Barriers to immunisation among children under school age (0-5 years old) of Myanmar migrant parents living in Mueang District, Samut Sakhon Province, Thailand

By

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ABSTRACT

Background

Immunisation via vaccines is the most cost-effective health intervention to save and prevent children's lives from acquiring infectious diseases. Although Thailand has launched a vaccination program for all children in the country, the National Expanded Program on Immunisations has not reached many migrant children. Since 2013, the coverage of routine vaccinations for children under five years old had not reached the 90% coverage target. There are outbreaks of vaccine-preventable diseases among migrant children. Myanmar nationals make up the largest group of migrant workers in Thailand. To improve immunisation coverage and service, it is crucial to examine barriers to immunisation among Myanmar migrant children.

Aim and Objectives

This study aims to examine barriers to immunisation encountered by under-school-age (zero to five-year-old) Myanmar migrant children living in Thailand. This aim will be achieved through the following research objectives: 1) identifying the barriers to immunisation and 2) examining the correlation between the demographic backgrounds and immunisation rates among under-school-age migrant children in Thailand.

Methods

This correlation study uses data collected from a web-based questionnaire survey regarding the parents' demographics, Myanmar migrant children's immunisation rates and barriers to immunisation in Myanmar migrant children. The correlations analysed the data for significant relationships between the variables impacting immunisation levels.

Results

A total of 255 Myanmar parents living in Mueang District, Samut Sakhon Province, participated in the study. The barriers to immunisation divided into four themes, taken from the research literature, are as follows: the first theme–difficulties in accessing immunisation services. The exploration of the first theme found that travelling to healthcare centres, not having enough money and language barriers were obstacles. Findings concerning the second theme, knowledge and awareness of immunisation, showed that parents' lack of knowledge about vaccine's adverse effects, vaccination schedules, the benefits and the availability of immunisation services. The findings of the third theme, parents' immunisation attitudes, showed that participants generally had a positive attitude. The fourth theme was issues relating to the healthcare service. The results pertaining to this theme indicated that the main problems were having to wait a long time to access the vaccination service. Regarding the correlation between the parents' demographics and Myanmar children's immunisation rates, there was a low negative correlation with statistical significance between the Myanmar children's immunisation rates and the number of children living in Thailand with a parent ($\chi 2 = -0.330$, $p < 0.001$). Additionally, there was a low positive relationship between the Myanmar children's immunisation rates and parent's income sufficiency ($\chi 2 = 0.257$, $p < 0.001$). There was no correlation between the parent's age, the number of years they had been living in Samut-Sakhon Province, their legal status, total family income, the parent's education level and their children's immunisation rates.

Significance

These findings, detailing the barriers to vaccination uptake, are important to service providers and can help inform policy-making regarding migrant children in Thailand. Additionally, the findings can assist healthcare providers in understanding the barriers to immunisation to develop nursing interventions that promote effective immunisation services to migrant children in the future.

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed.....Palinrach K.....

Date.....9th July 2021.....

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GLOSSARY

The definition used in this thesis replicates the World Health Organization definitions (World Health Organization, 2021a). The definitions show below.

Term	Definition
Adverse events	An "adverse event" is any health problem after a medication or other vaccines have been administered. A vaccine might indeed cause an adverse event, or it might be pure coincidence.
Complete or fully immunisation status	A child has received all immunisations required for age.
Healthcare workers	A professional who delivers health services. Examples of healthcare workers include physicians, physician assistants, nurse practitioners, naturopathic physicians, and osteopathic physicians.
Immunity	Protection from an infectious disease. If you are immune to a disease, you can be exposed to it without becoming infected
Immunisation	A process by which a person becomes protected against a disease through vaccination. This term is often used interchangeably with vaccination or inoculation.
Immunisation schedule	A timetable with recommended ages for immunising against particular vaccine-preventable diseases.
Immunisation status	A child’s immunisation history as it relates to school and child care immunisation requirements.
Infectious	Capable of spreading disease. Also known as communicable.
Migrant children	A child who moves across a school district or state lines with parents or guardians due to seasonal or temporary work
Side Effect	Undesirable reaction resulting from immunisation.
Vaccine	A product that stimulates a person’s immune system to produce immunity to a specific disease, protecting the person from that disease. Vaccines are usually administered through needle injections but can also be administered by mouth or sprayed into the nose.
Vaccination	The act of introducing a vaccine into the body to produce immunity to a specific disease.

LIST OF ABBREVIATIONS

CASP	Critical Appraisal Skills Program
CDC	Centers for Disease Control and Prevention
EPI	Expanded Program on Immunisation
HCC	Healthcare centre
HCW	Healthcare worker
LMICs	The lower- and middle-income countries
MoPH	Ministry of Public Health
PHTOs	Public Health Technical Officers
PIDST	Pediatric Infectious Diseases Society of Thailand
VPDs	vaccine-preventable diseases
WHO	World Health Organization

1. CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter discusses the research background. It describes the importance of immunisation and outlines why low immunisation rates in migrant children in Thailand is important. Although data shows that childhood immunisation rates in Thailand have reached the World Health Organization's (WHO) target, there are still outbreaks of vaccine-preventable diseases (VPDs) in some areas where migrant people settle (Bureau of Epidemiology, 2020). As these areas in Thailand have high migrant populations, the outbreaks could be attributed to low immunisation rates among migrant families.

In Thailand, the lack of full immunisation coverage in migrant families is concerning. Therefore, identifying barriers to immunisation helps understand the thoughts and concerns surrounding the immunisation of migrant children. The research question explores these barriers and asks what factors influence the immunisation rates for Myanmar migrant children in Thailand. This chapter explains the problem, the research question, the aims of the research, the study's background and its significance. This chapter offers an overview of the rest of the chapters in the thesis.

1.2 Background

1.2.1 Immunisation and why it matters

Immunisation via vaccines is the most significant, successful, and cost-effective health intervention, saving children's lives and preventing children from acquiring infectious diseases (Centers for Disease Control and Prevention [CDC], 2018). A vaccine works by stimulating a person's immune system in order to develop immunity to a specific disease, thereby shielding them from the infectious disease (Ben-Joseph, 2019). Vaccination is an essential tool in eliminating and controlling VPDs, such as polio, mumps, measles and diphtheria (WHO, 2021b). Before vaccines were developed and immunisation programs were launched, it was estimated that two to three million children died from VPDs each year (WHO, 2020a). Since

1974, the WHO has recommended its Expanded Program on Immunisation (EPI) in addition to its global immunisation policy (Keja, Chan, Hayden, & Henderson, 1988). Since the EPI was initiated, the number of children receiving lifesaving vaccines has continuously increased (Keja et al., 1988). Vaccination against six diseases (diphtheria, tuberculosis, measles, pertussis, poliomyelitis, and tetanus) has prevented millions of deaths and disabilities (WHO, 2018). However, an incomplete or delayed vaccination can lead to death and disability from VPDs (Keja et al., 1988).

1.2.2 Immunisation program in Thailand

The EPI was introduced in Thailand in 1977 (Taharn, 1989). Taharn (1989) explained the process by which the EPI was incorporated into Thailand's health services, including hospitals and health-promoting centres. Consequently, all healthcare centres (HCCs) in Thailand must provide EPI intervention at 'well baby' clinics and offer vaccination programs for children free of charge (Muangchana, Thamapornpilas, & Karnkawinpong, 2010). The immunisation schedule for 2020 contained the ten Thai EPI vaccines (shown in Figure 1.1 below) recommended by the Pediatric Infectious Diseases Society of Thailand (PIDST) (PIDST, 2020). The EPI coverage target for all vaccines in Thailand is greater than 90% (Pinna et al., 2020). Thailand focused on the WHO vaccination target due to Thailand free provision of the EPI (Muangchana et al., 2010). The EPI coverage is reported to have been more than 90% from 2000 to 2013 in Thailand (Pinna et al., 2020). However, as reported by the Thai Ministry for Public Health (MoPH), since 2013, the immunisation coverage of routine vaccines for children under five years old has not reached this target (MoPH, 2020). Thailand established the Advisory Committee on Immunisation Practice to recommend ways to improve the immunisation service for everyone in Thailand to improve immunisation coverage (Muangchana et al., 2010). However, certain populations within Thailand, including migrant groups, have been under-serviced regarding vaccinations (Pinna et al., 2020). Consequently, the 90% immunisation coverage target has not been attained because some migrants cannot access immunisation services (Pinna et al., 2020).

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Figure 1.1 Thailand's national immunisation schedule (PIDST, 2020)

Figure 1 above provides an overview of the comprehensive EPI program available for free to everyone in Thailand (PIDST, 2020). The schedules include age-appropriate delivery of the vaccine and information on the infectious diseases targeted (PIDST, 2020). The comprehensive immunisation program is also available free to children of refugees and migrants (PIDST, 2020).

1.2.3 Myanmar migrant status in Thailand

Thailand's recent, rapid economic growth has led to shortages in the workforce (Sarapirom, Muensakda, & Sriwanna, 2020). Migrant labour from neighbouring countries is in high demand for Thailand's industries, and most regular migrants to Thailand come from Myanmar (Harkins, 2019). The great majority of migrant workers in the country are low-skilled, with Myanmar nationals making up the largest migrant worker group, accounting for 79.28% of all migrant workers, with an estimated population of 2.3 million (Sarapirom et al., 2020). Samut Sakhon Province has the highest number of migrant workers and also the highest concentration of Myanmar migrant workers (Harkins, 2019). In general, Myanmar migration to Thailand can be divided into two categories: registered migrants and unregistered migrants (Mon, 2010).

Registered or legal migrants have to register and complete the national verification process, and have a passport and work permit to work legally in Thailand (International Labour Organization, 2014). Unregistered or illegal migrants are migrants who enter Thailand without a valid visa and work permit and are not registered with the Thai government (International Labour Organization, 2014). The length of stay in Thailand differs among Myanmar migrants. Some migrant workers plan to return home after a few years, once they have gathered together enough savings, while others plan to migrate permanently to Thailand (Chantavanich & Vungsiriphisal, 2012).

1.2.4 Myanmar migrant workers' quality of life in Thailand

Myanmar migrants and labourers typically live in substandard environments, which sometimes have no access to clean water, and have inadequate access to healthcare (Sarapirom & Muensakda, 2018). Several aspects of Myanmar migrants' living circumstances in Thailand raise concerns, including the number of people who share a home, unhygienic conditions, and no privacy and comfort at home (Sarapirom et al., 2020). Many people are at risk of becoming unwell due to terrible environmental conditions (Sarapirom et al., 2020). Their children regularly suffer from respiratory and digestive ailments, such as common colds, coughs and diarrhea (Sarapirom et al., 2020). Pinna et al. (2020) explained how the area where a migrant lives or works affects that migrant's ability to access healthcare services. For example, a migrant residing in an industrial area far from an established community area might not have any HCCs close to their workplace (Pinna et al., 2020; Sarapirom & Muensakda, 2018). Myanmar migrants primarily self-medicate, and the low usage rates of public healthcare services by Myanmar migrants and their children imply that they might not be accessing basic healthcare (Promphakping, Promphakping, Somaboot, Weeranakin, & Rot, 2019).

1.2.5 Myanmar migrant children's health

In lower- and middle-income countries (LMICs), including Thailand and Myanmar, migrants are the group most under-serviced by the healthcare system (Awoh & Plugge, 2016). Harkin (2019) explained that most Myanmar migrants move to Thailand with their families and

children. The WHO (2019a) defines that children who follow their parents to settle in a new country often lack continuity of care in health services, particularly regarding immunisation services. Additionally, there are no up-to-date health records within the Thai and Myanmar health systems tracking migrant children's healthcare, which leads to incomplete immunisation in children (WHO, 2019a). Kantayaporn et al. (2013) found that the immunisation coverage for Myanmar children who lived in Myanmar (their own country) was higher than that of Myanmar migrant children who moved to Thailand. Migrant children with a delayed or incomplete vaccination history may contribute to VPD outbreaks in Thailand (Pinna et al., 2020).

1.2.6 The 2019 measles outbreak

In 2019, an outbreak of measles was reported in Thailand. From January 2019 to December 2019, 6,370 cases were reported, including 415 cases among migrants from Myanmar (Bureau of Epidemiology, 2020). Among children aged zero to four years old, there were 2,221 cases, and 108 of the cases within this age group were Myanmar children (Bureau of Epidemiology, 2020). The fact that the majority of measles cases were within the age group of zero to four years old highlights the importance of routine vaccinations in preventing VPDs.

As described by the Thai national immunisation program, all standard vaccines are required for children aged between zero and six (PIDST, 2020). The immunisation status among under school-age children is directly influenced by parents who are responsible for taking their child to an HCC for vaccination (Kantayaporn et al., 2013). In contrast, school-aged children can benefit from school immunisation programs (Kaji et al., 2016). The Thai health minister maintains the immunisation records for all children in Thailand, but these records do not always cover all children; for example, vaccination results are sometimes absent for migrant children or for those living in tribal societies or rural areas (Kantayaporn et al., 2013). It is essential to identify the immunisation rates and the factors that influence the immunisation rates among Myanmar migrant children to understand the specific problems relating to the low immunisation coverage.

The current study also explores barriers to immunisation among children under five years old (those who are under school-age). Previous research has used qualitative responses from parents (Canavati, Plugge, Suwanjatuporn, Sombatrungjaroen, & Nosten, 2011). The development of a comprehensive questionnaire is essential to map the types of barriers to immunisation children experience. Schools in Thailand already provide a school-based immunisation program for children attending school (Kaji et al., 2016). However, the children under school-age can only access immunisation services at HCCs. Thus, examining factors related to immunisation uptake and what can be done to manage this situation will help to identify barriers to vaccination uptake and could be used to inform policy-making regarding Myanmar migrant children in Thailand.

1.2.7 Issues related to immunisation for migrant families in Thailand

Many factors influence migrant's immunisation rates worldwide, including attitudes towards immunisation, knowledge of immunisation, distance to immunisation centres, difficulties in accessing immunisation, language barriers, and health service issues (Canavati et al., 2011; Han et al., 2014; Hu, Li, Chen, Chen, & Qi, 2013; Munsawaengsub, Hlaing, & Nanthamongkolchai, 2011). Factors relating to the immunisation rates of migrant children vary across the world. A systematic review of immunisation concerns in low- and middle-income countries identified knowledge about immunisation and health service issues as the primary concerns (Cobos Muñoz, Monzón Llamas, & Bosch-Capblanch, 2015). Although studies were conducted in Thailand's Samut Sakhon and Tak Provinces, exploring the factors that influence immunisation status, they did not cover all children under five years old, and some studies were conducted more than ten years ago (Canavati et al., 2011; Prakunwisit & Areesantichai, 2015). Moreover, a review of the literature, reported in Chapter 2, found a lack of research instruments covering the various barriers to immunisation faced by Myanmar parents accessing immunisation and healthcare for their children. Thus, the current study is necessary to identify the barriers to immunisation Myanmar migrants living in Thailand experience.

1.3 Problem statement

Since 2013, Thailand's MoPH reported that the EPI coverage with routine vaccines had not reached its 90% target (MoPH, 2020). There were still outbreaks of VPDs among hard-to-reach populations, such as migrants and rural residents who do not regularly access health services (Kantayaporn et al., 2013). In recent years, measles outbreaks have been reported in certain provinces, particularly in border areas and among groups of Myanmar migrants (Bureau of Epidemiology, 2020), which may be in part because the national vaccination uptake survey did not include all children in Thailand; migrant children were often excluded (Kantayaporn et al., 2013). As a nurse on the paediatric infectious disease ward at Ramathibodi Hospital in Thailand, this thesis's author encountered many migrant patients with VPDs and chickenpox, which suggests that the rate of immunisation is lower among migrant children living in Thailand. Thus, it is essential to identify the factors that influence immunisation rates. This study seeks to answer the following research question: what factors do Myanmar migrant parents report as influencing the immunisation rate for Myanmar migrant children in Samut Sakhon Province, Thailand.

1.4 Aim and objectives of the study

This study examines and understands the barriers to immunisation in under school-age (zero to five years) Myanmar migrant children living in Thailand. This will be achieved through the following research objectives:

1. Identifying barriers to immunisation in under school-age Myanmar migrant children in Thailand.

2. Examining the correlation association between the demographic backgrounds and immunisation rate among under school-age migrant children in Thailand.

1.5 Significance of the research

The results of this study will benefit Myanmar migrants by supporting access to the immunisation service, as through the use of the questionnaire, it is possible that this research's findings could be generalised to other Myanmar migrant children living in Thailand. The obstacles to immunisation will be reported to the relevant community HCCs and provincial public health organisations in Thailand to inform policy-making that will help Myanmar parents and their children receive easier access to the immunisation service. This research will also contribute to the body of knowledge surrounding barriers to the immunisation of migrant children in Thailand. The significance of this research to Myanmar migrants and the social benefits it offers are explained below.

1.5.1 Myanmar migrants

Myanmar migrant parents may benefit from the opportunities obtained by expressing their childhood immunisation problems to the research project. However, the benefit of this research project is that it will demonstrate the main factors related to immunisation uptake in Myanmar migrant children. The findings regarding the barriers to immunisation will be disseminated to the relevant health organisations, including Samut Sakhon Hospital. Thus, health providers may develop interventions to help solve some of the problems that impact migrant children who cannot access full immunisation.

1.5.2 Social benefit

If the barriers to immunisation facing Myanmar migrant children were removed, outbreaks of VPDs within the Myanmar communities in Thailand would decrease. Moreover, the findings of this research will guide a future pilot study that seeks to establish interventions to improve immunisation services across Thailand.

1.6 Conclusion

This research aims to understand the contributors to the immunisation status in Myanmar migrant children living in Thailand. The migrant immunisation background in Thailand shows

that many Myanmar migrant children have not received age-appropriate vaccines. Also, most migrant children have not been included in Thailand's national surveys. This research addresses this gap. The barriers to immunisation facing Myanmar migrant children living in Thailand should be examined in depth. The findings of the research will enable interventions to be developed for migrant immunisation services. Thus, the number of Myanmar migrant children who are fully immunised should increase and outbreaks of VPDs should decrease.

1.7 Overview of chapters in the thesis

This thesis consists of five chapters. This initial chapter has introduced the research, explaining the background to this study. It provided a background of immunisation uptake among Myanmar migrant children, particularly in Thailand, followed by a discussion of the problem statement, and the purpose and significance of the study. The background literature led to a discussion of the problem statement, the study's importance and its aim.

The second chapter presents a scoping literature review regarding factors that influence the immunisation rates in migrant children worldwide and discusses six factorial themes influencing immunisation in migrant children, including demographic factors, parents' lack of knowledge and awareness, health service issues, attitudes towards immunisation, socioeconomic factors and difficulties in accessing immunisation services. The Chapter 2 literature review summarises the main current barriers to immunisation facing migrant children and identifies existing gaps in the research literature.

The third chapter presents the research methodology and the methods used in this study, commencing with an outline of the methodological principles that provided the framework for this quantitative study and justifies their use to answer the research question. The chapter discusses the quantitative research approach used, along with the ethics approval process and considerations. The setting and types of participants are explained, and the data collection and data analysis approaches are described.

The fourth chapter reports the findings by offering descriptive results for the quantitative data and statistical analysis through text descriptions and table data from each survey section. The selected parents' demographics (including parents' age, parents' education level, family income per month, the number of children in the family living in Thailand, the length of stay in Thailand and their migrant status) and the children's immunisation rate use a Spearman correlation to determine the relationship between them.

The fifth chapter provides a discussion and conclusions regarding the barriers to immunisation experienced by Myanmar migrant children living in Thailand. Throughout this chapter, the study results are considered within the context of the existing literature, and the limitations of the research process are considered. A conclusion, recommendations for future research and suggestions are provided to address immunisation factors in migrant children living in Thailand.

2 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter two of this thesis presents and synthesises the current literature relevant to factors influencing immunisation uptake among migrant children in different countries. This chapter explains the search methods used, article selection and article analysis, followed by a discussion of findings. The quality of the 12 articles included in the literature review was assessed using the critical appraisal tool that suits each study type (Critical Appraisal Skills Program [CASP], 2018). The findings from the literature review are categorised by using thematic analysis. Six themes summarised in the literature review are presented below. The author used a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram to show the literature review process and utilised a summary review table to organise and summarise the review.

2.2 Article search and selection process

A scoping literature search framework uses a broader concept of searching the literature in research areas where literature is limited and can incorporate research articles, research reports, grey literature and policy documents (Parry, Grant, & Burke, 2016). This review style provides a broad view of a problem or area of study (Parry et al., 2016). A scoping review framework was used for this study to identify studies/articles relating to factors influencing the immunisation rate among migrant children from databases that focus on the fields of nursing, biomedicine, alternative/complementary medicine and medical. Initially, the researcher conducted searches for articles from three electronic databases, including the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline and ProQuest. These databases are trustworthy for nursing and other health professions (Polit & Beck, 2017). Further, the author utilised the backward and forward reference searching method for the retrieved articles to discover more articles relevant to the area of research. Backward reference searching, commonly referred to as chain searching, entails examining the

references cited in an article (Padron, 2020). Forward reference searching is used to identify the article that cited an original article after it has been published (Padron, 2020). These searching techniques helped to gather all relevant articles.

2.3 Inclusion and exclusion criteria

A critique of the literature question generated the search terms, which included 'immunisation or vaccination or vaccine or shots', 'child or children or baby or babies or paediatric or pediatric', 'barriers or determinants or factors', 'migrant or immigrant or migration or immigration', 'Myanmar' and 'Thailand'. Combining medical subject headings and said search terms were used as a search strategy.

Table 2.1 Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Published between 2010-2020	Published before 2010
Original studies	Secondary research articles, e.g. a literature review
Peer-reviewed literature	Not a peer-reviewed literature
Published in English language	Published in other languages
Related to factors influencing migrant children immunisation	Related to adult immunisation Not related to factors influencing migrant children immunisation

Table 2.1 above shows the inclusion and exclusion criteria, based upon the year of publication, type of studies, language, and research approach. All searches focused on original studies published in peer-reviewed English journals were included in this literature review. All studies, including qualitative and quantitative, that address factors influencing the immunisation rate among migrant children and met the inclusion criteria were included. Initially, the researcher intended to have only articles published from 2015–2020, but a scarcity of relevant research was completed within the last five years. Thus, broadening the research time frame would increase the potential articles found, focusing on the articles published in 2010–2020. Applying

the inclusion and exclusion criteria and the described search terms yielded a few pieces that seemed helpful in exploring the research question. After some initial searches, due to limited numbers of relevant articles, the search terms ‘Thailand’ and ‘Myanmar’ were excluded. A manual search of the reference lists from the relevant reports and searching from Findit@Flinders were used to broaden the search.

A search of the three databases using the search criteria resulted in 293 articles from CINAHL 67 articles, from Medline 35 articles, and from ProQuest 186 articles. Additionally, there were five articles from additional records through grey literature and Findit@Flinders. The 27 duplicate articles were excluded. The title and the abstract of 266 articles were screened by reading for relevance to the research question. There were 236 articles excluded as they were not related to the research question and did not address the inclusion criteria. The remaining 30 articles achieving all criteria were read in full text. There were then 18 articles excluded: 11 articles did not study the migrant children group, four articles did not include factors influencing immunisation, and three articles did not report original data. As a result, the final number of 12 articles were included in the review.

The review process and the search results are represented in the PRISMA chart (see Appendix 1). The final 12 articles for the review originated from China (4), Thailand (3), Nigeria (1), India (1), Netherlands (1), United States (1) and Sweden (1). The 12 articles consisted of eight quantitative studies and four qualitative studies. The year of publication ranged from 2010 to 2019.

2.4 Critical appraisal and critique

A research critique is a detailed evaluation of a study’s strengths and weaknesses (Polit & Beck, 2017). The selected 12 articles were analysed by critical appraisal tools determining the quality and reliability of the studies. Each study was assessed and analysed to determine the value of individual studies and the overall quality of a study. It is essential to use appropriate

appraisal tools to assess the quality of chosen articles included in the review (Polit & Beck, 2017). The CASP checklist specified for the study design was used to appraise each paper and summarise the results in the tables shown in Appendix 2 for qualitative studies and in Appendix 3 for quantitative studies. The critique results were reviewed by a second reviewer who is a Master of Nursing student. The qualitative studies were appraised by the CASP tool appropriate to the research methodology of each paper (CASP, 2018). The weak points of qualitative studies were ethics approval and researchers' bias. For example, the Canavati study (2011) did not mention how the researcher avoids a conflict of interest. The cross-sectional studies were appraised by the CASP cross-sectional study tool (Downes, Brennan, Williams, & Dean, 2016). The weak points of quantitative studies were the sampling method and ethics approval. Some studies did not show how the researcher recruited the participants (Antai, 2010). Moreover, some studies did not have ethical approval because the researcher stated it was a part of the national surveys (Hu et al., 2013). However, no articles were excluded as all articles were considered rigorous in findings and methods once assessed against the critical appraisal tools. The final number of relevant articles was 12, which were included in the literature review.

2.5 Presentation of the findings

The findings of the 12 selected articles discuss the factors influencing immunisation in migrant children in seven different countries. Regarding the factors influencing immunisation, a thematic analysis was conducted on included article's findings. A summary of all articles included in the review is shown in Appendix 4. The initial step to analyse the theme was identifying the results from qualitative and quantitative studies and categorising them into themes by grouping similar findings into the same theme. After that, the researcher analysed and interpreted each theme by creating a connection between them. As a result, the six themes in the prevalence of factors influencing immunisation uptake identified include demographic factors, parents' lack of knowledge and awareness toward immunisation, health

service issues, attitudes toward immunisation, socioeconomic factors, and difficulties in accessing healthcare services. Each theme has sub-themes developed from each article's findings shown below.

Table 2.2: Theme table

Themes	Sub-themes	Article number	References
Demographic factors (8)	Parent's age	1,2,7,8,9	(Antai, 2010); (Baker, Dang, Ly, & Diaz, 2010); (Hu et al., 2013); (Kusuma, Kumari, Pandav, & Gupta, 2010); (Munsawaengsub et al., 2011)
	Number of children in a family	1,3,7	(Antai, 2010); (Canavati et al., 2011); (Hu et al., 2013)
	Parent's education level	1,2,5,7,8,9	(Antai, 2010); (Baker et al., 2010); (Han et al., 2014); (Hu et al., 2013); (Kusuma et al., 2010), (Munsawaengsub et al., 2011)
	Legal status	3,4	(Canavati et al., 2011); (Godoy-Ramirez et al., 2019)
Parent's lack of knowledge and awareness toward immunisation (8)	Parent's immunisation knowledge	3,5,9,10,12	(Canavati et al., 2011); (Han et al., 2014); (Hu et al., 2013); ; (Prakunwisit & Areesantichai, 2015); (Wang, Lam, Wu, Liao, & Fielding, 2014)
	Length of migration	7,8	(Hu et al., 2013); (Kusuma et al., 2010)
	awareness of the importance of immunisation	3, 11	(Canavati et al., 2011); (Sun et al., 2010)
Health service issues (7)	Place of delivery	1,5,7,8	(Antai, 2010); (Han et al., 2014); (Hu et al., 2013); (Kusuma et al., 2010)
	Staffing issues at HCCs	1,6,8,9,10	(Antai, 2010); (Harmsen et al., 2015); (Kusuma et al., 2010); (Prakunwisit & Areesantichai, 2015); (Wang et al., 2014)
Attitudes toward immunisation (5)	Religion and ethnicity	2,6	(Baker et al., 2010); (Harmsen et al., 2015)
	Misunderstanding about immunisation importance	4,5,6,10	(Godoy-Ramirez et al., 2019); (Han et al., 2014); (Harmsen et al., 2015); (Wang et al., 2014)
Socioeconomic factors (5)	Parent's occupation	1,3,5,8	(Antai, 2010); (Canavati et al., 2011); (Han et al., 2014); (Kusuma et al., 2010)
	Parent's income and status	1,5,7	(Antai, 2010); (Han et al., 2014); (Hu et al., 2013)
Difficulty in accessing immunisation service (3)	Distance to HCCs	3,6	(Canavati et al., 2011; Harmsen et al., 2015)
	Language barriers	6,10	(Harmsen et al., 2015; Prakunwisit & Areesantichai, 2015)

Table 2.2 above illustrates the condensing of the themes found in the literature review. Of note, eight articles found that demographic influences had impacted the immunisation rates. Each of the themes is identified in Table 2.2. will be addressed in sequence.

2.5.1 Demographics factors

This theme consisted of four subthemes, including the parent's age, the number of children in the family, parent's level of education and parent's legal status categorised from eight articles that mentioned demographic factors related to migrant children immunisation.

One important demographic factor that could significantly affect migrants' children access to healthcare is the parent's age. Five quantitative studies focused on the association between parent's age and children's immunisation rate (Antai, 2010; Baker et al., 2010; Hu et al., 2013; Kusuma et al., 2010; Munsawaengsub et al., 2011). Three quantitative studies, one study conducted in China (Hu et al., 2013), one study conducted in California (Baker et al., 2010) and another study conducted in Thailand (Munsawaengsub et al., 2011), described that there was no difference in migrant children immunisation coverage by the parent's age. However, two studies argued that there was a correlation between parent's age and their children's immunisation uptakes (Antai, 2010; Kusuma et al., 2010). Antai (2010) found that the likelihood of completed immunisations was considerably higher for children of mothers aged 34 years old or older. In contrast, children whose mothers gave birth to their first child when they were 18 years old or younger seemed to have a reduced chance of receiving full vaccinations (Antai, 2010). Similarly, a cross-sectional study on migrant mothers in India supported this point, offering a reasonable explanation for such correlation that the older the mother, the more responsible, aware and mature they were to take care of their child (Kusuma et al., 2010).

Another influential factor from previous researchers has investigated the migrant children's immunisation rate and the number of children in the family. A quantitative study in Nigeria explained that the more children there were in the family, the more time and parents'

attendance needed (Antai, 2010). Some parents did not have enough time to take all their children to receive complete immunisations (Antai, 2010). A qualitative study in Thailand also mentioned that some parents expressed that they have many children to care for, so they do not have money or time to take their child for immunisation services (Canavati et al., 2011). However, a cross-sectional study in East China found that the number of children in the family did not relate to the immunisation rate (Hu et al., 2013).

While it is not always clear how educated and knowledgeable migrant parents are about immunisation, this plays an essential role in helping children get their vaccinations on time (Baker et al., 2010). Five quantitative studies found that the likelihood of a child getting full immunisations rose with parent's education level (Antai, 2010; Han et al., 2014; Hu et al., 2013; Kusuma et al., 2010; Munsawaengsub et al., 2011). A quantitative study in Thailand showed that migrant mothers with a lower-level education had a 4.92 times higher likelihood of incomplete immunisation of their children (Munsawaengsub et al., 2011). However, a study in California found a negative correlation between parent's level of education and migrant children's immunisation rate.

The last demographic factor related to the immunisation rate was the parent's legal status. Although many countries have the policy to provide healthcare access to all people, this right to healthcare might not be extended to unregistered migrants (Godoy-Ramirez et al., 2019). Unregistered migrants in Sweden expressed fear of being questioned about their legal status and their children's health (Godoy-Ramirez et al., 2019). For example, although when their child had a health problem, most unregistered migrants would try to avoid encounters with healthcare providers and potentially the police because of their questionable citizenship (Canavati et al., 2011). Moreover, unregistered migrants in Thailand mentioned that they were afraid of being arrested because many police checkpoints were on the way to HCCs. Only if their child had a severe illness would they take them to HCCs (Canavati et al., 2011; Godoy-Ramirez et al., 2019).

2.5.2 Parent's lack of knowledge and awareness toward immunisation

In this theme, there were three sub-themes summarised from the findings of eight studies: the level of parent's immunisation knowledge, the length of migration, and remembering the children immunisation appointment.

Parent's knowledge of childhood immunisation influences migrant children immunisation coverage in many studies (Prakunwisit & Areesantichai, 2015; Wang et al., 2014). Han et al. (2014) found a significant association between the level of immunisation knowledge and migrant children immunisation coverage. A qualitative study among the migrants living at the border of Thailand found that parents avoided taking their child to receive vaccinations because they feared that their child would have side effects after vaccination (Canavati et al., 2011). A qualitative study in China described that participants had poor immunisation knowledge, affecting immunisation uptake (Wang et al., 2014). It is, therefore, crucial to provide guidance and education for parents about children's healthcare so that they better understand the context of immunisations (Wang et al., 2014).

Moreover, the host country's migration length also relates to immunisation coverage (Hu et al., 2013). The longer their period of stay, the greater their ability to adapt to the new society (Kusuma et al., 2010). Regarding the length of stay of migration, a quantitative study in India categorised migrants into two groups, including recent migrants and settled migrants. Settled migrants moved to the new area for more than five years, while those who stayed less than five years were considered recent migrants (Kusuma et al., 2010). The quantitative studies in India and China found that children of recent migrants are less fully vaccinated than children of settled migrants (Hu et al., 2013; Kusuma et al., 2010).

In addition, parent's awareness towards immunisation related to children's immunisation rate. A quantitative study in China found that age-appropriate immunisation coverage associated with the primary caregiver's awareness of the importance of vaccination (Sun et al., 2010). Also, the qualitative study in Tak province explained that Myanmar migrant children could not

have complete vaccination because their parents could not remember when their child should be vaccinated (Canavati et al., 2011). Thus, improving parent's awareness might increase immunisation coverage in migrant children (Sun et al., 2010).

2.5.3 Health service issues

This theme consisted of two sub-themes: the place of delivery and staffing issues at the HCC, categorised from seven articles.

Healthcare services and policies in the host country had a significant effect on migrant immunisation coverage. Migrant mothers who had a child delivered at the hospital usually continued to use healthcare services such as childhood immunisations and a postnatal clinic (Antai, 2010). Children born in the hospital always receive health documents that show the immunisation schedule, immunisation appointments, and other health information (Kusuma et al., 2010). Compared with children born at home, children born in the hospital were more likely to receive age-appropriate immunisations (Han et al., 2014). Sometimes, children born at home were not immunised or followed by healthcare providers (Han et al., 2014).

The staffing ratios and the level of training of healthcare professionals working at health centres can, directly and indirectly, affect the coverage of migrant children's immunisation (Antai, 2010). These health workers undertake various duties such as communicating with patients, performing the procedures and affecting immunisation services for migrant children. Harmsen et al. (2015) explained that the nurses or other healthcare providers' clinical knowledge was essential and related to the migrant's immunisation rate. Some migrant parents would need more explanation about the vaccine's effects and vaccine appointment, but there was not always enough staff to take care of all parents (Kusuma et al., 2010). Moreover, when a recommendation to conduct an immunisation comes from healthcare providers, it has a more pronounced impact on migrant parents' likelihood to take their children for vaccinations on time (Wang et al., 2014). As shown in the Myanmar migrant children in

Thailand, among children with full immunisation, 75.3% of their mothers had received health information from professionals (Prakunwisit & Areesantichai, 2015).

2.5.4 Attitude toward immunisation

This theme consisted of two sub-themes: religion and ethnicity; and misunderstanding about immunisation importance, categorised from five articles. Attitude toward immunisation can influence immunisation coverage. Migrant mothers with negative attitudes toward immunisation had a 4.22 times higher chance of incompletely immunised children (Munsawaengsub et al., 2011). While religion and ethnicity are not attitudes, these factors impact attitude toward immunisation. Religion and ethnic backgrounds are among the attitudes that have been identified as affecting how likely migrant children are to receive vaccinations (Baker et al., 2010). Harmsen et al. (2015) found that Muslim migrant parents tend to foster a positive attitude believing that vaccinations were necessary for their children. Misunderstanding of immunisation knowledge led to poor attitudes towards immunisation (Munsawaengsub et al., 2011). Some parents are not aware that minor side effects such as fever are common, and when this occurs, it causes them to avoid further immunisation (Godoy-Ramirez et al., 2019).

2.5.5 Socioeconomic factors

This theme consisted of two sub-themes categorised from five articles: parent's occupation and parent's income and status. Socioeconomic factors can significantly affect immunisation rates, as illustrated by a study of migrant families with higher income who are more likely to have their children being immunised (Han et al., 2014). The career of the parents affects the immunisation rate (Kusuma et al., 2010). The more flexible the parent's job, the higher their chances for their children to access timely and complete immunisations (Kusuma et al., 2010). Conversely, most migrant parents in China work as manufacturing employees for long hours with low pay, which prevents them from taking their children to get appropriate-age vaccines (Han et al., 2014).

2.5.6 Difficulty in accessing immunisation service

This theme consisted of two sub-themes categorised from three articles. The two sub-themes are distance to HCCs and the language barrier.

In general, most migrants in different regions usually do not have good access to public facilities and services because of the distance to the HCC from their location in the countryside or rural areas. A qualitative study by Canavati et al. (2011) in Tak province (Thailand) showed that most Myanmar migrant parents could not obtain healthcare services because they lived too far away and there was no public transportation in their neighbourhood. Harmsen et al. (2015) found that parents of migrant children in Guangdong, China, also faced the same barrier due to the lack of public transportation and the occurrence of natural disasters, such as flooding.

Communication with healthcare providers was essential to making the migrant parents understand the necessity of immunisation (Harmsen et al., 2015). Harmsen et al. (2015) found that the language barriers of migrant parents in the Netherlands led to misunderstood communication that related to lower immunisation rates. Migrant parents in Thailand did not always understand the Thai language, which led to a lack of knowledge about immunising their children (Prakunwisit & Areesantichai, 2015). Another study in Thailand described a lack of health documents translated into the migrant's language, making migrant parents unable to understand the necessity of immunisation (Munsawaengsub et al., 2011).

2.6 Discussion

Maintaining and increasing immunisation coverage among children is significant in preventing VPD outbreaks (WHO, 2019b). The WHO (2019c) describes how addressing a low rate of or incomplete vaccination requires a proper understanding of the problem's barriers and the need to provide the appropriate management to help hard to reach people access to immunisation services. This literature review summarises the findings relevant to the factors associated with the immunisation rate in migrant children. There are six themes of the barriers

to immunisation in migrant children summarised in this literature review. In different countries, there were significant factors that influenced the immunisation rates of migrant children.

This literature review's findings indicate similar themes to a systematic review of factors associated with incomplete vaccination internationally (Tauil, Sato, & Waldman, 2016). First, family features such as demographics and socioeconomic background are associated with the childhood immunisation rate (Tauil et al., 2016). This theme also includes the parent's religion and culture. Second, parent's knowledge and attitudes affect children immunisation uptake (Tauil et al., 2016). One qualitative study in Sweden found that some parents thought their children would be sick after receiving immunisations (Godoy-Ramirez et al., 2019). That made these parents avoid immunising their children. Third, healthcare service issues also have an essential role in supporting migrant children accessing immunisation services (Tauil et al., 2016). Many studies have shown that migrant children experienced difficulties accessing immunisation services due to the distance of healthcare services and the lack of public transportation (Canavati et al., 2011; Harmsen et al., 2015; Tauil et al., 2016). Moreover, most Thai healthcare services only provide health information in the Thai language. Sometimes, migrant people cannot understand the Thai language. That makes migrant people forget their appointment and unable to understand the necessity of getting immunised (Prakunwisit & Areesantichai, 2015)

Myanmar migrants constitute most of the migrant population in Thailand (Harkins, 2019). Many Myanmar children living in Thailand do not get age-appropriate vaccines, impacting the outbreak of VPDs (MoPH, 2017). This issue should be investigated for the main factors that influence the immunisation rate in Myanmar migrant children. The study of Canavati et al. (2011) in Tak province at the Thailand border of Myanmar provided an immunisation program at school for migrant children and provided immunisation education to parents and teachers. This research has changed immunisation practice and service delivery. However, the school immunisation program did not support other migrant children under school age (0–4 years).

It appears that there are few studies that research barriers to immunisation in Myanmar migrant children in Thailand. Moreover, two studies were conducted at the Thailand border with Myanmar. The literature incorporated in this review suggests that a future study should be conducted in different areas in Thailand, such as Samut Sakhon Province, which has the largest Myanmar migrant community. As this group has not been targeted with any current strategies, the target population should be migrant children under school age.

2.7 Research questions

1. What are the factors that influence the immunisation rate for Myanmar migrant children in Samut Sakhon Province, Thailand?
2. What is the relationship among parent's age, the total number of children in the family, parent's education level, family income, length of stay in Samut Sakhon Province and immunisation uptake in Myanmar migrant children aged under five years?

2.8 Hypothesis

1. The parent's age is related to the immunisation rate in Myanmar migrant children aged under five years
2. The number of children in a family living in Thailand with their family is related to the immunisation rate in Myanmar migrant children aged under five years
3. The total family income is related to the immunisation rate in Myanmar migrant children aged under five years
4. The parent's education level is related to the immunisation rate in Myanmar migrant children aged under five years
5. The length of stay in Samut Sakhon Province is related to the immunisation rate in Myanmar migrant children aged under five years
6. The migrant parent's legal status is related to the immunisation rate in Myanmar migrant children aged under five years

2.9 Conceptual framework

Regarding the literature review, the researcher selected six parent's demographics that might impact children's immunisation rates. The questions directly relate to each area arising from the literature. A correlation test determined the relationship between these areas and the influence of these factors on each theme.

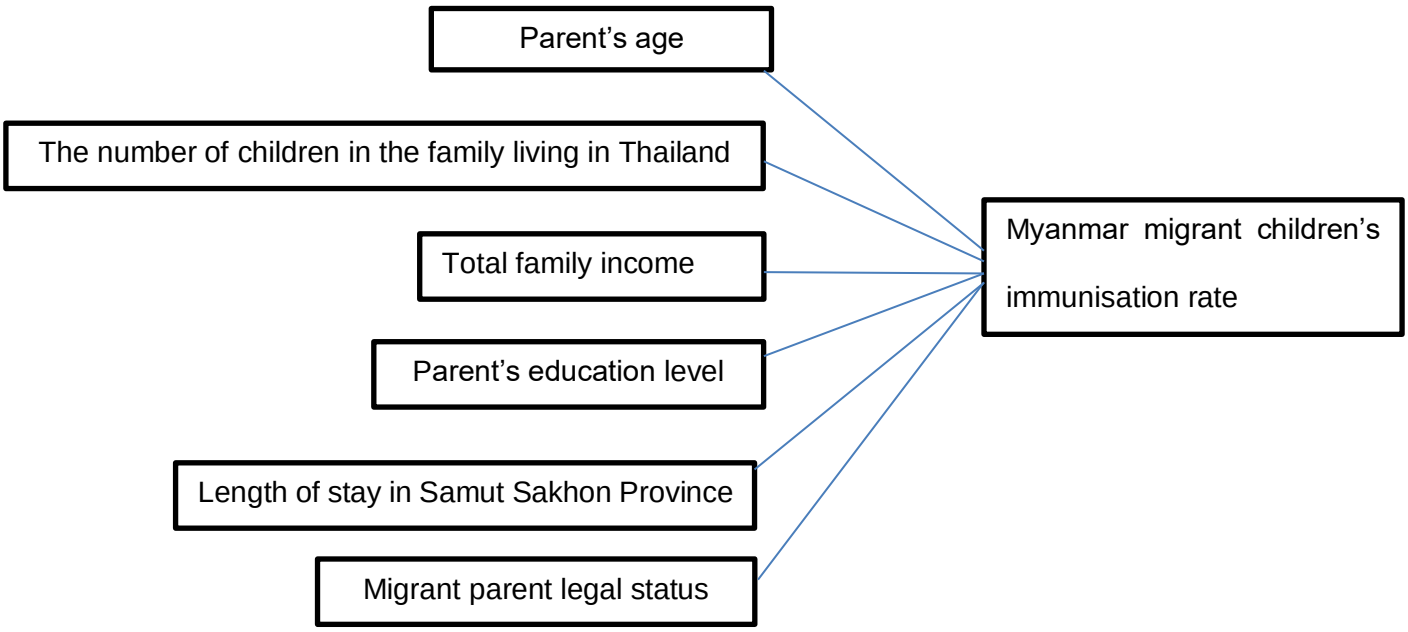

Figure 2.1: A conceptual framework

Figure 2.1 above illustrates the conceptual framework emerging from the literature review findings and that has been incorporated into the questionnaire. This research project and thesis aimed to implement the questionnaire in an area of high migrant labourers to determine if the barriers and enablers highlighted in the literature impact the Myanmar migrant workers and their families.

2.10 Limitation

The literature review was expanded to a ten-year limit because there were not enough relevant articles concerning migrant immunisation within the last five years. According to inclusion

criteria that only include the original English articles, the research may have missed relevant articles in other languages. Some relevant articles in Thai language were not included in the literature review because they were conducted for more than ten years. Literature in the Thai language may identify the specific barriers from a Thai perspective similar to the target population, consistent with this review's research question.

2.11 Conclusion

The literature review provides an understanding of the factors associated with immunisation coverage. Researchers in this area contributed to knowledge about the factors influencing immunisation uptake among migrant children in several countries. The factors influencing immunisation uptake can be categorised into six themes: parent's lack of knowledge and awareness; demographic factors; health service issues; attitudes toward immunisation; difficulties accessing healthcare services; and socioeconomic factors. The literature review helped to create the questionnaire used in this study. The previous research conducted in Thailand did not focus on parent's attitudes and awareness across larger cohorts of participants. The critique of the literature assessed the methodologies. This literature review assisted in determining the appropriate method and research design to conduct future research.

3 CHAPTER THREE: METHODOLOGY

3.1 Introduction

The previous chapters have discussed the study's background and the literature review relating to factors influencing the immunisation rates of migrant children. This chapter outlines the research methods and explains how the study was carried out. The chapter starts with an overview of the methodology that is supported using a quantitative approach to address the research question and an explanation of the study's research design. The discussion of the sampling, the recruitment venue, the recruitment process, data collection and the study's ethical considerations are explained. An explanation of the research's rigour and method used for data analysis are also described in this chapter.

3.2 Paradigm identification

Using the quantitative paradigm here answers the research question appropriately. Polit and Beck (2017) described quantitative research as identifying characteristics, frequencies, trends, correlations, and categories in and of a specific population. It also relies on the collection and analysis of numerical data to describe, explain, predict, or control variables and phenomena of interest (Gray, Grove, & Sutherland, 2017). All quantitative studies' findings are expected to be replicable and generalised to similar groups (Schneider, Whitehead, & LoBiondo-Wood, 2016). Regarding the present study, the research question aims to identify barriers to immunisation, and examine the correlational relationship between the parent's demographics and the immunisation rate among preschool-age (zero to five years old) migrant children in Samut Sakhon Province, Thailand. The quantitative study describes the current status of identified variables, such as the relationship between parent's age and children's immunisation rates, and provides systematic information about the factors under investigation. The findings can be generalised to a similar population to show the impact of several characteristics on immunisation rates for migrant children (Polit & Beck, 2017). As this study aimed to gather generalised information about the barriers to immunisation facing Myanmar migrants in Thailand, the researchers did not use a qualitative approach to examine their in-depth experiences.

3.3 Methodological approach justification

The methodology used in this research is a simple correlational study. According to the research problem statement, it is known that the immunisation rates are lower or incomplete for Myanmar migrant children living in Thailand (Kantayaporn et al., 2013). For many years, the under-immunisation of migrant children has not been addressed or managed by the relevant organisations (Muangchana et al., 2010). One reason for this could be that the relevant organisations do not know exactly which factors or causes influence low immunisation rates in Myanmar migrant children. Although some studies were conducted in a similar population – one qualitative study in Tak Province (Prakunwisit & Areesantichai, 2015) and one quantitative study conducted more than a decade ago (Munsawaengsub et al., 2011), – these may not represent the current context of migrant parents in Samut Sakhon Province. Thus, it is necessary for this thesis to determine the present barriers to immunisation uptake. Also, the researcher must focus on how each factor relates to the Myanmar migrant children's immunisation rates. Thus, the most appropriate methodology is a simple correlational study.

A correlational study is a type of research design in which a researcher seeks to understand the natural relationship between pairs of variables (Schneider et al., 2016). A correlational study is an efficient method of collecting data about an issue of interest (Schneider et al., 2016). Correlational studies provide a framework to explore the relationship between variables that cannot be manipulated and is useful for identifying areas for future research (Schneider et al., 2016). The statistics used to establish the results are predominantly correlational, while descriptive statistics are used to describe participants' characteristics, children's immunisation history and barriers to immunisation (Gray et al., 2017). A descriptive correlational study was chosen as a methodological approach in this research to determine the barriers relating to poor vaccination uptake. The present study helps to identify the barriers to vaccination uptake, inform policy-making, and decrease instances of VPDs and the associated preventable deaths of migrant children in Thailand.

3.4 Method

A web-based questionnaire survey (produced using Qualtrics) was used to collect data about the parents' demographics, Myanmar migrant children's immunisation rates and the barriers to immunisation faced by Myanmar migrant children. An online survey requires less time than a face-to-face survey, and the results can be generalised to other Myanmar migrant groups (Schneider et al., 2016). Furthermore, an online survey is well suited to investigating variables that have specific participant characteristics (Bonita, Beaglehole, & Kjellström, 2006). Previous studies have only explained the barriers of immunisation from a qualitative perspective: the current research operationalised that into a quantitative perspective in the survey. Also, some findings from the quantitative studies were selected for inclusion in the survey too. A survey was chosen to capture information on Myanmar migrant parents' views and their characteristics, potentially reaching a wider proportion of Myanmar migrant parents living in Samut Sakhon Province, Thailand, for an overall description of the topic under investigation. Thus, the researcher can explore barriers to immunisation experienced by Myanmar migrant children and the variables associated with the Myanmar children's immunisation rates.

3.5 Setting

The study was conducted where Myanmar migrants reside in Mueang District, Samut Sakhon Province, Thailand. A large number of Myanmar migrants live in multistorey condominiums in Mueang District with their families. Public health technical officers (PHTOs) from Samut Sakhon Hospital are responsible for providing home visits in this area. During the home visits, two PHTOs from Samut Sakhon Hospital volunteered to provide the families with flyers about the research.

Myanmar migrants have accounted for the majority of migrants in Thailand for many years (Harkins, 2019). Most Myanmar migrants live in Samut Sakhon Province, located in central Thailand (Foreign Workers Administration Office, 2015). In 2018, there were 243,748 Myanmar workers in Samut Sakhon, while Mueang District had the highest number of Myanmar migrants because it is an industrial district surrounded by many factories (Provincial Labour Office Samutsakhon, 2018). Samut Sakhon Hospital provides home visits to migrants living in Mueang District to assess their

health and problems. Through the home visits, PHTOs interact with the migrant population, including children, their parents, adult migrants and the elderly.

3.6 Sample

The participants were Myanmar parents residing in Mueang District, Samut Sakhon and receiving home visits from Samut Sakhon Hospital. The inclusion and exclusion criteria are shown in Table 3.1 below. The participants were aged 18 or over and were parents of Myanmar migrant children. The research did not include parents of migrant children from other countries, such as Cambodia and Laos. Participation was open to all Myanmar parents with at least one child in the family aged five or younger (under school-aged). Participants included both registered and unregistered migrants. The length of stay in Thailand was not an eligibility criterion. Respondents had to be able to connect to the internet to access the online survey. Moreover, participants had to be able to read and write in the Myanmar-language to answer the questionnaire.

Table 3.1: Inclusion and exclusion criteria for the study

Inclusion	Exclusion
• Myanmar migrant parents • Parents of Myanmar migrant children living in Samut Sakhon Province, Thailand. • Aged 18 or over • Have at least one child under school-age (less than five years old). • Able to read and write in Myanmar-language. • Able to connect to the internet	• Migrant parents from countries other than Myanmar, such as Laos and Cambodian • Parents of Myanmar migrant living outside Samut Sakhon Province, Thailand • Aged under 18 years old • Illiterate • No internet access • Refuse to participate in the study.

3.7 Sampling strategy

To ensure a successful data collection process, the researcher identified a sampling strategy to provide access to potential participants suitable for the study (Polit & Beck, 2017). A convenience sampling method was used to recruit all potential participants via home visits by PHTOs from Samut Sakhon Hospital across Mueang District, Samut Sakhon Province. Convenience sampling is a type of non-probability sampling commonly used when an entire population cannot be accessed (Costa

& Schneider, 2016). PHTOs presented recruitment flyers to all potential participants during the home visits. According to the limited number of Myanmar migrant parents of under school-age children, it was better to select an accessible population (Gerrish & Lathlean, 2015). Snowball sampling was also be used to recruit potential participants (Polit & Beck, 2017). PHTOs asked participants to share the survey link with other potential participants. The recruitment flyers also encouraged potential participants to forward information about the project to other people who may be interested (see Appendices 5 and 6 for the English-language flyer and Myanmar-language flyer, respectively). To screen the target participants, the survey's first page provided the inclusion and exclusion criteria to ensure that only Myanmar parents completed the survey.

3.8 Sample size justification

According to the Myanmar migrants' legal status, there were two groups of migrants: registered and unregistered migrants. The actual number of Myanmar migrants in Samut Sakhon was challenging to determine because there are no statistical records of all the Myanmar migrant children in the province. However, the Samut Sakhon Hospital's records from home visiting show 441 Myanmar children under seven years old in Mueang District (Samut Sakhon Hospital, 2018). This research used a simplified formula for Yamane proportions to calculate the sample size with a 95% confidence interval, 5% precision level and 441 population numbers (Israel, 1992). The sample size calculated by the Yamane formula was 210 participants.

3.9 Instrument

The questionnaire was created based on an analysis of the literature review reported in Chapter 2. From the literature review, themes emerged regarding the factors influencing immunisation rates in migrant children. The online survey consisted of three parts and 31 questions, of which 12 covered the parents' demographics and backgrounds. There were three questions about the children's immunisation history and 16 questions exploring the potential barriers to immunisation. The survey aimed to identify the barriers to immunisation experienced by Myanmar migrant children.

The first part of the questionnaire consisted of demographic questions adapted from the questionnaire used in the studies by Munsawaengsub et al. (2011) and Prakunwisit and Areesantichai (2015). These consisted of 12 demographic questions to elicit information related to the relationship to the child, parent's age, religion, marital status, the number of children in the family, the number of children living with the participant in Thailand, educational level, occupation, monthly family income, income sufficiency, the length of stay in Samut Sakhon Province, legal status and details about the children. The demographics and immunisation rate questions were closed-ended, with a fixed number of alternative responses that addressed the parents', family's and children's characteristics (Costa & Schneider, 2016).

The second part of the questionnaire consisted of three questions about the children's immunisation history, including the completeness of the children's immunisation status, on-time immunisation status and if each child had a pink book. The pink book is provided at birth in Thailand by hospitals and birthing centres for all children to collate and map their health services use and immunisation status. The immunisation history questions used closed-ended questions, with three alternative responses included 'yes', 'no' and 'not sure'.

The third section of the questionnaire asked about barriers to immunisation by using five-point Likert scale questions, which are used to determine a participant's opinion. A Likert scale is a questionnaire item used to obtain people's opinions based on a rating scale that allows participants to feel more at ease when selecting an answer (Nardi, 2018). The questions in this section were separated into four themes. Questions 17 to 20 pertained to theme A, difficulties in accessing the immunisation service. Questions 21 to 24 addressed theme B, which was knowledge and awareness of immunisation among participants. Questions 25 to 28 were about theme C, parent's attitudes toward immunisation. Questions 29 to 32 asked about theme D and identified potential issues accessing health services. Participants had to read each statement and indicate which answer best fits their experience of immunisation services in Thailand by selecting a response on a 1 to 5 rating scale (where 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree). Additionally, at the end of each theme, there was an open-ended question for participants who

wanted to add extra information about the barriers to immunisation they may have experienced. The validity and reliability of the questionnaire instrument were tested prior to use (see Section 3.10 for a description). The full English-language version of the questionnaire can be found in Appendix 7 and the Myanmar-language version in Appendix 8.

3.10 Rigour appropriate for approach

Methodological rigour in quantitative research refers to the soundness or accuracy of a study in terms of research planning, data collection, analysis and reporting (Marquart, 2017). To enhance quantitative studies' rigour, it is essential to include techniques to avoid bias and control for confounding variables (Polit & Beck, 2017). In this research, the validity and reliability of the research are considered in each process of the quantitative study.

Validity is a quality criterion referring to the degree to which the study's inferences are precise and well-founded in measurement (Polit & Beck, 2017). The researcher created the data-collecting instrument (questionnaire) based on previous studies and a comprehensive literature review (Chapter 2). The questionnaire was tested for content validity and the comprehensiveness of content by six experts. The definition of content validity was the degree to which an assessment instrument's items are relevant to the targeted construct for a particular assessment purpose (Yusoff, 2019). The six experts who reviewed the questionnaire were two paediatric nurse instructors with expertise in childhood immunisation and development in Thailand; one Myanmar paediatric nurse, who works with Myanmar children; one paediatric nurse practitioner in Australia; one family doctor with expertise in immunisation and one pharmacist with expertise in migrant groups (see the list of experts in Appendix 9). The six experts were provided with the questionnaire and the content validity form described by Yusoff (2019).

In the content validation form, the definition of domain and the items that represent the domain were provided, as shown in Appendix 10. The experts were requested to critically review the domain and its items before scoring each item. The experts were encouraged to provide comments to improve the relevance of the items to the targeted domain. The experts had to score each item independently

based on the relevant scale (where 1 = the item is not relevant to the measured domain, 2 = the item is somewhat relevant, 3 = the item is quite relevant, and 4 = the item is highly relevant) (Yusoff, 2019). Before calculating the content validity index (CVI), the relevance rating was recoded as zero (relevance scale of one or two) or one (relevance scale of three or four). Then the researcher calculated the content validity index for this instrument based on the average method (see Appendix 11). The scale-level content validity index [total] = 0.97, which is more than the acceptable cut-off score for CVI (Yusoff, 2019). Next, the questionnaire was translated into Myanmar. The face validity of the questionnaire in Myanmar was tested through consultation with a Myanmar nursing paediatric instructor from Mandalay University to ensure the completeness of the questionnaires in relation to the research objectives.

3.11 Data collection

The web-based questionnaires were used to collect the data (produced using Qualtrics). The final version of the questionnaire was developed using the Qualtrics tool, an online tool to create and distribute questionnaires to participants (Qualtrics, 2019). All the items were translated into Myanmar, as the potential respondents were Myanmar migrant parents. Healthcare staff from Samut Sakhon Hospital recruited potential participants for the study during home visits by promoting the project's flyers and using a verbal script (see Appendix 12). Home visits by PHTOs from Samut Sakhon Hospital usually occur two to three days per week. During home visits, the staff promoted the project's flyers to potential participants. The staff also promoted the recruitment poster at health events for Myanmar migrants. The recruitment flyers consisted of general research information, the purpose of the research, participation criteria, a link and the QR code for the online survey (see Appendix 6). The first page of the survey provided the information sheet (see Appendices 13 and 14 for the information sheet in English-language and Myanmar-language, respectively). Participation in the project was voluntary, and potential participants were advised that participating in the research had no impact on their current or future care provision. Data collection started after the participants accessed the questionnaire via the web link. Participants were advised that they could quit the survey

anytime if they felt uncomfortable. The average participation time to complete the survey was less than ten minutes. The data collection processes in this study are shown below.

1) This study required ethics approval from two committees. The first committee was the Social and Behavioural Research Ethics Committee (SBREC) of Flinders University (see Appendix 15). After receiving approval from Flinders University, the researcher submitted this approval to the Samut Sakhon Hospital's Institutional Review Board (IRB) in Thailand to conduct the research there (see Appendix 16). Each committee's consideration process took between four weeks and three months. The researcher conducted the research only after gaining approval.

2) Following ethical approval, the researcher contacted the head of the social medicine department at Samut Sakhon Hospital. The researcher had an online meeting with the head home visiting team and their team from the department of social medicine at Samut Sakhon Hospital to introduce herself, and explain the study's purpose and data-collecting process.

3) Recruitment was done by healthcare workers (HCWs), who promoted the project's flyer during home visits to potential participants and used a home visit recruitment verbal script.

4) Potential participants interested in joining the project accessed the survey link via a QR code or a website from the flyer. The potential participants then read the information sheet, which was the first page of the survey. If potential participants were happy to complete the survey, they clicked 'Start the survey' to enter the questionnaire. If potential participants did not want to participate in the survey, they could close the survey at any time.

5) After completing the survey, all data were saved in a password-protected electronic file. Only project researchers can access the data. The data are stored securely at the College of Nursing and Health Sciences, Flinders University, for five years after publication.

3.12 Ethical consideration

Ethics approval to conduct the study was granted through Flinders University's SBREC (approval number 8537), in line with the National Statement on Ethical Conduct in Human Research guidelines,

deeming it to be a ‘low or negligible risk’ research project. As this study’s participants were the parents of Myanmar migrant children living in Thailand, ethics approval from the IRB at Samut Sakhon Hospital, Thailand was obtained, in line with the ethics-based International Guidelines for Human Research Protections, the Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice (ICH-GCP).

Anonymity and confidentiality were implemented to ensure that the respondents were treated fairly and respectfully. The survey was designed so that it did not request any identifying information from the respondents, such as their name and address, and to keep participants anonymous. Plus, the researcher de-identified all personal data by using an identification number. Regarding the participants’ confidentiality, all survey responses are stored using a password-protected electronic file and will be kept securely in Flinders University’s cloud storage for at least five years after publication as per the National Health and Medical Research Council (2019) standards.

There was a low-risk burden related to respondents’ participation in this research. There was a small chance some participants could experience emotional discomfort from answering the online survey. The researcher provided research information and the contact details for support services on the information sheet, and at the beginning and the end of the survey. If the participants experienced emotional discomfort or distress, they were advised to contact the mental health department’s hotline on 1323 for support or counselling. The survey was created to ask only necessary questions to minimise any potential burden participants might feel by giving up their time.

3.13 Data analysis

The data from the responses were analysed by Statistical Packages for the Social Science (SPSS) software version 21. The data was collected and downloaded from the Qualtrics site into SPSS. The descriptive statistics describe the general characteristics, demographics, children’s immunisation history data and barriers to immunisation data, such as mean, standard deviation and frequency. Categorical data, which include nominal and ordinal measurements, were described in this study.

This research further explored the relationships between the parent's demographics and their children's immunisation rates using non-parametric statistics.

Non-parametric statistical analyses, such as Spearman's rank-order correlation coefficient, are distribution-free techniques used to analyse at least interval-level data (Polit & Beck, 2017). The correlations between a parent's age, their marital status, the number of children they have in Thailand, family income, income sufficiency, the parents' education, the number of years resident in Samut Sakhon Province and the immunisation status of their first child were tested using Spearman's rho correlation. Spearman's rho correlation is a non-parametric measure of the strength and direction of the relationship between two variables measured on at least an ordinal scale (Gray et al., 2017). Field (2013) explained that correlations were represented based on the correlation coefficient's value between −1.0 and +1.0. A coefficient of +1 indicates that the two variables are perfectly positively correlated: if one variable increases, the other increases too. Conversely, a coefficient of −1 indicates a perfectly negative relationship: if one variable increases, the other decreases (Field, 2013). The strength of the correlation is described in Table 3.2 below (Akoglu, 2018). The additional barriers from the qualitative data were analysed by thematic analysis**.**

Table 3.2: Interpretation of the Spearman's correlation coefficients

Correlation coefficient	**Strength of relationship**
<0.4	weak
0.4–0.69	moderate
≥0.7	strong

3.14 Study design's Strength

Online surveys strengths are their accessibility, that they allow participants access at a time that suits them and that they offer greater anonymity than a face-to-face questionnaire (Kumar, 2014). Online surveys are able to reach elusive participants, such as unregistered migrants. Participants can complete the survey on their mobile phone, computer or tablet. Moreover, online surveys reduce survey bias because the participant is free to answer the questions without a researcher's perceived influence. Data collected via an online survey also facilitates data analysis and preserves data

integrity, as it removes the need for manual data entry and the possibility of keystroke errors (Kumar, 2014).

3.15 Study design's Limitation

Conducting the survey online limited the number of participants to access the survey. To participate in the study, participants needed to have access to the internet and can read and write in Burmese. Consequently, the results could be impacted as the study would have missed lower incomes and literate participants. However, the present study used convenience sampling and snowball sampling to recruit potential participants by PHTOs' promoting the project's flyers during home visits and encouraging potential participants to forward the project's information to other Myanmar parents who may be interested.

The main disadvantage of convenience sampling is that the risk of bias is higher than that of other sampling strategies because participants are self-selecting and volunteer to participate (Fisher & Fethney, 2016). Additionally, the response rate for online surveys tends to be lower than mailed questionnaires and face-to-face questionnaires (Polit & Beck, 2017). It was assumed that the response rate might be lower than hoped for. Moreover, recruiting participants through those receiving home visits and snowballing limited the study to participants in the health system. However, these techniques recruited many potential participants living in Samut Sakhon province because they usually lived together in multistorey condominiums in Mueang District with their families. Thus, it was convenient for participants to forward the project's information to their neighbours.

The questionnaires were not tested with participants within the research group, but they used information from qualitative and quantitative studies that have been used in previous studies with similar participants. Also, in the current study, six experts evaluated the questionnaire for content validity and comprehensiveness of content. The face validity of the questionnaire in Myanmar was tested through consultation with a Myanmar nursing paediatric instructor to ensure understanding before conducting the research.

3.16 Conclusion

This chapter outlined the study's methodology and developed the groundwork for the data analysis and the discussion to follow in Chapters 4 and 5. The sampling strategy, data collection process and measurements used were discussed. The research used a quantitative design, comprising an online survey, using a new questionnaire created by the researcher based on the literature review. HCWs from Samut Sakhon Hospital promoted the project by sharing recruitment flyers during home visits. The study was approved by the SBREC at Flinders University and the ethics committee at Samut Sakhon Hospital in Thailand. The participants' identities were not requested or trackable, ensuring their anonymity. The quantitative data were organised and analysed using SPSS. The findings from this study are discussed in the following chapter.

4 CHAPTER FOUR: RESULTS

4.1 Introduction

The previous chapter provided an overview of the methodology used to achieve this study's research objective. Meanwhile, this chapter presents data collection results and analysis of the data obtained in the online survey concerning barriers to immunisation among Myanmar migrant children living in Thailand. This is a descriptive correlational study that examines the relationships between the demographics of Myanmar migrants' parents and the immunisation rates of their children aged under five years old. The demographic data are presented initially, followed by the findings relating to each of the research project's objectives. The results are divided into four parts, which are as follows: (1) the response rate of the survey, (2) a demographic summary, (3) the results for research objective 1 and (4) the results for research objective 2. Each of them is provided below.

4.2 Response to the Survey

The participants (Myanmar parents) were invited to complete the online survey using Qualtrics, and 285 parents of Myanmar migrant children living in the Samut Sakhon Province in Thailand entered to do the survey. However, there were 30 participants who commenced the survey but did not complete the survey. Possible reasons that could have prevented the completion of the survey were issues with the software, internet connections and/or devices. Consequently, the final number of participants who completed all the survey questions was 255, and only the completed questionnaires have been included in the analysis. The research objectives that informed the analysis are:

1. To identify barriers to immunisation in under school-age Myanmar migrant children.
2. To examine the correlational association of parents' demographic backgrounds and immunisation rates among Myanmar migrant children.

4.3 Demographic Summary

This segment begins by highlighting the results of the demographic data as well as offering a profile of the participants; it also presents the characteristics of the parents, the families and the children

within them. The demographic section describes several factors that were identified as important in the literature and previous surveys, which have been combined here to gain a more comprehensive picture of the migrant families.

4.3.1 The sociodemographic of Myanmar migrant parents

Table 4.1 presents the sociodemographic details of the participants. As shown in Table 4.1, a total of 255 parents participated in the present study. Below, Table 4.1 illustrates the demographical characteristics, such as the relationship to the child, the parent's education level, marital status and religion.

Table 4.1 Parents' Characteristics (n = 255)

Variables	N	Frequency (%)
Relationship to the child		
Mother	243	95.3
Father	12	4.7
Parent's age (years)		
21–24	11	4
25–28	117	45.8
29–32	106	41.6
33–37	21	8.3
(Mean = 28.56, Standard deviation [SD] = 2.702, Min = 21, Max = 37)		
Parent's religion		
Buddhism	245	96.1
Christianity	5	2
Islam	5	2
Parent's marital status		
Married	244	95.7
Separate	8	3.1
Widow	2	.8
Did not respond	1	.4
Parent's Education		
Never attended formal education	41	16.1
Primary school	164	64.3
Junior high school	48	18.8
Senior high school	1	.4
Bachelor's degree or above	1	.4
Parent's occupation		
Factory worker	194	76.1
Housemaid	12	4.7
Unemployed	49	19.2
Years living in Samut Sakhon Province		
<5 years	162	63.5
>5 years	93	36.5
(Mean = 4.28, SD = 2.125, Min = 0, Max = 12)		
Parent's legal status		
Registered migrant	253	99.2
Unregistered migrant	2	8

Table 4.1 above provides an overview of the parents who responded to the survey. Most respondents were mothers (95.3%, n = 243), while fathers who were participants (4.7%, n = 12) were much fewer in number. The age of participants ranged from 21 to 37 years, with a mean of 28.56 years. In terms of their stated religion, 96.1% (n=245) of parents were Buddhists, 2% (n = 5) were Christians and another 2% (n = 5) were Muslims. Most of the participants were married (95.7%; n = 244), and an examination of the extent of their education showed that 64.3% (n = 164) said the primary school was their highest level, while 16.1 % (n = 41) identified themselves as illiterate. Regarding the occupation of the parents, the majority were factory workers (76.1%; n = 194), 19.2% were housemaids (n = 49), and the rest of the respondents were unemployed (4.7%, n = 12). The average number of years that these parents had been living in the Samut Sakhon Province was 4.28 (SD =2.215), and 63.5% of them (n = 162) had lived there for less than five years, while 36.5% of respondents (n = 93) resided in the region for more than five years. Most of the parents were registered as migrants (99.2%, n = 253).

4.3.2 Family characteristics

Below, Table 4.2 indicates the income level of the families and the total number of children in each group. The average family income per month of Myanmar migrant parents living in the Samut Sakhon Province was 14,666 baht (SD = 2799.322); meanwhile, the lowest family income per month was 7000 baht and the highest was 25,000 baht. Regarding income sufficiency, parents who believed that they have the right amount of money necessary to meet their basic needs included 48% of participants, 28.2 % of participants did not have enough money to spend per month and 23.1 % of respondents sometimes did not have enough to cover their necessities or monthly expenses.

Table 4.2: Characteristics of the family (n = 255)

Variables	N	Frequency (%)
Family income per month (baht)		
7,000–10,000	25	9.8
10,001–13,000	54	21.2
13,001–16,000	123	48.2
16,001–19,000	35	13.7
19,001–22,000	17	6.7
22,001–25000	1	.4
(Mean = 14,666.75, SD = 2799.322, Min = 7000, Max = 25,000)		
Income sufficient for participant's needs		
Yes	124	48.6
No	72	28.2
Sometimes	59	23.1
The number of children each participant has		
1	218	85.5
2	33	12.9
3	3	1.2
7	1	.4
(Mean = 1.18, SD = .536, Min = 1, Max = 7)		
The number of children living with a participant in Thailand		
1	223	87.5
2	31	12.2
3	1	.4
(Mean = 1.13, SD = .348, Min = 1, Max = 3)		

Table 4.2 presents data in relation to the number of children each participant has: 85.5% (n = 218) of respondents only had one child, while 12.9% had two children. There were three participants (1.2%) who had three children and one individual had seven children in their family. Regarding the number of children living with the participants in Thailand, 223 respondents (87.5%) had one child staying with them, while the other participants had two (n = 31, 12.2%) and three children (n = 1, .4%) with them in Thailand, respectively.

4.3.3 The age, birthplace characteristics and immunisation history of Myanmar migrant children

Table 4.3 summarises the characteristics of each child within the family. Furthermore, it reports the ages, birthplaces and the characteristics of the immunisation status of Myanmar migrant children who are living with the participant in Thailand.

Table 4.3: The characteristics of Myanmar migrant children (n = 288)

	First child		Second child		Third child		Total	
	N	%	N	%	N	%	N	%
Age 1–2 3–4 5 (Mean = 2.54, SD = 1.43, Min = 1, Max = 5)	 132 105 18	 45.3 37.5 6.3	 27 5	 9.4 1.7	1	.3	 160 110 18	 55 39.2 6.3
Country Of birth Thailand Myanmar	 243 12	 84.4 4.3	32	11.1	1	.3	 276 12	 95.7 4.3
Place of delivery Hospital Home	 241 14	 83.7 4.9	32	11.1	1	.3	 274 14	 95.1 4.9

Table 4.3 above indicates the participants had 288 children altogether. The age of the children ranged from one to five years, with a mean of 2.54 years. The greatest number of the children were born in Thailand at 95.7% (n=276) and the remainder were born in Myanmar (4.3%, n = 12). Additionally, 95.1% of children were born at the hospital, while 4.9% were born at home; importantly, hospital births indicate the children are known to authorities and that the birth was recorded.

4.3.4 The immunisation history of Myanmar migrant children

Table 4.4 presents the immunisation history of Myanmar migrant children living with the participants in Thailand. Respondents reported that 79.8% of their offspring had been fully immunised, 18.1% had not been fully immunised and 2.1 % were not sure about their children's immunisation status.

Table 4.4: The immunisation history of Myanmar migrant children

	First child		Second child		Third child		Total	
	N	%	N	%	N	%	N	%
Fully immunised Yes No Not sure	 199 50 6	 69.1 17.4 2.1	 30 2	 10.4 .7	1	.3	 230 52 6	 79.8 18.1 2.1
Immunised on time Yes No Not sure	 174 73 8	 60.4 25.3 2.8	 27 4 1	 9.4 1.4 .3	1	.3	 202 77 9	 70.1 26.7 3.1
Have a pink book Yes No Not sure	 235 18 2	 81.6 6.3 .7	 30 2	 10.4 .7	1	.3	 266 20 2	 92.4 6.9 .7

Notably, Table 4.4 demonstrates that most of the children have a complete and up-to-date immunisation status (70.1%, n = 202) as well as a pink book (child's health record) (92.4%, n = 266).

4.4 Results for research objective 1: barriers to immunisation

To identify barriers to immunisation in under school-age Myanmar migrant children, descriptive statistics have been used accordingly to report frequency counts of the responses and the respective percentages. After this, the correlation between these barriers is presented.

4.4.1 Descriptive results

The barriers to immunisation were divided into four themes in the survey: difficulties in accessing the immunisation service, knowledge and awareness of immunisation among participants, parents' attitudes toward immunisation and health service issues. Each theme had four statements and used a five-point Likert scale to determine a participant's opinion.

4.4.1.1 Difficulties in accessing the immunisation service

Questions regarding the difficulties in accessing the immunisation service sought to capture parents' experiences regarding immunisation appointment times, obstacles in travelling to the HCC, financial expenses and the language barrier. Table 4.5 provides parental responses to the difficulties in accessing the immunisation services. Of the 255 participants, the appointment timing was not considered a barrier for most, with 42% (n=107) of the answers given being in the 'disagree' category and 24.3% (n=62) strongly disagreeing with the appointment time for the vaccine injection was not convenient. The HCC's location was reported to be a barrier, with 32.9% (n=100) of the responses strongly agreeing with the statement that they experienced difficulties in travelling to them

Table 4.5: Difficulties in accessing the immunisation service

Theme A: difficulties in accessing the immunisation service		N	Frequency (%)
The appointment time for vaccine injection was not convenient	Strongly disagree	62	24.3
	Disagree	107	42
	Neither agree nor disagree	36	14.1
	Agree	1	.4
	Strongly agree	49	19.2
There are difficulties in travelling to the HCCs	Strongly disagree	36	14.1
	Disagree	65	25.5
	Neither agree nor disagree	50	19.6
	Agree	4	1.6
	Strongly agree	100	39.2
I do not have enough money to take my child to vaccination service	Strongly disagree	16	6.3
	Disagree	64	25.1
	Neither agree nor disagree	45	17.6
	Agree	23	9
	Strongly agree	107	42
I do not understand Thai language	Strongly disagree	10	3.9
	Disagree	67	26.3
	Neither agree nor disagree	38	14.9
	Agree	46	18
	Strongly agree	94	36.9

Table 4.5 also reports the data indicating the rates of financial barriers to accessing immunisation, with 42% (n = 107) of participants indicating that they 'strongly agree' with the statement, 'I do not have enough money to take my child to vaccination service'. Familiarity with the Thai language was another barrier as 36.9% (n = 94) of respondents put themselves in the 'strongly agree' category and 18% (n = 46) agreed that they do not understand the language.

4.4.1.2 Knowledge and awareness of immunisation among participants

Survey questions on knowledge and awareness of immunisation sought to ascertain how well the parents understand its side effects, age-appropriate immunisation, how vaccines work and if they know immunisation services are available in Thailand. This information reflects how the participants' immunisation knowledge needs to be improved.

In relation to this, Table 4.6 provides parental responses to the statements linked to knowledge and awareness of immunisation. Therein, the findings with regard to the participants' opinions show that

more than one-third ‘agree’ with the statement, ‘I worry that my children will have adverse effects from vaccination’ (39.2%, n = 100). Conversely, for 93 participants (38%), the vaccine’s side effects were not considered a barrier, with 32.5% (n= 83) of responses being in the ‘disagree’ category and 5.5% (n = 14) strongly disagreeing that vaccinations will have an adverse effect on their child.

Table 4.6: Knowledge and awareness of immunisation among participants

Theme B: knowledge and awareness of immunisation among participants		N	Frequency (%)
I worry that my children will have adverse effects from vaccinations	Strongly disagree	14	5.5
	Disagree	83	32.5
	Neither agree nor disagree	58	22.7
	Agree	100	39.2
	Strongly agree	0	0
I do not know when my child should be vaccinated	Strongly disagree	19	7.5
	Disagree	73	28.6
	Neither agree nor disagree	75	29.4
	Agree	85	33.3
	Strongly agree	3	1.2
Maintaining hygiene and sanitation is responsible for preventing infectious diseases rather than having vaccines	Strongly disagree	18	7.1
	Disagree	43	16.9
	Neither agree nor disagree	68	26.7
	Agree	108	42.4
	Strongly agree	18	7.1
I do not know what kind of immunisation services are available for migrant children in Thailand	Strongly disagree	9	3.5
	Disagree	86	33.7
	Neither agree nor disagree	77	30.2
	Agree	80	31.4
	Strongly agree	3	1.2

Table 4.6 indicates that participants know the childhood vaccination schedule, while 28.6% (n = 73) do not agree and 7.5% (n = 19) strongly disagreed with the statement, ‘I do not know when my child should be vaccinated’. At the same time, other respondents highlighted that they did not know their children’s vaccination schedule, with 33.3% participants (n = 85) placing themselves in the ‘agree’ category and 1.2% of parents (n = 3) strongly agreeing that they did not know when to take their offspring to get their vaccination. Additionally, 29.4 % of parents (n = 75) placed themselves in the ‘neither agree nor disagree’ category. Thus, it is necessary to educated parents about the childhood vaccine schedule and age-appropriate vaccinations.

Regarding good hygiene and sanitation, 42.4% (n=108) agreed that infectious diseases could be prevented by maintaining hygiene and sanitation rather than being vaccinated against those diseases. Additionally, the number of participants who agree and disagree was close; in terms of the statement 'I do not know what kind of immunisation services are available for migrant children in Thailand', 33.7% (n=86) disagreed and 3.5% (n = 9) strongly disagreed, while 31.4 % (n = 80) put themselves in the 'agree' category, 1.2% (n = 3) were in the 'strongly agree' category and 30.2% (n = 70) were not sure that they know what immunisation services are provided for migrant children. This highlights the need for relevant organisations to educate parents about the available services in Thailand to increase the number of migrant children who have access to them, preventing delays or incomplete vaccination programs.

4.4.1.3 Parents' attitude toward immunisation

Survey questions on the parents' attitude toward immunisation sought to capture parents' views on the matter, including in relation to its importance, their confidence in visiting the HCC, remembering the child vaccination schedule and vaccine safety. An exploration of the parents' attitudes as a potential barrier to immunisations can be found in Table 4.7, which provides the participants' responses in accordance with a five-point Likert scale to related statements.

Table 4.7: Parents' attitude toward immunisation

Theme C: parents' attitude toward immunisation		N	Frequency (%)
I believe that vaccination is not important	Strongly disagree	30	11.8
	Disagree	100	39.2
	Neither agree nor disagree	72	28.2
	Agree	53	20.8
	Strongly agree	0	0
I am not confident in visiting HCCs	Strongly disagree	20	7.8
	Disagree	87	34.1
	Neither agree nor disagree	90	35.3
	Agree	57	22.4
	Strongly agree	1	.4
I cannot remember my children's immunisation appointment	Strongly disagree	17	6.7
	Disagree	79	31
	Neither agree nor disagree	82	32.2
	Agree	73	28.6

Theme C: parents' attitude toward immunisation		N	Frequency (%)
	Strongly agree	4	1.6
I am concerned that vaccines are not safe for my children	Strongly disagree	21	8.2
	Disagree	97	38
	Neither agree nor disagree	80	31.4
	Agree	55	21.6
	Strongly agree	2	.8

The attitudes presented in Table 4.7 generally show that the parents held a positive attitude towards vaccination. Focusing on the importance of vaccines, 100 participants (39.2%) believed that they are vital and disagreed with the statement, 'I believe that vaccination is not important', while 28.2% (n = 72) were not sure and 20.8% (n = 53) placed themselves in the 'disagree' category. Among all of the respondents, 35.3% (n = 90) neither agreed nor disagreed with the statement, 'I am not confident in visiting HCCs', which means they are unsure when visiting HCCs; in comparison, the number of confident participants was 34.1% (n = 87).

Meanwhile, 82 participants (32.2%) were unsure whether they could remember their child's vaccination appointment. A similar number of respondents aligned themselves with the other options as 79 (31%) parents put themselves in the 'disagree' category, and 73 (28.6%) agreed with the statement, 'I do not remember my children's immunisation appointment'. There were also comparable numbers in terms of the two options regarding vaccine safety as 97 (38%) individuals disagreed and 80 (31.4%) were not sure if they concurred with the statement, 'I am concerned that vaccines are not safe for my children'. However, 21.6% (n = 55) of participants agreed that the vaccine is not safe.

4.4.1.4 Health service issues

Statements on health service issues sought to capture parents' experiences of barriers to childhood immunisation relating to healthcare services and providers, including getting explanations about immunisation from HCWs, the availability of Myanmar-language immunisation documents, the location of HCCs and the time spent at the immunisation service. Table 4.8 provides parental responses to statements about health service issues. More than half of the 255 respondents surveyed disagreed with the statement, 'I do not get any immunisation information from the

healthcare providers' (55.3%, n=141). In contrast to the previously reported barrier about Thai language proficiency in table 4.5, 123 respondents disagreed with the statement about there being no immunisation documents available in the Myanmar-language (48.2%). However, 22.4% (n = 57) were unsure and 16.1% (n = 41) agreed that there were no accessible Myanmar-language immunisation documents. Additionally, this result links to the language barriers found in relation to immunisation difficulties, indicating that 54.9% of participants do not understand the Thai language.

Table 4.8: Health service issues

Theme D: health service issues		N	Frequency (%)
I did not get any immunisation information from the healthcare providers	Strongly disagree	39	15.3
	Disagree	141	55.3
	Neither agree nor disagree	39	15.3
	Agree	30	11.8
	Strongly agree	6	2.4
There are no immunisation documents available in Myanmar-language	Strongly disagree	34	13.3
	Disagree	123	48.2
	Neither agree nor disagree	57	22.4
	Agree	39	15.3
	Strongly agree	2	.8
There is no HCC close to my house	Strongly disagree	15	5.9
	Disagree	87	34.1
	Neither agree nor disagree	63	24.7
	Agree	76	29.8
	Strongly agree	14	5.5
It takes a long time to receive the vaccination service due to a long queue at the HCC	Strongly disagree	9	3.5
	Disagree	47	18.4
	Neither agree nor disagree	37	14.5
	Agree	130	51
	Strongly agree	32	12.5

The additional barriers that were explored in Table 4.8 above showed that most participants (34.1%, n = 87) disagreed that there was no HCC close to their house. Moreover, there was a similar number of respondents present among the other options as 76 (29.8%) agreed and 63 (24.7%) were not sure whether there were HCCs close to their houses. Regarding the time commitment involved to receive the vaccination, more than half of the participants agreed that it takes a long time to receive the vaccination service due to long queues at the HCC (51%, n = 130).

4.4.2 The relationship between barriers to immunisation

The relationships between all 20 statements from the four themes relating to immunisation barriers were tested using Spearman's rho correlation. Explainable correlations and relationships of interest within the data have been presented in the following paragraphs and tables (see more information from Table 4.9 to Table 4.16). As described above, exploring the barriers to children's immunisations is important. The relationship between various characteristics indicates that several factors influence parents' access to immunisation. Below, Table 4.9 presents the correlational value between three variables with a moderate relationship to these barriers and shows a positive relationship with statistical significant between travel difficulties and appointment timing.

Table 4.9: The relationship between difficulties in travelling to the HCCs and other statements about barriers

Variables	There are difficulties in travelling to the HCCs
The appointment time for vaccine injection is not convenient	Rho = .497**
I do not have enough money to take my child to vaccination service	Rho = .558**
I do not know when my child should be vaccinated	Rho = .405**

*p<.05, **p<. 001, Rho = Spearman's rho correlation

The above Table 4.9 indicates there is a positive relationship with statistical significance between travel difficulties and appointment timing ($\chi 2$ = .497, p <0.001.), cost ($\chi 2$ = .558, p <0.001) as well as immunisation scheduling ($\chi 2$ = 497, p <0.001). Identifying these barriers for the first time quantitively illustrates the importance of the relationship between these characteristics. Meanwhile, Table 4.10 presents the correlational value between the two variables, showing that they have a moderate relationship with these barriers.

Table 4.10: The relationship between money sufficiency and statements about other barriers

Variables	I do not have enough money to take my child to vaccination service
I do not understand Thai language	Rho = .559**
I do not know what kind of immunisation services are available for migrant children in Thailand	Rho = .402**

*p<.05, **p<.001, Rho = Spearman's rho correlation

Table 4.10 above shows a positive relationship with statistical significance between having sufficient money and understanding the Thai language ($\chi 2 = .559$, $p < 0.001$) as well as the availability of the immunisation service ($\chi 2 = .402$, $p < 0.001$). This might suggest that parents who not understand the Thai language earn less money. Additionally, if parents did not know about the availability of the service, how were they to know if they have enough money to take their child for their vaccination? Indeed, they may assume there is a cost for the vaccination and might not know immunisations are free. Table 4.11 below presents the correlation between all four variables relating to knowledge and awareness regarding immunisation, which exhibit a low and moderate relationship to a lack of proficiency in Thai language.

Table 4.11 The relationship between understanding the Thai language and other statements about barriers

Variables	I do not understand Thai language
I worry that my children will have adverse effects from vaccination	Rho = .466**
I do not know when my child should be vaccinated	Rho = .414**
Maintaining hygiene and sanitation is responsible for preventing infectious diseases rather than having vaccines	Rho = .392**
I do not know what kind of immunisation services are available for migrant children in Thailand	Rho = .423**

*p<.05, **p<.001, Rho = Spearman's rho correlation

Table 4.11 above shows a positive relationship with statistical significance between not understanding the Thai language and worries about the possibility of adverse effects of vaccines ($\chi 2 = .466$, $p < 0.001$) as well as knowing the vaccination schedule ($\chi 2 = .414$, $p < 0.001$), privileging hygiene and sanitation ($\chi 2 = .392$, $p < 0.001$) and being aware of the availability of the immunisation service ($\chi 2 = .423$, $p < 0.001$). The correlation illustrated in table 4.11 represents the link between knowledge about immunisation and a lack of understanding of the Thai language, highlighting that parents who cannot communicate in Thai may lack knowledge about immunisation. Next, Table 4.12 demonstrates the correlational value between three variables with a moderate relationship to the vaccination schedule.

Table 4.12: The relationship between the vaccination schedule and other statements about barriers

Variables	I do not know when my child should be vaccinated
I do not know what kind of immunisation services are available for migrant children in Thailand	Rho = .583**
I do not remember when my child's immunisation appointment is	Rho = .589**
I am concerned that vaccines are not safe for my children	Rho = .461**

*p<.05, **p<.001, Rho = Spearman's rho correlation

The previous table 4.12 shows a positive correlation with statistical significance between not knowing the vaccination schedule and the availability of the immunisation service ($\chi 2 = .583$, $p < 0.001$) as well as knowledge about the availability of the immunisation services ($\chi 2 = .589$, $p < 0.001$), the ability to remember the vaccination appointment ($\chi 2 = .589$, $p < 0.001$) and acceptance of the vaccine's safety ($\chi 2 = .461$, $p < 0.001$). Subsequently, table 4.13 underlines the correlational value between two variables in attitudes toward immunisation theme that have a moderate relationship with regard to the availability of the immunisation services.

Table 4.13: The relationship between the availability of the immunisation service and other statements about barriers

Variables	I do not know what kind of immunisation services are available for migrant children in Thailand
I do not remember when my child's immunisation appointment is	Rho = .450**
I am concerned that vaccines are not safe for my children	Rho = .460**

*p<.05, **p<.001, Rho = Spearman's rho correlation

The above table 4.13 indicates a positive correlation with statistical significance between the availability of immunisation services and remembering vaccination appointments ($\chi 2 = .450$, $p < 0.001$) as well acceptance of the vaccine's safety ($\chi 2 = .460$, $p < 0.001$.). Below, Table 4.14 presents the correlational value between five variables that have a moderate relationship to the appreciation of the vaccination's importance.

Table 4.14: The relationship between the importance of the vaccine service and statements about other barriers

Variables	I believe that vaccination is not important
I do not know when my child should be vaccinated	Rho = .453**
I do not know what kind of immunisation services are available for migrant children in Thailand	Rho = .428**
I am not confident visiting HCCs	Rho = .685**
I do not remember my child's immunisation appointment	Rho = .559**
I am concerned that vaccines are not safe for my children	Rho = .604**

*p<.05, **p<.001, Rho = Spearman's rho correlation

Above, a positive correlation with statistical significance is shown between acceptance of the vaccine's importance and knowing about the vaccination schedule ($\chi 2 = .453$, $p < 0.001$) as well as the availability of the immunisation service ($\chi 2 = .428$, $p < 0.001$), having the confidence to visit HCCs ($\chi 2 = .685$, $p < 0.001$), remembering vaccination appointments ($\chi 2 = .559$, $p < 0.001$) and acknowledging the vaccine's safety ($\chi 2 = .604$, $p < 0.001$). The results demonstrate that parents with a negative attitude towards immunisation tend to have misunderstood information about it. Meanwhile, Table 4.15 below underscores the link between three variables in attitudes towards immunisation theme that have a moderate relationship to confidence in visiting HCCs.

Table 4.15: The relationship between having the confidence to visit HCCs and other statements about barriers

Variables	I am not confident in visiting HCCs
I do not know when my child should be vaccinated	Rho = .405**
I do not remember when my child's immunisation appointment is	Rho = .607**
I am concerned that vaccines are not safe for my children	Rho = .551**

*p<.05, **p<.001, Rho = Spearman's rho correlation

Table 4.15 above shows a positive relationship with statistical significance between having the confidence to visit HCCs and awareness of the vaccination schedule ($\chi 2 = .405$, $p < 0.001$) as well as remembering vaccination appointments ($\chi 2 = .607$, $p < 0.001$) and acknowledging the vaccine's safety ($\chi 2 = .551$, $p < 0.001$). When parents were not self-assured enough to visit HCCs, it meant they did not acquire knowledge about immunisations, which lead to a negative attitude toward the

service. Next, Table 4.16 presents the correlational value between getting information from an HCW and the availability of immunisation documents in Myanmar-language.

Table 4.16: The relationship between getting information from an HCW and the availability of Myanmar-language immunisation documents

Variables	I do not get any immunisation information from the healthcare providers
There are no immunisation documents available in Myanmar-language	Rho = .593**

*p<.05, **p<.001, Rho = Spearman's rho correlation

The previous table 4.16 shows a positive correlation with statistical significance between getting information from an HCW and the availability of Myanmar-language immunisation documents ($\chi 2$ = .5.93, p <0.001). These findings highlight that the accessibility of Myanmar-language immunisation documents is important for participants to get educated by healthcare providers.

4.4.3 The Summary of Research Objective 1

In conclusion, the quantitative analysis showed that participants responded to a five-point Likert scale regarding barriers to immunisation that were divided into four themes. The first theme, which was difficulties in accessing immunisation services, found that travelling to HCCs, not having enough money and language barriers were obstacles to having vaccinations among Myanmar migrant parents. The second theme was knowledge and awareness of immunisation found that parents lack knowledge about the vaccine's adverse effects, vaccination schedules, benefits, and availability of immunisation services. Findings concerning the third theme, parental attitudes to immunisation, showed that participants generally have a positive attitude. Lastly, the fourth theme was issues relating to the healthcare service. The results indicated that the main problems were having to wait a long time to access the vaccination service and HCCs being far from the participants' respective houses.

4.5 Results for research objective 2: correlational association between parent's demographics and child's immunisation rates

This section aims to examine the correlational association of the parent's demographics and immunisation rates among Myanmar migrant children.

4.5.1 The correlation between parent's demographics and their children's immunisation rate

The correlations between a parent's age, the number of children they have in Thailand, family income, income sufficiency, the parent's education, the number of years they have lived in the Samut Sakhon Province and the immunisation status of their first child were tested using Spearman's rho correlation. Exploring factors relating to barriers to children's immunisations is important. The relationship between various parent's characteristics mentioned above and the immunisation rate of children indicates this area needs to be focused on. The rate of having the first child immunised was selected to correlate with parents' characteristics because most families in this study only have one child. Below, Table 4.17 presents the correlation between eight parental demographic variables and the rates of the first child being immunised.

Table 4.17: The relationship between parent's age, the number of children in Thailand, family income, income sufficiency, parent's education level, years living in Samut Sakhon Province, parent's legal status and immunisation status of the first child

Variables	The first child immunisation status
Parent's age	Rho = .001
The number of children in Thailand	Rho = −.330**
Total family income	Rho = .077
Monthly income sufficiency	Rho = .257**
Parent's education level	Rho = .025
Years living in Samut Sakhon Province	Rho = −.058
Parent's legal status	Rho = −.063

*p<.05, **p<.001, Rho = Spearman's rho correlation

Table 4.17 above table illustrates a low negative correlation with statistical significance between Myanmar migrant children's immunisation rates and the number of children living in Thailand with a parent ($\chi 2 = -.330$, $p < 0.001$). This correlation indicates that the higher the number of children living

with a parent in Thailand, the more children with completed vaccinations tend to decrease. Additionally, there was a meaningfully low positive relationship between Myanmar migrant children's immunisation rates and parental income sufficiency ($\chi 2 = .257$, $p < 0.001$). This indicates that children living with a parent who has enough money to cover basic needs tend to be fully vaccinated. However, the results showed no correlation between the parents' age, the number of years they have been living in the Samut Sakhon Province, their legal status, total family income, the parents' education and their children's immunisation rates.

4.5.2 Summary Research Objective 2

The Spearman correlation underlined a significant correlation between monthly income sufficiency, the number of children living with participants in Thailand and their child's immunisation rate. The results show that the number of children living with a parent in Thailand had a low negative correlation with the immunisation rate, which is converse to the low positive correlation that income sufficiency exhibited. However, other parents' demographic variables did not correlate with the immunisation rate. This result suggests improving childhood immunisation rates; for instance, the parents with more than one child living with them might need more vaccination reminders.

4.6 Conclusion

Chapter 4 has outlined the findings from the data collected from Myanmar migrant parents living in the Samut Sakhon Province in Thailand. The data outcomes outlined the sociodemographic of the participants, their family, their children and the immunisation history of Myanmar migrant children. This chapter also explored the barriers to childhood immunisation and found that there were difficulties in accessing related services, including travelling to HCCs, financial barriers and not understand Thai language. Moreover, some participants lack knowledge and awareness about immunisation. Some respondents had a negative attitude toward immunisation and participants sometimes experienced health service issues that take a long time at vaccination services. This chapter further explored the link between parental demographics and childhood immunisation rates, uncovering that the number of children living with a parent in Thailand had a low negative correlation with being immunised. In contrast, financial insufficiency had a low positive correlation. These

findings are discussed in Chapter 5. A summary and discussion of the results, along with conclusions based on them, also are explored in the next chapter. The study's limitations, implications for practice, recommendations for further research and an overall summary are provided in the next chapter as well.

5 CHAPTER FIVE: DISCUSSION AND CONCLUSION

5.1 Introduction

The previous chapter presented the findings of the data collection. This final chapter aims to interpret and discuss the results presented in Chapter four. This study's main purposes are to investigate barriers to immunisation in Myanmar migrant children aged five years old and under in Thailand and explore the correlation between parent's demographics and the immunisation rate among Myanmar migrant children aged five years and under in Thailand. Therefore, the discussion focuses on participants' demographics, perceived barriers to immunisation, and the relationship between parent's demographics and the immunisation rate in Myanmar migrant children. Throughout this discussion, the study results are discussed within the context of the existing literature. The limitations of the study are presented. Finally, the implications of the findings for improving the immunisation rate are considered, as will avenues for future research related to this topic.

5.2 Demographics of participants

In this study, the 255 participants were parents of Myanmar migrant children aged five years old and under living in Mueang District, Samut Sakhon Province, Thailand. The majority of the participants in this study were mothers (95.3%, n = 243) aged 21–37 years (mean = 28.56, SD = 2.702). Most participants had completed primary school as their highest qualification (64.3%, n = 164) and worked as factory workers (76.1%, n = 194). This demographic data was similar to that of a study conducted ten years ago in Samut Sakhon Province, Thailand, in which all the participants (n = 183) were migrant mothers aged between 17 and 40 years, with most only having completed primary school (44.3%) (Munsawaengsub et al., 2011). The quantitative study of Munsawaengsub et al. (2011) found that a lower education level was correlated with immunisation status, thus reflecting on the lack of immunisation. However, the current study did not find an association between parental education level and immunisation rate. Therefore, the difference in the results may be due to the studies being conducted ten years apart. In that ten years, there have been advances in technologies for seeking immunisation knowledge, and more availability of immunisation documents in Myanmar-language could be reasons supporting the differences in results. These will be discussed in more

detail later on. Moreover, higher household income significantly increases the likelihood of full immunisation since families have money to pay for transportation (Hu et al., 2013). The family income reported by participants in the present study ranged from 7,000 to 25,000 baht. The average was 14,666 baht; this aligns with the average income in Thailand, which is 14,620 baht (National Statistical Office of Thailand, 2019). Furthermore, 48.6% (n = 124) of participants in the present study reported that they had sufficient monthly income for family expenditure. The link between household income and childhood immunisation status is discussed in section 5.4.3.

5.3 Barriers to immunisation among children of Myanmar migrant parents living in Mueang District, Samut Sakhon Province, Thailand

According to the present study's findings, there are four main barriers to immunisation among Myanmar migrant children living in Samut Sakhon Province, Thailand. These are parents' immunisation knowledge and awareness of immunisation, difficulty accessing immunisation services, parents' attitudes toward immunisation, and health service issues. These four barriers to immunisation are discussed in the following sections.

5.3.1 Difficulty in accessing immunisation services

Thailand provides free immunisation services for all children (WHO, 2018). However, the present study in Samut Sakhon Province found migrants faced difficulties in accessing the immunisation service, including difficulty in travelling to the HCC, not enough money for vaccination expenses, and language barriers.

5.3.1.1 Difficulty in travelling to HCCs

Almost 40% of participants agreed that it is difficult to travel to HCCs. The present study confirms qualitative data reported in a previous study suggesting that distance to the healthcare service is an issue (Canavati et al., 2011). In qualitative research among Myanmar migrants in Tak province, Thailand, three main reasons for difficulty in travelling to HCCs were found: distance, transportation, and weather condition (Canavati et al., 2011). The distance to immunisation services was a barrier due to the housing for the migrants being too far from HCCs (Canavati et al., 2011), which is an issue among migrants in other countries, such as the Netherlands (Harmsen et al., 2015). Although

more than 20 community health services were provided in Mueang District, Samut Sakhon Province, where the participants in the current study lived, they did not cover all the areas where Myanmar migrants live. One community health service per sub-district in Mueang District is located in each sub-district urban area (Samut Sakhon Hospital, 2018). The present study found that most participants were factory workers (76.1%; n = 194). This causes access issues since it becomes difficult for migrant parents to access the HCC, as most of them live in the dormitory provided by factories located in industrial areas far from the community health service. Consequently, Myanmar migrant parents have difficulty in travelling to HCCs since the distance requires the use of public transport or a private vehicle to travel there. Thailand provides free immunisation; however, the cost to travel to the service may still be a barrier linked to the distance to the HCC since people have to pay for transport.

5.3.1.2 The extra cost of taking the child to the immunisation service

Although migrant children who live in Thailand have the right to access the EPI free of charge (WHO, 2018), other expenses are incurred to take the child to the immunisation service. The present study found that 42% of participants strongly agree that they do not have enough money to take their child to the immunisation service. The extra cost of taking the child to the immunisation service includes the transport cost, meal cost, and no payment for missing work. A previous study on Myanmar migrants found that some migrants could not afford the extra cost and consequently, migrant children would not be vaccinated unless a mobile vaccination service was available (Pinna et al., 2020). In Samut Sakhon Province, vaccine appointments are usually provided on a weekday (Monday to Friday) of the first week of each month (Samut Sakhon Hospital, 2018). Therefore only one childhood vaccination service a month is provided (Samut Sakhon Hospital, 2018). Most parents cannot work on the day when they need to take their child to the vaccination service. As a result, the parent will not get paid on that day and spend more money on travelling. Due to the difficulty in accessing the immunisation service, travelling and cost burden problems can prevent children from being fully vaccinated unless there is a mobile vaccination service or the vaccination service is available at the weekend. If such services were offered, parents would not need to stop working for a day.

5.3.1.3 Language barriers

The last difficulty is the language barrier; 36.9% of parents in the present study strongly agree that they cannot communicate in and understand the Thai language. The previous study on Myanmar migrants in Tak province found an association between language barriers and children's immunisation rates (Prakunwisit & Areesantichai, 2015). In Thailand, the Thai language is the primary language used to communicate. Immunisation information in Myanmar-language, including side effects and vaccination schedule, is provided in the childhood immunisation book (Samut Sakhon Hospital, 2018). However, HCWs can only speak Thai. Therefore, each HCC has provided one or two Myanmar-language translators to help Myanmar migrants communicate with HCWs (Samut Sakhon Hospital, 2018). Sometimes, miscommunication occurred since each parent could talk with HCWs for only a short time. Consequently, Myanmar migrant parents could not ask about or clarify their concerns. The recommendation to resolve this difficulty is that the HCCs should play a video about immunisation knowledge in the Myanmar-language language in the waiting area to assist any migrants with difficulty reading. In addition, it would help other Myanmar migrants to have a time for face to face education with HCWs (Kaufman et al., 2018). Moreover, a helpline needs to be set up to help Myanmar migrants clarify their concerns about health information by having people who can speak Myanmar-language standing by on weekdays to answer the migrants' questions or by receiving information in their language in pamphlet form.

5.3.2 Parents' knowledge and awareness of immunisation

Myanmar migrant parents' knowledge and understanding of immunisation are discussed below. Issues related to their understanding of side effects, immunisation sources, immunisation schedule, maintaining hygiene to prevent infectious disease, and the importance of communication from healthcare providers are considered.

5.3.2.1 Understanding of the side effects

The present study's findings highlighted that Myanmar migrant parents living in Thailand misunderstood the information about childhood immunisation. Results showed that 39.2% of participants agreed that they were worried that their child would have side effects from the vaccination. This finding is similar to another qualitative study conducted in Thailand, which showed

that fear of side effects, particularly fever, was one of the main barriers to immunisation among Myanmar migrant parents living in Tak province (Canavati et al., 2011). The finding is also similar to that of a systematic review of concerns about vaccination in low- and middle-income countries that the fear of vaccine-related side effects was the most frequently expressed concern in qualitative research (Cobos Muñoz et al., 2015). Vaccines were believed to have significant detrimental effects on children's health in all three continents and nine of the 15 countries reported this concern (Cobos Muñoz et al., 2015). Concerns regarding the possible harm of vaccinations were more common among parents of children who had not been immunised (Naeem, Adil, Zia-Ul-Islam Khan, & Abbas, 2011). According to the Australian Immunisation Handbook, vaccines could cause side effects; side effects such as a low-grade fever or swelling, pain and redness at the injection site are common, while the long-lasting serious side effects are very rare (Australian Government, 2019). However, the WHO (2020b) explain the common misconception of vaccines originally highlighted by the CDC, stating that some parents misunderstand the type and severity of the adverse effects. Some parents believe that vaccines cause harmful side effects (WHO, 2020b). Furthermore, some parents were worried as they were not confident that they would be able to take care of their children if they had side effects from vaccines. The qualitative study conducted by Prakunwisit et al. (2015) among Myanmar migrants living in Tak province, Thailand, found that information on side effects was associated with immunisation status, indicating that parents who receive accurate information about vaccine side effects tend to have completely immunised children. This indicates that parents who know that side effects are common usually take their child to receive vaccinations. Therefore, it is important to ensure that parents are educated and understand that vaccine side effects are common and know how to take care of their child when they have the side effects after receiving vaccinations. These results are in line with those of the present study, which found that 39.2% of participants were worried about vaccination side effects. Therefore, parents need to be educated to prevent incomplete vaccination and the impact of VPD.

5.3.2.2 Understanding of the vaccination schedule

Another area of immunisation knowledge among Myanmar migrants that needs to be considered is the immunisation schedule. The present study found that 33.3% of participants agreed that they do

not know when their child should be vaccinated. This finding is similar to the previous research on Myanmar migrant children conducted ten years ago in Samut Sakhon Province. The Munsawaengsub et al. (2011) study found that parents did not know the appropriate time to take their children for vaccination and the frequency of vaccines needed before the age of one year (Munsawaengsub et al., 2011). The ten-year gap between the previous study and this current study shows that the lack of knowledge of immunisation schedules among migrant parents still needs to be addressed by the relevant organisation to improve the vaccination coverage of migrant children. There was an innovation for vaccination education in Thailand provided for ethnic population called “Lau” that also have lack of children immunisation knowledge (Sengklong, 2018). The innovation was a vaccine education box containing important information about immunisation of children that have yet to be demonstrated as effective to improve knowledge (Sengklong, 2018).

In Thailand, the paediatric immunisation schedule created by PIDST outlines the age-appropriate immunisation required in children (PIDST, 2020). The definition of age-appropriate immunisation is when the child receives the first dose and the following vaccine doses at the appropriate age and intervals (Han et al., 2014). The main barrier preventing children from having age-appropriate immunisation is the lack of knowledge or misunderstanding of vaccination information (Prakunwisit & Areesantichai, 2015). An integrative review has suggested some potential reasons for the lack of knowledge of childhood vaccination schedules and age-appropriate vaccination (McKee & Bohannon, 2016). Some parents fear that administering several vaccines simultaneously can overwhelm their child’s immune system and that enabling all vaccinations to take place within the recommended schedule will increase the safety risk (McKee & Bohannon, 2016). The view that receiving multiple vaccines increases the risk of harmful side effects was considered one of the misconceptions about vaccination worldwide (WHO, 2020b). As a result of this thinking, some studies in the integrative review showed that children’s immunisation is delayed since many parents choose to delay vaccines to protect their children (McKee & Bohannon, 2016).

5.3.2.3 Vaccination misconceptions

The CDC (1998) explained another of the common misconceptions regarding childhood immunisations: some people believed that diseases had already started to disappear before vaccines were introduced because of better hygiene and sanitation. This misconception was included in the questionnaire of the present study relating to the misunderstanding of immunisation knowledge. The present study found that 42.2% of participants believed that maintaining hygiene and sanitation is responsible for preventing infectious diseases rather than receiving the vaccine. This is an area that has not been studied in detail, and therefore it may require further research. The systematic review relating to the misconception of immunisation knowledge did not find anything about hygiene and sanitation (Cobos Muñoz et al., 2015). Additional examples of the misconceptions related to immunisation were that having the illness was beneficial for the child and strengthened their immune system (Smith, Amlôt, Weinman, Yiend, & Rubin, 2017), healthy lifestyle and diet reduce the risk of contracting preventable childhood diseases (Harmsen et al., 2013), and if the child contracted one of the diseases, it would be easily treatable (McKee & Bohannon, 2016). Although hygiene and sanitation were not found in the systematic review (Cobos Muñoz et al., 2015), this issue represented the main immunisation misconception of Myanmar migrant parents in the present study. This present study found that a high percentage of parents believe that if their children have good hygiene, they will not get infectious diseases specific to the Myanmar migrant group. This question has not been asked previously. The misconception that hygiene and sanitation are better than vaccination may be a change in belief over the years.

5.3.2.4 Factors that influence parents' immunisation knowledge and the recommendation to improve parents' immunisation knowledge

One of the potential factors that cause participants in this study to have varying levels of vaccination knowledge is information sources. A previous study among a different Myanmar migrant group along the Thailand border found an association between immunisation status and source of immunisation knowledge ($p<0.05$), as well as the content of the immunisation information provided (Prakunwisit & Areesantichai, 2015). Information sources can be divided into two groups: those from the health sector, such as vaccination centre operators, paediatricians and other HCWs, and scientific literature, and those sources from non-health sectors, such as mass media and the internet, friends

and relatives (McKee & Bohannon, 2016). A literature review has found that parents discover most of their vaccination information from the media or their peers (McKee & Bohannon, 2016). A study conducted in Thailand among pregnant women indicated that the internet was the most-used source to obtain health information; however, pregnant women followed the information provided by HCWs and trusted it the most (Surinprateep, Ratinthorn, & Limruangrong, 2019). Another study conducted in Thailand showed the use of sources to seek health information among Myanmar migrants (Boonchutima, Sukonthasab, & Sthapitanonda, 2020). The study found that the primary sources of HIV information were non-government organisations, friends and colleagues (Boonchutima et al., 2020). It was found that vaccine information from the non-health sector, such as the internet, television, radio, family and friends, continuously influenced the parents' views on childhood vaccination (Dubé, Vivion, & MacDonald, 2015). Some media, such as newspapers and unreliable internet sources, highlight both short-term adverse reactions and the possibility of long-lasting negative effects, which are exaggerated sometimes (McKee & Bohannon, 2016). As a result, these issues reported in the media may be one factor that leads Myanmar migrant parents to be worried about having their children vaccinated. A literature review suggests that some vaccine-hesitant parents may make decisions based on information gathered from various unreliable sources, which leads to the misunderstanding of immunisation side effects and can cause parents to refuse vaccines completely (Chung, Schamel, Fisher, & Frew, 2017).

Vaccination education from HCWs is a key player in equipping parents with the necessary information to make responsible immunisation decisions for their children (McKee & Bohannon, 2016). According to the immunisation service for migrants in Thailand, educating parents about the importance of childhood immunisation and the types and number of vaccines that children should receive is the health provider's duty (Pinna et al., 2020). If parents' need for immunisation information was not fulfilled, they started to seek information from other sources, including peers and the internet, which may not be evidence-based or reliable (Harmsen et al., 2013). It was difficult for the parents to find reliable childhood vaccination information based on all the positive and negative information they found from other sources (Harmsen et al., 2013). Consequently, these were potential reasons for parents' vaccine hesitancy. Effective communication with HCWs is one

healthcare quality indicator (Rosen et al., 2018). Physicians, nurses and other healthcare providers need to educate and give essential data to the parents about childhood immunisation (Kaufman et al., 2018). Although the migrants perceived the importance of immunisation, they sometimes did not remember the age-appropriate vaccine and what type of disease could be prevented by the vaccines (Pinna et al., 2020). Therefore, it is important to improve parents' immunisation knowledge, such as providing a short session about vaccination knowledge at waiting areas or providing face to face education in HCCs that help parents improve knowledge and allow parents to ask concerned questions.

5.3.3 Parental attitudes toward immunisation

In the present study, less than 53% of participants believe that vaccination is essential, 28.2% are not sure and 20.8% think it is unnecessary. Therefore, it is necessary to explore attitudes towards immunisation, focusing particularly on the Myanmar migrant group with negative attitudes. A previous study conducted ten years ago among Myanmar migrant parents in the Samut Sakhon Province used a questionnaire to ask participants about their immunisation knowledge and perception (Munsawaengsub et al., 2011). Munsawaengsub et al. (2011) found that a mother's negative attitude towards immunisation had a 4.22 times higher chance of incompletely immunised children than a mother's positive attitude. Concerns regarding the possible harm of vaccinations were more common among parents who had negative attitudes towards vaccination in general (Naeem et al., 2011). Most parents refusing vaccination for their children were worried about vaccine safety (Harmsen, 2015).

In contrast, in a systematic review of factors affecting childhood immunisation, attitudinal factors positively associated with uptake included believing that the vaccine is necessary or valuable and agreeing with vaccination (Smith et al., 2017). Although parents were concerned about the side effects in the present study, more than half believed the vaccine is safe, which showed that parents could have two opposing thoughts simultaneously. This indicates that the relationship between what makes parents consider that a vaccine is safe and an acceptable level of side effects might need to be explored. Researchers could investigate parents' attitudes before providing the immunisation and

provided the relevant information about vaccine safety or adverse effects for those who need reassurance.

5.3.4 Health service issues

The predominant health service issues that impact the immunisation status among Myanmar migrant children in Samut Sakhon Province are the time taken to receive the immunisation service and the availability of Myanmar-language immunisation information documents.

5.3.4.1 The time taken to receive the immunisation service

This study's findings show that most Myanmar migrant parents (51%) agree that it takes a long time to receive the immunisation service due to the long queues at the HCC. One factor contributing to the increased waiting time could be the shortage of HCWs in Thailand. The need for HCWs has become a problem in Thailand's healthcare services (Prakunwisit & Areesantichai, 2015). Due to the lack of HCWs and facilities, Samut Sakhon Province provides the vaccination service only once a month, usually on weekdays (Samut Sakhon Hospital, 2018). The number of parents who visit the HCCs is generally higher than the number of HCWs. This leads to long queues to receive childhood immunisation and reduces the time to provide the necessary health education required by some parents.

5.3.4.2 Health education from healthcare providers

Although some of the participants (48.2%) indicated that immunisation documents were available in Myanmar-language, most HCWs provided immunisation information and knowledge to migrant parents in the Thai language. In the current study, 14.2% of participants did not receive enough vaccine information, and 22.4% were unsure. Prakunwisit and Areesantichai (2015) found an association between children immunisation status and receiving vaccine information during vaccination service provided by HCWs at the HCC. Their research studied the same group of migrants but in a different area in Thailand. The lack of immunisation information could lead to incomplete and delayed vaccination among Myanmar migrant children (Canavati et al., 2011; Prakunwisit & Areesantichai, 2015). Effective communication with HCWs helps patients to have a good understanding of their health and adhere to a greater extent to their treatment plans (Rosen et

al., 2018). However, the main issue that prevents HCWs from providing the appropriate education could be the shortage of HCWs in Thailand.

5.4 Relationships among parent's age, the total number of children in the family, parent education level, family income, length of stay in Samut Sakhon Province and immunisation uptake in Myanmar migrant children aged under five years

The hypotheses were tested by Spearman's Rho. The results showed that the variables were related to the immunisation uptake of Myanmar migrant children aged under five years, which is discussed below.

5.4.1 Hypothesis 1: The parent's age is related to the immunisation rate in Myanmar migrant children aged under five years

Parent's age was not associated with the immunisation rate in Myanmar migrant children aged under five years (x^2 = 0.013, $p<0.001$). This finding is consistent with the result of the previous study conducted in the same province on factors relating to immunisation, which found that the age of mothers did not affect the immunisation status of Myanmar migrant children (Munsawaengsub et al., 2011). Regarding humans' learning, experiential learning is the process whereby people learn by doing and reflecting on their life experiences (Passarelli & Kolb, 2011). Knowledge results from the combination of grasping and transforming experience (Passarelli & Kolb, 2011). The previous study explained that the older mother tends to have more experiences in life and has more responsibility to take care of the child (Kusuma et al., 2010). However, nowadays, with access to technology and things, people have greater knowledge sources available to them now electronically instead of relying on life experience (Laal, 2013). As described in the study of Harmsen et al. (2013) explained that parents using technology such as the internet to study vaccination's knowledge (Harmsen et al., 2013). Mckee and Bohannon (2016) described that parents usually discovered most of their vaccination information from the media (McKee & Bohannon, 2016). Thus, age is not the factor that related to people knowledge and life experiences as it used to be.

5.4.2 Hypothesis 2: The number of children in a family living in Thailand is related to the immunisation rate in Myanmar migrant children aged under five years

The study results showed that the number of children in a family was negatively and significantly related to the full immunisation rate in Myanmar migrant children aged under five years ($x^2 = -0.330$, $p<0.001$). The current study found that the family with more children tend to has more chance that their child would receive lower immunisation coverage. This finding aligns with the findings of a study among migrant parents in Nigeria that found fewer children in a household was significantly correlated with complete vaccination (Antai, 2010). Children's health outcomes can vary depending on the community's environment where they live and their family's circumstances (Australian Institute of Health and Welfare, 2019). Much evidence has shown that children's health also depends on how the family spend time with each child (American Psychological Association, 2009). Children from smaller sized families tend to have better care from their parents because parents can focus on and provide essential support for their child (American Psychological Association, 2009). Therefore, the evidence suggests that larger families with higher numbers of children may have less parental attention and less immunisation (Antai, 2010).

The parents wish to care for their children; however, the family income also plays a role in children's health, and with more children, the amount of money to spend on each child might decrease. Some families need to spend more money surviving on food and accommodation than medical expenses (McKean, Lessem, & Bax, 2005). Regarding the Myanmar migrant families in Thailand in the present study, the survey showed that most Myanmar migrants are married and live with their children. Also, each Myanmar family had a small number of children in the current study. By comparison, the previous study found that a high number of family members may cause more difficulty in obtaining a better quality of life and proper education and health (McKnight, 2020). However, there were very few families in this study included with a large number of family members; this is something that this study could not determine.

5.4.3 Hypothesis 3: The total family income is related to the immunisation rate in Myanmar migrant children aged under five years

In the current study, total family income was not associated with the immunisation rate in Myanmar migrant children aged under five years ($x^2 = -0.065$, $p<0.001$). This indicated that children in a family

with a higher income would not usually have a higher immunisation rate. Considering the income sufficiency, the present study showed that income sufficiency had a low positive correlation with immunisation rate with statistical significance ($x^2 = 0.257$, $p<0.001$). When income sufficiency was related to the immunisation rate, it indicated that the children in a family with sufficient income tended to have a higher immunisation rate in this study. According to low-middle-income country immunisation barriers, many indirect expenses associated with immunisations, including transportation to clinics, were more tolerable for households with higher incomes, suggesting that household income plays a significant role in access to immunisation services (Glatman-Freedman & Nichols, 2012). This finding is supported by a study conducted in China among migrant children, which indicated that parents with better socioeconomic status, such as employment and a steady salary, may have a better chance of making their children full immunised (Hu et al., 2013).

In this case, we can assume that this applies to the situation of Myanmar migrants in Thailand. Myanmar migrants migrated to Thailand for seeking a better quality of life and higher income (McKnight, 2020). The minimum wage per day in Thailand was increased to 300 baht, which is more than the daily wage in Myanmar (Promphakping et al., 2019). However, the current study found that Myanmar migrants' income seems to be cover the daily expenses, but most migrants mentioned their income was insufficient. The possible reason was that not only daily expenses migrants had to pay, but also they had to send money back to their family in their home country (Chantavanich & Vungsiriphisal, 2012).

In addition, money management plays an important role. The amount of money in the family does not matter much if there is good money management (Australian Government Services Australia, 2020). According to McKean et al. (2005), each family that employed money management divided money for homeownership; transportation; utilities such as gas, electricity and water; telephone; and medical expenses. However, more than one-third of the families did not manage money for medical costs or did not have enough money to obtain healthcare services (McKean et al., 2005). Consequently, children from families with insufficient income tend to have lower health outcomes and do not have enough money to get proper care included immunisation (Cooper & Stewart, 2013).

5.4.4 Hypothesis 4: The parent's education level is related to the immunisation rate in Myanmar migrant children aged under five years

In the present study, parent's education level was not associated with the immunisation rate of Myanmar migrant children aged under five years with statistical significance ($x^2 = -0.005$, $p>0.001$). The majority of the parents in this study graduated from primary school, similar to those in the previous study conducted in Samut Sakhon (Munsawaengsub et al., 2011). However, the results were inconsistent with the those of research conducted in Thailand, where it was found that the mother's education in the EPI had a significant influence on the immunisation status of children, indicating that the low education level of the mother had a 4.92 times higher chance of incomplete immunisation of children (Munsawaengsub et al., 2011). It is paramount to note that the parents' education may impact the child's development and parenting; for example, parents with higher education levels may take care of the children better (Hu et al., 2013).

However, parents with any education level could seek immunisation information to take care of their child to get the immunisation nowadays. The possible reason for this is that parents can use the internet to access reliable health information about immunisation, adverse effects and age-appropriate vaccination online (Harmsen et al., 2013). This health information contributes to the parents supporting their child to get immunisation appropriately (Harmsen et al., 2013). Although the parents have different educational levels, they can access learning resources in the same way. Internet-based health information, telephone advice, telemedicine, pamphlets, infographics, websites are examples of health information channels that can be accessed quickly and are user-friendly (Khoo, Bolt, Babl, Jury & Goldman, 2008). In Thailand, there is reliable online health information providing by the Thai government, Myanmar community and HCWs. For example, the Facebook page run by the Myanmar community and HCWs provides general health information to all Myanmar living in Thailand (Samut Sakhon Hospital, 2018). Thus, parents can learn about health information and apply it to their children. To sum up, in the present study, the parents' education level was not related to the immunisation rate in Myanmar migrant children aged under five years, and the way parents seek the information to take care of their child is more important.

5.4.5 Hypothesis 5: The length of stay in Samut Sakhon Province is related to the immunisation rate in Myanmar migrant children aged under five years

The length of stay in Samut Sakhon Province was not associated with the immunisation rate of Myanmar migrant children with statistical significance ($x^2 = -0.058$, $p>0.001$). The results were not congruent with those of previous studies among migrant children in India and China, which indicated that migrant children who settle in a new country longer tend to have a higher immunisation rate (Hu et al., 2013; Kusuma et al., 2010). Usually, Myanmar migrants live together as a big community (Chantavanich & Vungsiriphisal, 2012). According to Chantavanich and Vungsiriphisal (2012), some Myanmar migrants, especially skilled workers with a higher education level, can speak or even write in the Thai language. However, the rest cannot communicate in Thai and mostly remain close to people from the same country (Chantavanich & Vungsiriphisal, 2012). Since some migrants cannot communicate with people other than those from Myanmar, they may not know that many resources can help them access healthcare services even though they have been in Thailand for many years (Mon, 2010). In addition, the Thai government still cannot provide proper support for migrants and refugees to know their rights to access facilities, including the healthcare system (Mon, 2010).

Furthermore, the previous study illustrated that the migrants from Myanmar come legally and illegally; however, only registered workers can benefit from Thai healthcare services (Canavati et al., 2011). The problem is that sometimes the registered workers' families are not included in the health system (Brees, 2010). Registration is the barrier for Myanmar's people to access healthcare services (Veerman & Reid, 2011). Similarly, information in a comprehensive guide to resettlement written by the International Catholic Migration Commission (2013) states that Myanmar migrants have been in Thailand since the 1980s, before the registration and admission system was introduced. Some of them were unregistered, and even though there is resettlement, it is not very functional (The International Catholic Migration Commission, 2013). More than half of the Myanmar migrant workers are still in Thailand illegally (Chantavanich & Vungsiriphisal, 2012; Mon, 2010). Therefore, some children might have been born into unregistered families or do not know their rights to access healthcare services. This might be the reason that some migrants still cannot receive proper immunisation for their children.

5.4.6 Hypothesis 6: The migrant parent's legal status is related to the immunisation rate in Myanmar migrant children aged under five years

Regarding the current finding, only two from 255 Myanmar migrants answered that they were unregistered migrants. The legal status of participants in the present study might not be correct if they were afraid to answer truthfully. Therefore, this number might not represent the exact number of unregistered migrants. Thus, the small number of unregistered migrants could not determine the association between parents' legal status and immunisation rates in Myanmar migrant children.

Regarding the previous study in Thailand, the results showed that most unregistered Myanmar migrants did not want their children to receive the vaccination since they were afraid that they would be caught by the police (Canavati et al., 2011). Future research needs to carefully select a method that can capture the participant's actual legal status. Thus, future research can explore the relationship between parents' legal status and children's immunisation rates and

5.5 Limitations

This study was conducted online, the survey was provided in the Myanmar-language, and the data was collected from participants in the Mueang District in Samut Sakhon Province, Thailand. Online surveys are relatively easy and convenient for participants to access via their smartphone or tablet. However, the present online survey may not reflect the general migrant population since it was promoted and conducted in only one District in Samut Sakhon Province. People that could not participate in the survey include those who are not parents, Myanmar migrants who do not have access to the internet, and Myanmar migrants who cannot read in Myanmar-language. Connectivity was a problem due to unstable internet connections, which made the completion of the study difficult.

Furthermore, reliability can be an issue for an online questionnaire since the participants may not be truthful or refuse to provide answers to questions. The question about legal status was unable to confirm the legality of migrant status since the participants' responses were self-reported. In the present study, only two migrants (0.8%) self-reported that they are illegal migrants. There is a possibility that participants might not have answered truthfully about their legal status. As a result, there were not enough responses to determine the correlation regarding legal status. It was not

possible to correlate the legality of this status with the immunisation status of participants' children. Furthermore, promoting online surveys only during home visits and recruiting participants by snowball sampling would have missed lower incomes and literate participants.

Other limitations include the possible misinterpretation of some of the items in the survey instrument. The wide range of choices in the response scale may have led to a lack of clarity in interpreting the results. It would have been easier for the participant to read easily understandable questions and fewer response options. Although professional specialists reviewed the survey questions, the instrument was not piloted in the target population before being delivered to the participants. Future research on this topic would benefit from conducting a small pilot study to ensure that the items are clear to the participants, elicit the information that the item was intended to elicit, and assess the instrument's accuracy.

Moreover, although the sample size in the present study was good, it was impossible to determine the percentage it represents of the migrant parents living in Mueang District, Samut Sakhon Province. The researcher only knew the number of people who participated in the online survey, but information on the exact numbers of migrants and migrant parents in the Mueang District, Samut Sakhon Province, remains unknown. As such the researcher does not know the proportion of the total number of migrants in Mueang District who participated in the survey. Therefore, other Myanmar migrants may need to be included to summarise the overall barriers to immunisation in this area.

5.6 Recommendations

Based on the results of the present study, what can be done to support Myanmar migrants to access immunisation services is discussed below. The recommendations for practice and the recommendations for future research are outlined below.

5.6.1 Recommendations for practice

- Additional information on immunisation should be given to parents by registered nurses

Effective communication with HCWs is essential to improve the quality of care (Rosen et al., 2018). Parents want to be well-informed and ask for more information regarding childhood vaccination

(Harmsen et al., 2013). Although there are various sources to access information about immunisation in children (i.e. the internet, friends, family, television, radio and newspapers), healthcare providers' information and recommendations, remain the most highly reliable information sources (Harmsen et al., 2013). Although the present study showed that healthcare professionals educated most participants, they still lacked knowledge of childhood immunisations. Therefore, it is crucial to ensure that parents understand childhood immunisation by assessing what migrant parents know after education has been provided.

- Extending immunisations services that meet parents working lives, e.g. providing immunisation services at the weekend

Most participants in the study indicated that they have difficulty in travelling to HCCs. Moreover, it takes a long time to receive the vaccination. Most participants have to stop working to take their child for vaccination, which can affect their salary. Therefore, it would be better to have an additional vaccination day or provide immunisation services at the weekend. This would mean that the parent would not need to stop working and it would reduce the possibility of not having their child vaccinated.

- Mobile vaccination service

Difficulty in travelling and the cost burden can prevent children from receiving all the vaccinations. A mobile vaccination service can help migrant groups access immunisation services. The HCC should explore the number and the location of immunisation service groups that are difficult to reach. This would enable the HCC to provide a mobile vaccination service covering all the groups that are difficult to reach.

- Additional childhood immunisation media and helpline in Myanmar-language

The childhood immunisation media, including the immunisation video in the Myanmar-language version, should be provided in the waiting area since it can assist any migrant who has difficulties reading the documents and help in improving the participants' knowledge. The HCC should also provide a helpline in the Myanmar-language, for example, providing a helpline on weekdays.

5.6.2 Recommendations for future research

This study aimed to determine the barriers to immunisation among Myanmar migrant children aged under five years living in Thailand. The study found that there was a lack of knowledge of childhood

immunisation. The main barriers to immunisation were not the parents' demographics but the parents' knowledge and healthcare immunisation service issues. There is still a need to identify the factors, such as friends, relatives and the media, that impact parents' knowledge and attitudes towards immunisation. These factors could be explored further to understand how to promote the intervention to improve parents' knowledge. Therefore, future research could investigate multiple factors that may influence the knowledge of immunisation and immunisation uptake. Moreover, future research should explore the barriers to immunisation from the perspective of the healthcare providers so that the barriers to immunisation perceived by both parents and HCWs can be identified. Such research would highlight the need to implement more equitable policies and contribute to planning immunisation promotion that focuses on the migrant group in the future.

5.7 Conclusion

This correlational study aimed to examine the barriers to immunisation among under school-age (zero to five-year-old) Myanmar migrant children living in Thailand. Also, the correlations analysed the data for significant relationships between the variables impacting immunisation levels. The study using a web-based questionnaire survey (produced using Qualtrics) was used to collect the data regarding the parents' demographics, Myanmar migrant children's immunisation rates and barriers to immunisation in Myanmar migrant children. To maximise participation rates, convenient and snowball sampling approaches were used.

A total of 255 Myanmar migrant parents living in Mueang District, Samut Sakhon Province, participated in the study. The results were divided into four themes are as follows: the first theme– difficulties in accessing immunisation services. The exploration of the first theme found that travelling to healthcare centres, not having enough money and language barriers were obstacles to vaccinations for Myanmar migrant parents. There was one community health service per sub-district in Mueang District, Samut Sakhon Province, and it did not cover all the areas where Myanmar migrants live. Travelling to HCCs required the use of public transport or a private vehicle due to the long distance. Moreover, there were other expenses of taking the child to immunisation service, including transport cost, meal cost, and no payment for missing work

Findings concerning the second theme, knowledge and awareness of immunisation, showed that parents' lack of knowledge about the vaccine's adverse effects, vaccination schedules, the benefits and the availability of immunisation services impacted their children's immunisation rates. Also, parents had a misconception about immunisation. Most parents believed that maintaining hygiene and sanitation is responsible for preventing infectious diseases rather than receiving the vaccine. This is an area that has not been studied in detail. In this study, information sources were potential factors that caused participants to have varying levels of vaccination knowledge. Vaccine information from the non-health sector led to a misconception about the vaccine, while information from HCWs increased the rate of immunisation.

Regarding the third theme, parental attitudes to immunisation, the findings showed that the participants generally had a positive attitude. Although participants were concerned about the side effects, more than half believed the vaccine was safe, showing that parents could simultaneously have two opposing thoughts. This indicates that the relationship between what makes parents consider a vaccine safe and an acceptable level of side effects might need to be explored.

Lastly, the fourth theme was issues relating to the healthcare service. This theme indicated that the main problem was having to wait a long time to access the vaccination service. The shortage of HCWs in Thailand was a factor contributing to the increased waiting time. The number of parents who visit the HCCs is generally higher than the number of HCWs. This situation leads to long queues to receive childhood immunisation and reduces the time to provide the necessary health education required by some parents.

Regarding the correlation between the parents' demographics and Myanmar migrant immunisation rates, there was a low negative correlation with statistical significance between the Myanmar migrant children's immunisation rates and the number of children living in Thailand with a parent ($\chi 2 = -0.330$, $p < 0.001$). Additionally, there was a low positive relationship between the Myanmar migrant children's immunisation rates and parental income sufficiency ($\chi 2 = 0.257$, $p < 0.001$). There was no correlation between the parent's age, the number of years they lived in Samut Sakhon Province,

their legal status, total family income, the parent's level of education and their children's immunisation rates.

Examining and understanding the barriers to vaccination uptake is essential to service providers and can help inform policy-making regarding Myanmar migrant children in Thailand. Additionally, the results can assist healthcare providers in understanding the barriers to immunisation in order to develop nursing interventions that promote effective immunisation services to Myanmar migrant children. The recommendation for practice to promote effective immunisation services is to face education by HCWs, providing immunisation services on the weekend, mobile vaccination service and adding childhood immunisation media and helpline in Myanmar language. This study recommends further exploration of multiple factors that may influence the knowledge of immunisation and immunisation uptake. Additionally, future studies should look into immunisation barriers from the perspective of HCWs, so that both parents and HCWs can identify immunisation barriers. Such research would emphasise the need for more equitable policies to be implemented in the future and aid in developing immunisation campaigns that target migrants.

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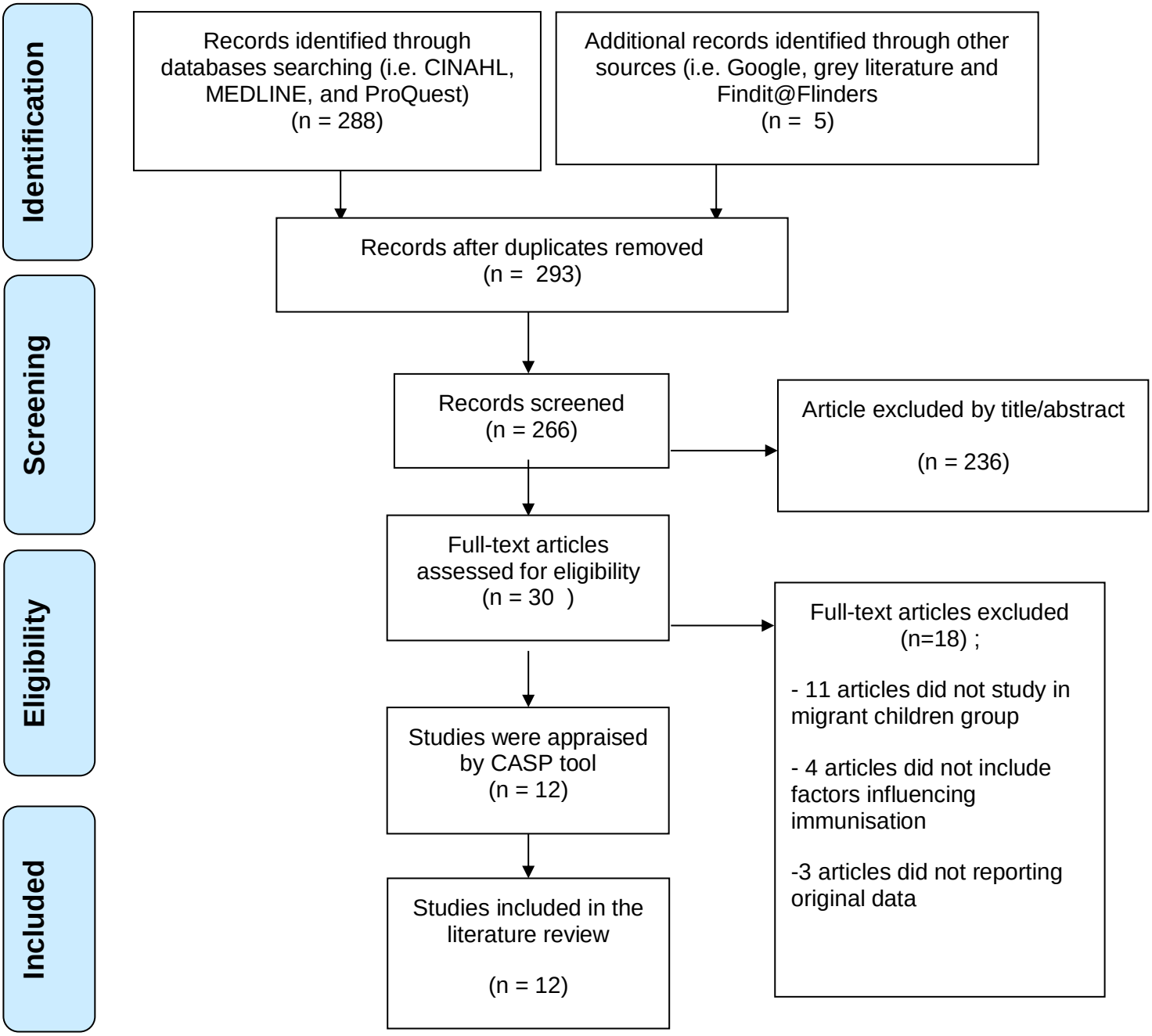
APPENDICES

Appendix 1-The PRISMA chart shows the flow diagram of the literature search and inclusion of studies



Appendix 2-Evaluation of Qualitative Studies Included for Review

Author and Date	Q1 - clear research aims	Q2 Qualitative approach appropriate	Q3 Research design appropriate	Q4 Recruitment strategy appropriate	Q5 Data collection methods appropriate	Q6 Researcher bias recognised	Q7 Ethical issues considered	Q8 Data analysis rigorous	Q9 Findings clearly stated	Q10 research is valuable
Canavati et al. 2011	Y	Y	Y	Y	Y	N	?	Y	Y	Y
Godoy-Ramirez et al. 2019	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Harmsen et al., 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wang, Lam, Wu, Liao, & Fielding, 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

As adapt from CASP qualitative tool (NHS Public Health Resource Unit 2018)

Appendix 3-Evaluation of Quantitative Cross-sectional Studies Included for Review

Author and Date	Q1 clear aim	Q2 appropriate research design	Q3 justified sample size	Q4 participant clearly defined and selected appropriate population	Q5 variables accounted for in the design of the study	Q6 used appropriate data statistics and analysis	Q7 results were adequately described	Q8 the consistent result	Q9 results present were described in the method	Q10 discussing and conclusion justified by the results	Q11 Identified limitations	Q12 Ethical approval
Antai, 2010	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Baker et al., 2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Han et al., 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hu et al., 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Kusuma et al., 2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Munsawaengsub et al., 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Prakunwisit & Areesantichai, 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	?
Sun et al., 2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	?

As adapt from critical appraisal tool to assess the quality of cross-sectional studies (AXIS) (Downes, Brennan, Williams, & Dean, 2016)

Appendix 4-Summary review table

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
1	(Antai, 2010) Migration and child immunisation in Nigeria: individual- and community-level contexts	To describe the effects of community-level and individual-level characteristics of a migrant group on childhood immunisation uptake	A quantitative study using data from the Nigeria Demographic and Health Survey	Sample of 6029 children from 3725 mothers from 365 communities in Nigeria	-Children of rural non-migrant were fully immunised more than migrant children -Individual-level characteristics affected on immunisation rate was demographic and socioeconomic -Older mothers increase the percentage of a child being fully immunised -Lower wealth status could be a barrier to full immunisation. -Community-level characteristic effected on immunisation rate was a region of residence and mothers who had a delivery at a hospital	-Strength: the results can be generalised across the country -Limitation: other significant barriers did not include in the study	Themes; -Demographic factors include mother age and number of children -Socioeconomic factors include wealth index - Health service issues
2	(Baker et al., 2010) Perception of barriers to immunisation among parents of Hmong origin in California	To explore factors that related to the perception of determinants to immunisation	A cross-sectional study using a community-based survey (SHOTS survey)	Parents or caregivers of Hmong origin aged 18 and older living in the United States for at least one year and having at least one child under	-Three factors associated with perceived barriers were the nativity, accessing traditional Hmong healthcare, and socioeconomic position. -Parent's age, education, gender, English skills did not associate with perceived barriers	-Strengths: a significant number of participants -Limitations: cannot generalised finding to other migrant groups	Themes: -Demographic factors -Parent's lack of knowledge and awareness -Attitudes toward immunisation

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
				nine years old (n=417)			
3	(Canavati et al., 2011) Barriers to immunisation among children of migrant workers from Myanmar living in Tak province, Thailand	To examine determinants to complete immunisation in migrant children in Tak province	A qualitative study through 57 focus groups	Parents of under 12-year-old migrant children in three clinics along the border with Myanmar in Tak province, Thailand. (n=371)	Four determinants to immunisation include Difficulties in accessing immunisation services, fear of cardiac arrest due to side effects, forgetting the immunisation appointment, and the necessity of work impacting on parent's time	-Strengths: changed the immunisation service delivery and practice -Limitation: children under school age did not access to a school immunisation program	Themes: -Difficulties in accessing immunisation service -Demographic factors -Parent's lack of knowledge and awareness -Attitude toward immunisation
4	(Godoy-Ramirez et al., 2019) Exploring childhood immunisation among undocumented migrants in	To examine barriers to immunisation among unregistered migrants using the TIP guide	A qualitative study includes three steps: 1.an initial workshop to indicate problem statement; 2.in-depth interview with	-unregistered migrant parents who visited non-governmental clinic (n=7)	Two main themes: 1. Parents fear being questioned on the health of children and legal status 2. Parent views and acceptance on the importance of child immunisation 3. Parents believe that child immunisation is essential, but they are scared to be	-Strength: data were well analysed and trustworthy -Limitation: Small population group	Themes: -Demographic factors - Attitudes toward immunisation

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
	Sweden - following qualitative study and the World Health Organisations Guide to Tailoring Immunisation Programmes (TIP)		undocumented migrant mothers and nurses;3. a second workshop to gather findings into a conceptual framework	-nurses at Child health Centres (n=3)	caught Thus, parents avoid accessing health facilities		
5	(Han et al., 2014) Vaccination coverage and its determinants among migrant children in Guangdong, China	-To estimate age-appropriate immunisation coverage -To examine factors that influence up-to-date immunisation	A quantitative study through interviewed participants using a questionnaire survey	Primary caregivers of migrant children age 12-59 months from 70 villages in Guangdong, China (n=1530)	1. The age-appropriate immunisation rate was 12.9% for the 1:3:3:3:1 Immunisation series 2.Factors related to up-to-date immunisation: -parent with higher education -primary caregiver's knowledge about vaccine and disease -a good attitude toward the immunisation of primary caregivers -higher-income -manufacture employers do not have available time	-Strength: findings provide vital information to improve immunisation coverage of migrant children in other towns -Limitation: some selection bias from sampling method	Themes: -Demographic factors -Socioeconomic factors - Health service issues -Parent's lack of knowledge and awareness

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
					-boys were more immunised -children living in their own house -children who born at a hospital		
6	(Harmsen et al., 2015) Vaccination decision-making of immigrant parents in the Netherlands; a focus group study	To examine factors that influence decision-making in parents with different ethnic backgrounds living in the Netherlands	-A qualitative study through six focus groups Using thematic analysis to analysed data	-Immigrant parents who had at least one child aged 0-4 years and lived in Netherland for more than one year (n=33) -Setting: mother-baby meeting organised by the welfare organisation	Factors influencing immunisation uptake: -Participants had a positive view of immunisation -cultural and religion, e.g., Islam believed vaccination is important -social norm -negative experiences, e.g., get sick after vaccination -Language barrier to understanding NIP-information -Knowledge gaining from health providers -Child Welfare Centres were far away due to weather and transportation conditions	-Strength: results showed detailed information -Limitation: some selecting bias because participants might have a good attitude towards immunisation	Themes: -Difficulties in accessing healthcare service - Health service issues -Parent's lack of knowledge and awareness -Attitudes toward immunisation
7	(Hu et al., 2013) Determinants of childhood immunisation uptake among socio-economically disadvantaged	-To determine immunisation coverage –To identifies barriers to immunisation among migrant children in Yuwu	A cross-sectional survey	Migrant mothers of a child under 2-year-old were categorized into two groups, including recent migrants and	-Migrant children have a lower immunisation rate, especially in recent migrants. -Factors related to full immunisation uptake, including the higher education level of mother: higher socioeconomic status and children delivery at a hospital. -Gender of a child, mother's age, and a	-Strength: a big number of participants -Limitation: the study did not collect data from health services' outreach, supply, and human resources, which may impact the	Themes: -Demographic factors -Socioeconomic factors - Health service issues -Parent's lack of

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
	migrants in East China	city, Eastern China		settled migrants (n = 1,426)	number of children did not relate to migrant's immunisation.	healthcare system and serve to deliver	knowledge and awareness
8	(Kusuma et al., 2010) Migration and immunisation: determinants of childhood immunisation uptake among socioeconomically disadvantaged migrants in Delhi, India	To explore immunisation coverage and identifies determinants to complete immunisation among migrant children in Delhi, India.	A cross-sectional survey. Participants were categorized into two groups: settled migrant and recent migrant. Participants were interviewed with a questionnaire.	Mothers of migrant children age under 2-year-old (n= 746)	-Settled migrants were more fully immunised -Factors related to full immunisation uptake: mother's age (older is better); mother's education level: higher socioeconomic status: a career of the head of household: mother's access to the postnatal clinic: and children who delivery at a hospital. -The gender of a child does not relate to immunisation uptake. -The study indicates that healthcare services should be developed explicitly for migrant communities	-Strength: methodological strength and adequate sample size -Limitation: bias from retrospective reports of immunisation uptake history	Themes: -Demographic factors -Socioeconomic factors - Health service issues -Parent's lack of knowledge and awareness
9	(Munsawaengsub et al., 2011) Factors influencing immunisation status of Myanmar migrant children	To examine the factors influencing the immunisation status of Myanmar migrant children	A cross-sectional study by structured questionnaires.	The 183 Myanmar migrant mothers had 1-5 years old children and lived in the Mahachai District.	- Education of mothers and the perception of mothers towards the EPI had a significant influence on the immunisation status of children (p-value <0.05). Low education of mothers and poor perception of mothers had higher chances of incomplete immunisation of children.	Strength: the research design was appropriate for the topic, and the sample size was clear identified	Themes: - Parent's lack of knowledge and awareness - Attitudes toward immunisation

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
	among 1-5 years in Mahachai District, Samutsakorn Province, Thailand	among 1-5 years.				Limitation: samples cannot present to other migrant groups	
10	(Prakunwisit & Areesantichai, 2015) Factors associated with immunisation status among Myanmar migrant children aged 1-2 years in Tak province, Thailand	To examine the relationship between the immunisation status of Myanmar migrant children aged 1-2 years and maternal knowledge about immunisation	A cross-sectional study using a questionnaire survey	Mothers of Myanmar migrants who live in four Thai-Myanmar border areas, including Mae Sot, Phop Pra, Mae Ra Mad, and Ta Song Yang in Tak province.	Immunisation status associated with a level of knowledge about immunisation, language barriers, health education, the information content and the content that mothers get during immunisation service	Strength: obtain detailed information from participants Limitation: the findings cannot be generalized	Themes: - Health service issues -Parent's lack of knowledge and awareness
11	(Sun et al., 2010) Immunisation status and risk	To determine the immunisation status and	A cross-sectional study through an interview by using	-The 1820 primary caregivers of migrant children aged 12-35	-The age-appropriate immunisation coverage for OPV, DTP, MCV and HepB was 49.6%, 50.8%, 54.7%, 45.6% -Demographic factors were associated with	Strength: sample select method was appropriate and clear defined	Themes; -Demographics - Health service issues

No.	Author(s) surnames and year/country Title	Study aims/purpose	Study design/methodology	Setting and sample	Main findings	Strengths and limitations	Relevance to research
	factors of migrant children in densely populated areas of Beijing, China.	determine the factors associated with the immunisation rate of migrant children in the densely populated area in Beijing.	questionnaire surveys	months. - Participants lived in 23 densely populated towns and townships in Beijing, China.	the immunisation rate including child's migrant characteristics, primary caregivers' awareness of immunisation uptaking, and healthcare services from the relevant organisation	Limitation: there was some bias in the study because the children who did not present the immunisation card was included in an incomplete vaccination group. This action might affect real immunisation coverage.	-Parent's lack of knowledge and awareness
12	(Wang et al., 2014) Chinese immigrant parents' vaccination decision making for children: a qualitative analysis	To examine factors related to vaccination-decision making to protect children's health in new immigrant mothers from mainland China living in Hong Kong	A qualitative study through an in-depth interview under a Grounded Theory approach	-Chinese women who migrated from mainland China to Hong Kong for less than seven years and have children aged 14 years old or under 14 years old (n=23)	Five themes of VDM: 1. Institutional factors include policies and immunisation schedule 2.lack of vaccination knowledge, awareness, and advice; 3.vaccinated motivation such as fear of diseases; 4.barriers to immunisation such as cost and side effects; and 5.social influenced by other's attitude toward vaccine - The most impact on parent's VPD in this study is social norms.	Strengths: show in-depth detail about vaccination-decision making Limitations: sample cannot represent all Chinese migrant mothers in Hong Kong	Themes: - Health service issues -Parent's lack of knowledge and awareness -Attitudes toward immunisation

Appendix 5- Flyers in English-language

BARRIERS TO IMMUNIZATION IN MYANMAR CHILDREN

A research study seeks to identify barriers to immunization in Myanmar migrant children living in Samutsakorn province, Thailand. This will help relevant organizations providing service to you.

Potential participants: You may qualify to participate in this voluntary research study if you:

- Are older than 18 years old
- Are the parent of Myanmar children
- Have at least one child under 5 years old
- Live in Samutsakorn province
- Be able to read and write in Burmese

What potential participant require to do?

A 15 minutes online survey.

For further information, please do not hesitate to contact research team

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Are you ready?

Please go to the survey link or QR code below.

www.qualtric.com/barrierstoimmunization

Please refer the link to other potential participants

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Appendix 6- Flyer in Myanmar-language

မြန်မာကလေးငယ်များတွင်ကာကွယ်ဆေးထိုးရန်အတွက် အနောက်အယှက်အတားအဆီးများ

ထိုင်းနိုင်ငံ Samutsakorn Province တွင်နေထိုင်သော မြန်မာကလေးငယ်များ ကာကွယ်ဆေးထိုးရာတွင် အနောက်အယှက်အတားဆီးဖြစ်စေသောအချက်များအား ရှာဖွေဖော်ထုတ်သော သုတေသနစာတမ်းဖြစ်ပါသည်။

(၁၅) မိနစ်ကြာမြင့်ပါမည်။

ပါဝင်မည့်သူသည် အသက် (၁၈) နှစ်ပြည့်ပြီးဖြစ်ရပါမည်။

မြန်မာနိုင်ငံသားဖြစ်ရပါမည်။

အသက်ငါးနှစ်အောက်ကလေးအောက်ကလေး အနည်းဆုံးတစ်ယောက်ရှိရပါမည်။

Samutsakorn ဒေသတွင်နေထိုင်သူဖြစ်ရပါမည်။

မြန်မာစာရေးတတ် ဖတ်တတ်ရပါမည်။

သင်စိုးရိမ်ပူပန်မှုရှိပါကသုတေသနအဖွဲ့သို့ဆက်သွယ်ပါ

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အဆင်သင့်ဖြစ်ပြီလား

https://qualtrics.flinders.edu.au/jfe/form/SV_1FBB47Rfyv2xCcZ

ကျွန်စီမံကိန်းကိုစိတ်ဝင်စားသောအခြားသူများအားလင့်ခ်ပို့ပါ

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Appendix 7- Questionnaire

Part 1

Part I: Demographics and backgrounds

Please complete the following demographic and background questions (check in the box that matches to you)

Your relationship to the child

- ○ Father
- ○ Mother
- ○ Other (please specify) _____

Your age (years)

_____

Religion

- ○ Buddhism
- ○ Christian
- ○ Islam
- ○ Other (please specify) _____

Your marital status

- ○ Married
- ○ Divorced
- ○ Separate
- ○ Widow
- ○ Not to respond

How many children do you have in a family?

_____

How many children live with you in Thailand?

_____

Education level –pick your highest level of education

- ○ Never attend formal education
- ○ Primary school
- ○ Junior high school
- ○ Senior high school
- ○ Bachelor's degree or above
- ○ Other (please specify) _____

Occupation

- ○ Housemaid
- ○ Factory worker
- ○ Fisherman
- ○ Selling in the market
- ○ Unemployed
- ○ Other (please specify) _____

The total family income per month (Thai baht)

_____

Is family income sufficient for your needs?

- ○ Yes
- ○ No
- ○ Sometimes

Years living in Samutsakorn province?

- ○ <1
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ >5 (please specify) _____

Your legal status in Thailand?

- ○ Registered migrant
- ○ Unregistered migrant

Detail of your children

	Age (year)	Country of birth	Place of delivery
1st Child			
2nd Child			
3rd Child			
4th Child			

Part2

Part II: Immunisation history of children under five years old or less in the family who is now living in Thailand.

Please read the following questions and check in the box that matches you.

Is each child fully immunised?

	Age (year)	Is each child fully immunised?
1st Child		
2nd Child		
3rd Child		

Does each child always get the immunisation on time?

	Age (year)	Does each child always get the immunisation on time?
1st Child		
2nd Child		
3rd Child		

Does your child have a Pink Book (Child personal health record) in Thailand?

	Age (year)	Does your child have a Pink Book (Child personal health record) in Thailand?
1st Child		
2nd Child		
3rd Child		

Part 3

Part III: Barriers to immunisation

Included here are four themes, which may impact on childhood immunisation uptake. The following pages contain a number of statements with which some people agree, and others disagree. Please read each statement and indicate which answer best fits your experience of immunisation services. Please rate how much you personally agree or disagree with these statements. Use the following scale:

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Theme A: Difficulties in accessing the immunisation service

My children would not be completely immunised as I believe that:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The appointment time for vaccine injection is not convenient	○	○	○	○	○
There are difficulties in travelling travel to the health care centres	○	○	○	○	○
I do not have enough money to take my child to vaccination service	○	○	○	○	○
I do not understand Thai language	○	○	○	○	○

Theme B: Knowledge and awareness of immunisation among participants

My children would not be completely immunised as I believe that:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I worry that my children will have adverse effects from vaccination	○	○	○	○	○
I do not know when my child should be vaccinated	○	○	○	○	○

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Maintaining hygiene and sanitation is responsible for preventing infectious diseases rather than having vaccines	○	○	○	○	○
I do not know what kind of immunisation services are available for migrant children in Thailand	○	○	○	○	○

Theme C: Parent's attitudes toward immunisation

My children would not be completely immunised as I believe that:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I believe that vaccination is not important	○	○	○	○	○
I am not confident to visit health care centres	○	○	○	○	○
I do not remember my children's immunisation appointment	○	○	○	○	○
I am concerned that vaccines are not safe for my children	○	○	○	○	○

Theme D: Health service issues

My children would not be completely immunised as I believe that:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I do not get any immunisation information from the healthcare providers	○	○	○	○	○
There are no immunisation documents available in Burmese language	○	○	○	○	○
There is no healthcare centre close to my house	○	○	○	○	○

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
It takes a long time for receiving the vaccination service due to a long queue at the health care centre	○	○	○	○	○

-

Do you have any other factors that influence immunisation uptake?

- ○ No
- ○ Yes (please describe) _____

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Appendix 8- Questionnaire in Myanmar-language

Part 1

ပထမပိုင်း- လူနေမှုအခြေအနေဆိုင်ရာမေးခွန်းများ
ကျေးဇူးပြု၍အောက်ပါ လူနေမှုအခြေအနေဆိုင်ရာမေးခွန်းများကို ဖြေပါ။ (အဖြေကို အမှန်ခြစ်ပါ)

ကလေးနှင့်တော်စပ်ပုံ

- အဖေ
- အမေ
- တခြား

အသက်

ဘာသာ

- ဗုဒ္ဓဘာသာ
- ခရစ်ယာန်
- အစ်စလန်
- အခြား (ဖော်ပြရန်)

သင့်အိမ်ထောင်ရေးအခြေအနေ

- အိမ်ထောင်သည်
- အိမ်ထောင်ကွဲ
- ခွဲနေ
- မုဆိုးဖို/မုဆိုးမ
- အခြား (ဖော်ပြရန်)

မိသားစုတွင်ရှိသော ကလေးအရေအတွက်

ထိုင်းနိုင်ငံတွင်ရှိသော ကလေးအရေအတွက်

အမြင့်ဆုံးပညာအရည်အချင်း

- ကျောင်းမနေဘူးပါ
- မူလတန်း
- အလယ်တန်း
- အထက်တန်း
- ဘွဲ့ရနှင့်အထက်
- အခြား (ဖော်ပြရန်)

အလုပ်အကိုင်

- အိမ်ရှင်မ
- စက်ရုံလုပ်သား
- ရေလုပ်သား
- ဈေးရောင်း
- ဗီဒို
- အခြား (ဖော်ပြရန်)

မိသားစုဝင်ငွေ (ထိုင်းဘတ်)

မိသားစုဝင်ငွေလုံလောက်မှုရှိပါသလား

- ရှိပါသည်
- မရှိပါ
- တစ်ခါတစ်ရံလုံလောက်ပါသည်

Samutsakorn ဒေသတွင်နေထိုင်သောနှစ်

- ၁ နှစ်အောက်
- ၁နှစ်
- ၂နှစ်
- ၃နှစ်
- ၄နှစ်
- ၅ နှစ်
- အခြား (ဖော်ပြရန်)

တရားဝင်နေထိုင်မှုအခြေအနေ

- ပြောင်းရွေ့မှုတ်ပုံတင်ပြီး
- မှတ်ပုံမတင်ရသေး

သင့်ကလေး၏အသေးစိတ်

	အသက်နှစ်	မွေးဖွားရာတိုင်းပြည်	မွေးဖွားရာနေရာ
ပထမကလေး			
ဒုတိယကလေး			
တတိယကလေး			
စတုတ္ထကလေးအ			

Part2

အပိုင်း (၂) ယခုလက်ရှိထိုင်းနိုင်ငံတွင်နေထိုင်နေသော သင့်မိသားစုထဲရှိ ငါးနှစ်အောက်ကလေးများ၏ကာကွယ်ဆေးထိုးရာဇဝင်

ကျေးဇူးပြုပြီး အောက်ဖော်ပြပါမေးခွန်းများဖတ်ပြီး သင့်တော်ရာဖြေပါ။ ကျေးဇူးပြုပြီး ထိုင်းနိုင်ငံတွင် ယခုလက်ရှိသင်နှင့်အတူနေထိုင်သော အသက်ငါးနှစ်အောက်ကလေးနှင့်ပတ်သက်သည့် သတင်းအချက်အလက် များသာဖြေကြားပေးပါရန်။

ကလေးကိုကာကွယ်ဆေးထိုးပြီးပြီလား။

	အသက်နှစ်	ကလေးကိုကာကွယ်ဆေးထိုးပြီးပြီလား။
ပထမကလေး		
ဒုတိယကလေး		
တတိယကလေး		

ကလေးတစ်ယောက်ချင်းစီက ကာကွယ်ဆေးအချိန်မှီရခဲ့ပါသလား။

	အသက်နှစ်	ကလေးတစ်ယောက်ချင်းစီက ကာကွယ်ဆေးအချိန်မှီရခဲ့ပါသလား။
ပထမကလေး		
ဒုတိယကလေး		
တတိယကလေး		

သင့်ကလေးတွင် ထိုင်းနိုင်ငံကာကွယ်ဆေးထိုးကပ်ပြား ရှိပါသလား။

	အသက်နှစ်	သင့်ကလေးမှာ ထိုင်းနိုင်ငံကာကွယ်ဆေးထိုးကပ်ပြား ရှိပါသလား။
ပထမကလေး		
ဒုတိယကလေး		
တတိယကလေး		

Part 3

အပိုင်း (၃) ကာကွယ်ဆေး ထိုးခြင်း အတွက် အခက်အခဲများ

ကလေးကာကွယ်ဆေးထိုးခြင်းနှင့် ပတ်သက်သည့် မေးခွန်းလေးခု ပါဝင်ပါသည်။ အောက်ဖော်ပြပါ အချက်အလက်များတွင် တစ်ချို့ကသဘောတူပါလိမ့်မည်၊ တစ်ချို့ကက သဘောမတူနိုင်ပါ။ ကျေးဇူးပြုပြီး အောက်ဖော်ပြပါမေးခွန်းများဖတ်ပြီး ထိုင်းနိုင်ငံတွင် ကလေးကာကွယ်ဆေးထိုးရာတွင် သင်ကြုံတွေ့ရ သည်များထဲမှ သင့်တော်ရာဖြေပါ။

အောက်ဖော်ပြပါအချက်များအား သင်ကိုယ်တိုင် သဘောတူ၊မတူဖြေပါ။ အောက်ဖော်ပြပါ အတိုင်းအတာများကို အသုံးပြုပါ။

၁- လုံးဝသဘောတူပါသည်

၂-သဘောတူပါသည်

၃- မသိပါ

၄- သဘောမတူပါ

၅- လုံးဝသဘောမတူပါ

(က) ကာကွယ်ဆေး ထိုးခြင်း အတွက် အခက်အခဲများ

ကျွန်တော်/ကျွန်မ၏ကလေးအားကာကွယ်ဆေးပြည့်အောင်မထိုးရခြင်းမှာ

	လုံးဝသဘော မတူပါ	သဘောမတူပါ	မသိပါ	သဘောတူ ပါသည်	လုံးဝသဘောတူ ပါသည်
၁၇. ကာကွယ်ဆေးထိုးရိုန်သည် ကျွန်တော်/ကျွန်မတို့အတွက် အဆင်မပြေပါ။	○	○	○	○	○
၁၈.ကျန်းမာရေးဆေးပေးခန်းသို့သွားရောက်ရာတွင် ခရီးလမ်းအခက်အခဲများစွာရှိပါသည်။	○	○	○	○	○
၁၉. ကလေးကို ကာကွယ်ဆေး ထိုးပေးသည့် နေ့ရာသို့ ခေါ်ဆောင်သွားရန် ကျွန်တော်/ကျွန်မတွင် ပိုက်ဆံလုံလုံလောက်လောက်မရှိပါ။	○	○	○	○	○
၂၀.ထိုင်းဘာသာစကားကို နားမလည်ပါသောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○

(ခ) ကျွန်တော်/ကျွန်မ ၏ ကလေးအား ကာကွယ်ဆေးထိုးခြင်းနှင့် ပါတ်သတ်သော အသိပညာများ

ကျွန်တော်/ကျွန်မ၏ကလေးအားကာကွယ်ဆေးပြည့်အောင်မထိုးရခြင်းမှာ

	လုံးဝသဘော မတူပါ	သဘောမတူပါ	မသိပါ	သဘောတူ ပါသည်	လုံးဝသဘောတူ ပါသည်
၂၁. ကလေးကာကွယ်ဆေးထိုးပြီးနောက် ဆေး၏ဘေးထွက် ဆိုးကျိုးများ ကလေးအား ခံစားရမည်ဟု စိုးရိမ်သောကြောင့်ဖြစ်ပါသည်	○	○	○	○	○
၂၂. ကလေးအားမည်သည့်အချိန်တွင် ကာကွယ်ဆေးထိုးရမည်ကို မသိသောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၂၃. တကိုယ်ရေသန့်ရှင်းရေးနှင့် ပတ်ဝန်းကျင် သန့်ရှင်းအောင်ထိန်းသိမ်းခြင်းသည် ကာကွယ်ဆေးထိုးခြင်းထက်ကျူးစက် ရောဂါများကို ကာကွယ်ပေးနိုင်သည်ဟုယူဆ ပါသောကြောင့် ဖြစ်ပါသည်။	○	○	○	○	○
၂၄. ထိုင်းနိုင်ငံသို့ပြောင်းရွေ့လာသောကလေးများအတွက် ရရှိသောကာကွယ်ဆေး ပန်ဆောင်မှုများအား မသိသော ကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○

(ဂ) ကာကွယ်ဆေးထိုးခြင်းနှင့်ပတ်သက်၍ မိဘများ၏ ခံယူချက်သဘောထားများ
ကျွန်တော်/ကျွန်မ၏ကလေးအား ကာကွယ်ဆေးပြည့်အောင်မထိုးရခြင်းမှာ

	လုံးဝသဘော မတူပါ	သဘောမတူပါ	မသိပါ	သဘောတူ ပါသည်	လုံးဝသဘောတူ ပါသည်
၂၅. ကာကွယ်ဆေးထိုးခြင်းသည် အရေးမကြီး ဟုယုံကြည်သောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၂၆. ကျန်းမာရေးစောင့်ရှောက်မှုပေးသော နေရာ သို့သွားရောက်ရန် ယုံကြည်မှု မရှိသော ကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၂၇. ကလေးအားကာကွယ်ဆေးထိုးရန် ရက်ချိန်းအား မမှတ်မိသော ကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၂၈. ကာကွယ်ဆေးများသည် ကလေးများအတွက် ဘေးအန္တရာယ်ရှိသည်ဟု သံသယရှိသောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○

(ဃ) ကျန်းမာရေးဝန်ဆောင်မှုနှင့်ပတ်သက်သောအကြောင်းအရာများ
ကျွန်တော်/ကျွန်မ၏ကလေးအား ကာကွယ်ဆေးပြည့်အောင်မထိုးရခြင်းမှာ

	လုံးဝသဘော မတူပါ	သဘောမတူပါ	မသိပါ	သဘောတူ ပါသည်	လုံးဝသဘောတူ ပါသည်
၂၉. ကျန်းမာရေး ဝန်ထမ်းများ ထံမှ ကာကွယ်ဆေး ထိုးခြင်းနှင့် ပါတ်သတ်၍ မည်သည့် သတင်းအချက်အလက်မရသောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၃၀. မြန်မာ ဘာသာဖြင့် ရိုက်နှိပ်ထားသော ကာကွယ်ဆေး ထိုးခြင်းနှင့် ပါတ်သက်သော	○	○	○	○	○
၃၁. ကျွန်ုပ်အိမ်ဝန်းကျင်တွင် ကျန်းမာရေး ဆေးပေးခန်း များ မရှိသောကြောင့်ဖြစ်ပါသည်။	○	○	○	○	○
၃၂. ကျန်းမာရေး ဆေးပေးခန်းတွင် လူအများကြီး ရှိနေပါသဖြင့် ကလေးအား ကာကွယ်ဆေးထိုးရန် စောင့်ရသည်မှာ အချိန်ကြာသောကြောင့်ဖြစ်သည်။	○	○	○	○	○

-

သင့်တွင်ကာကွယ်ဆေးထိုးခြင်းအပေါ်လွှမ်းမိုးသောအခြားအချက်များရှိပါသလား။

○ မဟုတ်ဘူး

○ ဟုတ်ကဲ့ (ဖော်ပြပါ) _____

Appendix 9- List of content validity experts

1. Dr Kannikar Hannah Wechkunanukul

   PhD, MHA, MPharm(Community Pharmacy), GDipPHC, BPharm, MPS

   Senior Lecturer, Public Health, Torrens University Australia

2. Ruankwan Kanhasing, M.D., MPC

   Head of Family Medicine, Faculty of Medicine, Thammasat University

3. Daw Sandi Thaw

   Instructor, Maternal and Child Health Nursing Department, University of Nursing, Mandalay

4. Alicia Bell

   Paediatric Nurse Practitioner and Lecturer, College of Nursing and Health Sciences,

   Flinders University

5. Pawanrat Panjatharakul

   Assistant instructor, Division of Pediatric Nursing, Ramathibodi School of Nursing,

   Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

6. Dr Monrudee Chokprajakchad

   Instructor, Division of Pediatric Nursing, Ramathibodi School of Nursing,

   Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

Appendix 10-Content validation form

Dear Experts,

This inventory contains three domains and 31 items related to the association between influencing factors and immunization among migrant Myanmar children in Thailand. These items will be included in the survey used with parents of migrant children. We need your expert judgement on the degree of relevance of each item to the measured domains. Please be as objective and constructive as possible in your review and use the following rating scale:

Degree of relevance:

1 = the item is not relevant to the measured domain

2 = the item is somewhat relevant to the measured domain

3 = the item is quite relevant to the measured domain

4 = the item is highly relevant to the measured domain

The survey is presented on the following pages. We welcome your ranking of relevance and any suggestions or comment you have about the items.

Thank you for your feedback.

Domain 1: Demographics and backgrounds

Instruction for participants: Please complete the following demographic and background questions (check in the box that matches to you)

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
1. Relationship to the child ☐ Father ☐ Mother ☐ Other (please describe) ……..					
2. Your age (years)					
3. How many children do you have in a family?					
4. How many children live with you in Thailand?					
5. Education status- pick your highest level of education ☐ Never attend formal education ☐ Primary school ☐ Junior high school ☐ Senior high school ☐ Bachelor's degree or above					
6. Occupation ☐ Housemaid ☐ Factory worker ☐ Seafood worker ☐ Selling in the market ☐ Not working ☐ Other (please describe)					
7. Total family income (Thai baht) ☐ <10000 ☐ 10000-19999 ☐ 20000-29999 ☐ 30000 or above					

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
8. Is family income sufficiency for your needs? ☐ Yes ☐ No					
9. Years living in Samutsakorn province? ☐ <1 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ Other (please describe)					
10. Where were your children born? ☐ Home-based ☐ Health facility-based e.g. hospital					
11. Parent's legal status ☐ Registered migrant ☐ Unregistered migrant					
12. Parent's marital status ☐ Married ☐ Divorced ☐ Separate ☐ Widow					

Domain 2: Immunization history of children five years old or less in the family.

Instruction for participants: Please read the following questions and check in the box that matches you.

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
13. Is each child fully immunized up to their age? 1st Child age…….☐ yes ☐ no ☐ not sure 2nd Child age…….☐ yes ☐ no ☐ not sure 3rd Child age…….☐ yes ☐ no ☐ not sure 4th Child age…….☐ yes ☐ no ☐ not sure 5th Child age…….☐ yes ☐ no ☐ not sure					
14. Does each child always get the immunization on time? 1st Child age…….☐ yes ☐ no ☐ not sure 2nd Child age…….☐ yes ☐ no ☐ not sure 3rd Child age…….☐ yes ☐ no ☐ not sure 4th Child age…….☐ yes ☐ no ☐ not sure 5th Child age…….☐ yes ☐ no ☐ not sure					
15. Does your child have an Expanded Program on Immunization Card in Thailand 1st Child age…….☐ yes ☐ no ☐ not sure 2nd Child age…….☐ yes ☐ no ☐ not sure 3rd Child age…….☐ yes ☐ no ☐ not sure 4th Child age…….☐ yes ☐ no ☐ not sure 5th Child age…….☐ yes ☐ no ☐ not sure					

Domain 3: Barriers to immunization

Instruction for participants: Included here are four themes, which may impact on childhood immunization uptake. The following pages contain a number of statements with which some people agree, and others disagree. Please read each statement and indicate which answer best fits your experience of immunization services. Please rate how much you personally agree or disagree with these statements. Use the following scale:

1) Strongly agree
2) Agree
3) Undecided
4) Disagree
5) Strongly disagree
6)

- Theme A: Difficulty in accessing the immunization service

My children would not be completely immunized as I believe that:

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
16. The time for Immunization is not convenient					
17. There is no available transportation to go to the health care centres					
18. The service is too far from my place					
19. I do not understand Thai language					

- Theme B: Parent's immunization knowledge and awareness

My children would not be completely immunized as I believe that:

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
20. I worry that my children will have adverse effects after vaccination					
21. I do not know when my child should be vaccinated					
22. Better hygiene and sanitation are actually responsible for decreased infections, not vaccines					
23. I do not know what kind of health services are available for migrant children					

- Theme C: Parent's attitudes toward immunization

My children would not be completely immunized as I believe that:

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
24. I believe that vaccination is not important					
25. I am not confident to visit health care centres					
26. I do not remember my children's immunization appointment					
27. I am concerned that vaccines are not tested enough for safety					

- Theme D: Health service issues

My children would not be completely immunized as I believe that:

Tested Items	Relevance				Expert comment and suggestion
	1	2	3	4	
28. I do not get any immunization information from the healthcare providers					
29. There are no immunization documents available in Burmese language					
30. There is no healthcare centre close to my house					
31. It takes a long time for a vaccination appointment due to a long queue at the health care centre					

Appendix 11- Content validity index calculation

Table 1: The relevance rating on the item scale by six experts

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6		Expert in agreement	*I-CVI
Item									
Q1	1	1	1	1	1	1		6	1
Q2	1	1	1	1	1	1		6	1
Q3	1	1	1	1	0	1		5	0.83
Q4	1	1	1	1	1	1		6	1
Q5	1	1	1	1	1	1		6	1
Q6	1	1	1	1	1	1		6	1
Q7	1	1	1	1	1	1		6	1
Q8	1	1	1	1	1	1		6	1
Q9	1	1	1	1	1	1		6	1
Q10	1	1	1	1	1	1		6	1
Q11	0	1	1	1	1	1		5	0.83
Q12	1	1	1	1	1	1		6	1
Q13	1	1	1	1	1	1		6	1
Q14	1	1	1	1	1	1		6	1
Q15	1	0	1	1	1	1		5	0.83
Q16	1	0	1	1	1	1		5	0.83
Q17	1	1	1	1	1	1		6	1
Q18	1	1	1	1	1	1		6	1
Q19	1	1	1	1	1	1		6	1
Q20	1	1	1	1	1	1		6	1
Q21	1	1	1	1	1	1		6	1
Q22	1	1	0	1	1	1		5	0.83
Q23	1	1	1	1	1	1		6	1
Q24	1	1	1	1	1	1		6	1
Q25	1	1	1	1	1	1		6	1
Q26	1	1	1	1	1	0		5	0.83
Q27	1	1	1	1	1	1		6	1
Q28	1	1	1	1	1	1		6	1
Q29	1	1	1	1	1	1		6	1
Q30	1	1	1	1	1	1		6	1
Q31	1	1	1	1	1	1		6	1
Proportion relevance	0.97	0.93	0.97	1	0.97	0.97		**S-CVI/AVE	0.967
Average proportion of items judged as relevance across the ten experts							0.97		

*I-CVI (item-level content validity index): The proportion of content experts giving item a relevance rating of 3 or 4

**S-CVI/Ave (scale-level content validity index based on the average method): The average of the I-CVI scores for all items on the scale or the average of proportion relevance judged all experts. The proportion relevant is the average of relevance rating by individual expert.

Appendix 12- The verbal script for healthcare workers to promote the flyers

The verbal script for healthcare providers to introduce the flyers of a research project

My name is …… I would like to promote the research project about barriers to immunisation in Myanmar migrant children. This project conducts by is a Thai master student at Flinders University. This project has an aim to identify the factors influencing the immunisation rate. This project may be beneficial for others Myanmar migrant children. This research may create a future intervention to solve the problem that migrant children cannot have immunisation fully. The flyers provide information about a research project, potential participants, and researchers' contact. The Myanmar migrant parents can read further details in the flyers.

The potential participants will be Myanmar parents aged more than 18 years old who has at least one children under five years old. Also, the parents can read and write in Burmese. I would like to invite Myanmar parents who are interested in this project to do the online survey. Please refer to the flyers to go to the online surveys by QR code or link on the flyers. It will not take more than 15 minutes to complete the survey. This is project is not affect accessing healthcare services. All parents will get standard service cares. The participants will be voluntary join the project.

Appendix 13- English-language information sheet

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CRICOS Provider No. 00114A

Participant Information Sheet

'A cross-sectional study of barriers to immunisation in Myanmar migrant children under school-age in Samutsakorn province, Thailand.'

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Description

Low or incomplete immunizations in children can lead to the outbreak of vaccine-preventable diseases. This study is part of the project titled a cross-sectional study of barriers to immunization in migrant children under school-age in Samutsakorn provinces, Thailand. This project will investigate the parent's perception of child immunization barriers. This project is supported by Flinders University, College of Nursing and health science.

Purpose

This project aims to identified barriers to immunization, and to examine the correlations between demographic background and immunization rates in Myanmar migrant children under school-age in Thailand

What will I be asked to do?

Participation is entirely voluntary and anonymous. Participants are able to read and write in Burmese. Participants have to live in Samutsakorn province. If you do not wish to take part, you do not have to. If you decide to participate, you cannot withdraw when the survey questionnaire has submitted. The participants involve completing the online survey. Participants can access to the survey through QR code or link on the flyers. It will take approximately 15 minutes to finish the survey. There are three parts in the online survey include demographics and backgrounds, and potential barriers to immunization.

What benefit will I gain from being involved in this study?

The sharing of experiences is not directly benefited the participants. However, it might useful to other migrant children because the findings of barriers to immunization will take action by the relevant health organisations. This will create a future intervention to solve the problem that migrant children cannot uptake full immunization.

Will I be identifiable by being involved in this study?

We do not need your name and you will be anonymous. Any identifying information will not be asked in the online survey. All information and results obtained in this study will be stored in a secure way, with access restricted to relevant researchers.

Are there any risks or discomforts if I am involved?

There are low risks related to your participation in this research. However, some participants could experience emotional discomfort. If any emotional discomfort is experienced please contact the Thailand call centre from the department of mental health hotline on 1323 for support or counselling that may be accessed free of charge by all participants.

How do I agree to participate?

Participation is voluntary. You may answer 'no comment' or refuse to answer any questions, and you are free to withdraw from the online survey at any time without effect or consequences. A consent form is not necessary. Once you return a completed the online survey, it indicates your participation in this study.

Questions or further information about the project

If you have any questions, please do not hesitate to contact one of the research teams via the contact above.

Thank you for taking the time to read this information sheet, and we hope that you will accept our invitation to be involved.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee in South Australia (Project number 8537). For queries regarding the ethics approval of this project please contact the Executive Officer of the Committee via telephone on +61 8 8201 3116 or email human.researchethics@flinders.edu.au

Appendix 14- Myanmar-language information sheet

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CRICOS Provider No. 00114A

ထိုင်းနိုင်ငံ Samutsakorn ဒေသတွင်နေထိုင်သော ကျောင်းမတက်ခင်အရွယ်မြန်မာရွှေ့ ပြောင်း ကလေးများ အတွက် ကာကွယ်ဆေးထိုးရာတွင် ကြုံတွေ့ရသော အခက်ခဲများကို လေ့လာခြင်း

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ဖော်ပြချက်

ကာကွယ်ဆေးစုံအောင် မထိုးမှသည် ကာကွယ်ဆေးဖြင့်ကာကွယ်ရနိုင်သော ရောဂါများဖြစ်ပွား စေတတ်ပါသည်။ ထိုင်းနိုင်ငံ Samutasakorn ဒေသတွင်နေထိုင်သော ငါးနှစ်အောက်အရွယ်ကလေးသူငယ်များ၏ ကာကွယ်ဆေးထိုးရာတွင် အနောက်ယှက်အဟန့်အတားဖြစ်စေသော အကြောင်းအရာများကို လေ့လာသော စာတမ်း ဖြစ်ပါသည်။ကာကွယ်ဆေးထိုးရာတွင် အနောက်ယှက်အဟန့်အတားဖြစ်စေသော အကြောင်းအရာ များနှင့် ပတ်သက်ပြီး မိဘများအမြင်ကို ဖော်ထုတ်ပေးပါလိမ့်မည်။ ဤစာတမ်းကို Flinders University, College of Nursing and Health Science မှ ထောက်ပံ့ပေးထားပါသည်။

ရည်ရွယ်ချက်

ကာကွယ်ဆေးထိုးရာတွင် အနောက်ယှက်အဟန့်အတားဖြစ်စေသော အကြောင်းအရာ များ၊ ထိုင်းနိုင်ငံတွင် ရွှေ့ပြောင်းနေထိုင်သော အသက်ငါးနှစ်အောက် မြန်မာကလေးငယ်များ၏ ကာကွယ်ဆေးထိုးနှံမှုနှင့် လူနေမှုအခြေအနေများ ဆက်စပ်မှုကို ဖော်ထုတ်ရန်ရည်ရွယ်ပါသည်။

လုပ်ဆောင်ချက်များ

သုတေသနတွင်ပါဝင်မည့်သူသည် မြန်မာစာရေးတတ်၊ ဖတ်တတ်ရပါမည်။ ပါဝင်မည့်သူသည် မိမိဆန္ဒအလျောက်ပါဝင်ပြီး အမည်ဖော်ပြမည်မဟုတ်ပါ။ သင်မဖြေချင်လျှင် မဖြေလို့ရပါသည်။ အကယ်၍ မေးခွန်းအားလုံးအပ်ပြီးမှ သင်နှတ်ထွက်၍မရပါ။ Online စာတမ်းပြီးသည်အထိ ပါဝင်ရမည်ဖြစ်ပါသည်။ ပါဝင်မည့်သူသည် ဤစာတမ်းကို QR code (သို့မဟုတ်) Flyer link မှတဆင့်ရယူနိုင်ပါသည်။ ဖြေဆိုချိန် (၁၅) မိနစ်လောက်ကြာမြင့်ပါမည်။ မေးခွန်းနှစ်ပိုင်းပါဝင်ပါသည်။ ပထမတစ်ပိုင်းမှာလူနေမှုအခြေအနေ မေးခွန်းများဖြစ်ပြီးဒုတိယအပိုင်းမှာ ကာကွယ်ဆေးထိုးရာတွင် အနှောက်အယှက်အဟန့်အတား ဖြစ်နိုင်ချေရှိသည်များပါဝင်ပါသည်။

အကျိုးကျေးဇူးများ

အတွေ့အကြုံများ မျှဝေပေးခြင်းဖြင့် တိုက်ရိုက်အကျိုးသက်ရောက်မှုတော့ ရမည်မဟုတ်ပါ။ သို့သော် သုတေသနရလဒ်များအရ ရွှေ့ပြောင်းကလေးငယ်များ၏ ကာကွယ်ဆေးထိုးရာတွင် အနှောက်အယှက် အတားဆီးဖြစ်စေသော အကြောင်းအရာများကို သိရှိပြီးလိုအပ်သော ကျန်းမာရေး စောင့်ရှောက်မှုများ ဆောင်ရွက်ပေးနိုင်မည်ဖြစ်ပါသည်။ ရွှေ့ပြောင်းကလေးငယ်များအတွက် ကာကွယ်ဆေး အစုံရရှိအောင် ဖော်ဆောင်ပေးနိုင်မည်ဖြစ်ပါသည်။

လျှို့ဝှက်ချက်များ

ဖြေဆိုသူအားလုံး၏ မေးခွန်းလွှာ များအား လျှို့ဝှက်နံပတ်များဖြင့် အသုံးပြုပါမည်။
တစ်ယောက်ချင်းစီ၏ အကြောင်းကို ဖော်ပြမည်မဟုတ်ပါ။ အဖြေအားလုံးကို သုတေသနလုပ်သူကိုယ်တိုင်သာ

အကယ်၍ပါဝင်ခဲ့လျှင် ဆိုးကျိုးများရှိနိုင်ပါသလား။

ဤသုတေသနတွင် ပါဝင်မှုအတွက် ဆိုးကျိုးမရှိပါ။ သို့သော်တစ်ချို့သူများအတွက် စိတ်ပိုင်းဆိုင်ရာ အဆင်မပြေမှု အနည်းငယ်ကြုံတွေ့နိုင်ပါသည်။ အကယ်၍စိတ်ပိုင်းဆိုင်ရာ အဆင်မပြေမှု တစ်ခုခုခံစားရလျှင် ထိုင်းနိုင်ငံ စိတ်ကျန်းမာရေးဝန်ဆောင်မှ လိုင်းခွဲ ၁၂၃၄ ကိုဆက်သွယ်နိုင်ပါသည်။ ငွေကြေးကုန်ကျမှုမရှိပါ။

ပါဝင်ဖို့ဘယ်လိုသဘောတူရမလဲ။

မိမိဆန္ဒအလျောက် ပါဝင်နိုင်ပါသည်။ သင်မဖြေကြားလိုသည်မေးခွန်းများပါလျှင် မဖြေလို့ရပါသည်။ နောက်ဆက်တွဲဆိုးကျိုး တစ်စုံတစ်ရာမရှိဘဲ ဤ အွန်လိုင်းသုတေသနမှ အချိန်မရွေးနှတ်ထွက်ခွင့်ရှိပါသည်။ ပါဝင်မှုအတွက်သဘောတူညီကြောင်း လက်မှတ်ထိုးပေးစရာ မလိုပါ။ မေးခွန်းအားလုံးဖြေကြားပြီးလျှင် ဤသုတေသနတွင် သင်ပါဝင်ပြီးဖြစ်ပါသည်။

သုတေသနနှင့်ပတ်သက်သည့် သိလိုသည့်မေးခွန်းများ

အကယ်၍သင်သိလိုသည့် မေးခွန်းများရှိလျှင် သုတေသနတွင်ပါဝင်သူတစ်ယောက်ဖေါက်အား ဆက်သွယ်ဖို့ မနှောင့်နှေးပါနှင့်။ ကျွန်တော်၊ ကျွန်မတို့သုတေသနတွင်ပါဝင်ဖို့ ဖိတ်ကြားမှုကို သင်လက်ခံမည်ဟု မျှော်လင့်ပါသည်။ သတင်းအချက်စာများကို ဖတ်ကြားဖို့အချိန်ပေးသည့်အတွက် ကျေးဇူးတင်ပါသည်။

ဤသုတေနစာတမ်းကို တောင်ဩစတေးလျနိုင်ငံ Flinders University ဆက်ဆံရေးနှင့် အပြုအမူများဆိုင်ရာ ကျင့်ဝတ်ကော်မတီမှ(စာတမ်းအမှတ် ၈၅၃၇) သဘောတူပြီးဖြစ်ပါသည်။
ကျင့်ဝတ်ဆိုင်ရာသိလိုသောမေးခွန်းများရှိပါက ကော်မတီရုံးဖုန်းနံပါတ် + 61882013116 (သို့)
human.researchethics@flinders.edu.au သို့ အီးမေးလ်ပြီးမေးမြန်းနိုင်ပါသည်။

Appendix 15- SBREC ETHICs approval

8537 ETHICS approval notice (28 February 2020)

Human Research Ethics <human.researchethics@flinders.edu.au>

Fri 2/28/2020 10:23 AM

To: Palinrach Kaewmanorom <kaew0012@flinders.edu.au>; Yvonne Parry <yvonne.parry@flinders.edu.au>; Tiffany Conroy <tiffany.conroy@flinders.edu.au>

4 attachments (12 MB)

8537 application (18 November 2019).pdf; 8537 ETHICS Conditional approval notice (13 December 2019).pdf; 8537 conditional approval response (21 January 2020); 8537 conditional approval response - Additional Info PROVIDED (27 February 2020);

Dear Palinrach,

Your conditional approval response for project 8537 was reviewed by the Chairperson of the Social and Behavioural Research Ethics Committee (SBREC) and was **approved.** The ethics approval notice can be found below.

APPROVAL NOTICE

Project No.:	**8537**
Project Title:	A cross-sectional study of barriers to immunization in Myanmar migrant children under school-age in Samutsakorn province, Thailand
Principal Researcher:	Miss Palinrach Kaewmanorom
Email:	kaew0012@flinders.edu.au
Approval Date:	28 February 2020
Ethics Approval Expiry Date:	**31 December 2020**

The above proposed project has been **approved** on the basis of the information contained in the application, its attachments and the information subsequently provided with the addition of the following comment.

Additional comments:

1. Permissions (Conditional approval response No.9)
   A reminder to please submit the email / letter from the Maung District Public Health Office, Samutsakorn Province, Thailand granting permission to conduct the project on receipt. Please be reminded that data collection cannot commence until all relevant permissions have been obtained.

RESPONSIBILITIES OF RESEARCHERS AND SUPERVISORS

1. **Participant Documentation**
   Please note that it is the responsibility of researchers and supervisors, in the case of student projects, to

ensure that:

- all participant documents are checked for spelling, grammatical, numbering and formatting errors. The Committee does not accept any responsibility for the above mentioned errors.
- the Flinders University logo is included on all participant documentation (e.g., letters of Introduction, information Sheets, consent forms, debriefing information and questionnaires – with the exception of purchased research tools) and the current Flinders University letterhead is included in the header of all letters of introduction. The Flinders University international logo/letterhead should be used and documentation should contain international dialling codes for all telephone and fax numbers listed for all research to be conducted overseas.
- the SBREC contact details, listed below, are included in the footer of all letters of introduction and information sheets.

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 'INSERT PROJECT No. here following approval'). For more information regarding ethics approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.

2. Annual Progress / Final Reports

In order to comply with the monitoring requirements of the *National Statement on Ethical Conduct in Human Research 2007 (updated 2018)* an annual progress report must be submitted each year on the **28 February** (approval anniversary date) for the duration of the ethics approval using the report template available from the Managing Your Ethics Approval web page.

Please note that no data collection can be undertaken after the ethics approval expiry date listed at the top of this notice. If data is collected after expiry, it will not be covered in terms of ethics. It is the responsibility of the researcher to ensure that annual progress reports are submitted on time; and that no data is collected after ethics has expired.

If the project is completed *before* ethics approval has expired please ensure a final report is submitted immediately. If ethics approval for your project expires please either submit (1) a final report; or (2) an extension of time request (using the modification request form).

First Report due date:	**28 February 2021**
Final Report due date:	**31 December 2020**

Student Projects

For student projects, the SBREC recommends that current ethics approval is maintained until a student's thesis has been submitted, assessed and finalised. This is to protect the student in the event that reviewers recommend that additional data be collected from participants.

3. Modifications to Project

Modifications to the project must not proceed until approval has been obtained from the Ethics Committee. Such proposed changes / modifications include:

- change of project title;
- change to research team (e.g., additions, removals, researchers and supervisors)
- changes to research objectives;
- changes to research protocol;
- changes to participant recruitment methods;
- changes / additions to source(s) of participants;
- changes of procedures used to seek informed consent;
- changes to reimbursements provided to participants;
- changes to information / documents to be given to potential participants;
- changes to research tools (e.g., survey, interview questions, focus group questions etc);

- extensions of time (i.e. to extend the period of ethics approval past current expiry date).

To notify the Committee of any proposed modifications to the project please submit a Modification Request Form available from the Managing Your Ethics Approval SBREC web page. Download the form from the website every time a new modification request is submitted to ensure that the most recent form is used. Please note that extension of time requests should be submitted prior to the Ethics Approval Expiry Date listed on this notice.

Change of Contact Details
If the contact details of researchers, listed in the approved application, change please notify the Committee so that the details can be updated in our system. A modification request is not required to change your contact details; but would be if a new researcher needs to be added on to the research / supervisory team.

4. Adverse Events and/or Complaints

Researchers should advise the Executive Officer of the Ethics Committee on 08 8201-3116 or human.researchethics@flinders.edu.au immediately if:

- any complaints regarding the research are received;
- a serious or unexpected adverse event occurs that effects participants;
- an unforeseen event occurs that may affect the ethical acceptability of the project.

Kind regards
Andrea

Andrea Mather and Rae Tyler
Human Research Ethics Officers (Social and Behavioural Research Ethics Committee)
Research Development and Support

Union Basement Building
Flinders University
Sturt Road, Bedford Park, South Australia, 5042
GPO Box 2100, Adelaide, South Australia, 5001

P: +61 8 8201 3116 (Andrea) | Monday - Friday
P: +61 8 8201 7938 (Rae) | Monday, Wednesday and Friday mornings
E: human.researchethics@flinders.edu.au
www.flinders.edu.au/research/researcher-support/

Appendix 16- Samut Sakhon Hospital Ethics approval

SKH REC No.30/2563

Samut Sakhon Hospital
Ministry of Public Health
1500 Ekachai Road, Mahachai District,
Samut Sakhon Province, Zip code 74000, Thailand, Tel 034-427099 ext 2107

Certificate of Approval

The Research Ethics Committee of the Samut Sakhon Hospital, Thailand, has approved the following study which is to be carried out in compliance with the International guidelines for human research protection as Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

Study Title	:	A cross-sectional study of barriers to immunization in under school-age Myanmar migrant children living in Samutsakorn province, Thailand
Study Code	:	SKH REC 30/2563 v.1
Principal Investigator	:	Palinrach Kaewmanorom
Study Center	:	Flinders University, Australia
Review Method	:	Expedited
Continuing Report	:	At least once annually or submit the final report if finished.

Signature: Lakkana Jirapong
(Lakkana Jirapong)
Chairperson
Samut Sakhon Hospital Research Ethics Committee

Signature: [illegible]
([illegible])
Director of Samut Sakhon Hospital

Date of Approval : 25 JUNE 2020 **Approval Expire Date** : 25 JUNE 2021

Approval is granted subject to the following conditions: (see back of this Certificate)

All approved investigators must comply with the following conditions:

1. Strictly conduct the research as required by the protocol;
2. Use only the information sheet, consent form (and recruitment materials, if any), interview outlines and/or questionnaires bearing the Institutional Review Board's seal of approval ; and return one copy of such documents of the first subject recruited to the Research Ethics Committee (REC) for the record;
3. Report to the Institutional Review Board any serious adverse event or any changes in the research activity within five working days;
4. Provide reports to the Research Ethics Committee concerning the progress of the research upon the specified period of time or when requested;
5. If the study cannot be finished within the expiry date of the approval certificate, the investigator is obliged to reapply for approval at least one month before the date of expiration.
6. All the above approved documents are expired on the same date of the previously approved protocol (Protocol Number SKH REC 30/2563 v.1)