems including specific functions and responsibilities, (2) recognising and raising societal awareness about the values of GPs, (3) examining their local primary care needs, (4) building curriculum based on GPs' role and societal primary care demand, (5) identifying distinct training pathways with the similarity of GPs' roles to compare and find their advantages, (6) considering the adaptability of advantages identified in their local practice

settings, and (7) continuing to update curriculum and training pathways in order to respond to the changing world with its forthcoming and unprecedented challenges. Undoubtedly, to conduct this successful transformation in GP training, a strong collaboration between policymakers, medical educators, researchers, trainers, trainees and patients is essential.

For the future, all nations are heading toward sustainable development. Noticeably, at its core are the 17 sustainable development goals, which insist on the importance of good health and well-being as the third goal in achieving sustainability (Cf, 2015). Meanwhile, general practice serves a crucial role in providing the continuity of care that is clarified to be significantly correlated with increased patient satisfaction, increased take-up of health promotion, broader acceptance of primary medical advice prior to seeking hospital services, and lower mortality rates (D. J. P. Gray, Sidaway-Lee, White, Thorne, & Evans, 2018). Therefore, general practice will be at the heart of medicine to achieve the third goal of sustainable development in the future. The sustainable future of general practice will be moulded not only by policy shifts but also by raising societal awareness about the value and mission of family medicine in the medical sector.

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APPENDICES

Appendix 1 – Medline search strategy

Search Strategy:

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1. "General practi*".mp. (82695)
2. ("family practic*" or "family medicine" or "family physician*" or "primary care").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (163832)
3. "medic* school*".mp. (30367)
4. ("Medic* education" or "medic* college*" or "medic* program*" or "medic* training" or "medic* curricul*" or "medic* undergraduate*" or "medic* postgraduate*").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (81629)
5. 1 or 2 (210082)
6. 3 or 4 (101507)
7. 5 and 6 (9242)
8. limit 7 to english language (8536)
9. limit 8 to yr="2010 - 2019" (2939)

Appendix 2: Interview Protocol

My name is Janice,

Thank you for agreeing in taking part in my research project.

I am in my third year PHD. I am conducting my doctoral research to reach a better understanding about the diversity of training pathways for GPs to develop a typology of education and training pathways for GPs or Family Physicians.

My research question is: What are stakeholders' perceptions of education and training pathway for GPs in their countries?

As you're not a GP the question will focus on your perceptions based on whatever that experience may be about managing and operating primary health care practice in your health care system.

The interview will last approximately 45-60 minutes.

The interview will also be recorded.

You can at any time decide not to answer the questions or withdraw from the interview.

Once the interview has been completed, our conversation will be transcribed for analysis.

Only the researchers will have access to your information. Your name will not be on the tape and interview transcripts so as to keep your identity confidential. Direct quotes may be used in publications but these will be anonymised and anything which could identify you or your company will be removed.

We will start with a form that includes some background questions and then move on to more specific questions.

Is that ok?

A. Please complete a short form that includes some background questions

B. Perceptions about the education and training pathway

- Please can you tell me about your current role?
- Please can you tell me about the training pathway for GPs/ Family Physicians in your country?
- Are you aware of other routes to become a GP in your context?
- To what extent did your training in your course prepare you to work as a GP? *(only for trainees, lecturers, GPs)*
- Please can you give an example of where you were prepared/unprepared? *(only for trainees, GPs)*
- What do you think are the challenges/difficulties for the education and training pathway for GPs in your country?
- In an ideal world, how might the existing difficulties be resolved? What suggestions could you make to improve the training pathway?

C. Introduce typologies of training pathways

- Where would you position the training pathway in your country, according to these diagrams?
- What are the similarities and differences between the training pathway in your country, and these typologies?
- What are your thoughts about these training pathway typologies? What are their challenges and advantages? Which one do you prefer and why?

That's the end of the interview.

That brings our questions to an end. Is there anything further you would like to add?

Thank you very much for taking the time to answer questions given today, your input is much appreciated and valued.

Appendix 3: Certificate of Ethical Approval

GRADUATE SCHOOL OF EDUCATION

St Luke's Campus Heavitree Road Exeter UK EX1 2LU

http://socialsciences.exeter.ac.uk/education/

CERTIFICATE OF ETHICAL APPROVAL

Title of Project:
Developing a global typology of education and training pathways for general practitioners

Researcher(s) name: Thi Huong Hoang

Supervisor(s): Prof Karen Mattick
Prof Vivienne Baumfield

This project has been approved for the period

From: 09/10/2019
To: 25/09/2020

Ethics Committee approval reference: D1920-011

Signature: Justin Dillon Date: 30/08/2019

(Professor Justin Dillon, Professor of Science and Environmental Education, Ethics Officer)

Appendix 4: Information Sheet for Participants

PHD RESEARCH – GRADUATE SCHOOL OF EDUCATION

INFORMATION SHEET FOR PARTICIPANTS
(VERSION 3: 20th OCTOBER 2019)

What is this research?

The doctoral research focuses on exploring typologies of education and training pathways for General Practitioners (known as family medicine doctors in some countries) and determine their characteristics. This research aims to understand: ***what are stakeholders' perceptions of education and training pathway for GPs in their countries?***

Who is conducting this research?

I am Janice (Thi Huong) Hoang, a doctoral researcher in Medical Education at the University of Exeter in England and this research is a part of my PhD project. My supervisors are Professor Karen Mattick - k.l.mattick@exeter.ac.uk and Professor Vivienne Baumfield - V.Baumfield@exeter.ac.uk

What does being part of this study mean for me?

It will include one interview, either in-person or by telephone. You will be asked to complete a short personal details form providing demographic and education-related details (in order to define the characteristics of our sample). You will then be asked questions to understand your perceptions of education and training pathways for GPs in your healthcare systems. The interview will last around 45-60 minutes. I would like to record this interview with your agreement. You are able to be withdrawn the interview at any time.

Anonymity & Confidentiality

The data you contribute to the study will be kept anonymous and, whilst segments of the transcript of your interview may be published, either in journal articles or elsewhere, following this research. Personal confidentiality will be maintained (see below).

What will happen to my interview data?

Your interview data will be stored and used in accordance with the Data Protection Act.

The data will be gathered and analysed specifically for the purposes of this research and will not be made available to anyone else other than myself and my supervisors. Regarding the anonymity and confidentiality, the personal information of all participants will be confidential. I will ensure that no output will provide information which might allow any participant to be identified from names, data, contextual information, or a combination of these. The data will be stored and anonymised in such a way as to make participants untraceable unless they give permission for it to be otherwise. The data will be anonymised through the use of pseudonyms in the written dissertation.

Interview recordings

The digital recording of your interview will be deleted as soon as there is a written transcript of your interview.

a) Interview transcripts and contact details

Interview data will be used on an anonymous basis, with no mention of your name, but we will refer to the group of which you are a member.
Your personal and contact details will be stored separately from your interview transcript and may be retained for up to 5 years.
If you request it, you will be supplied with a copy of your interview transcripts so that you can comment on and edit it as you can see fit.
Third parties will not be allowed to access to interview tapes and transcripts except as required by law or in the event that something disclosed during the interview causes concerns about possible harm to you or to someone else.

1. What are the benefits for taking part in this study?

You can have an opportunity to reflect on your experiences and share your perceptions related to education and training pathways for GPs. There are likely to be benefits to medical schools, policy makers or medical students in improving or reforming training pathways.

Time will be the main drawback for participating. A further disadvantage may be that the conversation topics could potentially cause distress for you. It is important to note that if you do not wish to answer a question, you do not have to.

2. Who can I contact for further information?

For further information about the research or your interview data, please contact:

Janice Hoang
Graduate School of Education
St Luke's Campus
Heavitree Road
Exeter
Devon
EX1 2LU
United Kingdom
Th436@exeter.ac.uk

If you have concerns/questions about the research you would like to discuss with someone else at the University, please contact:

Prof Karen Mattick
Medical School Building F12 / SC2.06
St Luke's Campus
Magdalen Road
Exeter
Devon
EX1 2LU
United Kingdom

This project has been reviewed and approved by the Graduate school of education Research Ethics Committee, University of Exeter.

Appendix 5: Consent Form for Participants

PHD RESEARCH – GRADUATE SCHOOL OF EDUCATION

CONSENT FORM FOR PARTICIPANTS
(VERSION 3: 20th OCTOBER 2019)

I have been fully informed about the aims and purposes of the project. I understand that:

1. there is no compulsion for me to participate in this research project and, if I do choose to participate, I may at any stage withdraw my participation and may also request that my data be destroyed ☐

2. I have the right to refuse permission for the publication of any information about me ☐

3. any information which I give will be used solely for the purposes of this research project, which may include publications or academic conference or seminar presentations ☐

4. if applicable, the information, which I give, may be shared between any of the other researcher(s) ☐
5. All participants in this project will be anonymised ☐

6. all information I give will be treated as confidential ☐

7. the researcher(s) will make every effort to preserve my anonymity ☐

8. I agree to take part in this study ☐

_____ _____ _____

Name of Participant Date Signature

_____ _____ _____

Researcher Date Signature

This project has been reviewed and approved by the Graduate School of Education Research Ethics Committee, University of Exeter.

Appendix 6: Short Questionnaire for Participants

PHD RESEARCH – GRADUATE SCHOOL OF EDUCATION

SHORT QUESTIONNAIRE FOR PARTICIPANTS
(VERSION 3: 20th OCTOBER 2019)

1. Please select your age group.

    - 23-34 years old
    - 35-44 years old
    - 45-54 years old
    - 55-64 years old
    - 65 years or older

2. What is your qualification and current occupation (if applicable)?

    ---

3. When did you qualify as a GP (if applicable)?

    ---

4. What is your position in your workplace (if applicable)?

    ---

5. How long have you been in this position (if applicable)?

    ---

6. Which country do you work in (if applicable)?

    ---

7. How would you describe your work location (e.g., rural/ urban), if applicable?

Please return this questionnaire with the Interview Consent form

Appendix 7: Characteristics of interviewees

No	Participant Code[2]	Types of PPT	Medical qualified[3]	Job Position	Country
1	A2409-VN	Trainee	Yes	Second-year resident	Vietnam
2	G2209-VN	Trainee	Yes	Third-year resident	Vietnam
3	A0701-USA	Trainee	Yes	Second-year resident	USA
4	L1401-USA	Trainee	Yes	Second-year resident	USA
5	I0301-UK	Trainee	Yes	Third-year trainee	UK
6	J0701-UK	Trainee	Yes	Second-year trainee	UK
7	O1910-VN	Medical Educator	Yes	Senior lecturer	Vietnam
8	H2310-VN	Medical Educator	Yes	Senior Lecturer	Vietnam
9	C1511-USA	Medical Educator	Yes	Professor	USA
10	N0601-USA	Medical Educator	Yes	Resident Trainer	USA
11	I0000-UK	Medical Educator	Yes	GP trainer, Examiner and Professor	UK
12	M2012-UK	Medical Educator	Yes	GP, Trainer	UK
13	U2410-VN	Policy Maker	Yes	Senior Officer	Vietnam
14	S2012-USA	Policy Maker	Yes	Director of Global Health	USA
15	R3012-UK	Policy Maker	Yes	Chairman	UK
16	A0601-UK	Policy maker	Yes	Clinical Project Lead	UK
17	N0411-VN	Patient	No	Farmer	Vietnam
18	D1212-USA	Patient	No	University Academic	USA
19	P0611-UK	Patient	No	Farmer	UK
20	H120-VN	GP	Yes	GP and Lecturer	Vietnam
21	D0111-VN	GP	Yes	GP	Vietnam
22	V0411-VN	GP	Yes	GP	Vietnam
23	M1211-USA	FD	Yes	Family doctor	USA
24	E0701-USA	GP	Yes	GP	USA
25	C3012-USA	FD	Yes	Associate Program Director	USA
26	J2911-UK	GP	Yes	GP and Lecturer	UK
27	A1911-UK	GP	Yes	GP	UK
28	H2711-UK	GP	Yes	Community sub dean, GP	UK

[2] These Codes were constructed with 8 or 9 characters starting by an uppercase letter from original names of participants, followed by 4 digits selected randomly, and the remaining two or three uppercase letters demonstrate the nations of participants.
[3] Medical qualified: qualifications include Basic Medical Qualifications (e.g., MBBS, BMBS, MBChB, MBBCh, MD), Higher Medical and Surgical Qualifications (several levels for doctors who undertake further specialist training) and PhD (Doctor of Philosophy).

Appendix 8: A published article "Typologies of education and training pathways for GPs" on the journal Education for Primary Care

Education for Primary Care

Taylor & Francis
Taylor & Francis Group

Typologies of education and training pathways for General Practitioners: a scoping review

Journal:	*Education for Primary Care*
Manuscript ID	TEPC-2020-0118.R1
Manuscript Type:	Research Article
Date Submitted by the Author:	n/a
Complete List of Authors:	Hoang, Janice; University of Exeter, Graduate School of Education Mattick, Karen; University of Exeter, the College of Medicine & Health Baumfield, Vivienne; University of Exeter, Graduate School of Education
Keywords:	general practitioners, training pathways, family doctors

Abstract:

Introduction
Variation in medical education and training among countries is well reported but evidence syntheses of similarities and differences are rare. We developed a typology of education and training pathways for General Practitioners (or equivalent) based on a scoping review of international peer-reviewed literature.
Methods
Applying search terms such as 'General practice' or 'Family medicine' and 'medical education or training' in Ovid Medline, EmBase, and ERIC, identified studies published since 2010 describing education and training pathways for GPs. Inclusion criteria were used to select studies for data extraction and thematic analysis to characterise distinct typologies.
Results
90 articles were included in the scoping review of which 47 discussed both undergraduate and postgraduate programmes and three typologies based on GPs' role in the healthcare system identified:
"Gatekeeper": Patients cannot access secondary or tertiary service without GP referral.
"Doctor of choice": Patients can choose to see a specialist and access secondary or tertiary care directly.
"Team member": Patients can access a network of health professionals in the community.
Conclusion
The typology provides a reference for medical educators and policy makers. Conceptualising the diversity in education and training pathways can inform implementation of educational and training transformation for GPs in different contexts.

Key words: general practitioners, training pathways, family doctors

Appendix 9: The initial thematic framework developed from Bronfenbrenner's Ecological Framework

Themes	Subthemes	Description
1. General Practitioners	1.1 Definitions of relevant terms	To this subtheme, I coded any element of transcripts relating to participants' definitions of terms that were relevant to the research study. Example. *"A primary care physician or primary care doctor includes generally an outpatient provider who attends to the care of populations of different ages."*
	1.2 Competences	To this subtheme, I coded any element of transcripts relating to GPs' clinical knowledge, skills, and practice or professional performance. Example. *"My view is that it prepares them to be a GP working anywhere. Because they do develop extensive clinical knowledge, medical knowledge. I think it makes them patient centred…. They develop those kinds of interpersonal skills and caring attitudes towards patients"*
2. **Education and training**	2.1 Training settings	To this subtheme, I coded any element of transcripts relating to training contexts or learning settings of GPs that were relevant to the research study. Example. *"when I first started in the NHS, it was very academic and possibly it still is. I think it was a lot of science and based a lot of ethological, anatomical, and biochemical techniques. So now, training has much improved and focus on looking at patients and seeing patients in their contexts as well in both GP practices and local hospitals in the area you're training"*
	2.2 Flexibility	To this subtheme, I coded any element of transcripts relating to the flexibility of training pathways for GPs. Example. *"It is competency based but it always takes the same time. Some people could be fully competent after four years and some people might be competent after six years. Why does it have to take everybody 5 years to become a confident qualified GP? It doesn't make sense because some of those people have naturally those kinds of skills and competencies earlier and some will take a*

		bit longer. So we need to be more flexible …"
	2.3 Structure & Duration	To this subtheme, I coded any element of transcripts relating to length and arrangement of learning contents of training pathways for GPs. Example. *"for doctors in my country they go to medical school and they have to do two years of foundation programmes in a hospital, and then they either have a time gap and they go overseas or whatever they do, and then they join a speciality programme"*
	2.4 Principles of training and assessment	To this subtheme, I coded any element of transcripts relating to principles of training and assessment methods that were applied in the training pathways. Example. *"in the US doctor training is pretty well standardized. There is one set of guidelines and rules on how people are trained….This standardized approach to make sure that everybody is trained with high quality training in different places…..in the US is more outcome based assessment using something called 'Milestones'. Each specialty has 'Milestones' that they use to access competency-based … ."*
	2.5 Suggested improvements for GP training	To this subtheme, I coded any element of transcripts relating to ideas or possible plans for improving training pathways GPs. Example. *"what would need to improve is extending the training by probably a couple years. And that would have a requirement of at least one more year in hospital covering a broad range of specialties, at least one year, one additional in general practice"*
3. Professional settings	3.1 Working settings	To this subtheme, I coded any element of transcripts relating to contexts of professional practice that was relevant to the research study, for example, hospital-based or community-based practice, and rural/remote or urban-based settings. Example. *"I'm aware of other routes for GPs in different countries. In places like Cuba, they have a very different model. They have a community-based and they don't have a hierarchy teaching hospital*

		that we have and working up through training practices"
	3.2 Scope of practice	To this subtheme, I coded any element of transcripts relating to scope of GPs' practice, duties, roles that were relevant to the research study. Example. *"A GP in the UK would be the main primary care provider to a family….. screening and working in the community as a gatekeeper. A GP in South Africa would be work in a rural hospital and provide a myriad of care like treating and diverging across primary care, A&E in a small district hospital"*
4. Healthcare systems	4.1 Influences of policy and legislation	To this subtheme, I coded any element of transcripts relating to complexity of the relationship or interaction between policies, law in professional practice Example. *"On the aspect of legislation, there should be some articles relating specifically to family medicine. We already had a circular, but to develop as a general or circular law is still a question. when there is no legal basis, it is impossible to arrange resources and money. Therefore, our healthcare insurance system does not cover for the treatment of family medicine and our government's budget cannot pay for family doctors….. family doctors are jobless"*
	4.2 Recognition	To this subtheme, I coded any element of transcripts relating to informal and formal recognition of GP roles in healthcare systems that were relevant to the research study. Example. *"I think fundamentally, in our day to day general practice need to be better remunerated. It needs to be a more appealing job, that people want to do and the knock-on effect is that GP are happier in that job…"*
	4.3 Financing & workload	To this subtheme, I coded any element of transcripts relating to salaries, payment methods and financial mechanism for GPs. Example. *"The United State is lopsided to prefer specialist and sub-specialist than family physicians…So if you are a primary carer whose doing one thing, if you are a specialist who doing the same thing, the specialist will be paid more than the*

		primary care physicians…… It does not make sense that primary care doctors are paid at the bottom of the total system. This needs to be addressed"