UNIVERSITY OF HULL

The duration and influencing factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand

being a thesis submitted in partial fulfilment of the

requirements for the degree of

Doctor of

Philosophy in Health Studies

in the University of Hull

by

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June 2020

Dedication

This thesis is dedicated to my beloved family, ancestors, teachers, friends, colleagues, and all Thai people.

Acknowledgements

First and foremost, I would like to express my deepest and sincere gratitude to my supervisors, Professor Roger Watson and Dr. David I Barrett for their kindness in providing me an opportunity to be their supervisee. I am also very appreciated for their valuable supervisions, suggestions, encouragement, supporting, guidance, and criticism throughout the course of my PhD study. I would like to express my genuine thanks to Dr. Parveen Ali, Professor Mark Hayter, Professor Peter Draper, and Dr. Moira Graham due to my viva and interim-viva examination committee for their helpful suggestions.

I would like to express my unlimited thanks to the Royal Thai government, the Sirindhorn College of Public Health Chonburi, and the Praboromarajchanok Institute for Health Workforce Development, the Ministry of Public Health, for the scholarship to study in PhD. I am also grateful to Nakhon Ratchasima Provincial Health Office and all TB staff in Nakhon Ratchasima Province for their cooperation and suggestions on data collection. I also would like to thank all TB patients who participated and gave me their valuable information. I would like to express my appreciation to my experts; Dr. Kamolnud, Dr. Orarat, Dr. Yananthorn, and Dr. Uriwan for their valuable comments. My special additional thanks are also to my Thai friends at University of Hull and other universities; Parichat, Nittiya, Choneratt, Pattarin, Pojana, Usa, Lalitwadee, Kantaphon, Thitika, and other Thai friends in Kingston upon Hull for their encouragement and friendship. Moreover, I would like to thank my beloved colleagues and friends in Thailand; Tharinee, Krisana, Siriwan, Niriyaporn, Pakjira, Suparat, Wikrom, Karnjanawan, Warangrat, Waraporn, Theerapong, Wallop and others for their supporting me for a long time.

Finally, I would like to express my sincere gratitude and appreciation to my beloved parents, Mr. Viroj Chaychoowong and Mrs. Lampang Chaychoowong who encouraged and supported me to study in the highest level of education. I deeply thank my brothers; Siravut and Anupong, sisters in law; Piyamas and Sophida, and my nephews and niece; Kasidith, Kritsakorn and Kannuda, who have taken care of my parents and supported me all the time. Furthermore, I would like to convey my deepest thanks and love to my British family; Kris Richards, Elliot Richards, Oliver Richards, Ty Richards, and other British friends for their true friendship, love, and support while I was staying in my second home, Kingston upon Hull, the United Kingdom.

Publications and Conferences

Chaychoowong, K., Watson, R. & Barrett, D. I. (2019) Factors influencing patient delay among pulmonary tuberculosis patients: a systematic literature review. *RCN International Nursing Research Conference and Exhibition 2019.* Sheffield Hallam University, 3-5 September 2019. United Kingdom: Royal College of Nursing.

Abstract

Background

Pulmonary tuberculosis (PTB) is an infectious disease caused by *Mycobacterium tuberculosis* complex. Although there have been many campaigns and strategies to end tuberculosis across the world for over two decades, it still remains in the top ten causes of death among humankind. Patient delay, the duration between the first onset of any TB-related symptoms and the first visit to any health providers is significantly related to both individual and community level in terms of an increased deaths and new TB cases. This study aimed to explore the duration and influencing factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand.

Design and methods

An explanatory sequential mixed methods design was adopted to discover the factors influencing patient delay which included two phases. In terms of quantitative phase, a descriptive cross-sectional design was addressed to identify the duration and influencing factors. The data were collected by surveys with a structured questionnaire among new 300 PTB patients. Descriptive statistics were used to describe information by percentage, distribution, mean, standard deviation, median, minimum and maximum. Inferential statistics were addressed to investigate the influencing factors by Chi-square test and Mann-Whitney U test for univariate analysis, and Multiple logistic regression test for multivariate analysis. In terms of the qualitative phase, individual in-depth interviews were undertaken among 25 PTB patients identified with patient delay. The data were collected by a semi-structured questionnaire and unstructured questions, and were analysed by content analysis based on themes.

Results

The quantitative findings showed that 39.33% of participants showed patient delay (more than 30 days). The median duration of the delay was 60 days among participants with common signs and symptoms. By multivariate analysis, the factors significantly influencing the delay were primary education (OR = 3.45, 95% CI = 1.62 – 7.33), upper secondary education (OR = 2.88, 95% CI = 1.01 – 8.20), previous TB knowledge (OR = 3.42, 95% CI = 1.29 – 9.12), recognition that TB is a somewhat serious disease (OR = 0.37, 95% CI = 0.19 – 0.75), stigmatisation of TB (OR = 1.08, 95% CI = 1.02 – 1.14), weight loss (OR = 2.37, 95% CI = 1.28 – 4.36), self-treatment (OR = 3.04, 95% CI = 1.54 – 6.03), the number of consultations with health providers (OR = 2.25, 95% CI = 1.52 – 3.33), and taking a motorcycle to the hospital (OR =0.51, 95% CI = 0.28 – 0.93).

The qualitative findings showed that there were many influencing factors including six main factors; 1) sociodemographic-economic factors; 2) knowledge, recognition; and stigmatisation about TB factors; 3) family and social factors; 4) health seeking behaviour factors; 5) accessibility and availability to TB services factors; and 6) satisfaction with health care services factors. By combining both strands, there were, therefore, only four factors namely knowledge, financial barrier, residence area, and social support influencing patient delay.

Conclusion

These results suggest that encouraging more education and gaining more knowledge about the disease can be used to improve adequate TB knowledge; establishing TB corners in factories, improving the health care system—especially primary care, and enhancing the competence of health providers and village health volunteers in the community can be used to address the problems resulting from financial barriers and residence area; and encouraging social support for the family and the community can help to enhance social support. These suggestions may help to decrease the death rate among PTB patients and the transmission rate of TB.

Key words: influencing factors, patient delay, pulmonary tuberculosis

Contents

List of Figures

List of Tables

Abbreviations

AFB:	Acid-fast bacillus
AIDS:	Acquired Immunodeficiency Syndrome
BCG:	Bacillus Calmette-Guerin
CXR:	Chest x-ray
DDC:	Department of Disease Control
EPTB:	Extrapulmonary tuberculosis
HIV:	Human Immunodeficiency Virus
LJ:	Lowenstein-Jensen
M-:	Sputum smear-negative
M+:	Sputum smear-positive
MDGs:	Millennium Development Goals
MDR-TB:	Multidrug-resistant tuberculosis
MGIT:	Mycobacterium Growth Indicator Tube
MTBC:	*Mycobacterium tuberculosis* complex
PAS:	Para-aminosalicyclic acid
PCU:	Primary care unit
PLHIV:	People living with HIV
PLHIV-AIDS:	People living with HIV/AIDS
PTB:	Pulmonary tuberculosis
RR-TB:	Rifampicin-resistant Tuberculosis
SDGs:	Sustainable Development Goals
TB:	Tuberculosis
TB01:	TB treatment card
TB03:	TB register
TST:	Tuberculin skin test
UN:	United Nations
UNAIDS:	The Joint United Nations Programme on HIV and AIDS
WHO:	World Health Organisation
XDR-TB:	Extensively drug-resistant TB

Chapter 1 Introduction

1.1 Introduction

This chapter aims to introduce the thesis and a brief description of what follows in subsequent chapters. This chapter includes my background and motivation, the importance of the problem and the research setting, the general aim of this research, and the study design. Finally, an outline of each chapter included in this thesis is provided.

1.2 My background and motivation

The motivation for this thesis arose from my experiences at two hospitals in Thailand: Buayai hospital, and Prachuap Khiri Khan hospital. After graduation, with a Bachelor of Public Health, I worked as a public health technical officer at Buayai hospital in Nakhon Ratchasima province for 2 years. I was assigned to be a head of a Tuberculosis (TB) clinic servicing over 100 patients a year. After that, I had moved to Prachuap Khiri Khan Hospital where I was also assigned as a head of a TB clinic where provides a one-stop service system for approximately 200 TB patients annually, including Thai and other nationalities such as Laos, Burmese and Cambodian.

At both clinics, I found that there were many cases of TB patients having a long duration since their TB symptoms onset until being treated with first line anti-TB drugs. The patients with a longer duration might have more severe symptoms and spread the disease to other people especially their family members. Regarding my previous experiences, I had seen some new TB patients who lived in the same house or community with confirmed TB patients coming to get TB treatment at the hospitals after the confirmed cases were diagnosed and treated with TB. This may indicate that new patients may have had a high risk of getting the disease from their family members. I took care of many TB patients for over 7 years before changing my position as a public health instructor at Sirindhorn College of Public Health Chonburi, under the Ministry of Public Health, Thailand.

Studying patient delay in TB treatment interests me because of the high mortality rate and transmission rate. Moreover, I have found that the factors associated with patient delay vary in each area so that the health providers must understand the significant factors associated with patient delay before providing the suitable models or particular strategies to solve the problems in their area.

1.3 The importance of the problem

In the modern world, tuberculosis or TB, an infectious disease in the respiratory system caused by the airborne bacillus *Mycobacterium tuberculosis* complex, is one of the top 10 causes of

death around the world. It remains a major problem since over the last two decades with a thousand million new people became infected. The World Health Organisation (WHO) estimated the number of TB patients from 2002 to 2020 worldwide at approximately 1,000 million people with new infections, 150 million people being new patients, and 36 million people killed by TB (World Health Organisation, 2019). Moreover, in 2018, there were approximately 860,000 and 10,350 TB patients with HIV positive around the world and in Thailand, respectively (World Health Organisation, 2019). Thailand is still ranked 16th among high burden countries worldwide with almost half of new TB patients having germs in their lungs who can spread them through coughing, sneezing, or spitting to other persons (World Health Organisation, 2019).

Although there are many strategies in Thailand to control TB, it is one of 194 countries facing a serious problem with a steady increase in new patients (Bureau of Tuberculosis, 2018). In addition, in 2016 – 2030, a new era of global TB monitoring, the WHO has noted that Thailand is one of 14 countries that faces three issues namely: TB; TB with human immunodeficiency virus (HIV); and multidrug-resistant TB (MDR-TB). To deal with TB, Thailand, provided by the Ministry of Public Health, has launched national policies to control TB for several years such as providing Bacillus Calmette-Guerin (BCG) vaccine for all newborn babies, blocking transmission in communities, detecting early in suspected cases, and increasing the effectiveness of therapy. In fact, it seems that TB problem gradually decreases but the number of new infected cases is still increasing every year which is caused by many factors.

There are many reasons related to an increase of TB patients such as delay in case detection, rising HIV cases, immigration, and increase in MDR-TB or extensive drug-resistant TB (XDR-TB) cases. Of these reasons, the most significant reason is ‘delay’, defined as the duration between symptoms onset and initial treatment, which can be explained into two important keywords: the duration, and influencing factors of delay. The delay does not affect only patients’ health status, but in their household and communities also. In other words, it is possibly related to an increase of transmission, destroyed lungs, and death rate. For example, Meintjes et al. (2008), studying the comparison between patients with and without delay, found an increased referral in severe cases at hospital among patient with the duration of delay for 14 days or over. Additionally, patients with delay for 30 days or over were related to an increased death rate more than patients without delay (Meintjes et al., 2008).

Delay, a major cause of unsuccessful control of TB, is an important factor in death and transmission. It can be divided into three periods: patient delay; health system delay; and total delay. In this study, patient delay, the time between symptom onset and the first visit to a health

provider, is considered as the most important period to be investigated for duration and influencing factors of delay in order to suggest improvements.

From previous studies, it can be seen that there are various gaps in knowledge. Briefly, it appears to be that there is no an obvious standard for identifying patients with delay, thus patients with delay might be treated late and spread the infection. In addition, there are many influencing factors for patient delay which are complex which health providers must investigate to solve this problem appropriately.

The research setting

The prevalence of TB cases in Thailand is currently high at 16th among the high burden countries worldwide. Moreover, the WHO has stated that Thailand is facing the three TB issues: TB; TB/HIV; and MDR-TB (World Health Organisation, 2016), especially in large rural cities. The TB reports in Thailand have shown that Nakhon Ratchasima province, one of four provinces in the Office of Disease Prevention and Control 9, is not only experiencing an increased incidence of new cases on TB issue, but also increased incidences on TB/HIV and MDR-TB. (Department of Disease Control, 2018). However, the Thai government is actively seeking to develop the National Tuberculosis Control Programme Guidelines to prevent, control, and promote education and awareness regarding TB. Thus, conducting research in the field of patient delay among PTB patient in Thailand is the first step in reducing TB transmission and controlling the disease through contextual and evidence-based strategies.

1.4 The general aim of the research

Attempting to identify the influencing factors with patient delay, needs to be contextual as there are variations in epidemiological patterns and socio-cultural backgrounds within countries. Clearly, it is important to reduce the duration of patient delay due to decreasing mortality rate among TB patients and transmission rate among close contacts as well as minimising the risk factors of patient delay in order to reduce the consequences of patient delay. Therefore, the main aim of this research is to identify those factors influencing patient delay among PTB patients in Nakhon Ratchasima province, Thailand.

1.5 The study design

Exploring the influencing factors of patient delay among PTB patients in Thailand is a challenging task as the problem is multifaceted. An explanatory sequential mixed methods approach is undertaken in the current study. The factors are explored in the first step using quantitative

method, followed by qualitative method, thus mixed methods approach is used to identify and explain the influencing factors in patient delay.

1.6 An outline of the chapters of this thesis

Chapter 1 offers a brief discussion concerning the research problem and the motivation of the researcher for conducting this research. It also provides an overview of the general aim and the setting for this research. An account of the research design adopted in this research is briefly referred to at the end of chapter.

Chapter 2 provides basic TB knowledge and the current situation. In this chapter, an overview is given of Thailand in terms of its geographical location, population, incidence of TB, and detail of Nakhon Ratchasima province. Global TB policies are also described in this chapter. Additionally, the effects of patient delay are explained. At the end of chapter, two psychological theories are presented which are related to health behaviours.

Chapter 3 outlines the search strategy and outcomes from the systematic literature review. Then, gaps in the previous literature are explained and frameworks from previous studies and this study are shown. Finally, strengths and limitations of literature review are identified.

Chapter 4 discusses the details of research questions and objectives, the philosophical assumption applied and the methodology adopted in this research. In addition, the empirical methods used are also described and the process for fieldwork and analysis are presented.

Chapter 5 shows the results of quantitative part which starts with the number and percentage of general information of each characteristic which is divided into two groups: patients with delay and without delay. The duration of patient delay is then presented according to the same two groups. Finally, the influencing factors of patient delay investigated by univariate analysis and multivariate analysis are presented, respectively.

Chapter 6 describes findings of the qualitative part by themes which describe the experiences of participants with patient delay. Each theme is explained and supported by quotations from some participants recruited for the interviews.

Chapter 7 discusses the findings of both strands with previous studies to derive the meanings, importance and relevance of the findings. It is demonstrated how the results relate to the theories, literature review and research questions.

Chapter 8 provides a summary of the study, contribution of the study, strengths and limitations, and then suggests the implications of the research in terms of practice, policy, and future study.

Chapter 2 Background

2.1 Introduction

The aim of this chapter is to present general information related to TB. The chapter is divided into five parts:

- The first part outlines basic TB knowledge which consists of causes of TB, reservoir hosts, ways of transmission, signs and symptoms of TB, diagnosis, and disease classification in Thailand.
- The second part explains the demographics of TB, not only around the world but in Thailand, and Nakhon Ratchasima province which is selected as an area of high burden. This part consists of the current statistics: the incidence rate and number of patients in each mentioned area.
- The third part covers the milestones in controlling TB, provided by the WHO and the United Nations (UN), which are divided into two periods: 2000-2015; and 2016-2030.
- The fourth part indicates the consequences of patient delay which affects the health of patients and household contacts with patients and the consequences of delay in the community as a risk factor in transmission. Finally, the rational for conducting this research is stated.
- The fifth part presents two psychological theories related to health behaviours. The two theories are the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA). Moreover, relationships between the theories and this research are provided.

2.2 Knowledge about TB

2.2.1 History of TB

Tuberculosis or TB is believed to be one of the ancient and deadliest diseases which has killed millions of humans (Evans, 1998; Delogu et al., 2013). There is a recent report that acid- and alcohol-fast bacilli in humans was found in skeletons in Heidelberg, Germany, dating back to 5000 BC, which is the oldest evidence of TB found in humans (Sager et al., 1972). Moreover, it has also been obtained from mummies in Egypt around 3500 BC (Zimmerman, 1979). TB had been considered as a major threat for humans for a long time until Para-aminosalicyclic acid (PAS) was first used to treat TB and streptomycin was then applied to TB patients in 1944 (Waksman, 1949; Lehmann, 1964) thus it was presumed that TB would not be a serious health problem worldwide. However, after acquired immune deficiency syndrome (AIDS) was identified in 1981 (Centres for Disease Control and Prevention, 2006), TB was considered to be a major global health problem again when it was found as an opportunistic infection of AIDS which is a leading cause of death among people living with HIV (PLHIV) (The Joint United Nations

Programme on HIV and AIDS, 1998). Nowadays, TB can be cured by a 6-month treatment course, but it remains one of the top 10 causes of death globally with 1.5 million people dying from the disease in 2018 (World Health Organisation, 2019).

2.2.2 Causes of TB

TB, is an infectious disease of the respiratory system caused by the airborne bacillus *Mycobacterium tuberculosis* complex (MTBC) that most often affects lungs (pulmonary tuberculosis: PTB) but can also affects other sites (extrapulmonary tuberculosis: EPTB) (World Health Organisation, 2016).

2.2.3 Types and reservoir hosts of *Mycobacterium tuberculosis* complex

The reservoir host of *Mycobacterium tuberculosis* complex (MTBC) relies on species of mycobacterium. Generally, humans are an important reservoir host of TB that have the highest potential for widespread transmission by human-to-human mycobacterium infection. While some animals can be a reservoir host of other species of mycobacterium. The bacteria are usually found in the lesion in patients' lungs and can be found in patients' sputum. From previous studies, it can be found that the MTBC affecting humans consists of seven main species:

2.2.3.1 *Mycobacterium tuberculosis*

Mycobacterium tuberculosis (*M. tuberculosis*) is the main cause of PTB in humans and is pathogenic only to humans and not at all to cattle (Kozińska et al., 2019). However, susceptibility to *M. tuberculosis* is quite high in humans, other mammals, and guinea pigs (LoBue et al., 2010). *M. tuberculosis* is an extremely effective pathogen that adjusts to remain alive within the host (Chai et al., 2018) and is speculated that it was a mutant of *Mycobacterium bovis* or *M. bovis* in cattle which is another cause of human tuberculosis infection.

2.2.3.2 Mycobacterium africanum

Mycobacterium africanum (*M. africanum*) is an endemic mycobacterium in West Africa and a major cause, up to half, of human PTB among the West African people (de Jong et al., 2010). It is also associated more with people born black than with people born white in the United States. The clinical characteristics of TB caused by *M. africanum* are similar to the characteristics of *M. tuberculosis* (Sharma et al., 2016).

2.2.3.3 *Mycobacterium bovis*

Mycobacterium bovis (*M. bovis*) is a cause of TB in animals, known as bovine TB, especially in cattle such as cows or buffalos which has a wide host range capable of infecting humans and some other species (Gormley & Corner, 2018). *M. bovis* can be a cause of human TB in

developing countries. It usually transmits to humans via the gastrointestinal tract of unpasteurised dairy products and often affects other areas such as lymph nodes, bones and joints, although airborne transmission is also possible (Torres-Gonzalez et al., 2016).

2.2.3.4 *Mycobacterium microti*

Mycobacterium microti (*M. microti*) is a cause of TB in small rodents such as voles thus it is known as vole tuberculosis (Cavanagh et al., 2002). The disease is also found in pet such as cats as well as being spasmodically detected in humans and other mammals (Kipar et al., 2014).

2.2.3.5 *Mycobacterium caprae*

Mycobacterium caprae (*M. caprae*) is a pathogen which can result in TB among animals and humans (Rodríguez et al., 2011). This species has been found mostly in central Europe. *M. caprae* infects most wild and domestic animals that are known to be its maintenance host such as red deer (Nigsch et al., 2019). Moreover, it has a zoonotic potential and possibility of transmission between animals and humans. Thus, it is also a cause of human TB (Kozińska et al., 2019).

2.2.3.6 *Mycobacterium pinnipedii*

Mycobacterium pinnipedii (*M. pinnipedii*) was a cause of an outbreak of TB in sea lions (Kiers et al., 2008) and fur seals (Loeffler et al., 2014). It has been found to be a cause of TB in a number of pinniped species (Kriz et al., 2011), and it was reported that it also can spread to livestock and humans (Roe et al., 2019).

2.2.3.7 *Mycobacterium canettii*

Mycobacterium cannettii (*M. canettii*) is a cause of TB infections described in the Horn of Africa. There has been a report that 20 French soldiers were infected by *M. canettii* (Briquet et al., 2019). Its infection mainly presents as lymph node and PTB while PTB caused by *M. canettii* is unique, seemingly, in being non-spreadable (Bouzid et al., 2017).

2.2.4 Transmission of TB

TB can mainly spread via inhalation of the TB organisms which are expelled from patients' lungs when they cough, sneeze, spit, or talk. Transmission of the disease depends on the number of bacilli in sputum, and the frequency of coughing, sneezing, spitting, or talking by TB patients. The patients create droplets that can be transmitted from person to person through the air. Large droplets fall to the floor while small droplets can suspend in the air. When a person inhales the droplets, the large ones stick at the sinus and upper respiratory system, then they are removed from the body. While small droplets can enter into bronchioles or alveoli; the body cannot remove them. However, TB also, but rarely, transmits via food contamination and breast

feeding, contacting with wounds or skin with disease lesion, or transmission from mother to child. There are three factors influencing TB transmission including: host; agent; and environment according to the theory of epidemiology (Mathema et al., 2017).

2.2.4.1 Host factors

A host describes the risk of progression of an individual to active TB after being infected. Some people who have other risk factors such as HIV infection, diabetes mellitus, steroid use, and malnutrition may have more risk to be TB patients than people who are healthier.

2.2.4.2 Agent factors

Agent includes species of mycobacterium which may be a cause of human TB such as *M. tuberculosis or M. africanum*. While some species may be a main cause of animal TB, they can also transmit to human as zoonotic disease such as *M. bovis*, *M. microti*, *M. caprae*, *M. pinnipedii*, or *M. canettii.* Humans are mainly infected with TB caused by *M. tuberculosis* because these usually live in humans as their reservoir host. While other species do live in animals as their reservoir host, they can rarely be transmitted to humans.

2.2.4.3 Environmental factors

Environment describes the risk of TB infection related to an appropriate environment for TB germs including indoor spaces, limited air circulation, and less UV light exposure. Outdoor spaces, good air circulation, and extreme UV light exposure may be not a suitable place for the organism to live.

2.2.5 Signs and symptoms of TB

TB occurring at any site may produce symptoms that are not specifically related to the organ or tissue involved but, rather, are systemic in nature or are remote from the site of disease (Hopewell, 1994). It can be divided patients suffering from TB into 2 groups:

2.2.5.1 Pulmonary tuberculosis (PTB)

Fever is the common symptom of general infectious diseases. However, in Thailand, most cases of chronic fever are suspected as TB disease especially among patients who have fever more than a week (Rattananupong et al., 2015). In this period, it can help to divide patients into two groups: with either gram-positive bacteria or gram-negative bacteria. The latter group usually have fever and other signs for less than a week. Fever often occurs with other symptoms such as chronic cough. Patient with miliary TB, a form of widespread TB in the body with small lesions, may have only fever for a week to a month. In Thailand, patients with fever of unknown origin

must be suspected as having TB. PTB patients usually have low-grade fever, and also may have high-grade fever in the afternoon and at night with night sweats.

Cough is a typical symptom of PTB. The cough may be non-productive initially, but consequently, as inflammation and tissue necrosis ensue, phlegm is typically produced. Inflammation of the lung parenchyma adjoining pleural surfaces may result in pleuritic pain. Spontaneous pneumothorax may also appear, often resulting in chest pain and perhaps dyspnoea. Dyspnoea (difficulty in breathing), a consequence of parenchymal lung association, is uncommon unless the disease is extensive. TB may, however, result in severe respiratory failure. Haemoptysis or cough up blood may also occur as a presenting TB-related symptom but it does not certainly indicate active TB. Haemoptysis may be resulted from residual tuberculous bronchiectasis, rupture of a dilated vessel in the wall of an old cavity, bacterial or fungal infection in a residual cavity, or erosion of calcified lesions into the lumen of an airway. In addition, weakness and weight-loss are usually found in the aggressive stage of disease (Campbell & Bah-Sow, 2006).

However, 20-50% of patients do not have any symptoms (Rojpibulstit et al., 2006). These patients are diagnosed from chest x-ray with the cavity or lesion in their lungs. Some patients who have a small cavity in the chest x-ray, may not have any symptom or only mild symptom thus they are not suspected as a TB patients (Ngamvithayapong et al., 2001).

2.2.5.2 Extrapulmonary tuberculosis

Extrapulmonary tuberculosis (EPTB) shows more of a diagnostic and therapeutic problem than PTB. In part, this problem associates with its being less common and, thus, less well-known to most physicians (Alvarez & McCabe, 1984; Weir & Thornton, 1985). Moreover, EPTB is associated relatively inaccessible sites, and because of the nature of the relevant sites, fewer bacilli can result in much more damage. The combination of small numbers of bacilli and inaccessible sites can result in bacteriologic confirmation of a diagnosis which more challenging and advanced techniques are frequently needed to start a diagnosis (Kim et al., 2018).

2.2.6 Diagnostic test of TB

Nowadays, there are many developed methods for diagnosing TB disease which includes:

2.2.6.1 Sputum smear microscopy

Sputum smear microscopy was developed more than a century ago and has been chosen to be the major technique for diagnosis for PTB in many low- and middle-income countries because the technique is easy, fast, and cheap with a high specificity. However, this technique known as acid-fast bacillus (AFB) has a limitations in its sensitivity in that it needs the bacterial load to be

more than 10,000 organisms/ml sputum sample for positive detection and it also has a low performance in EPTB (Desikan, 2013). In the present case definitions suggested by the WHO, one positive result is needed for a diagnosis of smear-positive PTB.

2.2.6.2 Rapid molecular tests

Rapid molecular test or Xpert MTB/RIF molecular test (Cepheid Inc., Summyvale, CA, USA) is currently a rapid test for diagnosis of TB. It was initially suggested by the WHO in 2010 for diagnosis of PTB in adults as well as it was suggested for children and specific forms of EPTB. The test has much enhanced accuracy than microscopy because a molecular test is based on polymerase chain reaction which detects *M. tuberculosis* DNA within two hours (Casela et al., 2018). Although it has a high sensitivity and specificity in the diagnosis of TB, it is not used widely in many countries because it is very expensive.

2.2.6.3 Culture methods

Culture methods for the diagnosis of TB include two different culture methods: the Lowenstein-Jensen (LJ) and the Mycobacterium Growth Indicator Tube (MGIT) (Kadioglu et al., 2014). These are the recent reference standard but need more sophisticated laboratory ability and may take up to 6 to 8 weeks to offer results (Ogwang et al., 2015). This may delay physician decisions in TB treatment for TB patients thus it is not often used to diagnose TB.

Globally, although microscopy and cultures remain compulsory to monitor treatment processes, using of rapid molecular tests is rising as well as using of smear microscopy for diagnostic purposes is phasing out in many countries. However, In Thailand, the microscopy and culture are still necessary because of the lower cost. Despite improvements in diagnostics, a significant proportion of the new TB cases informed to the WHO is still clinically diagnosed rather than bacteriologically confirmed. In 2015, for example, only 57% of the PTB cases informed to the WHO were bacteriologically confirmed (World Health Organisation, 2016).

2.2.7 Diseased classification

The WHO has classified TB patients into three groups (World Health Organisation et al., 2010):

2.2.7.1 Pulmonary tuberculosis-sputum smear-positive (PTB+; M+):

A case of PTB meets the below definition for smear-positive TB that include:

1. two or more initial sputum smear examinations positive for AFB, or

2. one sputum smear examination positive for AFB plus radiographic abnormalities consistent with active PTB as determined by a clinician, or

3. one sputum smear positive for AFB plus sputum culture positive for *M. tuberculosis.*

2.2.7.2 Pulmonary tuberculosis-sputum smear-negative (PTB-; M-):

A case of PTB that does not meet the above definition for smear-positive TB. In keeping with good clinical and public health practices, diagnostic criteria should include:

1. at least three sputum specimens negative for AFB, and

2. radiographic abnormalities consistent with active PTB, and

3. no response to a course of broad-spectrum antibiotics, and

4. decision by a clinician to treat with a full course of anti-TB chemotherapy.

2.2.7.3 Extrapulmonary tuberculosis (EPTB):

TB affects other organs than the lungs: e.g., pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges, etc. EPTB Diagnosis should be based on one culture-positive specimen, or histology or strong clinical sign consistent with active EPTB, followed by an assessment by a physician to remedy with a full course of anti-TB drugs. A patient identified with both PTB and EPTB should be categorised as a case of PTB.

2.3 Tuberculosis epidemiology

2.3.1 Tuberculosis global overview

Nowadays, TB is a major global health problem compared with previous times (Raviglione, 2010; Zaman, 2010; Quissell & Walt, 2016). In 2018, the WHO estimated the number of TB cases: there were approximately 10.0 million (range, 9.00 – 11.1 million) people having TB, of which 89% were adults, 57% were male, and 8.6% were PLHIV. Moreover, approximately 390,000 people had MDR-TB, and 500,000 people were new cases with rifampicin-resistant TB (RR-TB) who were also recently eligible for MDR-TB treatment. In addition, patients died from the disease approximately almost 1.2 million (range, 1.1 – 1.3 million), with 251,000 deaths (range, 223,000 – 281,000) resulting from TB patients with HIV. Although the number of TB deaths dropped by 27% between 2000 and 2018, TB was in the top 10 causes of death globally in 2000 and 2016 as shown in Figure 2.1 (World Health Organisation, 2018a; World Health Organisation, 2019).

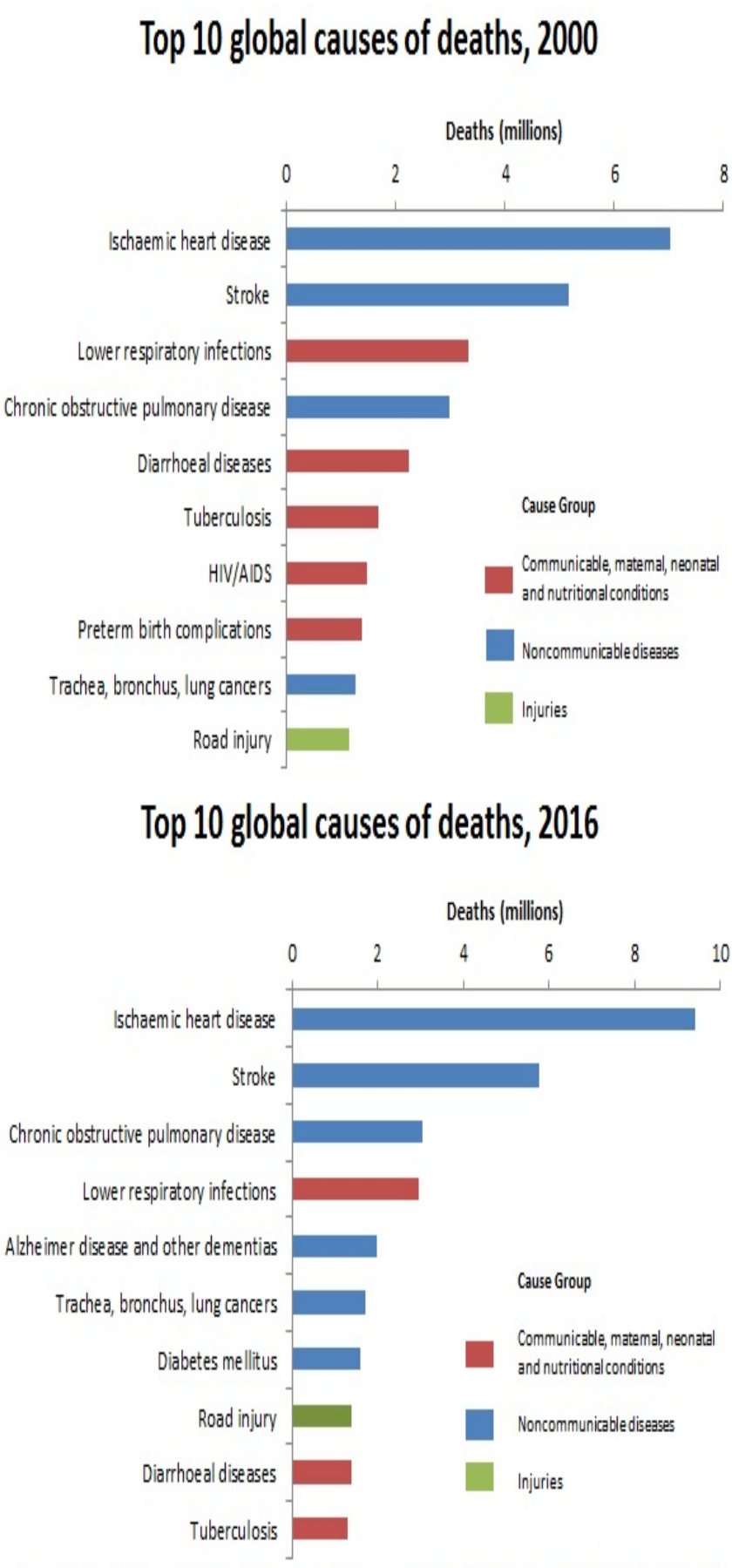


Figure 2.1 The top 10 causes of death globally 2000 and 2016. Taken from the World Health Organisation (2018b).

Among health care workers in 16 countries, the number of TB cases was more than double the notification rate in the overall adult population in 2018 which is a good indicator of the impact of TB infection control in health facilities. BCG vaccination should be offered to newborn babies as part of national childhood immunisation programmes in accordance with a country's TB epidemiology. In 2018, there were 153 countries informing the WHO about offering BCG vaccination as a standard part of these programmes; only 113 countries reported the coverage of BCG programme at above 90% (World Health Organisation, 2019).

Funding for TB care and prevention in low- and middle-income countries was approximately US$ 6.8 billion in 2019 (up from US$ 6.4 billion in 2018 and US$ 3.5 billion in 2006), of which 87% was from domestic sources. In addition, almost 95% of the funding in the BRICS group of countries (Brazil, Russian Federation, India, China, and South Africa) relied on domestic sources. While in other low- and middle-income countries, the funding remained crucial which was relied on international donors, approximately 38% of the funding available in the 25 high TB burden countries outside the BRICS and 49% of the funding available in low-income countries. The cost of TB treatment per patient is usually in the range of US$ 100-1,000 for drug-susceptible TB and US$ 2,000-20,000 for MDR-TB (World Health Organisation, 2019).

The WHO has described three TB high-burden issues: TB, TB/HIV, and MDR-TB which covers 30 countries for each issue as shown in Figure 2.2. The purposes are to offer an attention for global action on these crises in the countries where progress in most required to achieve the End TB strategy and the SDGs targets for these issues. Moreover, all issues help to build and sustain national political commitment, fund in the countries with the highest burden in terms of absolute numbers or severity, and promote global monitoring of progress in a well-define set of countries (World Health Organisation, 2019).

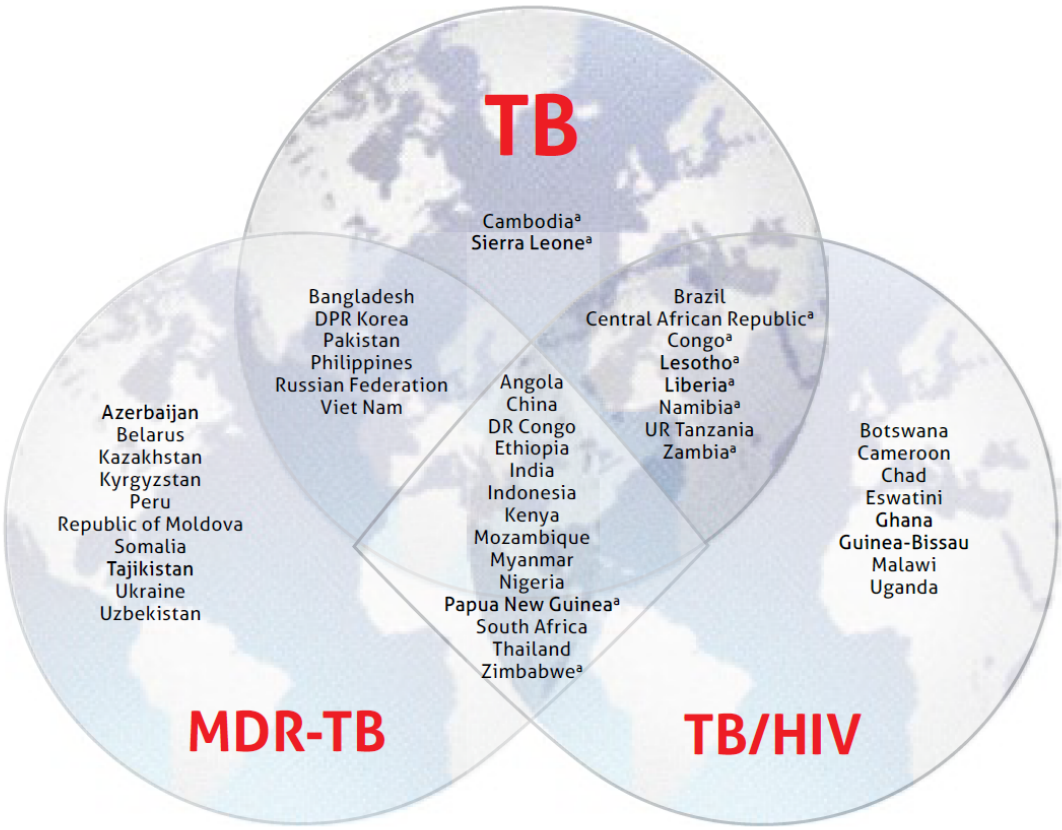


Figure 2.2 Countries in the three TB high-burden country lists used by the World Health Organisation during the period 2016-2020 and their areas of overlap. Taken from the World Health Organisation (2019).

2.3.2 Tuberculosis in Thailand

Thailand, the world's 50th-largest country, is a country which composes of 76 provinces. It is located in the centre of the Indochinese Peninsula in Southeast Asia as shown in Figure 2.3. Moreover, it is the world's 20th-most-populous country with 69 million people (United Nations, 2019; World Health Organisation, 2019). Thailand has been participating with the WHO in terms of reporting the number of TB patients since 2000. In 2018, it was ranked in the 20 high TB burden countries based on the absolute number of incident cases with an estimation of total TB incidence about 106,000 cases (153 per 100,000 population of total TB incidence rate), 15 per 100,000 population of HIV-positive TB incidence rate, and 5.7 per 100,000 population of MDR/RR-TB incidence rate. Indeed, total new and relapsed were 85,029 cases, 85% of those had PTB, 19% of those were tested with rapid diagnostics at time of diagnosis, and 59% of those were bacteriologically confirmed. In addition, 79% of those had known HIV status, 10% of those knowing HIV-status were HIV-positive, and 80% of those being HIV-positive were treated with antiretroviral therapy. Moreover, Thailand is one of 14 overlapping countries that are in all three WHO lists as shown in Figure 2.2 (World Health Organisation, 2019).

Figure 2.3 The map of the Kingdom of Thailand. Taken from Wikipedia (2009a).

Although Thailand spent US$27 million for TB treatment of which 88% was supported from domestic sources and 12% from international sources, the treatment success rates were lower than the WHO target with 84% among new and relapsed cases registered in 2017, 55% among previously treated cases (excluding relapsed cases) registered in 2017, 73% among HIV-positive TB cases registered in 2017, 61% among MDR/RR-TB cases treated with second-line treatment in 2016, and 75% among XDR-TB cases treated with second-line treatment in 2016. Moreover, the mortality rate was estimated at approximately 15 per 100,000 population among TB patients which excludes HIV-positive TB cases, and 5.7 per 100,000 population among TB patients with HIV-positive only (World Health Organisation, 2019). In addition, the TB success report in the first cohort in 2017 in Thailand showed that there were approximately 78.41% of success rate, 8.02% of death rate, and 4.38% of lost to follow-up which failed to meet targets (success rate = 85%, death rate = 5%, lost to follow-up = 0%) (Department of Disease Control, 2018).

In terms of the national strategies to control TB, the Thai government through the Ministry of Public Health has provided many strategies to deal with TB problems according to the recommendation of the WHO (Bureau of Tuberculosis, 2018). The Thai government has established a strategy called *Thailand Operation Plan to End Tuberculosis 2017-2021* (Bureau of Tuberculosis, 2017b). This national plan aims “to reduce the incidence of TB by 12.5% per year, from 171 per 100,000 population in 2014 to 88 per 100,000 population by the end of 2021”. This

plan consists of five strategies which are fully consistent with the Global End TB Plan recommended by WHO as shown in below (Bureau of Tuberculosis, 2017b):

Strategy 1 is to expedite TB case findings to ensure full coverage through TB screening in risk populations. This strategy aims to confirm that all (100%) suspected or presumptive TB cases have access to TB screening and early TB diagnosis via molecular diagnosis, as well as standardised TB treatment and care, and to ascertain an effective TB spread control.

Strategy 2 is to reduce TB mortality. This strategy aims to halve the TB mortality by 2021 compared to 2015.

Strategy 3 is to enhance human resource capacity on TB prevention, treatment, and control. This strategy aims to strengthen the leadership and strategic management capacity for TB preventive, treatment, and control.

Strategy 4 is to create a system to support a sustainable strategic management. This strategy aims to sustain political commitment by mobilising resources to support the system for TB prevention, care and control.

Strategy 5 is to promote research and innovation on TB prevention, treatment, and control. This strategy aims to intensify research to direct and optimise implementation and impact, including innovation to improve programme performance that is consistent with the local situation.

Since 2017, this operation plan has been established and applied across the nation for 4 years which has been done by cooperation from both government and private sectors to control TB. However, TB remains a major problem in the country which may result from various factors. Nowadays, the population structure in Thailand is changing to an aged society which has a significant impact on society. The Bureau of Tuberculosis (2017b) reported that older people are more likely to be infected with TB than young people and they also have longer periods of patient delay, thus they can spread the disease in their community during the untreated period (Asres et al., 2017). In addition, there is an increase in labour movement within the country which leads to an increased transmission rate. The Bureau of Tuberculosis (2017b) pointed out that there are a lot of Thai people, especially in the north-eastern part, moving to work in other provinces such as Bangkok or big cities. Some of them may have TB-related symptoms but do not get a TB treatment which may also lead to an increase in new TB patients among untreated patients.

Moreover, the national tuberculosis prevalence survey in Thailand in 2012-2013 showed that Thailand faced important challenges about TB including high mortality from TB, late diagnosis,

duplication in the monitoring and evaluation system, under-reporting from non-government settings, and insufficient coverage of MDR-TB detection. It can be seen that late diagnosis and insufficient coverage of MDR-TB detection may influence the increased number of new TB patients. The late diagnosis may delay TB suspected cases to seek appropriate timely treatment and these persons may spread the TB in their household and community. Also, insufficient coverage of MDR-TB detection may also delay MDR-TB patients to getting second-line treatment and these patients may further transmit MDR-TB in their family and society.

Additionally, there are difficulties in accessing TB care for migrant workers, including challenges related to freedom of movement of people within the Association of South-East Asian Nations Economic Community which came into effect on 31 December 2015. This may lead to an increase in the number of TB patients which may be infected by migrants from neighbouring countries with significantly higher rates of TB than among Thai nationals. Furthermore, causes of an increase of TB patients in Thailand may include the spread of HIV and AIDS which is related to TB as well as the increase in drug-resistant TB which requires longer and more complex treatment than usual.

The surveys also showed that more than 50% of TB patients did not have any TB-related symptoms or had mild symptoms which might be a cause of delay in initial treatment (Bureau of Tuberculosis, 2017a). Furthermore, only 59% of newly diagnosed TB patients were reported in the national TB system which could mean that some might delay in getting TB treatment or could not access to the treatment (Bureau of Tuberculosis, 2017b). Therefore, the result of these challenges is that Thailand is now failing to reach the WHO targets; the last report showed that the coverage of TB treatment was 80% and the success rate was 84% which were lower than the targets (coverage of TB treatment = 90%, success rate = 90%). Also, the death rate was 8% which was higher than the target (death rate = 5%) (Department of Disease Control, 2019).

2.3.3 Tuberculosis in a high burden area: Nakhon Ratchasima province

In Thailand, the Department of Disease Control (DDC), one of the Ministry of Public Health's agencies, has missions for communicable diseases and non-communicable diseases. Moreover, its aim is to protect people by working proactively to identify, assess, communicate, prevent, and control disease. TB is one of the top three communicable diseases which has affected significant numbers of Thai people for decades. The DDC has divided their regional offices nationwide into 12 Regional Offices of Disease Prevention and Control which each regional office is responsible for 4-6 provinces (Department of Disease Control, 2018).

The Office of Disease Prevention and Control 9, Nakhon Ratchasima, is located in the north-eastern part of Thailand which is responsible for four provinces called 'Nakhon-Chai-Bu-Rin' including Nakhon Ratchasima, Chaiyaphum, Buri Ram, and Surin. It has been reported that it was the top-most-cases region with 10.65%, 11.02%, 10.46%, and 9.95% of all TB patients in Thailand between 2014 to 2017, respectively. Moreover, the TB treatment outcome report in this region between 2014-2017 showed that the success rates were less than the WHO target at 82.32%, 82.01%, 83.80%, and 83.07%, respectively. While the death rates were more than the target at 6.49%, 6.64%, 7.44%, and 6.82%, respectively, and the lost to follow-up rates were also more than the target at 5.82%, 5.91%, 4.84%, and 3.08%, respectively (The WHO targets are 85% of success rate, 5% of death rate, and 0% of lost to follow-up rate) (Department of Disease Control, 2018).

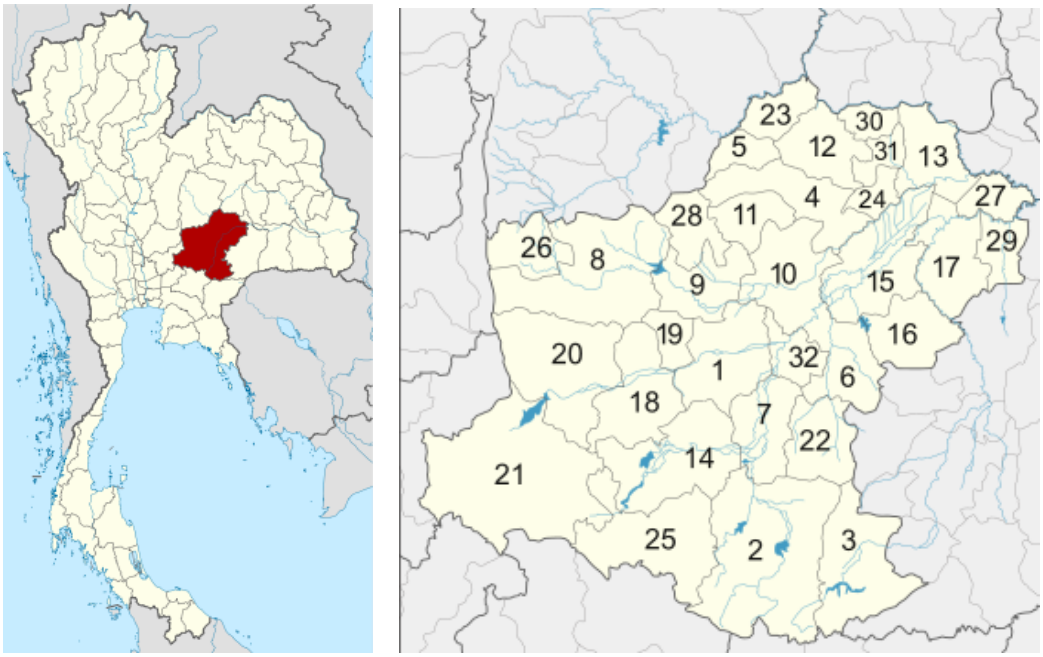


Figure 2.4 The map of Nakhon Ratchasima province. Taken from Wikipedia (2009b).

Nakhon Ratchasima, a province including 32 districts which is located in the Office of Disease Prevention and Control 9 as shown in Figure 2.4, is the first-most-cases province in this region. In 2014 – 2017, there were approximately 32.33%, 31.94%, 32.75%, and 33.93% of all TB patient in this area, respectively. Although the success rate in 2014 was higher than the target at 85.21%, the percent of success rates slightly decreased at 85.05%, 84.24%, and 80.18% in 2015 – 2017, respectively. Moreover, the death rates between the above years slightly increased at 6.74%, 6.99%, 7.02%, and 7.45%, respectively. In addition, the lost to follow-up rates remained stable at 4.17%, 3.54%, 3.77%, and 4.02%, respectively (Department of Disease Control, 2018).

According to the information above, it can be seen that TB has been a major health problem in this province. Although there were many TB projects in the province, the percentage of TB patients was still the highest in the region with low success rates of TB treatment outcome and the high death rates and lost to follow-up rates over 4 years. Thus, this province is selected as a high burden area of TB problem in this study (Department of Disease Control, 2018).

2.4 Eras of tuberculosis monitoring

2.4.1 The previous era

In this period, the Millennium Development Goals (MDGs) were stated by the UN in 2000 with TB-related targets to halt and reverse TB incidence by 2015. Most countries provided many strategies to reduce the TB burden which focused on achieving the targets. Moreover, stated in 2001, the Stop TB Partnership accepted these targets and added two further targets; TB prevalence and TB mortality rates should be halved by 2015 when were compared with their rates in 1990. Furthermore, the Stop TB Strategy, the global TB strategy established by the WHO for 2006-2015 had the overall goal of reaching all three targets (World Health Organisation, 2016).

The WHO assessed whether its targets for decreases in TB incidence, prevalence, and mortality were succeeded in October 2015. Worldwide, the TB mortality rate dropped by 47% between 1990 and 2015, with most of that development arising after 2000. A 50% reduction of mortality rate was seen in only four WHO regions: the America, the Eastern Mediterranean, the South-East Asia, and the Western Pacific. Moreover, TB prevalence fell by 42% between 1990-2015. A 50% reduction of prevalence rate was reached in only three WHO regions: the Americas, the South-East Asia, and the Western Pacific Region (World Health Organisation, 2016).

2.4.2 The current era

In 2016, the MDGs have been replaced by the Sustainable Development Goals (SDGs) approved by all UN Members, which set an end date of 2030. Similarly, the End TB Strategy has been changed from the Stop TB Strategy which covers the period 2016 – 2035. Its targets include a 90% reduction in TB deaths and an 80% reduction in TB incidence by 2030, compared with 2015.

The SDGs stated “Ensure healthy lives and promote well-being for all at all ages” which includes 13 targets. The target for TB is mentioned in target 3.3 as follows: “By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases, and combat hepatitis, water-borne diseases and other communicable diseases”. The “ending epidemics” is also now a noticeable component of global health strategies approved by the WHO and the Joint United Nations Programme on HIV and AIDS (UNAIDS), including the End TB Strategy. Such language is

much more motivated than the MDGs language of “halting and reversing” epidemics (or “stopping” them, as in the Stop TB Strategy). Moreover, Target 3.8 includes coverage of tracer interventions for prevention and treatment (including TB treatment coverage), and financial coverage provided by health insurance or a public health system. In addition, the SDGs and the End TB Strategy share a common aim: to end the global TB epidemic (World Health Organisation, 2016).

2.5 Delay of treatment in TB

2.5.1 Problem and effect of delay

Since the previous period, there have been many studies emphasising to investigate the consequences of delay in diagnosis and treatment among PTB patients. It can be summarised into two terms as patient-related consequence and community-related consequence (Said et al., 2017; Chaychoowong, 2019).

Patient-related consequences mean that delay in diagnosis and treatment may worsen the course of the disease and increase mortality (Said et al., 2017; Chaychoowong, 2019). According to an African study, exploring the comparison between patients who were identified as the delay group (14 days or over) and the non-delay group (less than 14 days), showed that the delay group had an increased referral to hospital. Additionally, patients who had delay (30 days or over) had more likely increased mortality than patients who had no delay (less than 30 days) (Meintjes et al., 2008). Moreover, other studies agreed that delay might increase mortality especially among HIV-coinfection TB patients (Lienhardt et al., 2001; Greenaway et al., 2002).

Community-related consequences are that delay may increase probability of transmission the disease (Said et al., 2017; Chaychoowong, 2019). El-Sony et al. (2002), studying the relation of grading of sputum smears to clinical features of TB, found that the highest grade of smear-positivity and longer duration of symptoms were predictors of having a sick person in the household. Moreover, Aldhubhani et al. (2013), studying the consequence of delay in diagnosis on the rate of TB among close contacts of TB patients, found that 55.6% of 239 close contacts had a positive tuberculin skin test (TST). Moreover, TST results among close contacts of TB index patients with long or short diagnosis delay times had a positive result at 56.6%, and 55%, respectively. In addition, the median number of close contacts being positive for TST was 2 among patient with long delay and 1 among patient with short delay. Although this study showed no significant difference between long and short delay groups, some studies found an increase in transmission of TB among close contacts due to longer delay in TB diagnosis (Ponticiello et al., 2001; Bassili et al., 2008; Talay et al., 2008).

In addition, Cheng et al. (2013), studying the consequence of diagnostic and treatment delay on the risk of TB transmission in Shenzhen, China: an observational cohort study, 1993-2010, found that the proportion presenting with positive sputum smears and with a pulmonary cavity increased significantly with an increased duration of delay. TB Patients with delay at 60 days or over would have sputum smear positive 7.6 times compared with those diagnosed with TB during a routine physical examination, and 5.0 times greater risk of having a cavity in their lungs.

In conclusion, the crucial importance of this study is highlighted to identify the influencing factors with patient delay to decrease the transmission rate in communities and severity of the disease related to mortality.

2.5.2 The rationale for conducting this research

My experiences as a public health technical officer and as a researcher, working with PTB patients for many years, has suggested that the need for a study which may discover these PTB patients with a long duration of patient delay in terms of duration and the influencing factors of the delay. The initial review of the literature has shown a lack of research in this area, particularly in Nakhon Ratchasima province. The study could explore and attempt to understand these factors in particular contexts. The expectation of this study is that the results could be useful for health providers and healthcare services to enable them to understand and provide the appropriate TB strategies performed by PTB patients with the delay. The challenge for the health facilities is in facing with PTB patients who have long duration of patient delay that could affect individual level in terms of having severe symptoms or dying as well as community level in terms of increasing TB transmission.

2.6 Psychological theories: health behaviour

Patient delay in TB treatment results in more severe illness and increased transmission of TB in community. Understanding health seeking behaviour of TB patients is therefore needed to improve TB case detection and provide initial TB treatment. There may be many factors influencing the behaviour which is a dynamic process that is influenced by socio-demographic, culture, and other factors (Madionos et al., 1993). Thus, it is important to understand health behaviour theories in the context of this research which they may be used to explain the way that individuals perform health behaviours.

The term ‘health behaviour’ is used to mean any behaviour that may influence a person’s physical health or any behaviour that a person believes which may influence a person’s physical health (Sutton, 2001). Nowadays, there are many psychological theories which have been established and developed to predict, explain, and change health behaviours. The theories are

useful for conducting practice in physical health, mental health, education, and other domains. They offer answers to intriguing questions regarding many kinds of thinking including learning, emotion, perception, and problem-solving. In addition, they aim to identify variables that affect individuals' behaviours, and using the sum of variables, how likely it is the individual may involve with a specific behaviour (Weinstein et al., 1998).

In this study, health seeking behaviour which may result in patient delay is needed to understand based on health behaviour theories. The most frequently mentioned theories in previous studies, the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA) are explored in terms of how they relate to health seeking behaviour and how they influence people with TB.

2.6.1 Health Belief Model (HBM)

The Health Belief Model, one of the earliest frameworks used to understand human behaviours, was developed in the 1950s by social psychologists to explain the broad failure of people to take place in the disease prevention and detection programme (Hochbaum, 1958; Rosenstock, 1960; Rosenstock, 1974). The HBM is always used to explain change of health-related behaviours and as a guiding framework for interventions. Over the decades, it has been expanded, compared, and contrasted to other frameworks and used to inform interventions to change health behaviour. This model is also used to explain behaviours with the potential to decrease risk of becoming a disease and the consequences of an existing disease. It declares that people may do health-related actions based on these factors and associated beliefs (Champion & Skinner, 2008; Skinner et al., 2015) as shown in Figure 2.5.

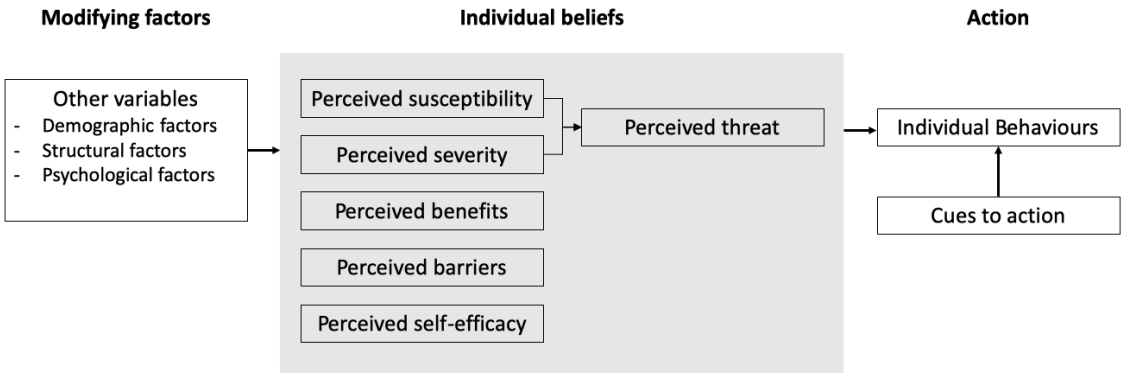


Figure 2.5 The component and linkages of the Health Belief Model

Perceived susceptibility is defined as a belief about the possibility of contracting a disease or condition. For instance, people must believe that they are a risk of getting TB infection before they are willing to take action by seeking TB screening test.

Perceived severity is a belief about the severity of contracting an illness or condition or of leaving it untreated, including physical effects (e.g. death, severe symptoms, uncomfortable) and social

effects (e.g. resulting in the ability to work, maintaining relationships with other people, or feeling stigmatised). For instance, people must know that they may die or have more severe symptoms as well as the need to stop working or feel stigmatised with TB.

Perceived threat is the construct formed by the combination of susceptibility and severity. Perceived susceptibility should be multiplied by perceived severity to calculate perceived threat; thus, if people do not perceive either of these components, the perceived threat would be zero. For instance, people do perceive on severity (e.g. having severe symptoms or dying) but do not perceive on susceptibility (having a risk of getting TB), thus they would not perceive on threat.

Perceived benefits are beliefs about positive aspects or advantages of a recommended action to minimise threat. These benefits might decrease threat of a disease or its effects. Moreover, other non-health-related benefits might be noticeable. For instance, people know the advantages of seeking initial TB treatment, they would save their time and money spent on seeking non-standard treatment.

Perceived barriers are defined as possible difficulties in taking action, which can include negative effects resulting from an action. These perceived barriers and negative effects could obstruct action or subsequent participation in the behaviour. For instance, barriers may include inconvenience, cost of transportation, fear of a TB screening procedure, or stigmatisation.

Cues to action include the concept of cues that can motivate actions. Cues could be both internal or external factors which it can activate health behaviours when appropriate beliefs are held. For instance, feeling a severe TB-related symptom that increased perceived threat (internal aspect), or people could be stimulated by media, publicity, social support, a suggestion from a health provider during visit, or a neighbour's diagnosis (external aspect).

Other variables include demographic, structural, and psychosocial factors which may result in beliefs and indirectly influence health behaviours. For instance, sociodemographic factors, such as educational level, can indirectly affect health seeking behaviours by changing perceptions of susceptibility, severity, benefits and barriers.

Perceived self-efficacy is defined as a belief that individual can perform the recommended health behaviour or individual's confidence. However, the construct of self-efficacy was not clearly represented by an HBM construct, although lack of self-efficacy was sometimes added as a barrier to take action. Finally, self-efficacy was added to the HBM as a separate construct in 1988. For instance, people believe on their ability to take action in self healthcare or prevention the diseases, they thus are confident to do self-treatment.

The Health Belief Model and patient delay

The HBM is a framework that helps suggest whether an individual may adopt or not a recommended health behaviour, seeking TB treatment initially. According to this model, people's decision to involve in seeking TB treatment initially is based on their perceptions. Therefore, by changing their perceptions, people can be persuaded to accept an appropriate behaviour. The HBM may be used to explain that people with TB-related symptoms may perform an initial TB treatment when they have positive perceptions, cues to actions, and other variables.

Due to initial health seeking behaviour, according to the model, people should initially have perceived the risk of contracting the health condition and be concerned about having a long duration in seeking initial TB treatment (perceived susceptibility), the seriousness and severity of the consequences and complications derived from the condition with its all physical, psychological, social and economic dimensions such as haemoptysis, becoming bedridden, dying, disease transmission, or inability to work or being asked to stop working (perceived severity), and the awareness of seeking TB treatment late (perceived threat). Moreover, people should also perceive the value of seeking TB treatment initially by comparing the costs and side effects of the treatment with the expected consequences of contracting an illness (perceived benefits), the expected expenditures such as cost of the treatment, transportation fees or living costs, and the difficulties of travelling from their residence to the health facilities (perceived barriers), and the ability to perform the recommended health behaviour (perceived self-efficacy) by receiving positive cues in the form of motivations from external or internal environments (cues to action) and other variables which may influence initial TB treatment seeking behaviour including demographic, structural, and psychosocial factors such as age, gender, economic status, level of education. Therefore, this behaviour, seeking TB treatment initially, may result in a decreased duration of patient delay.

2.6.2 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed to better understand relationships between attitude, intentions, and behaviours (Fishbein, 1967). The theory focuses on theoretical construct involved with individual motivational factors as factors of the probability of acting a particular behaviour. The TRA assumes the best predictors of a behaviour is behavioural intention, which in turn is defined by attitude towards the behaviour and social normative perceptions regarding it (Montano & Kasprzyk, 2008). It proposes that people may perform behaviours based on these factors as shown in Figure 2.6.

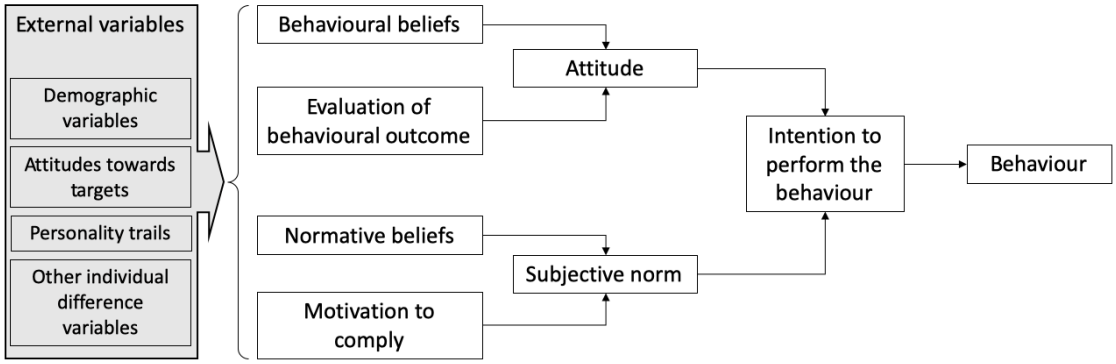


Figure 2.6 The component and linkages of the Theory of Reasoned Action

Attitude is defined by the individual's beliefs about outcomes or attributes of performing the behaviour (behavioural beliefs), weighted by evaluation of those outcomes or attributes. For instance, people who hold strong beliefs that positively valued outcomes may result in perform the behaviour and may have a positive attitude towards the behaviour.

Subjective norm is defined by an individual's normative beliefs, that is, whether important referent individuals approve or disapprove of performing the behaviour, weighted by their motivation to comply with those referents. For instance, people who believe that certain referents think they should perform a behaviour and is motivated to meet expectations of those referents may hold a positive subjective norm.

The Theory of Reasoned Action and patient delay

The TRA focuses on behavioural intention which is seen as the main factor of behaviour. It looks at an individual's attitudes towards that behaviour as well as the subjective norms of influential people and groups that could influence those attitudes. The TRA may be used to explain that people with TB-related symptoms may perform an initial TB treatment when they have positive attitude and subjective norm.

Due to perform initial health seeking behaviour, according to the model, people should initially perceive the probability that they may engage in a given behaviour, seeking TB treatment initially, by providing intention to perform the behaviour (behavioural intention). Moreover, people should also perceive the behaviour based on favourable or unfavourable assessment of the behaviour (attitude) and the particular behaviour which is influenced by the judgement of significant others such as parents, spouse, friends, colleagues, teachers, community, economy, demographic factors, etc (subjective norm). Their performance in seeking healthcare has optimum dependency upon the attitude of them towards the treatment and their subjective norms towards TB which may depend on how they are being influenced and who makes a

deeper impression in their mind. Therefore, the behaviour may also result in a decreased duration of patient delay.

2.7 Chapter summary

Tuberculosis or TB has remained a major global health problem which has killed millions of people over a long time. It is an infectious disease caused by *M. tuberculosis* complex which can spread from patient to other people via droplets. Although there are many campaigns provided by the WHO and the UN to stop TB, it has remained one of the top 10 causes of death globally for many years. Thailand has tried to stop this problem by providing a national tuberculosis control programme guideline adopted by the WHO for many years but it is still in the 20 high TB burden countries with a large number of new cases as well as it is one of 14 countries facing the three mentioned issues: TB, TB-HIV, and MDR-TB. Patient delay in treatment can result in two major consequences: patient-related; and community-related consequences which can lead to increased mortality and prevalence of new TB cases. To understand health-related behaviours, psychological theories are applied to explore in terms of why it is important to understand health behaviour theories in the context of this research, and how they can link to delays according to the Health Belief Model and the Theory of Reasoned Action.

Chapter 3 Literature review

3.1 Introduction

The aim of this chapter is to present information related to the literature review. There are several reasons why the literature review is an important step in constructing research. According to Fink (1998: p3) has stated that "a literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and interpreting the existing body of recorded work produced by researchers, scholars, and practitioners". Therefore, it can be found that the literature review is crucial in the context of a doctoral study which provides advantages to the researcher (Oliver, 2012). The literature review can be used to show my understanding on the topic which refers to my abilities to identify, summarise, and assess previous studies or research related to patient delay among PTB patients which is relevant to my current topic. Moreover, it can be used to justify gaps in knowledge from previous studies and assist formulating my research question for the current work. The theoretical framework can be formulated based on literature review which comprises of concepts and theories that my research is based on. In addition, a research methodology can be developed after conducting a literature review. It can show how relevant research have been undertaken in the previous as well as indicate weaknesses and strengths of previous research thus I can choose and apply the most appropriate methods including types of data sources, and statistics for analytical approaches for my work. The questionnaire for my current work can also be structured based on literature review which covers most relevant factors for patient delay among PTB patients. Furthermore, my own results and findings can be discussed in the light of existing studies and the crucial points of the findings can be provided when compared with the literature review. For instance, the literature can be used to compare and contrast findings between the current study and previous studies while the different findings are needed to discuss why and whether the differences are important further.

This chapter includes the search strategy including databases, search terms and combinations, date limits, inclusion and exclusion criteria, PRISMA 2009 Flow diagram, and quality assurance. The results of the literature review are then provided including definition, the cut-off value, the duration, and factors associated with patient delay. Then, the gaps in published papers and framework of the study are presented subsequently. Finally, the strengths and limitations of the literature are summarised at the end of this chapter which follow by an overall chapter conclusion.

3.2 The search strategy

The topic area for my systematic review started as 'patient delay of PTB patients'. The next step, which is similar to a funnel or reverted triangle, the topic area then was narrowed to a specific answerable review question such as 'factors associated with patient delay'. After that, my review question, 'What are the factors associated with patient delay in seeking treatment for PTB patients?', was developed further by using the PEO(T) technique which is often used for qualitative questions (Khan et al., 2003) as shown in Table 3.1.

Table 3.1 The PEO(T) technique to develop the search strategy

P-Population	**E-Exposure**	**O-Outcomes**	**T-Type of study**
PTB patients who have experienced patient delay	To account for the influencing factors of patient delay	Factors associated with patient delay	All methods

The search strategy consisted of databases, search terms and combinations, and date limits, then were provided aiming to find out appropriate and related articles.

3.2.1 Databases

The relevant articles were searched via online electronic databases on EBSCOhost including CINALH, Academic Search Premier, and MEDLINE (Bettany-Saltikov, 2012). These three electronic databases were related to the field of health and social care as shown in below:

1. CINAHL, which is the most extensive source globally of full-texts, indexes, or abstracts of nursing and allied health journals. There are more than 1,300 journals of full-text that being interesting and useful in health studies, particularly published by the National League for Nursing (NLN) and the American Nurses' Association (ANA) such as the *Journal of Nursing Measurement*, the *Journal of Nursing Education*, and the *Journal of Nursing Management*, and more than 17 related branches, including Biomedicine, Health sciences, alternative/ complementary medicine, consumer health, etc.
2. Academic Search Premier, which is a database that collects journal articles in all disciplines such as health, computer science, engineering, liberal arts, law, science, business, etc. Full texts are available for more than 8,500 journals. Over 4,600 peer-reviewed titles provide colour image information. Journal articles can be searched from 1975 to present.
3. MEDLINE, which is a comprehensive database of more than 5,200 life sciences journals including health sciences from 80 countries, conducted by U.S. National Library of Medicine (NLM).

3.2.2 Search terms and combinations:

The key search terms were created around the review question which were searched in the three mentioned electronic databases to find relevant literature. EBSCOhost suggested by the University of Hull Library Services was used to search across the main library's electronic resources which covers journal articles, electronic books, and online resources. These key search terms consist of four terms as shown below and in Table 3.2.

- tuberculosis* or tb*
- delay* or tim* or duration* or length* or interval*
- factor* or cause* or influence* or reason* or determinant*
- patient* or doctor* or treat* or diag* or health system*

* = truncation, to find all words based on a root

3.2.3 Date limits:

The literature search extended from 2000 to 2020 because the UN established the MDGs to decrease the burden of TB disease in 2000 and its target stated as 'to halt and reverse TB incidence' was set for 2015. After that, in 2001, the STOP TB Partnership approved this target and added two additional targets: TB prevalence and mortality rates should be halved by 2015 compared with their rates in 1990. Moreover, the WHO developed the global TB strategy for 2006 – 2015, the STOP TB Strategy, for coping TB problems. Therefore, since 2000 until now, most countries worldwide have provided many campaigns and projects to solve and stop TB problems based on the MDGs and the Stop TB strategy established in the previous era, followed by the SDGs and the End TB strategy replaced in the current era, not only by treatment strategy but also research.

The number of articles searched from the three mentioned electronic databases between 2000 to 2020 were 80,592, 16,530, 6,411, and 4,745 in the first to the fourth set of the search terms respectively as shown in Table 3.2.

Table 3.2 The results of search term from CINAHL, Academic Search Premier, and Medline

Search term	CINAHL & Academic Search Premier & Medline
Set 1 tuberculosis* or tb*	80,592
Set 2 tuberculosis* or tb* And delay* or tim* or duration* or length* or interval*	16,530
Set 3 tuberculosis* or tb* And delay* or tim* or duration* or length* or interval* And factor* or cause* or influence* or reason* or determinant*	6,411
Set 4 tuberculosis* or tb* And delay* or tim* or duration* or length* or interval* And factor* or cause* or influence* or reason* or determinant* And patient* or doctor* or treat* or diag* or health system*	4,745

3.2.4 Inclusion and exclusion criteria

The existing research on patient delay in TB treatment among TB patients employed a range of designs. For the purpose of this review, both quantitative and qualitative study designs were included and therefore this review identified all the relevant papers that were addressed this topic in the last 20 years. The inclusion and exclusion criteria were addressed to considerably recruit relevant articles for literature review.

3.2.4.1 Inclusion criteria

The inclusion criteria for considering studies for this review were drawn on PEO(T) technique which is normally used in qualitative studies or research questions (Bettany-Saltikov, 2012). In this review, the PEO(T) was applied to the review question: “What are the factors associated with patient delay in seeking treatment for PTB?” as shown in Table 3.1. To detail, studies recruited in the literature review were full-text only which were published in a peer-reviewed

journal in English between 2000 – 2020. However, there were some full-text articles which were not available to access in the mentioned electronic databases, I contacted the staff of the University of Hull Library Services to access them with payment. All studies were undertaken among TB patients aged 18 years old or over. The study designs included qualitative research, quantitative research (non-RCTs), and mixed methods research, as shown in Table 3.3.

Table 3.3 Specified additional criteria

Relevance detected	Full text only
Time frame	2000 - 2020
Publication status	Full text available online Articles from peer-reviewed publications
Language	English language only
Study's design target	Qualitative research, Quantitative research (Non-RCTs), Mixed methods research
The study population	TB patients aged 18 years old or over

3.2.4.2 Exclusion criteria

A study was excluded from the review and analysis if it did not meet at least one of the following criteria:

1. Participants and research design not meeting the inclusion criteria
2. Outcomes not meeting the criteria set for this review including PEO(T) and specified additional criteria

For this screening, the 4,745 articles recruited through databases searching and 142 additional articles recruited through other sources were removed the duplicated articles via PRISMA diagram. The 4,433 records after duplicates removed then were screened via their titles and abstracts thus there were only 293 records recruiting to assess the eligibility of each article. Finally, there were only 197 full-text articles assessed for eligibility including 10 qualitative studies, 29 cohort studies, 5 case-control studies, 148 cross-sectional studies, and 5 mixed methods studies. However, 96 full-text articles were excluded for eligibility with studying in diagnosis delay (62 articles), treatment delay (21 articles), and total delay (2 articles) which were not relevant and specific to the current topic, patient delay. Also, 11 systematic review studies were excluded for eligibility while the original studies included in these systematic review studies were searched and added in the 197 full-text articles. The process of recruiting the literature was described in the PRISMA Diagram as shown in Figure 3.1.

3.2.5 PRISMA 2009 Flow Diagram

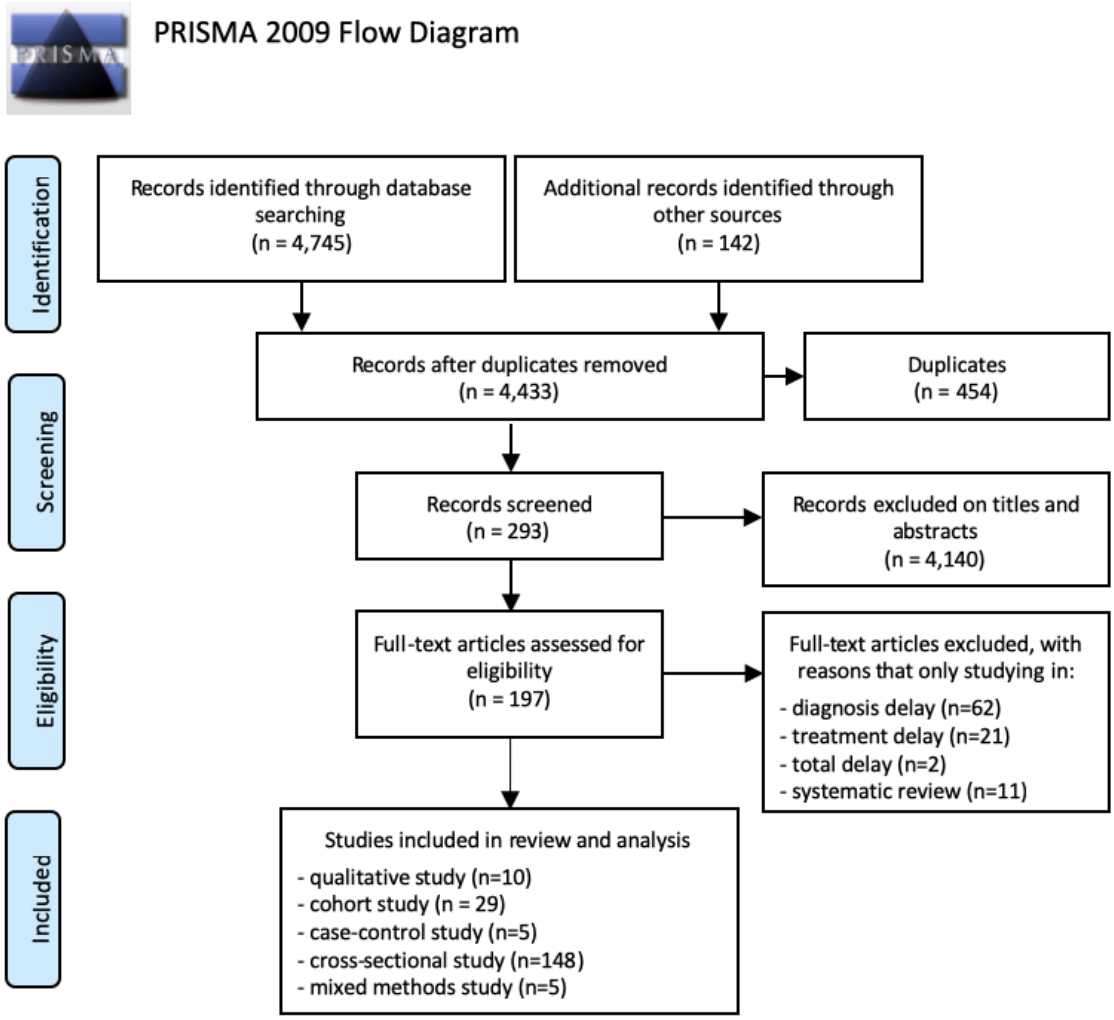


Figure 3.1 PRISMA 2009 flow diagram

3.2.6 Quality assurance:

This research was conducted using the mixed methods approach, thus both quantitative and qualitative studies were included into the literature review in order to obtain articles related to my current research topic - the duration and influencing factors of patient delay among pulmonary tuberculosis patients. The recruited articles then were critically appraised the quality and utility of each report.

In terms of critically appraising, the appropriate and standard critical appraisal tools are usually required specifically for evaluating the quality of published research reports in each method. Critical appraisal tools offer analytical assessment of the quality of each study, in specific this process was undertaken to minimise biases in this study (Katrak et al., 2004). The tools for critically appraising were appropriately and specifically chosen to each approach as shown in below.

For case-control studies, the CASP critical appraisal tool for case-control studies was used to review the case-control study articles which includes 11 questions (Critical Appraisal Skills Programme,

2018a). In addition, the CASP critical appraisal tool for cohort studies was also applied to assess the quality of cohort study reports which includes 12 questions (Critical Appraisal Skills Programme, 2018b). Moreover, the Qualitative Checklist of CASP was used for assessing the quality of qualitative studies which includes 10 questions (Critical Appraisal Skills Programme, 2018c).

Although the CASP appraisal checklists are generally used for critiquing in many types of research approach, there is no CASP critical appraisal tool for cross-sectional studies and mixed methods studies. Thus, other critical appraisal tools for critiquing the mentioned methods are needed to find out and apply in each method specifically. The ten questions recommended by Greenhalgh (2014) then were asked for critiquing the quality of cross-sectional study papers that describe the questionnaire research. In addition, the Mixed Methods Appraisal Tool (MMAT) version 2011, recommended by McGill University, Canada (Hong et al., 2018), was applied for critiquing the quality of mixed methods studies that consists of three parts within 5 sections: qualitative, quantitative randomised controlled (trials), quantitative non-randomised, quantitative descriptive, and mixed methods. For the quantitative part, the researcher must choose a section which is relevant to their chosen articles. In this case, the questions for critiquing begin with two screening questions (for all types), followed by the qualitative section, the quantitative descriptive studies section, and the mixed methods section, respectively.

3.3 Finding of the literature review

One hundred and ninety-seven studies were critically appraised, carefully reviewed, and systematically categorised under four key terms: definition of delay; the cut-off value of delay; the duration of patient delay across the world; and factors associated with patient delay, respectively.

3.3.1 Definition of delay

There were five main terms used to describe delay: patient delay; health system delay; diagnosis delay; treatment delay; and total delay. There were many researchers defining the definition of each type of the delay as shown in below (find more details in Appendix 1):

3.3.1.1 Patient delay:

Eighty-five studies were concerned with the definition of patient delay. All 85 researchers defined the starting point of patient delay as from the first onset of TB symptoms. However, there were several end points varying in each study such as: until the first visit to health provider or health care provider or medical provider (27 studies); health facility or medical facility (18 studies); health care service (9 studies); physician or doctor (8 studies); consultation (6 studies);

health care system (4 studies); health centre or hospital or clinic (3 studies); medical care (2 studies); health worker (1 study); care seeking action (1 study) and not mentioned (6 studies). Therefore, the definition of patient delay in my current research was defined as:

> Patient delay is the time interval from the first onset of any TB-related symptoms (i.e. persistent cough, expectoration, blood-tinged sputum, fever, weakness, night sweats, weight loss, chest pain, or respiratory symptoms) until the first visit, consultation, or presentation to health provider (i.e. doctor, physician, medical provider, or health worker) at the health or medical facility (i.e. hospital, health centre, or clinic).

3.3.1.2 Health system delay:

Seventy-two studies considered this delay. Most researchers (42 studies) used 'health system delay' for defining this duration, some of those used health care delay (9 studies), health service delay (7 studies), health provider delay (7 studies), doctor delay (4 studies), physician delay (1 study), health facility delay (1 study) and medical delay (1 study). This interval – health system delay – was defined from the first visit, consultation, or presentation to a health provider at the health or medical facility, but its end point varied in each study such as until the date of anti-TB treatment or DOTS (47 studies), diagnosis or confirmation as TB patient (22 studies), including diagnosis delay and treatment delay (3 studies).

I have reviewed and decided to use 'health system delay' in my research because it was used in most studies and covered all definitions not only the system terms, but the provider term also. In terms of definition, the health system delay in this current research was defined as:

> Health system delay is the time interval from the first visit, consultation, or presentation to health provider at the health or medical facility until the initiation of anti-TB treatment, that include the time interval of diagnosis delay and treatment delay.

3.3.1.3 Diagnosis delay:

Diagnosis delay was mentioned in 22 studies. Twelve studies defined the starting point as from the first onset of TB-related symptoms, eight studies stated as from the first visit, one study defined as the sum of patient delay and health system delay, and one study did not provide a definition. While the end point of the two mentioned groups – from the onset of TB-related symptoms, and from the first visit – were similar: until the date of diagnosis or labelling as TB patient from a physician or doctor. The definition of diagnosis delay for this research was defined as:

Diagnosis delay is the time interval between the first visit, consultation, or presentation to health provider at the health or medical facility and the diagnosis of PTB.

3.3.1.4 Treatment delay:

Treatment delay was stated in 31 studies. Most of these (25) defined treatment delay as the duration between the diagnosis of PTB and the initiation of anti-TB treatment. Four studies stated as from the first onset of TB-related symptoms to the initiation of anti-TB treatment. One study defined it as being from the first consultation until the initiation of anti-TB treatment. While there was no definition in one study. For this research, the definition of treatment delay was defined as:

Treatment delay is the time interval between the diagnosis of PTB and the initiation of anti-TB treatment.

3.3.1.5 Total delay:

Total delay was defined in 60 studies. There were two definitions with the same meaning. Thirty-four studies defined it as the time interval between the first onset of TB-related symptoms and the initiation of anti-TB treatment. In 26 studies, the sum of patient delay and health system delay was included. The definition of total delay in this current research was defined as:

Total delay is the total period from the first onset of TB-related symptoms and the initiation of anti-TB treatment.

The framework in Figure 3.2 shows all types of delay since the first onset of symptom to the initiation of treatment: patient delay, health system delay which includes diagnosis delay and treatment delay, and total delay. However, this study aimed to investigate the duration between the first onset of symptom and the first visit at health care provider and influencing factors related to the delay thus the patient delay period was highlighted in terms of involving with patient-related factors.

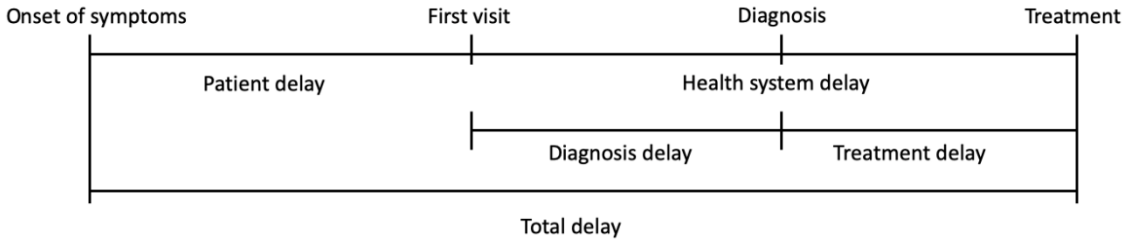


Figure 3.2 The actual framework of types of delay in this study.

3.3.2 The cut-off value of delay

There were 113 previous studies (57.36%) mentioning the cut-off value of delay. The cut-off value was used for dichotomizing patients into two groups, those with or without delay, for binary analysis. Most of those studies (39 studies) were based on the median of their data, 37 studies were based on the researchers' definition, 20 studies were based on previous studies, three studies were based on consultation with the TB specialist physicians in their workplace, two studies were based on national guidelines, two studies were based on percentile, and one study was based on the WHO recommendation. In addition, data were used for linear regression analysis but there was no cut-off value in 10 studies. (find more details in Appendix 2).

In terms of the value used for indicating delay, two values emerged. The former, more than the selected value was used to define as delay in 82 studies. The later, equal or more than the value was defined as the delay in 19 studies. For example, if the value was 30, the first one would start from 31 while the second would start from 30.

In terms of the number used in previous studies, 82 studies used 30 days as a cut-off value of patient delay, 14 days for health system delay and also diagnosis delay, 7 days for treatment delay, and 60 days for total delay.

For this study, patient delay was dichotomised into two groups, patient with or without delay, with more than 30 days, from onset of TB-type symptoms to the first visit at health care provider, defined as a cut-off value of patient delay.

3.3.3 The duration of patient delay across the world

From previous studies, the length of patient delay varied according to the studies and countries. This part shows the duration of the delay across six regions: Africa, America, Asia, Europe, European Union, Middle East, and Oceania, respectively (find more details in appendix 3).

3.3.3.1 Africa region

There were 34 studies exploring the duration of patient delay in Africa region. The median duration was used to identify patient delay in most previous studies. The longest patient delay was found in Uganda at approximately 4.5 months (Macfarlane & Newell, 2012) while the shortest patient delay of approximately 4 days was found in Sudan (Mohamed et al., 2013).

Moreover, less than a month was used as patient delay in most studies (Kiwuwa et al., 2005; Cambanis et al., 2007; Meintjes et al., 2008; Verhagen et al., 2010; Ayisi et al., 2011; Van Wyk et al., 2011; Belay et al., 2012; Ngangro et al., 2012b; Akrim et al., 2014; Makwakwa et al., 2014; Gebreegziabher et al., 2016a; Adenager et al., 2017).

In addition, around a month was used in some studies (Yimer et al., 2005; Mesfin et al., 2009; Yimer et al., 2009; Sendagire et al., 2010; Lusignani et al., 2013; Asefa & Teshome, 2014; Buregyeya et al., 2014; Gebeyehu et al., 2014; Takarinda et al., 2015; Amar et al., 2016; Bogale et al., 2017), and around two months was used to identify patient delay as well (Demissie et al., 2002; Odusanya & Babafemi, 2004; Gele et al., 2009; Ngadaya et al., 2009; Hussen et al., 2012; Saifodine et al., 2013; Ukwaja et al., 2013; Osei et al., 2015; Yirgu et al., 2017).

3.3.3.2 America region

In America region, there were 15 studies investigating the duration of patient delay. Most studies were undertaken in Brazil. The longest patient delay was found to be 90 days in Brazil (dos Santos et al., 2005) whilst the shortest duration was found to be 15 days in the same country (Wysocki et al., 2013).

Moreover, around a month was found as the median patient delay in many studies (Lambert et al., 2005; Zerbini et al., 2008; Machado et al., 2011; Coimbra et al., 2012; Silva-Sobrinho et al., 2012; Deponti et al., 2013; Rodriguez et al., 2016). In addition, 20 days was defined as the duration of patient delay in some countries (Villa et al., 2013; Trigueiro et al., 2014; Almeida et al., 2015), and around 2 months was also defined the delay as well (Ford et al., 2009; Maciel et al., 2010; Salinas et al., 2012).

3.3.3.3 Asia region

In Asia region, there were 52 studies studying the duration of patient delay. Most studies were undertaken in India and China, respectively. The longest period was found to be 366.5 days in disadvantaged areas in Afghanistan (Sabawoon et al., 2011) while the shortest period was found to be 6 days in China (Zhao et al., 2013). Moreover, in Vietnam, a-3-week was found as the median patient delay in two studies (Huong et al., 2007; Hoa et al., 2011).

In addition, less than a month was identified as the duration of patient delay in most studies (Sasaki et al., 2000; Rajeswari et al., 2002; Chiang et al., 2005; Tobgay et al., 2006; Leung et al., 2007; Wang et al., 2007; Aye et al., 2010; Ahmad et al., 2011; Lock et al., 2011; Ananthakrishnan et al., 2012; Jagadish et al., 2012; Li et al., 2012; Rabin et al., 2012; Tamhane et al., 2012; Zhou et al., 2012; Behera et al., 2013; Thakur & Murhekar, 2013; Tobe et al., 2013; Xu et al., 2013; Belkina et al., 2014; Chen et al., 2014; Konda et al., 2014; Basa & Venkatesh, 2016; Gothankar et al., 2016; Mistry et al., 2016; Wang et al., 2016; Xia et al., 2016).

Furthermore, the duration of patient delay was defined by nearly a month in many studies (Yamasaki-Nakagawa et al., 2001; Xu et al., 2005; Chang & Esterman, 2007; Qureshi et al., 2008;

Goel et al., 2011; Meyssonnier et al., 2012; Shu et al., 2014; Laohasiriwong et al., 2016b; Purty et al., 2016), two months in some studies (Karim et al., 2007; Lin et al., 2008; Basnet et al., 2009; Cheng et al., 2013; Kulkarni et al., 2013), or three months in a study of Bawankule et al. (2010).

In terms of previous studies in Thailand, a month was defined as the duration of patient delay in most studies (Rojpibulstit et al., 2006; Chaychoowong & Suggaravetsiri, 2009; Pungrassami et al., 2010; Rattananupong et al., 2015), and 11 days was defined as the duration of patient delay in a study of Ngamvithayapong et al. (2001).

3.3.3.4 Europe region

In Europe region, there were only eight studies investigating the duration of patient delay. The longest duration was 6.41 weeks found in Bosnia (Kurspahic-Mujcic et al., 2013) while the shortest duration was 4.5 days found in Turkey (Okutan et al., 2005). Moreover, one month was mostly found as the median patient delay in this region (Guneylioglu et al., 2004; Farah et al., 2006; Okur et al., 2006; van der Werf et al., 2006; Woith & Larson, 2008). In addition, 38 days was found as a patient delay in Croatia (Jurcev-Savicevic & Kardum, 2011).

3.3.3.5 European Union region

In the European Union region, there were 10 studies showing the duration of patient delay. The longest duration was 123 days defined by mean in Denmark (Leutscher et al., 2012) whilst the shortest duration was 7 days found in France (Gagliotti et al., 2006). Moreover, most studies found that around a month was the duration of patient delay such as in United Kingdom (Paynter et al., 2004; Saldana et al., 2013), and Italy (Pezzotti et al., 2015). In addition, 14, 22, 49, 79, and 81.5 days was defined as patient delay in other studies (Tattevin et al., 2012; Diez et al., 2004; Rodger et al., 2003; Pehme et al., 2006; Sultan et al., 2012).

3.3.3.6 Middle East region

In the Middle East region, there were five studies discovering the duration of patient delay. The longest duration was 59 days found in Iran (Nasehi et al., 2012) while the shortest duration was 13 days found in the same country (Mirsaeidi et al., 2007). Moreover, there have been a slightly increase of patient delay in Iran from 13, 48, and 59 days in 2007, 2009, and 2012, respectively (Mirsaeidi et al., 2007; Shamaei et al., 2009; Nasehi et al., 2012). In addition, a duration of about a month was found as the patient delay in the Syrian Arab Republic (Maamari, 2008) and Qatar (Ibrahim et al., 2016).

3.3.3.7 Oceania region

In Oceania region, there was only a study by Ward et al. (2001) in Australia which found that the median duration of patient delay was 29 days.

3.3.4 Factors associated with patient delay

From the literature review, there were many factors associated with patient delay. Some factors were predisposing constructs which were directly associated with the patient while other factors were involved with patients such as reinforcing or enabling constructs which were indirectly associated with the patient (Chaychoowong et al., 2019). The factors associated with patient delay may be divided into nine characteristics: (1) sociodemographic – economic characteristic (Maamari, 2008; Mesfin et al., 2009; Coimbra et al., 2012; Laohasiriwong et al., 2016b); (2) health behavioural characteristic (Coimbra et al., 2012; Deponti et al., 2013); (3) knowledge, recognition, and stigmatisation about TB characteristic (Maamari, 2008; Mesfin et al., 2009; Ayisi et al., 2011; Belkina et al., 2014; Laohasiriwong et al., 2016b); (4) family and social characteristic (Chaychoowong & Suggaravetsiri, 2009); (5) health status characteristic (Mesfin et al., 2009; Coimbra et al., 2012); (6) clinical of TB symptoms characteristic (Coimbra et al., 2012; Deponti et al., 2013); (7) health seeking behavioural characteristic (Mesfin et al., 2009; Van Wyk et al., 2011); (8) accessibility and availability of TB services characteristic (Ngadaya et al., 2009; Laohasiriwong et al., 2016b); and (9) satisfaction with health care services characteristic (Maamari, 2008). The results of the literature review in terms of factors associated with patient delay in each characteristic are shown in the following section, respectively.

3.3.4.1 Sociodemographic – economic characteristic

Gender

From the previous studies, there were conflicting findings: gender was associated with delay, and gender was not associated with the delay. In terms of female gender, Rodriguez et al. (2016) found that female patients in Colombia had longer duration of patient delay than males. This result corresponds with 19 studies in other areas: Bangladesh (Karim et al., 2007), Bangladesh-India-Malawi (Gosoniu et al., 2008), Brazil (Machado et al., 2011; Silva-Sobrinho et al., 2012), China (Meyssonnier et al., 2012; Xu et al., 2013), Ethiopia (Yimer et al., 2009), India (Konda et al., 2014), Iran (Alavi et al., 2015), Malaysia (Chang & Esterman, 2007), Nepal (Bam et al., 2012), Nigeria (Fatiregun & Ejeckam, 2010), Spain (Diez et al., 2004), United Kingdom (Rodger et al., 2003; Sultan et al., 2012), Vietnam (Huong et al., 2007; Hoa et al., 2011), seven countries of the Eastern Mediterranean Region (Bassili et al., 2008), and it also was found in a qualitative study in Zambia (Needham et al., 2001).

However, eleven studies reported that male gender was significantly associated with patient delay: Brazil (Beraldo et al., 2012), Estonia (Pehme et al., 2006), Ethiopia (Wondimu et al., 2007; Asefa & Teshome, 2014), India (Rajeswari et al., 2002), Iran (Nasehi et al., 2012), Peru (Ford et al., 2009), South Africa (Meintjes et al., 2008), South America (Lambert et al., 2005), Taiwan (Chiang et al., 2005), and Uganda (Buregyeya et al., 2014). However, there was no association between gender and patient delay in some studies (Almeida et al., 2015; Osei et al., 2015; Pezzotti et al., 2015; Rattananupong et al., 2015; Takarinda et al., 2015; Basa & Venkatesh, 2016; Das & Dwibedi, 2016; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Laohasiriwong et al., 2016a; Mistry et al., 2016; Wang et al., 2016; Adejumo et al., 2017; Adenager et al., 2017; Bogale et al., 2017; Said et al., 2017; Yirgu et al., 2017). Although being female seems to be a risk factor for patient delay, it is not possible to come to a conclusion based on the research.

Age group

Asres et al. (2017) showed that being an older patient was a significant risk factor associated with patient delay in Ethiopia. This result corresponds with many studies (Fatiregun & Ejeckam, 2010; Lin et al., 2010; Beraldo et al., 2012; Jagadish et al., 2012; Silva-Sobrinho et al., 2012; Zhou et al., 2012; Ukwaja et al., 2013; Xu et al., 2013; Yimer et al., 2014; Ilangovan et al., 2015; Gebreegziabher et al., 2016a; Adejumo et al., 2017). While some studies found that being a younger patient was a risk factor for delay (Farah et al., 2006; Saqib et al., 2011; Nasehi et al., 2012; Kulkarni et al., 2013), three studies reported that middle age was an associated factor such that the 30-39 age range had lower odds of delay (Rundi et al., 2011), aged ≥ 30 years (Wang et al., 2016), and 45-54 years old (Yirgu et al., 2017),. However, some studies found that there was no association between age and patient delay (Alavi et al., 2015; Almeida et al., 2015; Ilangovan et al., 2015; Osei et al., 2015; Pezzotti et al., 2015; Rattananupong et al., 2015; Takarinda et al., 2015; Basa & Venkatesh, 2016; Gebreegziabher et al., 2016b; Laohasiriwong et al., 2016b; Mistry et al., 2016; Rodriguez et al., 2016; Xia et al., 2016; Adenager et al., 2017; Bogale et al., 2017; Said et al., 2017). Although being older may be a risk factor for delay, it is not possible to come to a conclusion based on the research.

Marital status

There was an association between marital status and the delay in some previous studies while most studies reported that there was no association between them. Bassili et al. (2008), Gosoniu et al. (2008), and Meyssonnier et al. (2012) found that patient delay was associated with married patients, single patients (Ngamvithayapong et al., 2001; Trigueiro et al., 2014; Laohasiriwong et al., 2016a), and widowed patients (Ayuo et al., 2008; Zhao et al., 2013). Some studies found an association between patients living alone and delay (Jagadish et al., 2012; Kulkarni et al., 2013).

However, there was no association between marital status and patient delay in many studies (Basa & Venkatesh, 2016; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Wang et al., 2016; Adejumo et al., 2017; Adenager et al., 2017; Bogale et al., 2017; Yirgu et al., 2017), or living alone and the delay (Coimbra et al., 2012; Deponti et al., 2013; Almeida et al., 2015). Marital status seems not to be associated with patient delay, but it is not possible to come to a conclusion based on the research.

Education level

There were conflicting findings on the association between education and the delay. In terms of relationship with delay, lower education was a significant risk factor for patient delay in 13 previous quantitative studies (Jurcev-Savicevic & Kardum, 2011; Bam et al., 2012; Ngangro et al., 2012b; Salinas et al., 2012; Silva-Sobrinho et al., 2012; Lusignani et al., 2013; Ukwaja et al., 2013; Asefa & Teshome, 2014; Gebeyehu et al., 2014; Konda et al., 2014; Makwakwa et al., 2014; Trigueiro et al., 2014; Virenfeldt et al., 2014) and in a qualitative study (Needham et al., 2001) while the result of delay in TB case-finding and treatment in Mwanza, Tanzania showed that this delay was significantly longer in patients with longer level of education (Wandwalo & Morkve, 2000). In contrast, there was no significant association between education level and patient delay in many previous studies (Almeida et al., 2015; Osei et al., 2015; Takarinda et al., 2015; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Mistry et al., 2016; Wang et al., 2016; Xia et al., 2016; Adejumo et al., 2017; Adenager et al., 2017; Bogale et al., 2017; Yirgu et al., 2017). Furthermore, some studies about literacy and patient delay found that illiteracy was associated with patient delay (Bassili et al., 2008; Mesfin et al., 2009; Hussen et al., 2012; Jagadish et al., 2012; Akrim et al., 2014; Basa & Venkatesh, 2016; Laohasiriwong et al., 2016a) while the studies of Almeida et al. (2015), Tamhane et al. (2012), Cambanis et al. (2007), and dos Santos et al. (2005) found no association. It is possible to see that lower education level is a risk factor for patient delay, however it is not possible to come to a conclusion based on the research.

Occupation

There was an association between occupation and the delay in some previous studies, whilst many studies showed no association. There was an association between occupation and patient delay in 11 studies (Kiwuwa et al., 2005; Xu et al., 2005; van der Werf et al., 2006; Gosoniu et al., 2008; Lin et al., 2008; Mesfin et al., 2009; Rundi et al., 2011; Mohamed et al., 2013; Saifodine et al., 2013; Laohasiriwong et al., 2016a; Asres et al., 2017), type of farmer (e.g. nomadic livestock farmers) was a risk factor of the delay (Gele et al., 2009). Moreover, unemployment was associated with the delay (dos Santos et al., 2005; Leung et al., 2007; Mfinanga et al., 2008;

Machado et al., 2011; Jagadish et al., 2012; Trigueiro et al., 2014). However, some studies did not show an association between occupation and patient delay (Basa & Venkatesh, 2016; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Ibrahim et al., 2016; Mistry et al., 2016; Adenager et al., 2017; Bogale et al., 2017; Said et al., 2017). Occupation types look like to be related to patient delay such as nomadic livestock farmers, nevertheless this remains an inconsistent factor in this study.

Economic status

Economic status was associated with the delay in some previous studies, whilst some studies showed no association between economic status and the delay. In terms of a relationship between economic status and the delay, lower income was a significant factor in some studies (Ahmad et al., 2011; Ayisi et al., 2011; Beraldo et al., 2012; Jagadish et al., 2012; Meyssonnier et al., 2012; Zhou et al., 2012; Mohamed et al., 2013; Thakur & Murhekar, 2013; Wysocki et al., 2013; Akrim et al., 2014; Bogale et al., 2017) while a few studies showed that higher income was a significant risk factor for patient delay (Wondimu et al., 2007; Bassili et al., 2008; Adejumo et al., 2017). Moreover, patients being the main income earner (Cambanis et al., 2007), selling their assets (Cambanis et al., 2005; Hussen et al., 2012; Ngangro et al., 2012b), living in welfare household (Tobe et al., 2013), receiving food from the government (Mesfin et al., 2009), and borrowing money from other people (Ngamvithayapong et al., 2001) were associated with patient delay. However, there was no significant association between patient delay and level of income in many studies (Almeida et al., 2015; Chen et al., 2015; Basa & Venkatesh, 2016; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Wang et al., 2016; Xia et al., 2016; Adenager et al., 2017; Said et al., 2017), having debt (Needham et al., 2001; Zhao et al., 2013; Tobe et al., 2013), being the main income earner (Needham et al., 2001; Li et al., 2012), or being land ownership (Yirgu et al., 2017). Patients who have lower income could be considered as having longer patient delay from previous studies, however, it is not possible to come to a conclusion based on the research.

The number of work-days per week

From previous studies, a relationship between the number of workdays per week and patient delay was investigated in four studies. The results shown in all studies revealed that a higher number of work-days was a high-risk factor for the delay such as more than 5 days a week (Zhou et al., 2012; Tobe et al., 2013), and more than 24 days a month (Li et al., 2012). In addition, being a patient who could not take time off work was associated with delay (Tamhane et al., 2012). Although the number of work-days may be argued that it is a factor in patient delay, there is no research about this factor in Thailand.

Language

An association between language and patient delay was undertaken in two previous studies. The results showed that there was no association between language and the delay (Meintjes et al., 2008; Belay et al., 2012). Language seems not to be associated with patient delay and all participants in this study use Thai language. Thus, language is excluded from this research.

Religion

There are several previous studies investigating an association between religion and patient delay. It can be found that there was only a study from Fatiregun and Ejeckman (2010) showing that being Christian was associated with patient delay compared with Muslims while many studies did not show the association (Demissie et al., 2002; Ayuo et al., 2008;Deponti et al., 2013; Trigueiro et al., 2014; Virenfeldt et al., 2014; Almeida et al., 2015; Adenager et al., 2017; Bogale et al., 2017). Religion seems not to be associated with patient delay; all participants are Buddhist in the research area also. Thus, this is excluded from this research.

Ethnic group

A relationship between ethnic group and patient delay was studied in many countries. It can be seen that there was an association between ethnic group and patient delay in Denmark (Leutscher et al., 2012), Iran (Nasehi et al., 2012), Thailand (Ngamvithayapong et al., 2001), and United Kingdom (Rodger et al., 2003) also. Nevertheless, some studies found that there was no association between the delay and ethnic group (Belay et al., 2012; Sultan et al., 2012; Deponti et al., 2013; Virenfeldt et al., 2014; Rattananupong et al., 2015; Xia et al., 2016; Bogale et al., 2017), or race (Trigueiro et al., 2014; Almeida et al., 2015). It could be considered that ethnic group is not a factor for patient delay, and all participants in this research are Thai. Thus, this is excluded from this research.

History of being prisoner

From three previous studies, there were two studies showing that the delay was longer in non-prisoner than prisoner due to early TB case finding in prisons (Diez et al., 2004; Nasehi et al., 2012). While a study in Iran found that imprisonment was not associated with patient delay (Alavi et al., 2015). It looks like being a prisoner is not a risk factor for delay, but it is not possible to come to a conclusion based on the research.

3.3.4.2 Health behavioural characteristic

Alcohol consumption

Five studies found an association between alcohol consumption and longer duration of patient delay (Rajeswari et al., 2002; Diez et al., 2004; Kiwuwa et al., 2005; Gatey et al., 2012; Amar et al., 2016) while a study in Sao Paulo found that the longest period during seeking assistance occurred among patient who did not consume alcohol (Beraldo et al., 2012). Nevertheless, there was no association between drinking alcohol and patient delay in many studies (Lin et al., 2010; Maciel et al., 2010; Coimbra et al., 2012; Deponti et al., 2013; Lusignani et al., 2013; Thakur & Murhekar, 2013; Wysocki et al., 2013; Belkina et al., 2014; Almeida et al., 2015; Rattananupong et al., 2015; Takarinda et al., 2015; Basa & Venkatesh, 2016; Wang et al., 2016; Xia et al., 2016). Alcohol consumption is probably related to the delay, nevertheless it is not possible to come to a conclusion based on the research.

Smoking

Eight studies found that smoking behaviour was associated with patient delay (dos Santos et al., 2005; Bassili et al., 2008; Basnet et al., 2009; Jurcev-Savicevic & Kardum, 2011; Bam et al., 2012; Hussen et al., 2012; Jagadish et al., 2012; Alavi et al., 2015). However, there was no association between smoking behaviour and patient delay in other studies (Deponti et al., 2013; Lusignani et al., 2013; Mohamed et al., 2013; Saifodine et al., 2013; Wysocki et al., 2013; Belkina et al., 2014; Gebeyehu et al., 2014; Shu et al., 2014; Almeida et al., 2015; Rattananupong et al., 2015; Takarinda et al., 2015; Wang et al., 2016; Xia et al., 2016). Smoking behaviour may be associated with the delay; however, it is not possible to come to a conclusion based on the research.

Using illicit drugs

Two studies showed that there was an association between patients who used illicit drugs with longer patient delay (Shamaei et al., 2009; Coimbra et al., 2012). Moreover, some studies found an association between patient delay with other types of drugs such as marijuana (Coimbra et al., 2012), cocaine and crack (Coimbra et al., 2012; Deponti et al., 2013). However, there was no a significant association between the delay and drug abuse in other studies (Deponti et al., 2013; Belkina et al., 2014; Alavi et al., 2015; Almeida et al., 2015; Rattananupong et al., 2015), or with shoemaker glue (Coimbra et al., 2012). Using illicit drugs is probably a risk factor for patient delay, but it is not possible to come to a conclusion based on the research.

3.3.4.3 Knowledge, recognition, and stigmatisation about TB characteristic

Knowledge about TB

The result of seven quantitative studies showed that having lower TB knowledge was associated with longer patient delay (Biya et al., 2014; Konda et al., 2014; Makwakwa et al., 2014; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Wang et al., 2016; Asres et al., 2017). Moreover, a qualitative study found that inadequate knowledge about TB was associated with patient delay (Nyasulu et al., 2015). While there was only one study found that patients having higher TB knowledge was a risk factor for patient delay (Beraldo et al., 2012). In addition, a qualitative study in Uganda showed that the main factor for delay among Ugandan women was a lack of recognition of symptoms (Macfarlane & Newell, 2012). However, there was no association between patient delay and TB knowledge in other studies (Li et al., 2012; Tamhane et al., 2012; Lusignani et al., 2013; Wysocki et al., 2013; Buregyeya et al., 2014; Trigueiro et al., 2014; Almeida et al., 2015; Osei et al., 2015; Laohasiriwong et al., 2016a; Xia et al., 2016; Adenager et al., 2017; Bogale et al., 2017), or patient who ever heard TB (Makwakwa et al., 2014; Takarinda et al., 2015). Moreover, there was no association between the delay and patients who knew about national policy in some studies (Schneider et al., 2010; Li et al., 2012; Ngangro et al., 2012b; Zhao et al., 2013), or knew about TB prevention or control (Wysocki et al., 2013; Akrim et al., 2014). Knowledge about TB is probably associated with delay, but it is not possible to come to a conclusion based on the research.

Recognition about TB

The perception that TB was common (Ford et al., 2009), or that the illness was not serious (Mesfin et al., 2005) was associated with a longer delay. Moreover, patient delay was significantly related to self-perception because participants thought that early symptoms were not relevant to TB (Tamhane et al., 2012), believed that TB was associated with HIV/AIDS (Ngadaya et al., 2009), lacked awareness or misperceptions about causes of PTB (Mesfin et al., 2009; Basa & Venkatesh, 2016), or thought that TB-related symptoms would disappear by themselves (Akrim et al., 2014). In terms of qualitative studies, there also was an association between the delay and patients' perception (Furlan et al., 2014), low self-awareness (Nyasulu et al., 2015), a sense of not being a likely victim of TB (Sagbakken et al., 2010), or hopelessness (Kuznetsov et al., 2013).

However, some studies found that there was no association between perception or attitude and patient delay (Aye et al., 2010; Lock et al., 2011; Wysocki et al., 2013; Almeida et al., 2015; Laohasiriwong et al., 2016a; Mistry et al., 2016; Wang et al., 2016). In addition, a study in limited

resource countries showed that misunderstanding of the microbial causing of TB was associated with delayed diagnoses (Ngangro et al., 2012b). Moreover, a perception that smoking being a cause of TB was a risk factor for patient delay (Kiwuwa et al., 2005) and a misinterpretation of early symptoms was the most common reasons reported for the delay (Ayisi et al., 2011). Recognition about TB is probably associated with delay, but it is not possible to come to a conclusion based on the research.

Stigmatisation about TB

Four previous studies in Africa found that patients having a high level of stigmatisation about TB were associated with patient delay due to feeling ashamed (Asefa & Teshome, 2014; Osei et al., 2015), fearing of being diagnosed with TB (Adenager et al., 2017), or fear HIV-related TB stigmatisation (Fatiregun & Ejeckam, 2010). Moreover, a study in India showed that females had high score of TB stigmatisation than males (Thakur & Murhekar, 2013) while a study in Thailand found that males reporting higher TB stigmatisation had longer delay and females reporting higher TB stigmatisation had shorter duration (Pungrassami et al., 2010). In addition, the delay was associated with patients who feared diagnosis or social isolation (Akrim et al., 2014). In terms of qualitative study, the stigmatisation about TB was found as a risk factor for the delay (Macfarlane & Newell, 2012; Chimbatata et al., 2017) and it was also found that there was an association between TB and HIV (Nyasulu et al., 2015). However, some studies showed that stigmatisation was not a risk factor for patient delay (Sabawoon et al., 2011; Li et al., 2012; Thakur & Murhekar, 2013; Almeida et al., 2015; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Laohasiriwong et al., 2016a). TB stigmatisation tends to be a risk factor for patient delay; therefore, it is an interesting variable for inclusion in this research.

3.3.4.4 Family and social characteristic

The Number of family members

From previous studies about the number of family members and patient delay, some studies showed that there was a significant association between the larger number of family members and the greater the risk of patient delay in four studies (Jagadish et al., 2012; Tamhane et al., 2012; Konda et al., 2014; Purty et al., 2016). Moreover, family density (Asefa & Teshome, 2014) and the number of neighbourhoods (Rodriguez et al., 2016) were associated with the delay. However, most studies found that there was no association between the delay and the number of family members (Jurcev-Savicevic & Kardum, 2011; Machado et al., 2011; Lusignani et al., 2013; Basa & Venkatesh, 2016; Xia et al., 2016; Adenager et al., 2017; Said et al., 2017; Yirgu et al., 2017), the number of rooms in house (Yirgu et al., 2017), family support (Laohasiriwong et al., 2016a), or the number of dependent family members (Meintjes et al., 2008; Trigueiro et al.,

2014; Amar et al., 2016). It may be argued that this is a risk factor for delay, but it is not possible to come to a conclusion based on the research.

Contact TB case

Only two studies showed that there was an independent association between patient contacting with a previous TB case and patient delay (Guneylioglu et al., 2004; Mohamed et al., 2013). While contact with TB patients was not a risk factor for patient delay in some studies (Maciel et al., 2010; Schneider et al., 2010; Ananthakrishnan et al., 2012; Coimbra et al., 2012; Saifodine et al., 2013; Adenager et al., 2017; Bogale et al., 2017). Moreover, van der Werf et al. (2006) found that there was no association between the delay and patients who had risk factor for TB, or knew someone who had TB (dos Santos et al., 2005; Lacroix et al., 2008; Deponti et al., 2013; Xia et al., 2016). In addition, there was no association between a history of having TB in family members and patient delay in some studies (Saqib et al., 2011; Tamhane et al., 2012; Trigueiro et al., 2014). It seems that contact TB case is not associated with patient delay, however it is still an interesting factor to be explored in this research.

Previous TB treatment

Three studies that included not only new TB cases but retreated cases also, found that the previous TB treatment was associated with patient delay (Yimer et al., 2009; Tattevin et al., 2012; Ilangovan et al., 2015). However, there was no association between this factor and the delay in other studies (dos Santos et al., 2005; Machado et al., 2011; Coimbra et al., 2012; Meyssonnier et al., 2012; Sultan et al., 2012; Deponti et al., 2013; Almeida et al., 2015; Amar et al., 2016). It assumes that this is not a risk factor in delay, and only new patients are participants in this study thus it is excluded from this research.

Social support

A study in Thailand found that low social support was involved with delay because patients with low social support score (less than 80%) had more delay than patients with high social support score (Chaychoowong & Suggaravetsiri, 2009). Social support is probably associated with patient delay; however, it is investigated in this research because one study has investigated it.

3.3.4.5 Health status characteristic

Chronic disease

There was an association in some studies between increased duration of patient delay and coexistence of a chronic disease (Saifodine et al., 2013), comorbidity (Rundi et al., 2011), chronic obstructive pulmonary disease (COPD) (Mohamed et al., 2013), or receiving immunosuppressive

drug (Alavi et al., 2015). In contrast, other studies found that patient delay was not associated with patients who had COPD, diabetes mellitus (DM), asthma (Alavi et al., 2015), comorbidity (Machado et al., 2011; Rattananupong et al., 2015), hyperglycaemia (Wang et al., 2016), or chronic disease (Maamari, 2008). It is possibly seen that chronic disease is a risk factor for delay, but it is not possible to come to a conclusion based on the research.

HIV status

From previous studies, three studies found an association between patients being HIV positive and delay (Virenfeldt et al., 2014; Ilangovan et al., 2015; Bogale et al., 2017), four studies found that HIV negative patients had longer duration than patients with HIV positive or whose status was unknown (Ngamvithayapong et al., 2001; Diez et al., 2004; Beraldo et al., 2012; Ukwaja et al., 2013), and only one study showed that patients who had never tested for HIV were associated with delay (Yirgu et al., 2017). Nevertheless, many studies showed that there was no association between HIV status and the delay (Whitehorn et al., 2010; Coimbra et al., 2012; Nasehi et al., 2012; Deponti et al., 2013; Saifodine et al., 2013; Wysocki et al., 2013; Belkina et al., 2014; Buregyeya et al., 2014; Yimer et al., 2014; Alavi et al., 2015; Almeida et al., 2015; Osei et al., 2015; Takarinda et al., 2015; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Rodriguez et al., 2016; Adenager et al., 2017; Bogale et al., 2017; Said et al., 2017). It seems that HIV status is not a risk factor, nevertheless it is still an interesting factor in this research.

Body Mass Index: BMI

All previous studies showed that there was no association between BMI and patient delay (Coimbra et al., 2012; Meyssonnier et al., 2012; Virenfeldt et al., 2014; Wang et al., 2016; Xia et al., 2016) while Mesfin et al. (2009) found that malnutrition was associated with patient delay. It could be seen that BMI is not related to delay, however, it is still a factor to be investigated in this research.

BCG immunisation

There were only two previous studies investigating about BCG immunisation and patient delay. Both studies found that there was no association between BCG immunisation and patient delay (Saqib et al., 2011; Xia et al., 2016). BCG immunisation may be not a risk factor for the delay, thus it is excluded from this research.

3.3.4.6 Clinical signs and symptoms of TB characteristic

Clinical signs and symptoms of TB

From previous studies about symptoms of TB and patient delay, there was an association between respiratory symptoms and patient delay in some studies (Diez et al., 2004; Rojpibulstit et al., 2006; Sagbakken et al., 2010). The most common symptom, cough, was associated with patient delay (Maciel et al., 2010; Jurcev-Savicevic & Kardum, 2011; Machado et al., 2011; Meyssonnier et al., 2012; Laohasiriwong et al., 2016a; Xia et al., 2016). Moreover, other TB-related symptoms such as haemoptysis (Sabawoon et al., 2011; Li et al., 2012; Meyssonnier et al., 2012; Wang et al., 2016; Xia et al., 2016; Said et al., 2017), chest pain (Maciel et al., 2010; Sabawoon et al., 2011; Coimbra et al., 2012; Said et al., 2017), weight loss (Maciel et al., 2010; Schneider et al., 2010; Jurcev-Savicevic & Kardum, 2011; Coimbra et al., 2012; Leutscher et al., 2012; Belkina et al., 2014; Almeida et al., 2015; Pezzotti et al., 2015), low-grade fever (Leutscher et al., 2012; Tattevin et al., 2012; Pezzotti et al., 2015), sputum production (Maciel et al., 2010), night sweats (Okutan et al., 2005; Mfinanga et al., 2008; Schneider et al., 2010; Coimbra et al., 2012; Wang et al., 2016), fatigue (Schneider et al., 2010; Coimbra et al., 2012; Xia et al., 2016), dyspnea (Gosoniu et al., 2008; Xia et al., 2016), expectoration (Meyssonnier et al., 2012; Xia et al., 2016), and lack of appetite (Fatiregun & Ejeckam, 2010; Xia et al., 2016) were significant associated factors with longer patient delay. In addition, constitutional symptoms (Diez et al., 2004), other symptoms (Diez et al., 2004; Meyssonnier et al., 2012), non-specific symptoms (Lacroix et al., 2008), non TB-related symptoms (Diez et al., 2004; Gosoniu et al., 2008), severity of symptoms (Rojpibulstit et al., 2006; Hussen et al., 2012; Zhou et al., 2012; Tobe et al., 2013), first episode of symptoms (Xu et al., 2013) or duration of symptoms (Shu et al., 2014) were associated with the delay. However, there was no association between symptoms and patient delay in some other studies (Lin et al., 2010; Lock et al., 2011; Jagadish et al., 2012; Wysocki et al., 2013; Makwakwa et al., 2014; Trigueiro et al., 2014; Almeida et al., 2015; Pezzotti et al., 2015; Rattananupong et al., 2015; Amar et al., 2016; Mistry et al., 2016; Adenager et al., 2017). It may be argued that TB symptoms are related with patient delay, but it is not possible to come to a conclusion based on the research.

3.3.4.7 Health seeking behavioural characteristic

Self-treatment

From previous studies, nine studies found an association between self-treatment or self-medication with patient delay (Yimer et al., 2005; Tobgay et al., 2006; Belay et al., 2012; Jagadish et al., 2012; Rabin et al., 2012; Thakur & Murhekar, 2013; Belkina et al., 2014; Takarinda et al., 2015; Said et al., 2017), one study found that patients who thought they would get better on

their own had longer duration of patient delay (Tamhane et al., 2012). In terms of qualitative study, Ayisi et al. (2011) found that most patients who initially self-treated were associated with delay. However, there was no association between this factor and the delay in two studies (Aye et al., 2010; Adenager et al., 2017) as well as medication was not associated with the delay (Basa & Venkatesh, 2016). It could be seen that self-treatment is associated with longer patient delay, however it is not possible to come to a conclusion based on the research.

The first health care facility

Many previous studies showed an association between the first health care facility and longer patient delay (dos Santos et al., 2005; Ayuo et al., 2008; Bassili et al., 2008; Sabawoon et al., 2011; Asefa & Teshome, 2014; Ilangovan et al., 2015; Takarinda et al., 2015; Laohasiriwong et al., 2016a; Adejumo et al., 2017; Bogale et al., 2017). Some studies found that longer patient delay was associated with a variety of approaches in seeking care (Alvarez Gordillo et al., 2001), a government health care facility (Hinderaker et al., 2011; Lusignani et al., 2013; Gebreegziabher et al., 2016b), a non-government health care facility (Rundi et al., 2011), a private health care facility (Belkina et al., 2014; Adejumo et al., 2017; Asres et al., 2017), a clinic (Mesfin et al., 2009), an accident and emergency department (Paynter et al., 2004), a traditional healer (Verhagen et al., 2010; Hinderaker et al., 2011; Hussen et al., 2012; Saifodine et al., 2013; Asres et al., 2017) such as traditional medicines (Cambanis et al., 2007) or holy water (Asres et al., 2017), a non-special facility (Lin et al., 2010; Ngangro et al., 2012b; Tattevin et al., 2012; Ukwaja et al., 2013; Bogale et al., 2017), elsewhere (Deponti et al., 2013), or others (Bassili et al., 2008). Moreover, the first health provider visited was associated with longer patient delay (Ngamvithayapong et al., 2001; Skordis-Worrall et al., 2010; Takarinda et al., 2015), such as a formal health provider (Belay et al., 2012), a non-formal health provider (Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b), or did not go to any facility (Beraldo et al., 2012). In addition, the decision of the first visiting and seeking treatment because of symptoms were associated with patient delay (Mesfin et al., 2009). On the other hand, there was no association between the delay and types of the first health care facility in other studies (Schneider et al., 2010; Ahmad et al., 2011; Machado et al., 2011; Coimbra et al., 2012; Tamhane et al., 2012; Wysocki et al., 2013; Buregyeya et al., 2014; Makwakwa et al., 2014; Osei et al., 2015; Rodriguez et al., 2016; Adenager et al., 2017), a government health care facility (Yamasaki-Nakagawa et al., 2001), a private sector (Mesfin et al., 2009; Hinderaker et al., 2011), a traditional healer (Mesfin et al., 2009; Takarinda et al., 2015), other facilities (Yamasaki-Nakagawa et al., 2001), also intention score for treatment (Lock et al., 2011). Conceivably, types of the first health care facility are associated with patient delay but it varies in each study, thus this variable is still an interesting factor in this research.

Reason for consultation

From previous studies, there was no association between patient delay and the reason for consultation (Mesfin et al., 2005; Wondimu et al., 2007; Adenager et al., 2017; Bogale et al., 2017). However, the reason for visiting that particular health provider was associated with patient delay (Schneider et al., 2010; Lock et al., 2011; Xia et al., 2016). As well as discussing with the health care provider was associated with patient delay (Lock et al., 2011). It looks like that a reason for consultation is associated with delay, thus it is not possible to come to a conclusion based on the research.

The Number of visits to health care facility

Two studies found an association between multiple visits to a health care facility and longer patient delay (Sabawoon et al., 2011; Biya et al., 2014). In addition, there was an association between health care encounter more than one time and patient delay in some previous studies (Needham et al., 2001; Kiwuwa et al., 2005; Bassili et al., 2008; Maamari, 2008), the number of health care providers was associated with the delay (Lambert et al., 2005; Tamhane et al., 2012) as well as the delay was associated with the number of alternative treatments (Mesfin et al., 2009), and accessibility to health care facility (Ngangro et al., 2012b). However, there was no association between the delay and the number of visits in many studies (dos Santos et al., 2005; Saifodine et al., 2013; Thakur & Murhekar, 2013; Shu et al., 2014; Trigueiro et al., 2014; Almeida et al., 2015; Osei et al., 2015; Adenager et al., 2017; Bogale et al., 2017; Said et al., 2017). It may be argued that the number of visits to health care facility is related to patient delay, thus it is not possible to come to a conclusion based on the research.

3.3.4.8 Accessibility and availability of TB services characteristic

Residence area

Many studies found that patients who lived in rural areas had longer delay (Fatiregun & Ejeckam, 2010; Saqib et al., 2011; Hussen et al., 2012; Nasehi et al., 2012; Ngangro et al., 2012b; Gebeyehu et al., 2014; Yimer et al., 2014; Alavi et al., 2015; Osei et al., 2015; Purty et al., 2016; Bogale et al., 2017) while some studies found that living in an urban area was associated with patient delay (Wondimu et al., 2007; Hoa et al., 2011; Mohamed et al., 2013; Ukwaja et al., 2013; Rattananupong et al., 2015), living in a suburban area was associated with the delay (Bassili et al., 2008), and living in an elderly care home residence was also associated with the delay (Leung et al., 2007). Moreover, other studies found the association between region and patient delay (Huong et al., 2007), district area and the delay (Aye et al., 2010; Zhou et al., 2012), insecurity area and the delay (Sabawoon et al., 2011), or health district of treatment area and the delay

(dos Santos et al., 2005). However, most of studies showed that there was no association between residence area and patient delay (Aye et al., 2010; Ahmad et al., 2011; Hoa et al., 2011; Lock et al., 2011; Sabawoon et al., 2011; Coimbra et al., 2012; Li et al., 2012; Ngangro et al., 2012b; Lusignani et al., 2013; Thakur & Murhekar, 2013; Tobe et al., 2013; Asefa & Teshome, 2014; Belkina et al., 2014; Buregyeya et al., 2014; Shu et al., 2014; Virenfeldt et al., 2014; Alavi et al., 2015; Takarinda et al., 2015; Gebreegziabher et al., 2016a; Gebreegziabher et al., 2016b; Rodriguez et al., 2016; Xia et al., 2016). It tends to be that residence area is not associated with patient delay; however, it is not possible to come to a conclusion based on the research.

Duration of living in a current residence

Most studies found that there was no association between duration of living in a current residence and patient delay (Rodger et al., 2003; Lacroix et al., 2008; Li et al., 2012; Meyssonnier et al., 2012; Sultan et al., 2012; Tamhane et al., 2012), also birthplace was not associated with the delay (Rodger et al., 2003; Farah et al., 2006; Jurcev-Savicevic & Kardum, 2011; Pezzotti et al., 2015). However, a study in UK found that being UK-born was significantly associated with the delay (Saldana et al., 2013). It could be seen that duration of living in a current residence is not associated with delay, however it is still an inconsistent factor.

Living in an endemic area

Some studies found that staying in an endemic area was not a risk factor for the delay (Bassili et al., 2008; Lacroix et al., 2008). However, a study in the Syrian Arab Republic found that staying in crowded conditions with TB index cases was associated with delay (Maamari, 2008) whilst patients borne in a high prevalence country had shorter delays (Paynter et al., 2004). It seems that living in an endemic area is not a risk factor for delay, nevertheless it is still an interesting factor.

Distance from a current residence to the nearest health care facility

Seven studies found an association between the distance and patient delay (Hussen et al., 2012; Ngangro et al., 2012b; Salinas et al., 2012; Ukwaja et al., 2013; Basa & Venkatesh, 2016; Adenager et al., 2017; Yirgu et al., 2017). On the other hand, there was no association between them in many other studies (Belay et al., 2012; Jagadish et al., 2012; Li et al., 2012; Wysocki et al., 2013; Zhao et al., 2013; Buregyeya et al., 2014; Gebeyehu et al., 2014; Konda et al., 2014; Makwakwa et al., 2014; Osei et al., 2015; Takarinda et al., 2015; Gebreegziabher et al., 2016b; Laohasiriwong et al., 2016b; Wang et al., 2016). Distance may be a risk factor for patient delay related to residence area, it thus is not possible to come to a conclusion based on the research.

Mode of transportation

There was an association in some studies between the delay and patients who accessed to a health care facility by foot (Yirgu et al., 2017), needed transportation to health care facility (Zerbini et al., 2008), and paid for transportation fees (Cambanis et al., 2005; Basa & Venkatesh, 2016). However, there was no association between the delay and mode of transportation in other studies (Tamhane et al., 2012; Lusignani et al., 2013), cost of transportation (Ayuo et al., 2008; Sendagire et al., 2010; Lusignani et al., 2013; Osei et al., 2015), or difficulty in accessing to health care facility (Saifodine et al., 2013; Takarinda et al., 2015). Mode of transportation is probably associated with the delay, it thus is still an interesting factor.

Travelling duration to health care facility

Seven studies found that there was an independent association between travelling duration to health care facility and patient delay (Cambanis et al., 2005; Bassili et al., 2008; Mesfin et al., 2009; Lock et al., 2011; Van Wyk et al., 2011; Tobe et al., 2013; Takarinda et al., 2015). However, there was no association between the duration and the delay in many areas (Machado et al., 2011; Sabawoon et al., 2011; Tamhane et al., 2012; Lusignani et al., 2013; Asefa & Teshome, 2014; Belkina et al., 2014; Biya et al., 2014; Osei et al., 2015; Gebreegziabher et al., 2016a; Bogale et al., 2017). In addition, Cambanis et al. (2007) found that overnight travelling was not associated with patient delay. Travelling duration to health care facility is probably a risk factor for delay, but it is not possible to come to a conclusion based on the research.

3.3.4.9 Satisfaction with health care services

Satisfaction with care

One study showed that inadequate satisfaction with care was associated with patient delay in Pakistan while there was no association in Egypt, Somalia, Syrian Arab Republic, and Yemen (Bassili et al., 2008). Moreover, satisfaction with care (Maamari, 2008), health care facility available (Machado et al., 2011), and TB education in the facility (Lusignani et al., 2013; Xia et al., 2016) were not associated with patient delay. It could be seen that satisfaction with care is not a risk factor for patient delay, however it is still an interesting factor in this research.

Health insurance

From previous studies, health insurance was associated with longer patient delay as shown in many studies (Ngangro et al., 2012b; Tattevin et al., 2012; Zhou et al., 2012; Tobe et al., 2013; Osei et al., 2015; Rodriguez et al., 2016) while some studies did not find the association between health insurance and the delay (Ngamvithayapong et al., 2001; Machado et al., 2011; Li et al.,

2012; Zhao et al., 2013; Xia et al., 2016). It seems that having health insurance is associated with longer patient delay, thus it is still an interesting factor.

Expenses for treatment

Two previous studies showed that there was an association between expenses for diagnosis or treatment and patient delay (Tobgay et al., 2006; Hoa et al., 2011). However, expense was not a risk factor for patient delay in other studies (Bassili et al., 2008; Lusignani et al., 2013; Thakur & Murhekar, 2013). Expense for treatment is probably a risk factor for patient delay but it is not possible to come to a conclusion based on the research.

3.4 Gaps in published papers and ways to reduce them

The systematic review of the literature in this chapter has pointed out the evidence from various global contexts related to patient delay among TB patients. The review also includes the literature on the main important issues including the duration of patient delay, and, especially, influencing factors of patient delay which involves with various factors. It has also shown several important issues related to the consequences of TB patients with the delay.

The literature has significantly highlighted several gaps in the knowledge based on various issues that need further study. For example the following questions remain: How long is an acceptable duration between TB-related symptoms onset and the first visit at health provider or getting a standard TB treatment?; What are consequences of getting TB treatment late? and, what are influencing factors of delay in getting TB treatment?

The findings from the literature review, combined with my practice and research experience, indicated to me that the duration of patient delay, a period between the first onset of TB-related symptoms and the first visit at any health provider, needs to be investigated further as there is no single definition of delay especially the duration between symptom onset until the initial treatment which there is no standard for cut-off for patients with or without delay. Moreover, patient-related factors influencing late presentation of TB patients is the most important and interesting issue because it is involved with many factors and a range of factors remains inconsistent in terms of their influence on patient delay in TB treatment. Furthermore, there is no study in this setting which has enquired into this topic. Due to the limited study in this area, the findings which explain the factors influencing patient delay among PTB patients could be benefit, important, and provided new knowledge on this area of TB care.

Therefore, the literature review contributes me to investigate in two main issues namely the duration of patient delay, and the influencing factors of the delay which the reviewed factors

are included as variables in this research. These variables divided into 9 characteristics are, specifically:

1) Sociodemographic – economic characteristic includes seven variables: gender, age group, marital status, education level, occupation, economic status, and history of being prisoner.

2) Health behavioural characteristic includes three variables: alcohol consumption, smoking, and using illicit drug.

3) Knowledge, recognition, and stigmatisation about TB characteristic includes three variables: knowledge about TB, recognition about TB, and stigmatisation about TB.

4) Family and social characteristic includes three variables: number of family member, contact TB case, and social support.

5) Health status characteristic includes three variables: chronic disease, HIV status, and BMI.

6) Clinical signs and symptoms of TB characteristic includes only the clinical of TB symptoms.

7) Health seeking behavioural characteristic includes four variables: self-treatment, the first health care facility, the first health care consulted, and the number of visits to health care facility.

8) Accessibility and availability of TB services characteristic includes six variables: residence area, duration of living in a current residence, living in an endemic area, distance from a current residence to the nearest health care facility, mode of transportation, and travelling duration to health care facility.

9) Satisfaction with health care services characteristic includes three variables: satisfaction with health care services, health insurance, and expenses for treatment.

3.5 Framework of the study

Previous studies included a conceptual framework for illustrating barriers and delays that limited accessibility to TB diagnostic and treatment services. These frameworks were described below.

Krishnan et al. (2014) illustrated a conceptual framework for the TB care continuum from symptom onset to treatment initiation that was used to define the barriers and delays that limited accessibility to TB diagnostic and treatment services at the individual and provider / system levels as shown in Figure 3.4.

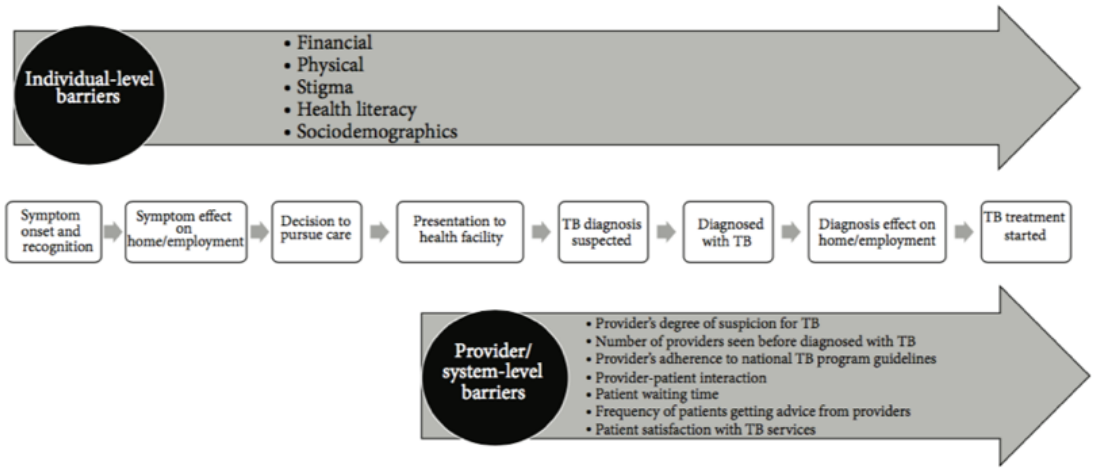


Figure 3.3 Conceptual framework illustrating barriers and delays that limit access to TB diagnostic and treatment services provided by Krishnan et al. (2014).

Regarding to another study, Yang et al. (2014) illustrated their conceptual framework which was similar to the first author. It also consisted of individual, and provider/system-level as shown in Figure 3.4.

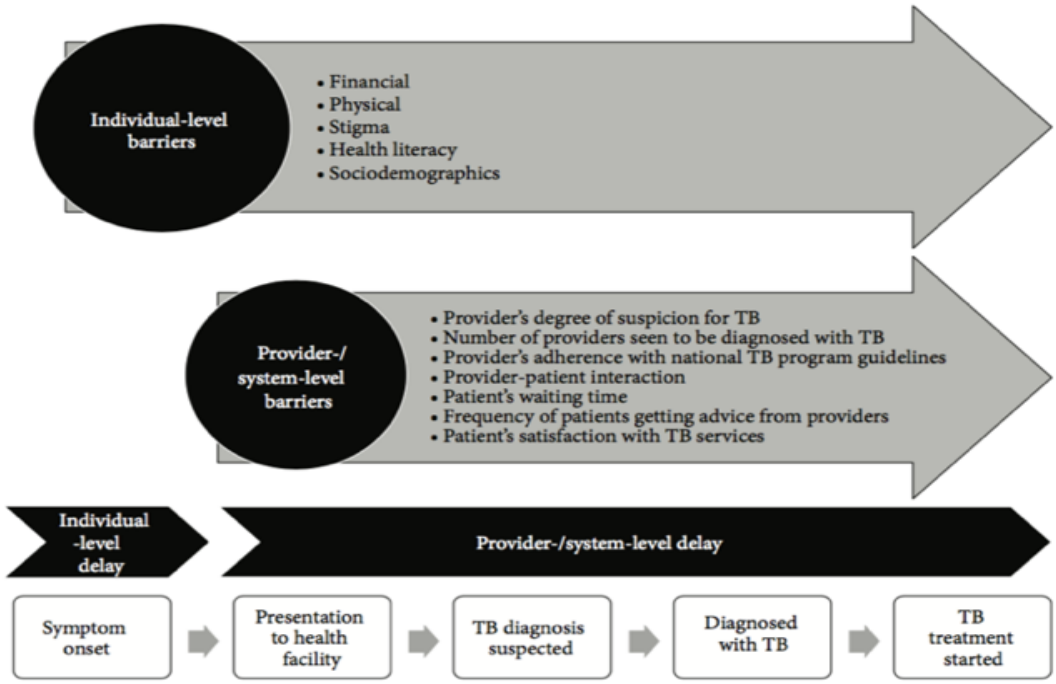


Figure 3.4 Conceptual framework illustrating barriers and delays that limit access to TB diagnostic and treatment services provided by Yang et al. (2014).

However, social science theory was used in this research as it can become an overarching framework for as mixed methods research employing both quantitative and qualitative methods. The conceptual framework of this study thus applied all of variables and the mentioned conceptual framework as shown in Figure 3.5.

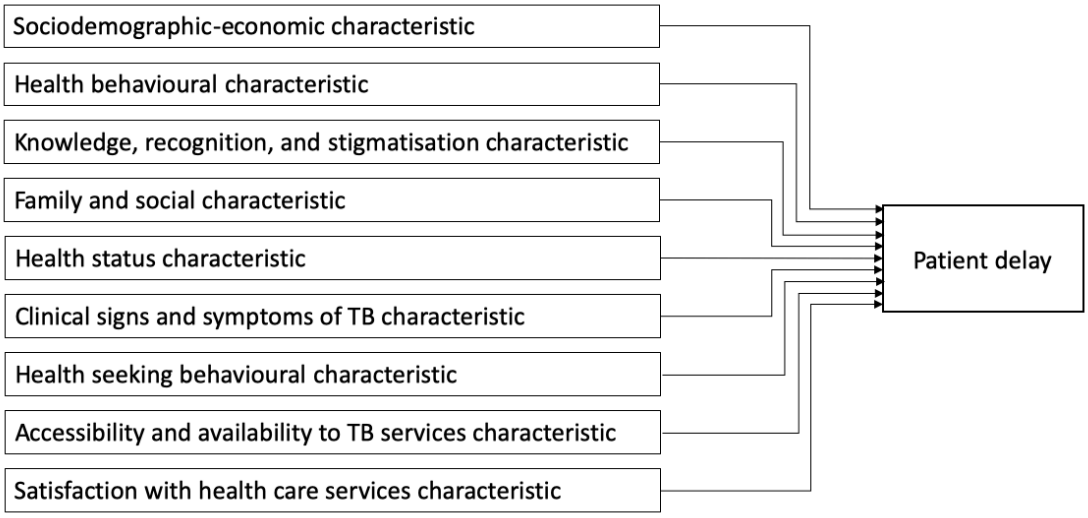


Figure 3.5 The conceptual framework of this study

3.6 Strengths and limitations of the literature

3.6.1 Strengths of the literature

1. Most quantitative studies addressed the sample size calculation to estimate an appropriate sample size into their studies. Thus, the results based on an appropriate sample size could be used to generalise to the whole population or other settings.

2. A pilot study was undertaken in some studies in which the questionnaire had been previously tested before using to collect data with the samples. This could allow the researchers to improve the instrument.

3. Both PTB and EPTB cases were analysed and compared together in some studies while most studies investigated delays among PTB cases only. Both sites of the disease were different according to symptoms and diagnosis methods. Therefore, it could explore some important factors for patient delay related to different symptoms and diagnosis methods.

4. The medical record was included as one of instruments for data collection in some studies which it contained some important information related to signs and symptoms of participants. It also showed the details of each visit when participants came to meet the provider at the healthcare facility. The medical record thus may inform some details about the duration between their symptoms onset and getting TB treatment.

5. Advance statistical analysis, e.g. multiple regression, was used to analyse the data due to the adjustment for interactions and potentially confounding factors. Thus, the results obtained from the statistics may be more precise than univariate analysis only. Also, it may help to understand the relationship among variables presented in the dataset.

3.6.2 Limitations of the literature

1. Some studies were not conducted by in the native language of the participants, thus the participants may have found it difficult to communicate or express themselves fully to a stranger from a difference culture. While some studies were conducted using a native language thus the research may have found it difficult in translation process.

2. The definition of patient delay varied in each study. Some researchers have defined and used their own definition which may be different to other studies. Thus, the researcher may need to identify the definition of patient delay based on literature review.

3. The medical records from private sectors were not available to investigate in some studies thus it could have introduced an underestimation of the duration of patient delay. The researcher thus provides an appropriate approach to collect correct data from participants.

4. Some qualitative studies involved in-depth interviews thus the sample size of their studies was small which could have introduced bias into the findings. Moreover, a purposive or a convenience sampling method were addressed in some studies thus it also could have introduced selection bias into the results.

5. Most studies were undertaken with previous experiences of their participants that relied on participants' memory thus recall bias could be introduced into the findings. Moreover, participants might be more likely to report common TB symptoms such as cough, sputum production, blood-tinged sputum, or haemoptysis, rather than TB-related symptoms such as weight loss, night sweats, or low-grade fever, thus the researcher may misread about the first symptom onset.

6. There were a number of factors associated with patient delay, whereas some studies investigated only few of them; for example, some studies explored factors involved with demographic factors only while there might be other significant factors associated with patient delay which the researchers did not address into their research. Therefore, the findings may not cover all influencing factors for the delay.

3.7 Chapter summary

In this chapter, a review of the existing literature on the issues related to definition of delay and the cut-off value of delay have been discussed, as well as duration of patient delay in each region and factors associated with patient delay have also been shown. Moreover, the study framework was presented followed by the strengths and limitations of the literature review. This was accomplished through both a narrative and a systematic literature review. The

narrative review section of this chapter played an important role in focusing the scope of the systematic review. On the other hand, the systematic literature review focused on identifying the factors that associated with patient delay among PTB patients. According to the literature review, the patient delay was associated with many factors which varied across studies, nine characteristic factors based on literature review are investigated in this study which may be specific to this area: Nakhon Ratchasima province. The following chapter presents the methodological and practical procedures as well as ethical considerations. The research aims, questions, and objectives are also presented in the chapter which follows.

Chapter 4 Design and methods

4.1 Introduction

The aim of this chapter is to explain the methodology and study design, followed by population and setting, samples and sampling method, variables measurement, questionnaires construction, data collection and analysis. Finally, the ethical issues are considered.

4.2 Aims, research questions, and objectives of the study

The aims of this study were to estimate the duration of patient delay and discover the factors influencing patient delay among PTB patients in a high burden area in Thailand. There were four research questions and its relevant objectives of this study as shown in below:

4.2.1 Research questions

- What is the prevalence of patient delay among PTB patients in a high burden area, Thailand?
- How long is the duration of patient delay among PTB patients in a high burden area, Thailand?
- What are the factors influencing patient delay among PTB patients in a high burden area, Thailand?
- How do patients experience with patient delay?

4.2.2 Objectives:

General objective: To explore the duration and influencing factors on patient delay among PTB patients in a high burden area, Thailand.

Specific objectives:

- To estimate the prevalence of patient delay among PTB patients in a high burden area, Thailand.
- To estimate the duration of patient delay among PTB patients in a high burden area, Thailand.
- To identify the influencing factors with patient delay among PTB patients in a high burden area, Thailand.
- To explain the patients' experiences with patient delay among PTB patients in a high burden area, Thailand.

4.3 Philosophical worldview, methodology and research methods

4.3.1 Philosophical worldview: pragmatism

Pragmatism, one of four worldviews, is drawn from the pragmatists: Peirce; James; Mead; and Dewey (Cherryholmes, 1992) as well as authors such as Murphy (1990), Patton (1990), and Rorty (1990). It is resulted from actions, situations, and consequences rather than antecedent conditions. As a philosophical supporting for mixed methods studies, Patton (1990), Morgan (2007), and Tashakkori and Teddlie (2010) support its importance for concentrating consideration on the research problem in social science research and then using mixed approaches to obtain knowledge about the problem.

4.3.2 Methodology: Explanatory sequential mixed methods

A mixed methods approach is an approach to collect, analyse, and mix or combine both qualitative and quantitative data within a single research in order to gain more understanding on the research topic (Creswell, 2005; Tashakkori & Teddlie, 2010). The field of mixed methods research offers an opportunity to address more elaborate research questions, enhance the strengths and control the weaknesses of the two research approaches (Green et al., 1989; Miles & Huberman, 1994). In this way, the discussion of results could be more complete than conducting either quantitative or qualitative approach only.

The main reason for choosing a mixed methods approach in the current research was to illustrate and enhance the complementarity of the overall results. Using a mixed methods approach has advantages compared with the use of each method alone as it combines the strengths of two methods and reduces their weaknesses (Green & Caracelli, 1997; Tashakkori & Teddlie, 1998). Moreover, Strand et al. (2011) found that there was a limitation in the number of surveyed cases that decreased statistical power but increased external validity as the findings revealed the real-life experience of TB patients. However, this limitation could be controlled by using a calculated sample size.

Tashakkori and Teddlie (2003) have reported that there are approximately 40 mixed methods research designs. The explanatory sequential mixed methods, one of those designs in mixed methods, was chosen for this research. In addition, it was preferred by many researchers as it was found to be addressed in both many previous social and behavioural sciences research (Kinick & Kempner, 1988; Ceci, 1991; Klassen & Burnaby, 1993; Janz et al., 1996). It implies collecting and analysing quantitative data first and then qualitative data in two sequential stages within one study (Creswell, 2003).

4.3.3 The rational for choosing the explanatory sequential mixed methods

The rationale for addressing the explanatory sequential mixed methods in this study is that it brings together two types of information providing greater understanding and insight into the research topic that may not have been obtained analysing and evaluating data separately (Bowen et al., 2017). The rationale for undertaking quantitative phase first can be explained in each individual has a different background, experience, and understanding about the studied phenomena and to be able to measure and compare variables in individuals towards the phenomenon. A structured questionnaire used in the first phase was then constructed based on the literature review. Thus, the quantitative approach was used to establish and verify the extent of the problem of patient delay and to offer a broad understanding of the research questions. Also, it established the factors associated with the delay in order to know what should be prioritised and explored in the qualitative phase. Moreover, once the questionnaire is released it is not possible to add or change the questions and the researcher is not able to ask questions to help clarify some hidden facts (Bowen et al., 2017), an issue that is addressed by the qualitative phase.

Thus, a qualitative approach was chosen and addressed in the second phase of this research to help gain more in-depth understanding of the phenomena being studied, discover the hidden facts, and complete the picture. Interviews provided more depth, helping to explain participants' feeling, beliefs, or experiences which allows interviewer and interviewee to discuss further questions that may not be asked as part of the questionnaire (Bowen et al., 2017). Thus, the qualitative data and its findings helped to clarify and explain the statistical findings in more depth.

Therefore, an explanatory sequential mixed methods approach, was appropriate in this study based on its potential as the findings from interviews helped explain findings from the questionnaire; findings that may not be identified if one approach was used alone. Undertaking the study sequentially was considered a sensible and practical way of understanding this research. According to the chosen design, the quantitative phase was first conducted by data collection and analysis and then followed by qualitative data collection and analysis. Moreover, this design was chosen to address in this research as it is popular in fields with a strong quantitative orientation and enables investigation of the quantitative results in more depth (Morse, 1991).

4.3.4 Research methods

The current research consisted of multiple phases that were divided into two main stages: the development stage; and the main study stage. The development stage related to the

development and assessment of a structured questionnaire for surveys and a semi-structured questionnaire for interviews while the main study stage involved three main phases including quantitative data collection and analysis, qualitative data and analysis, and integration of both strands as shown in Figure 4.1.

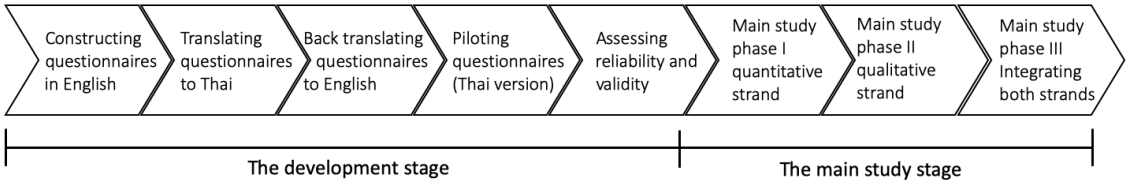


Figure 4.1 The stages of the study

4.3.4.1 The development stage

This stage involved the processes of constructing research instruments for collecting data in both strands. In terms of quantitative data collection, a structured questionnaire was constructed based on the literature review which was used for gathering quantitative data among PTB patients. It involved closed-ended questions to assess participant's variables. Moreover, a semi-structured questionnaire was drafted for gathering further information in the qualitative part. Both questionnaires were first constructed in English, translated to Thai, and then back translated to English to check the words and meanings of each item by four bilingual and six content experts. The questionnaire was piloted among 15 participants in a similar area to that of the intended project and assessed for its reliability and validity.

4.3.4.2 The main study stage

This stage involved the processes of quantitative data collection and analysis, then qualitative data and analysis, and discussion the findings of both strands together.

In the first phase of the main study stage, a self-administered questionnaire and an interviewer-administered questionnaire (face-to-face) were conducted by a structured questionnaire to gather patients' information which associated with patient delay.

The second phase of the main study stage addressed individual in-depth interviews by a semi-structured questionnaire to explore further factors from the quantitative data on patients' experiences, beliefs, and thoughts. The interview topics that guide the interviews was influenced by the literature review and findings from the first phase. In addition, unstructured questions were constructed during the interviews to gain more depth information.

The final phase of the main study stage was to integrate the findings from both approaches, as well as to evaluate the extent to which qualitative phase was used to explain the findings of quantitative phase. In other words, this phase evaluated the ability of the semi- and unstructured interviews to clarify the findings revealed by the structured questionnaire. In addition, it also assessed the clarity of the whole picture obtained following the integration of both arms of the study in the discussion chapter.

4.4 Population and setting

The target population for this research was new PTB patients registered at hospitals located in Nakhon Ratchasima province, Thailand. The research aimed to reveal the influencing factors of patient delay which met by integrating quantitative and qualitative data gathering techniques thus all participants were PTB patients recruited by:

4.4.1 Inclusion criteria for study participants:

1) New PTB patients were 18 years old or over.

2) New PTB patients registered in one of the co-operating hospitals.

4.4.2 Exclusion criteria for study participants:

1) Patients who were not fit for surveys or interviews because of physiological problems caused by the severity of the disease such as patients who were considered too unwell to participate. Thus, these patients were vulnerable group, they were needed to be observed and taken care closely by doctors and nurses. Also, they might not be able to communicate or provide their information.

2) Patient who were not fit for surveys or interviews because of psychological problems such as patients who were treated with antipsychotics. Thus, these patients might have some problems about memory or communication, they might provide inaccurate information.

4.5 Sample and sampling method

4.5.1 Sample

The sample for this research was new PTB patients aged 18 years or over, lived and registered in nine hospitals in Nakhon Ratchasima province between July – December 2018.

4.5.2 Sample size

This research was undertaken among a sample of PTB patients; thus the sample should be representative of the target population. It is important to ensure an adequate sample size to make an inference regarding the influencing factors of patient delay on the PTB population. Also,

the researcher can avoid the risk of resulting a false-negative finding (Type II error) (Biau et al., 2008). Thus, the number of participants should be large enough to certify a sufficient level of precision of the results when comparing groups. The number of participants should not be too large so that the participants' time is not wasted (Patino & Ferreira, 2016). Thus, the process of sample size calculation was necessarily addressed in this study. In terms of quantitative part, a formula for estimating the sample size in cross-sectional analytical study with the finite population (Daniel, 1999) was used:

$$n = \frac{NZ^2P(1-P)}{d^2(N-1) + Z^2P(1-P)}$$

where n = Sample size with finite population correction,

N = Finite population size: the number of TB patients in Nakhon Ratchasima province was 1,137 (Department of Disease Control, 2018),

Z = Z statistic for a level of confidence: 95% was used as the level of confidence which is conventional, Z value was 1.96,

P = Expected proportion (in proportion of one): it was the prevalence of patient delay that researcher estimated by the previous study, P value was 0.31 (Chaychoowong & Suggaravetsiri, 2009), and

d = Precision (in proportion of one): 5% was used as a precision if the prevalence of patient delay was between 10% and 90%, d value was 0.05.

then, $$n = \frac{(1{,}137)\,(1.96)^2\,(0.31)\,(0.69)}{(0.05)^2\,(1{,}136) + (1.96)^2\,(0.31)\,(0.69)}$$

$n = 255.15, \approx 256$

However, the sample size in this study was adjusted to account for the anticipated non-response. A conservative estimate of a response rate of 80% is the recommended rate to anticipate while a response rate of 90% or more is also recommended in countries with a higher response rate (World Health Organisation, 2017). In this study, a response rate of 85% was used to estimate the sample size based on response rate of previous study. Thus, the sample size in quantitative part of this study was 300.

In terms of the qualitative part, participants with patient delay (PTB patients who had the duration between the first symptom onset and the first visit at health care facility more than 30 days) identified in the quantitative part were interviewed to obtain their views about patient delay. In the qualitative phase, sample size is also needed to be considered but not using the same approach. Saturation, the ubiquitous concept for sample size in qualitative study, is defined as the point which the data do not offer any new or relevant data (Dworkin, 2012). In addition, information power is also used to guide sufficient sample size for qualitative study. Information power is usually used to indicate the more information held by the samples, relevant to the actual study, and the lowest amount of participants is needed (Malterud et al., 2016). Thus, sample size in qualitative part of this study based on the concepts of saturation and information power was 25.

4.5.3 Sampling method

For the quantitative part, a probability sampling method was used in this research which was based on the fact that every member of a population has an equal chance to be selected (Bornstein et al., 2013) which consisted of four steps as shown in below:

Firstly, according to TB patients in Nakhon Ratchasima province living in every district, a stratified random sampling was applied to select samples as the effectiveness of stratified random sampling is normally better than the effectiveness of simple random sampling since the classification of population into strata can decrease variability of measurement within a stratum and result in smaller bounds and estimation errors (Lohr, 1999). According to this approach, the TB population was divided into 32 strata called “district” (Bornstein et al., 2013). The districts then were grouped according to the number of TB patients into 3 groups: high (more than 50 cases); medium (20-50 cases); and low (less than 20 cases) as shown in Table 4.1.

Table 4.1 Groups of districts divided by the number of TB patients

Group	District	Number of TB cases
High cases	Mueang	90
	Pak Chong	89
	Sikhio	85
	Bua Yai	82
	Khon Buri	81
	Phimai	60
	Sung Noen	56
	Dan Khun Thot	51

Group	District	Number of TB cases
Medium cases	Non Sung	44
	Pak Thong Chai	44
	Prathai	41
	Khong	40
	Kham Thale So	39
	Chok Chai	35
	Lam Thamenchai	35
	Kham Sakaesaeng	31
	Soeng Sang	30
	Kaeng Sanam Nang	26
	Huai Thalaeng	25
	Wang Nam Khiao	25
	Nong Bunmak	24
	Chum Phuang	20
Low cases	Non Thai	19
	Ban Lueam	14
	Chaloem Phra Kiat	13
	Chakkarat	11
	Non Daeng	7
	Mueang Yang	5
	Phra Thong Kham	5
	Bua Lai	4
	Sida	3
	Thepharak	3

Secondly, a simple random sampling was then addressed to pick three districts to be representatives of each group following the steps below (Kim et al., 2013):

1. The districts in each group were randomly labelled the number instead of its name.

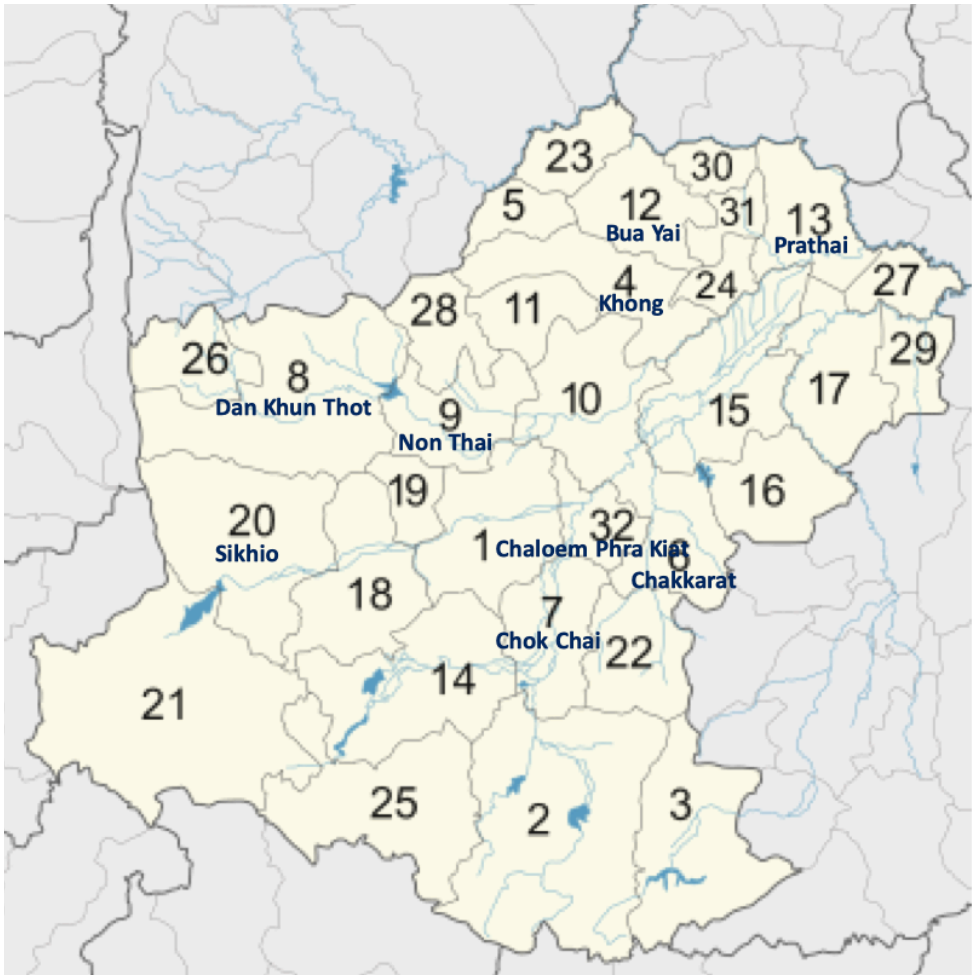
2. Each number was picked by applying a simple random sampling to be a representative of each group until reaching 3 districts in each group. In this step, the picked number was returned to mix with the rest numbers in order to have an equal chance to be selected.

According to the above steps, the random selected districts were shown in Table 4.2 and Figure 4.2.

Table 4.2 Selected districts in each group divided by the number of TB cases

Groups	District	Number of TB cases
High cases	Sikhio	85
	Bua Yai	82
	Dan Khun Thot	50
Mediam cases	Prathai	41
	Khong	40
	Chok Chai	35
Low cases	Non Thai	19
	Chaloem Phra Kiat	13
	Chakkarat	11

Figure 4.2 The map of selected districts in Nakhon Ratchasima Province



Thirdly, the sample size of each selected district was calculated based on its proportion with the formula of the sample size for proportion allocation (Hunt & Tyrrell, 2001):

$$n^h = \frac{nN^h}{N}$$

where n^h = Sample size in each district

n = Sample size with the finite population correction

N^h = Finite population size in each district

N = Finite population size in all selected districts

Then, the sample size of each district was shown in Table 4.3.

Table 4.3 Sample size of each district

District	Number of TB cases	Sample size
Sikhio	85	68
Bua Yai	82	65
Dan Khun Thot	50	39
Prathai	41	33
Khong	40	32
Chok Chai	35	28
Non Thai	19	15
Chaloem Phra Kiat	13	11
Chakkarat	11	9

Lastly, simple random sampling was applied to select samples with the following steps (Kim et al., 2013):

1. TB patients in each district were randomly labelled the number called “identification number” instead of their name.

2. Each identification number was picked by applying a simple random sampling to be a representative of each district until reaching the calculated sample size in each district. In this step, the picked identification number was also returned to mix with the rest numbers in order to have an equal chance to be selected.

In case the selected sample did not meet the criteria and were not willing to participate in the project, the new sample would be selected by applying a simple random sampling again until reaching the calculated sample size.

In terms of qualitative part, a non-probability sampling method was performed which selected only participants with patient delay. Maximum variation sampling, a type of purposive sampling, was chosen to recruit the participants for in-depth interviews to capture a wide range of perspectives related to the delay (Patton, 1990; Given, 2008; Benoot et al., 2016). Due to the saturation and information power, the samples in this part were only 25 participants living in one selected district of each group. The one selected district of each group was selected by applying a simple random sampling to be a representative of each group.

4.6 Variables measurement

The variables in this research were measured into 4 scales: nominal, ordinal, interval, and ratio:

- The nominal scale included gender, marital status, occupation, main source of family income, family financial status, history of being prisoner, smoking behaviour, alcohol consumption, using illicit drugs, knowledge about TB in each item, suspected as having TB, having previous knowledge about TB, contact with TB case, main caregiver, chronic disease, HIV status, clinical history of TB symptoms, self-treatment, the first health care facility, the first health care consulted, residence area, living in an endemic area, mode of transportation, comfortable journey, health insurance, and expenses for treatment.
- The ordinal scale included education level, recognition about TB (opinion towards TB), level of stigmatisation of each item, and satisfaction with health care services.
- The interval scale included knowledge about TB score, stigmatisation score, and social support score.
- The ratio scale included duration of patient delay, age, total income, duration of being prisoner, duration of smoking, duration of alcohol consumption, duration of using illicit drugs, the number of family members, BMI, the number of visits to health care facility, duration of living in the current residence, the number of TB cases in the area, distance from residence to the nearest health care facility, cost for transportation, and travelling duration to health care facility.

Moreover, the details of each variable were described and shown in Table 4.4.

Table 4.4 Variables, definition, measurement, and tools

Variable	Definition	Measurement	Tools
Dependent variable			
Patient delay	The time interval from the first onset of any TB-related symptoms until the first visit, consultation, or presentation to health provider at the health or medical facility	- Ratio scale - For data analysis, it was categorised into 2 groups: 1 = PTB patient with delay (> 30 days)	- Questionnaire - TB01 - Medical record

Variable	Definition	Measurement	Tools
		2 = PTB patients without delay (≤ 30 days) (a median delay is 30 days)	
Independent variable			
Sociodemographic – economic characteristic			
Gender	Status of being male or female	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = male 2 = female	- Questionnaire - TB01 - Medical record
Age	Current age (years)	- Ratio scale - For data analysis, central tendency and spread were used and it was categorised into 6 groups: 1 = ≤ 24 years 2 = 25-34 years 3 = 35-44 years 4 = 45-54 years 5 = 55-64 years 6 = >65 years	- Questionnaire - TB01 - Medical record
Marital status	Status of being married or not married	- Nominal scale - For data analysis, it was categorised into 4 groups: 1 = single 2 = married 3 = widow 4 = divorced	- Questionnaire - Medical record
Education level	The highest education level	- Ordinal scale - For data analysis, it was categorised into 6 groups: 1 = illiterate 2 = primary education 3 = lower secondary education 4 = upper secondary education 5 = under graduation 6 = post-graduation	- Questionnaire
Occupation	Occupation earning income	- Nominal scale - For data analysis, it was categorised into 7 groups: 1 = unemployed 2 = farmer 3 = labour 4 = government officer 5 = trader 6 = student	- Questionnaire - TB01 - TB03

Variable	Definition	Measurement	Tools
		7 = Buddhist priest	
Economic status	Total income (Baht per month)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
	Main source of family income	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = yes 2 = No	- Questionnaire
	Family financial status	- Nominal scale - For data analysis, it was categorised into 3 groups: 1 = have savings 2 = income=expenses 3 = in debt	- Questionnaire
History of being prisoner	History of being prisoner in the previous time	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire - TB03
	Duration of being prisoner (year)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Health behavioural characteristic			
Smoking behaviour	History of smoking	- Nominal scale - For data analysis, it was categorised into 3 groups: 1 = Yes, a smoker 2 = Yes, an ex-smoker 3 = No	- Questionnaire - Medical record
	Duration of smoking (year)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Alcohol consumption	History of alcohol consumption	- Nominal scale - For data analysis, it was categorised into 4 groups: 1 = Daily 2 = Weekly 3 = Occasionally 4 = Never	- Questionnaire - Medical record
	Duration of alcohol consumption (year)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Using illicit drugs	History of using illicit drugs	- Nominal scale - For data analysis, it was categorised into 3 groups: 1 = Yes, a user 2 = Yes, an ex-user	- Questionnaire - Medical record

Variable	Definition	Measurement	Tools
		3 = No	
	Duration of using illicit drugs (year)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Knowledge, recognition, and stigmatisation about TB characteristic			
Knowledge about TB	Score of knowledge about TB	- Interval scale - For data analysis, central tendency and spread were used	- Questionnaire
	Correct knowledge about TB	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 =True 2 = False	- Questionnaire
Recognition of TB	Suspected as having TB	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire
	Having previous knowledge about TB	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire
	Opinion on whether TB is serious	- Ordinal scale - For data analysis, it was categorised into 3 groups: 1 = very serious 2 = somewhat serious 3 = not very serious	- Questionnaire
Stigmatisation about TB	Score of stigmatisation about TB in terms of being TB patient	- Interval scale - For data analysis, central tendency and spread were used	- Questionnaire
	Level of stigmatisation of each item	- Ordinal scale - For data analysis, it was categorised into 4 groups: 1 = totally agree 2 = agree 3 = disagree 4 = totally disagree	- Questionnaire
Family and social support characteristic			
The number of family members	The number of family members who live in the same household with participant	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
	The number of family members who stay in the same bedroom with participant	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire

Variable	Definition	Measurement	Tools
Contact TB case	History of contacting with TB case in participant's household or community	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire - Medical record
Family and social support	Score of family and social support from participant's family member, friend, or colleague	- Interval scale - For data analysis, central tendency and spread were used	- Questionnaire
	The main caregiver who looks after participant	- Nominal scale - For data analysis, it was categorised into 4 groups: 1 = father/mother 2 = husband/wife 3 = son/daughter 4 = others	- Questionnaire - Medical record
Health status characteristic			
Chronic disease	History of chronic disease	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No - Each chronic disease was described by frequency and percentage	- Questionnaire - TB01 - Medical record
HIV status	Status of HIV infection	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No - Each HIV result was described by frequency and percentage	- Questionnaire - TB01 - TB03 - Medical record
Body mass index (BMI)	Status of body mass index including weight (kilograms), height (metres), and BMI (kg/m^2)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire - TB03 - Medical record
Clinical signs of TB symptoms characteristic			
Clinical of TB symptoms	TB signs and symptoms including cough, sputum production, blood-tinged sputum, cough up blood (haemoptysis), chills, low-grade fever, weakness, night sweats, weight loss, chest pain, lack of appetite, other respiratory symptoms	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire - TB01 - Medical record
Health seeking behavioural characteristic			
Self-medication / self-treatment	History of self-medication or self-treatment in the previous time before being diagnosed with TB	- Nominal scale - For data analysis, it was categorised into 2 groups:	- Questionnaire - Medical record

Variable	Definition	Measurement	Tools
		1 = Yes 2 = No	
	Duration of self-medication or self-treatment	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire - Medical record
	History of previous learning about TB	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire
The first health care facility	The first health care facility where participant chose after TB sign or symptom onset	- Nominal scale - For data analysis, it was categorised into 8 groups: 1 = primary health care unit 2 = government hospital 3 = private clinic 4 = private hospital 5 = pharmacy store 6 = traditional healer 7 = grocery 8 = selling drug car	- Questionnaire - Medical record
The first health care consulted	The first health care provider who participant consulted after TB sign or symptom onset	- Nominal scale - For data analysis, it was categorised into 5 groups: 1 = public health provider 2 = private health provider 3 = TB specialist 4 = pharmacist 5 = grocer	- Questionnaire - Medical record
The number of visits to health care facility	Frequency of visiting to all health care facility	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire - Medical record
	Frequency of consulting to all health care provider	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire - Medical record
Accessibility and availability to TB service characteristic			
Residence area	A current residence area	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = urban area 2 = rural area	- Questionnaire - TB01 - TB03
Duration of living in a current residence	Duration of living in a current residence (years)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire

Variable	Definition	Measurement	Tools
Living in an endemic area	History of living in area where there was TB case	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire - TB03
	The number of TB cases in the area	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire - TB03
Distance for travelling to the nearest health care facility	Distance between a current residence to the nearest hospital (kilometres)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Mode of Transportation	Mode of transportation which participant chose to get to the hospital	- Nominal scale - For data analysis, it was categorised into 6 groups: 1 = on foot 2 = bicycle 3 = motorcycle 4 = personal car 5 = bus 6 = taxi	- Questionnaire
	Cost for transportation (Baht per round-trip)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
	Comfortable for travelling to the hospital	- Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire
Travelling duration to health care facility	Duration between a current residence to the nearest hospital (minutes)	- Ratio scale - For data analysis, central tendency and spread were used	- Questionnaire
Satisfaction with health care service characteristic			
Satisfaction with health care services	Score of satisfaction of participant with previous health care services	-Ordinal scale - For data analysis, it was categorised into 4 groups: 1 = excellent 2 = satisfactory 3 = moderate 4 = unsatisfactory	- Questionnaire
Health insurance	Status of health insurance	- Nominal scale - For data analysis, it was categorised into 3 groups: 1 = universal coverage scheme 2 = social security scheme	- Questionnaire - TB03

Variable	Definition	Measurement	Tools
Expenses for treatment	Expectation of participant on free of charge on treatment cost	3 = government or state enterprise officer - Nominal scale - For data analysis, it was categorised into 2 groups: 1 = Yes 2 = No	- Questionnaire

4.7 Tools for this research

The research tools of this study consisted of various tools which were used in two data collection phases: quantitative and qualitative phase. The details of each tool were shown in below.

4.7.1 Quantitative phase

For the quantitative part of this study, a self-administered questionnaire was completed by participants and an interviewer-administered questionnaire was used with participants who needed assistance. In this phase, there were four main instruments used to collect data including a questionnaire, TB treatment card, TB register, and a medical record.

A structured questionnaire was designed to gather data from PTB patients participated in the research. Based on the literature review, the questionnaire consisted of questions covering nine characteristics. First, sociodemographic – economic information such as gender, age, education level, and economic status, was collected. Health behaviour and health status which were associated with the health condition of the individual were included in the questionnaire. Knowledge, recognition, and stigmatisation were also collected as they were significantly associated with psychological theories related to health seeking behaviour. Family and social support and accessibility and availability of TB service which were involved external factors were addressed. In addition, clinical TB signs and symptoms, health seeking behaviour, and satisfaction with health services were collected to investigate the relationship with the patient delay (find more details in Appendix 4).

In addition, TB treatment card or TB01 is a standard form used to record TB treatment of individual cases. Individual information of each TB patient is recorded into this form including patient information, results of AFB and CXR, date of starting TB treatment and detail of regimen, record of taking anti-TB drugs in both intensive and continuous phases, and treatment outcome. This form was used to check the consistency of participants' answers collected from the questionnaire, i.e. patient information and date of starting TB treatment.

Moreover, TB register or TB03 is a form used to register all TB patients who get treatment at TB clinic of each hospital. It contains patient information and contact details, date of starting TB treatment and detail of regimen, type of TB, registration group, results of AFB and CXR, treatment outcome, a patient-centred approach, HIV counselling and testing, CD4, antiretroviral therapy, opportunistic infection, and risk categories for drug-resistant TB. This form was used to check the consistence of participants' answers obtained from the questionnaire, i.e. patient information, date of starting TB treatment, type of TB, a patient-centred approach, and result of HIV testing.

Furthermore, a medical record is a form that a doctor uses to note a patient's initial complain(s) and medical history, physical findings, results of diagnostic test and procedures, any therapeutic medicines or procedures, and subsequent development during the course of illness. This record was used to check the consistence of participants' answers gathered from the questionnaire, i.e. TB-related signs and symptoms, physical findings, and result of diagnosis.

4.7.2 Qualitative phase

For the qualitative part of the study, individual in-depth interviews were employed for data collection. In this phase, qualitative data were collected by various tools including a semi-structured questionnaire, an audio recording, and field notes. Moreover, an unstructured questionnaire was also used to obtain further information about participants' beliefs, views, and experiences.

A semi-structured questionnaire was used to gather more information from participants identified with patient delay. This questionnaire consisted of 9 questions which were used to ask participants about why and how participants had a delay in getting initial TB treatment (find more details in Appendix 4).

In addition, an unstructured questionnaire was applied to acquire further information from participants about their beliefs, views, or experiences on getting TB treatment late. General questions were asked to participants to be familiar with the researcher in the introduction section. Further questions based on their answers from semi-structured questions were used to get more in-depth information or hidden information related to patient delay. All questions were asked subsequently within three sections of the interviews including introduction, in-depth interviews, and closing session as shown in Table 4.5.

Table 4.5 Table of examples of the interview questions within three sections

Session of interviews	Details of questions
Introduction (these questions were asked to remind participants about the surveys and be familiar with them)	- How are you today? - What do you do? Or What is your job? - Have you smoked cigarette, consumed alcohol, or used illicit drug? - Have you got other diseases? - What are TB symptoms? - Do you think that you are suspected as TB patients? And why? - What is the definition of patient delay in TB treatment? - What were your symptoms in the first period of your illness? - Which symptoms made you decide to get treatment at the hospital? - Where did you go to get treatment in the first visit? - Have you had knowledge about TB? - Have you met or lived with PTB patients? - Were there other TB patients in your family or community?
In-depth (these questions were asked after using a semi-structured questionnaire to obtain more depth information)	- How long is your duration between TB symptoms onset until the first visit at health care facility? - Since the onset of symptoms until being treated at the hospital, did you get treatment at other places or buy any medication by yourself? - Why did you choose to go to the first health care facility that you mentioned? - Why didn't you go to the hospital in the first visit? - What are your reasons that you make you have patient delay? - What were your reasons that made you leave your symptoms for a long time? - Why did you leave your symptoms for a long time? - Did you have other reasons that made you delay to get treatment at hospital? - During the period when you began to have these symptoms, have you had other TB-related symptoms? - Why didn't you like to get treatment at the hospital? - Did you have other problems about getting initial TB treatment? - Did you have anything else to tell me about the health services here? - Why did you go to visit at a non-government facility in the first time? - How did other people feel after they knew about your illness? - Did you have a comfortable journey from your home to the hospital? And How? - How did you feel with the TB screening test, diagnosis, and treatment? - How did you think that delay in treatment affects other people? - Did you have any problem about travelling to the hospital? And How? - Why did you come to get treatment at this hospital? - Where did you learn or get previous knowledge about TB? - What did the doctor do for you to know you suffered from TB? And how? - Did your illness affect your daily life or working life? And how? - How did you feel about having TB? - Did you lack income on the previous time before you suffered from TB? - Did you think that other people would be infected TB from you? And how?

Session of interviews	Details of questions
	- What were your expectations that if you came to get an appropriate TB treatment late? And How?
	- As you had haemoptysis, why didn't you go to get treatment immediately?
	- How did you think about the causes of TB?
	- Where did you suspect that you got TB germs?
	- How many visits did you go to the primary care unit or private facility or drugstore or grocery in your village, and why?
	- After you had been diagnosed with TB, did your friends or other people surrounding you know that you were TB patient?
	- Why did you not tell them about your illness?
	- How do other people act with you after they know you having TB?
	- Did you fear that if you told other people then they would dislike or stigmatise you further? And how?
	- How does the patient delay affect you and other people?
	- How do you experience with patient delay?
Closing (these questions were asked before closing interviews)	- Do you have any suggestion for the TB services here?
	- Do you have any side-effect of the medication?
	- Do you have any reason else?
	- How do you feel about your health status nowadays?
	- How do you feel about the TB one stop service here?
	- Do you have any problem?

Moreover, an audio recording and field notes were used to record information while the interviews were undertaken. In terms of the quality of the data collection, the audio recordings and field notes were considered to be addressed in this process in order to enhance its quality according to Moore and Llompart (2017) stated that the field notes and voice recording or video recording can be used to enhance the quality of the data collection. The audio-recording was used in this study because it was very difficult to take handwritten notes of what was said and done by participants. Also, I needed to maintain the interviews based on a semi-structured questionnaire and create more relevant questions or unstructured questions to collect more depth details on participants' beliefs, views, experiences, thoughts, or feelings. Thus, it was useful to use the audio recording in this process. In addition, the field notes were used to complement the questionnaire and audio-recording to comment on expressions, environmental circumstances, or nonverbal communications that might not be sufficiently captured through the audio-recording as statement of Sutton and Austin (2015).

4.8 Constructing research tools

A structured questionnaire was constructed based on the literature review which consisted of various variables within nine characteristics. The questionnaire was first drafted in English, then

translated into Thai because data were collected among all Thais. Moreover, the questionnaire was checked the consistence of meanings on both languages by four bilingual experts and adjusted with their suggestions. From previous studies, there was no study addressing all variables shown in the literature review into an individual research. For example, some studies investigated the factors related to sociodemographic characteristic only while some studies explored the factors related to other characteristics. Thus, the existing instruments and scales did not cover all variables based on the literature review. The questionnaire for this study had to be constructed which more covered all variables based on literature review. Most sections in the questionnaire was mainly constructed by the variables found in the literature review while some sections were applied from previous studies or other sources as shown in Table 4.6.

Table 4.6 Sources of constructing a structured questionnaire

Section	Question	Source
1 Sociodemographic – economic characteristic		
	- Gender	Literature review
	- Age	Literature review
	- Marital status	Literature review
	- Education	Literature review
	- Occupation	Literature review
	- Financial status	Literature review
	- History of being prisoner	Literature review
2 Health behaviour characteristic		
	- Smoking	Literature review
	- Consuming alcohol	Literature review
	- Using illicit drugs	Literature review
3 Knowledge, recognition, and stigmatisation about TB characteristic		
	- Basic knowledge about TB	Centres for disease control and prevention (2009)
	- Recognition for TB	Elmi et al. (2014)
	- Stigmatisation about TB	Moya et al. (2014)
4 Family and social characteristic		
	- Family member	Literature review
	- TB case in household	Literature review
	- TB case in community	Literature review
	- Main caregiver	Literature review
	- Family and social support	Chaychoowong & Suggaravetsiri (2009)
5 Health status characteristic		
	- History of chronic disease	Literature review
	- HIV status	Literature review
	- Body mass index	Literature review

Section	Question	Source
6 Clinical signs of TB symptoms characteristic		
	- Type of symptoms	Literature review
	- Starting date of symptoms onset	Literature review
7 Health seeking behaviour characteristic		
	- Learned about TB	Literature review
	- Self-medication / treatment	Literature review
	- The first contacted facility/provider	Literature review
	- Reason for consultation	Literature review
	- A number of visiting	Literature review
8 Accessibility and availability to TB service characteristic		
	- Current residence	Literature review
	- Distance to health facility	Literature review
	- Travelling to health facility	Literature review
	- Transportation fee	Literature review
	- Comfortable journey	Literature review
9 Satisfaction with health care service characteristic		
	- Previous experiences	Literature review
	- Reason for satisfaction	Literature review
	- Health insurance	Literature review
	- Expectation to TB cost	Literature review

Although the questionnaire did not directly include the health psychological scales such as self-efficacy etc because it was not found to be investigated in the previous studies, other scales were used to construct the questionnaire to broaden the study into more theoretical domains such as recognition, stigmatisation, seeking behaviour, or self-medication.

Additionally, the semi-structured questionnaire was constructed from the literature review and the quantitative results. It was first drafted in English and then translated into Thai. Both Thai and English questionnaires were check the consistence in meanings by the bilingual experts.

In terms of obtaining in-depth information about the reason of participants with patient delay, unstructured questions were constructed subsequently based on participants' answers from semi-structured questions. Moreover, some general questions were asked to participants to establish a good relationship between the researcher and participants. These unstructured questions were asked in Thai language because they were constructed while the interviews went on to maintain the continuity and fluency of the interviews.

4.9 Reliability and rigour of research tools

In terms of a structured questionnaire, all items in the questionnaire were assessed for content validity by using the Item-Objective Congruence Index (IOC) (Turner & Carlson, 2003). In this process, six experts who were familiar with the content rated each item on the degree (+1, 0, -1) for the extent to which it did or did not measure specific objectives listed by the researcher. According to Brown (1996), if the IOC value is higher than 0.5, the item is acceptable due to its congruence between the items and the objectives. In this process, two content experts assessed the questionnaire in the English version while other four content and bilingual experts evaluated the questionnaire in both English and Thai version. The IOC value of each item was between 0.67 – 1.00 thus the items in this questionnaire were accepted (find more details in appendix 5). Moreover, both structured questionnaire versions were also amended with the experts' recommendations to be more congruent between the items and the objectives and more consistent between both versions. The amended questionnaire in the Thai version was then piloted with 15 PTB patients to evaluate the reliability of the questionnaire. The Cronbach's Alpha Coefficient (KR-20) was addresses in this process to assess the reliability of the set of questions in some sections including knowledge about TB and family and social support. According to Tavakol and Dennick (2011), the acceptable value of KR-20 ranges from 0.70 to 0.95. In this step, the KR-20 of knowledge about TB and family and social support sections were 0.80 and 0.79, respectively (find more details in appendix 6). While the set of questions about TB stigmatisation was previously tested in the research of Moya and others (2014) shown that the Cronbach's alpha was 0.88 – 0.91 thus this set of TB stigmatisation questions was accepted. Moreover, other questions were assessed and the understanding of each item from piloted participants indicated that these questions were understood well.

In terms of a semi-structured questionnaire, all questions were evaluated for content validity by applying the IOC which was similar to a structured questionnaire. Some questions were adjusted to be more congruent between the items and the objectives and more consistent between both versions by the experts including two nursing experts, two pharmacy experts, a public health expert, and a qualitative research expert. While unstructured questions were developed while the interviews were in progress, they were not assessed for content validity at that time. After each interview, unstructured questions were reviewed and improved for the next interviews.

As stated above, there was a process of translation between two languages: English and Thai. This process thus was very important to maintain the meanings of the first draft questionnaire. An English questionnaire was constructed first, translated into Thai version, and back translated into English by the researcher again. After that, both versions of questionnaires were check the

consistency of meanings by four bilingual experts. The experts are Thai instructors working in the Praboromarajchanok Institution of Health Workforce Development. Two of them have graduated with their PhD in the United Kingdom, one of them has graduated with her PhD in the United State of America, and another one has graduated with his PhD in an international programme in Thailand. In this process, two experts checked the translation from English to Thai language, and the others checked the translation from Thai to English language. All reports were sent to the researcher and then both questionnaires were amended with experts' recommendations.

4.10 Data collection

4.10.1 Quantitative data

In this process, three-hundred PTB patients who met the inclusion and exclusion criteria were recruited randomly to take part in the study by applying a stratified random sampling and a simple random sampling as shown in section 4.5.3. The data collection was conducted in the hospitals at the most convenient time and date when participants had an appointment with the doctor. Data were mainly collected by addressing a self-administered questionnaire while an interviewer-administered questionnaire was addressed to some participants who were illiterate or needed assistance to complete the questionnaire. The questionnaires were filled while the participants were waiting to meet the doctor or pharmacist in a private area without the presence of the researcher which lasted approximately 30 – 40 minutes. The Thai-version questionnaire was provided to collected data among these participants as they could communicate and understand only Thai language. The details of data collection process were shown in below:

1) A letter issued by my supervisor was sent to the director of each selected hospital in order to introduce and provide some information about the research project as well as to request permission for data collection in the settings (find more details in Appendix 7).

2) Staffs of TB clinic in each hospital were liaised to introduce and cooperate before undertaking data collection. In this step, more information about the research project were provided to all TB staffs including the research aims and objectives, data collection, data analysis, risks and benefits. In addition, the TB staffs were requested to access some essential information about TB patients, asked about the date and time providing TB clinic of each hospital, and arranged the data collection timetable.

3) Each PTB patient was labelled the identification number instead of their name and selected to be participants according to the inclusion and exclusion criteria for study participants by combining a stratified random sampling and a simple random sampling.

4) Information about the research project were introduced to the selected participants. In addition, the information sheet was provided to all participants to provide more information about the research project. In this process, the participants were provided all information about research project in the first. Moreover, at least for a week, participants then had time to make a decision before they decided and were requested to participate in the research project by signing relevant consent form to give permission for data collection in the second meeting.

5) The participants were requested to complete a structured self-administered questionnaire (Thai version). However, some participants who were illiterate could request their relatives to assist them complete the questionnaire or ask to be provided an interviewer-administered questionnaire to assist them fill the questionnaire. The surveys were conducted at a private area in the TB clinic which lasted approximately 30 – 40 minutes. This process of quantitative data collection was undertaken until reaching 300 participants which lasted for 4 months.

6) Completed questionnaires from participants in each visit were gathered by the researcher. Moreover, the secondary data (i.g. TB01, TB03, and medical record) were used to check the consistence of both primary and secondary data. If there were some inconsistent answers, participants would be asked to re-check their answers in this meeting again while they were waiting to meet the doctor or receive medicine because participants might spend their time between 8.00 am – 3.00 pm at the hospital.

7) Data were then stored as an electronic file for preparation for data analysis.

4.10.2 Qualitative data

In this process, all 25 participants who had completed the questionnaire in the quantitative part and then identified as having patient delay (the time interval from the first onset of any TB-related symptoms until the first visit to any health providers was more than 30 days) were purposive recruited for in-depth interviews in order to select the participants who had fruitful information related to patient delay (Palinkas et al., 2015). The interviews were conducted in the hospitals at the most convenient time and date when they had an appointment with the doctor in the third meeting. In this process, the interviews were conducted based on a semi-structure questionnaire which lasted between 30 – 45 minutes. The answers to the semi-structured questions would be applied to build more unstructured questions to obtain more in-depth or hidden information related to patient delay. The qualitative interviews were also

conducted in Thai language by individual in-depth interviews. The details of the data collection were shown below:

1) Only Participants who were identified as participants with patient delay (more than 30 days) were recruited into the individual in-depth interviews by purposive sampling.

2) The recruited participants were made an appointment to be interviewed in the next time when they came to meet the doctor at the hospital.

3) More important information about the research project especially about the individual in-depth interviews as well as the other tools were provided to the recruited participants. The participants also had time to make a decision before they were requested to sign the relevant consent form again. In addition, a permission to address audio-recording and field notes was requested from participants before undertaking the interviews.

4) The participants were requested to participate in in-depth interviews based on a semi-structured questionnaire. At the same time, their caregivers were allowed by participants to take part of the interviews with them. In addition, further unstructured questions were asked according to the answers arising from the interviews to provide some more details about their beliefs, experiences, feelings, and views on patient delay in accessing to TB treatment late. Both semi- and unstructured questionnaires were blended together while the interviews went on. All interviews were also conducted in a private area which lasted about 30-45 minutes per case. Moreover, triangulation was applied to increase the trustworthiness of the findings (Denzin, 2006; Carter et al., 2014) by using more than one approach including interviews, observations, questionnaires, and documents.

5) The data gathered from participants were reviewed to re-check the understanding that should be consistent with the received information as well as to verify the accuracy and clarity of the data in both surveys and interviews. In this step, the recruited participants were reviewed until the data were saturated which lasted for 2 months.

6) After each interview, the transcripts in Thai language were done before being translated to English language based on the information collected by the semi-structured questionnaire, unstructured questionnaire, audio-recording, and field notes.

7) All data were then stored as an electronic file for preparation for data analysis.

4.11 Analysing data

4.11.1 Quantitative data

Quantitative data were analysed by the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., 2017). The details of quantitative data analysis were shown in below:

1) Data were checked for correctness and consistency from the patient, TB01, TB03, and medical record, and then they were coded to prepare for data analysis.

2) Data were stored in Microsoft Excel twice, then checked them completely and correctly with Epi Data version 3.1.

3) Data were analysed by SPSS and explained with descriptive statistics and inferential statistics. In terms of descriptive statistics (Süt, 2014), frequency and percentage were used to describe variables in nominal and ordinal scales while the mean, median, standard deviation, minimum and maximum were used to explain variables in interval and ratio scales. In terms of inferential statistics, the Chi-square test and the Mann-Whitney U test were used to discover the factors associated with patient delay according to McHugh (2013) the Chi-square test is a statistical analysis to find whether there is an association between two categorical variables and Hart (2001) suggested that the Mann-Whitney U test is a statistical analysis used to determine whether there is any significant difference between the means of two independent samples. It is used for cases where the assumptions of the Independent t-test are not met as there is no normal distribution of the data. In addition, multiple logistic regression analysis was used to identify the factors influencing patient delay, accordingly it is a statistical analysis when there are one nominal variable and two or more measurement variables. It can be used to know how the measurement variables affect the nominal variable. In addition, it can be also used to predict probabilities of the dependent nominal variable, or for suggestion about which independent variables have a major effect on the dependent variable (Sperandei, 2014).

4.11.2 Qualitative data

Qualitative data were used to explain more details about the influencing factors with patient delay in each characteristic by using the strategy of thematic analysis: identification of key themes. The data were managed by Nvivo version 12 (QSR International Pty Ltd., 2018) which is a programme for assisting the researcher to deal with large volumes of qualitative data (Hilal & Alabri, 2013). Moreover, quantitative data of each participant in the surveys were stored in the programmed which could be linked and compared both data from interviews and surveys in individual and overall level. Qualitative data were analysed by content analysis following the steps below:

1) Transcripts were complete verbatim based on the semi-structured questionnaire, unstructured questionnaire, audio-recording, and field notes carefully without interpretation in Thai language in order to maintain the meaning and feelings of each participant according to Bertrand et al. (1992) suggested that combining all methods is useful to provide completeness, keep the data fresh for analysis, and provides contexts and verbal nuance.

2) The Thai transcripts were translated to English language by the researcher. All Thai and English transcripts were then checked for the re-translation between two languages to maintain all meanings and wordings of both languages by four bilingual experts. This approach was used to maintain the trustworthiness of the data which it lasted for 2 months.

3) The English transcripts were prepared in Microsoft Word and then transferred to be managed with the programme, Nvivo version 12.

4) All transcripts were read thoroughly to understand all contents and feelings according to the messages gathered from each participant as Erlingsson and Brysiewicz (2017) recommended that to read and re-read the interviews is the initial step in getting a sense of the whole and gaining a general understanding of what participants are telling you.

5) All important messages related to influencing factors of patient delay were coded, then similar messages were categorised into the same category (sub-node) within the programme. The important messages were given meanings by using the messages which were classified and categorised by each patient in order to mean in the context of the phenomena studied. In this process, the 9 pre-conceived themes based on literature review were first developed because they would be used to explain and expand the quantitative results.

6) The same categories or sub-themes (sub-nodes) were then arranged into each theme (node) which were based on common elements thus the results of quantitative part were explained by qualitative findings. Therefore, based on common elements, all messages (codes) derived from interviews were considered and arranged into the same sub-theme (sub-node), and the relevant sub-themes were then arranged under the final 6 themes (nodes) as shown in chapter 6.

4.12 Ethical consideration

This research was conducted based on the fundamental ethical principles which included respect for person, beneficial, and justice. The right of persons was considered to protect the negative impacts with the confidentiality and anonymity of the participants' personal information as shown in below:

1) Ethical permissions were obtained from the Faculty of Health Sciences Research Ethics Committee, University of Hull, United Kingdom and the Ethics Committee on Human Research, Nakhon Ratchasima Provincial Public Health Office, Thailand, for the reason that the research was conducted with humans and also the participants were TB patients with or without HIV infection and other vulnerable information. In this step, a research proposal in English (Application Number: FSH59) was approved by the Faculty of Health Sciences Research Ethics Committee on 17th July, 2018. In addition, a Thai research proposal (Application number: KHE 2018 – 043) was approved from the Ethics Committee on Human Research, Nakhon Ratchasima Provincial Public Health Office on 23rd July, 2018 (find more details in Appendix 8).

2) The information about research objective, data collection, data analysis, risks and benefits, and other information of this research were provided to research participants. Also, an information sheet (find more details in Appendix 9) containing the brief information of this study was also provided to each participant.

3) The participants had time to decide about their willingness to participate. In this process, the participants who would like to take part in the research project were requested to sign a relevant consent form before undertaking questionnaire or being interviewed. Both information sheet and consent form were kept in a protected place.

4) The data collection process was conducted with the least possible physical and psychological impact.

5) The confidentiality of information while collecting data in both surveys and interviews was considered and adopted to this research. The participants' name or related information were not disclosed. The structured questionnaire addressed an identification number as code to identify each participant instead of participants' name. In terms of the questionnaire, it did not include questions or request information such as names, ID numbers, telephone numbers, and e-mail addresses which could reveal to the participants' identities. Similarly, those interviewed in all processes were also informed twice about the confidentiality applied in this research which did not identify them. Moreover, the code sheet was kept separately from the questionnaire so that they could not be linked; only a researcher was able to access both.

6) The participants were provided to know their right that they could withdraw from the research project at any time if they felt uncomfortable or did not willing to continue. However, there was no consequence for participants in terms of accessing to health care services or treatments.

7) All documents were kept in a safe place where outsiders were not able to access to the documents.

8) Data were analysed and described collectively and were not able to be traced back to the participants. Moreover, all data were encrypted and saved in an external storage device. Ten years after the end of this project, they would be destroyed.

4.13 Chapter summary

In this chapter, the philosophical worldview, methodology, and research methods have been discussed in association with the study's aim and questions. The chapter concentrated on topics related to the research design including population and setting, sample and sampling method, variable measurement, research instruments, data collection and analysis. The chapter also discussed ethical considerations and how the researcher approached them in this research. The following chapter presents the results of quantitative data and the findings of qualitative data based on the data collected through the research methodology.

Chapter 5 Results: Quantitative data analysis

5.1 Introduction

This chapter presents results from quantitative data analysis which is divided into three sessions: demographic characteristics; duration of patient delay; and influencing factors of patient delay.

Three hundred questionnaires were answered and then returned with complete data by participants in nine hospitals representing a response rate of 100% because these participants were notified and invited to take part in advance, I provided more information about the research project, and had time to make a decision. Also, the surveys were undertaken at hospitals when participants were waiting to see a doctor. Thus, the total number of questionnaires used for the main study analysis was 300. Non-numerical data were coded and transferred into numerical form in Microsoft excel. All data then were checked, transferred and analysed using the IBM SPSS Statistics 25 for Windows.

The results of quantitative data analysis are shown in three sessions. First, the demographic characteristics of participants were analysed and presented by descriptive statistics (Süt, 2014), namely frequency, percentage, central tendency and spread divided into two groups: tuberculosis patients with delay, and another – without delay. This section includes nine characteristics which were constructed from the literature review: 1) sociodemographic – economic characteristic; 2) health behavioural characteristic; 3) knowledge, recognition, and stigmatisation about TB characteristic; 4) family and social characteristic; 5) health status characteristic; 6) clinical signs of TB symptoms characteristic; 7) health seeking behavioural characteristic; 8) accessibility and availability to TB service characteristic; and 9) satisfaction with health care service characteristic. Second, shown as central tendency and spread, the duration of patient delay in both groups were presented by the descriptive statistics (Süt, 2014), following their symptoms. This section provides more information about the duration between the first sign or symptom onset and the first visit to any health provider among both participant groups. Last, to identify the influencing factors with patient delay, there were two steps in data analysis. The first step – univariate analysis, all variables were analysed by using Chi-square test (McHugh, 2013) or Mann – Whitney U test (Hart, 2001) which depended on their types of variable namely categorical variables or continuous variables, respectively. Consequently, the second step – multivariate analysis, the significant factors analysed by univariate analysis were then analysed by multiple logistic regression (Sperandei, 2014) to identify influencing factors of patient delay using binary logistic regression forward stepwise.

5.2 Demographic Characteristics

5.2.1 Sociodemographic – economic characteristic

The results of sociodemographic – economic characteristic as shown in Table 5.1 showed the study sample comprising 118 PTB patient with delay (39.33%) and 182 PTB patients without delay (60.67%). Sociodemographic feature, most of the participants were male representing 65.25% and 63.19% among participants with delay and without delay, respectively. Most were aged 45 years or over with the biggest age group of participants with delay were aged 55-64 years (33.05%) and ones without delay were aged 45-54 years (21.98%). More than half of the participants were married representing 69.49% and 61.54% among participants with and without delay, respectively. Most of them had graduated at primary educational level representing 72.88% and 47.80% among participants with delay and without delay, respectively while 4.24% and 8.24% were illiterate among participants with and without delay, respectively. Just under half of participants with delay were farmers (46.62%) while 36.81% of participants without delay were manual labourers.

The median income per month was around £70-80 representing £70 and £82 among participants with and without delay, respectively (the average exchange rate on August 1 – December 31, 2018 = 42.83). Most of them overall were not a main source of their family income representing 61.02% and 58.24% among participants with and without delay with 70.83% and 45.28% of their children being the main one, respectively. More than half of participants overall were in debt which they had requested loans from some money sources representing 68.65% and 53.30% among participants with and without delay, respectively. Overall, only 16 participants had been arrested or charged with any offence representing 6.78% and 4.40% among participants with and without delay, respectively.

Table 5.1 Sociodemographic – economic characteristic of PTB patients

Sociodemographic – economic characteristic	**PTB patients**	
	With delay n (%)	**Without delay n (%)**
Gender		
Male	77 (65.25)	115 (63.19)
Female	41 (34.75)	67 (36.81)

Sociodemographic – economic characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Age (years)		
≤ 24 years	2 (1.69)	16 (8.79)
25 – 34 years	5 (4.24)	24 (13.19)
35 – 44 years	13 (11.02)	30 (16.48)
45 – 54 years	30 (25.42)	40 (21.98)
55 – 64 years	39 (33.05)	34 (18.68)
≥ 65 years	29 (24.58)	38 (20.88)
Median (Minimum – Maximum)	57 (19 – 83)	49 (18 – 91)
Marital status		
Single	11 (9.32)	42 (23.07)
Married	82 (69.49)	112 (61.54)
Widow	15 (12.71)	22 (12.09)
Divorced	10 (8.48)	6 (3.30)
The highest level of education*		
Illiterate	5 (4.24)	15 (8.24)
Primary education	86 (72.88)	87 (47.80)
Lower secondary education	12 (10.17)	34 (16.68)
Upper secondary education	14 (11.86)	33 (18.13)
Undergraduate	1 (0.85)	8 (4.40)
Post-graduate	0 (0)	5 (2.75)
Occupation		
Unemployed	23 (19.49)	35 (19.23)
Farmer	55 (46.62)	65 (35.71)
Labour	34 (28.81)	67 (36.81)
Government officer	1 (0.85)	1 (0.55)
Trader	1 (0.85)	6 (3.30)
Student	2 (1.69)	5 (2.75)
Buddhist priest	2 (1.69)	3 (1.65)
Income per month (Baht)		
Median (Minimum – Maximum)	3,000 (0 – 30,000)	3,500 (0 – 30,000)

Sociodemographic – economic characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Being main source of family income		
Yes	46 (38.98)	76 (41.76)
No	72 (61.02)	106 (58.24)
If No, who is the main source of family income		
Father/Mother	4 (5.56)	23 (21.70)
Husband/Wife	16 (22.22)	28 (26.42)
Son/Daughter	51 (70.83)	48 (45.28)
Brother/Sister	1 (1.39)	6 (5.66)
Others	0 (0)	1 (0.94)
Family financial status		
Have savings	3 (2.54)	5 (2.75)
Income = Expenses	34 (28.81)	80 (43.95)
In debt	81 (68.65)	97 (53.30)
Being arrested or charged with any offence		
Yes	8 (6.78)	8 (4.40)
No	110 (93.22)	174 (95.60)
If Yes, the duration of being arrested or charged (years)		
Median (Minimum – Maximum)	3 (0.03 – 11)	2.2 (0.1 – 15)

* P-value < 0.05 in multiple logistic regression test

5.2.2 Health Behavioural characteristic

As shown in Table 5.2, more than half of participants overall were smokers and ex-smokers whilst there were 37.29% and 48.90% among participants with delay and ones without delay were not smokers, respectively. The median length of the smoking duration was 30 years in the former group while it was 25 years in the latter group. Most of them overall consumed alcohol whilst 33.06% and 45.60% of each group did not consume alcohol, respectively. The median length of alcohol consumption duration was 29 years among participants with delay and 20 years among participants without delay. Overall, there were only 15 persons who used to use illicit drugs such as marijuana or amphetamine represented 4.24% and 5.49% among participants with and without delay with the median length of using illicit drugs duration was 8 years among participants with delay and 5 years among participants without delay.

Table 5.2 Health behavioural characteristic of PTB patients

Health Behavioural characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Smoking behaviour		
Yes, a smoker	15 (12.71)	18 (9.89)
Yes, an ex-smoker	59 (50.00)	75 (41.21)
No	44 (37.29)	89 (48.90)
If Yes, the duration of smoking (years)		
Median (Minimum – Maximum)	30 (3 – 70)	25 (1 – 60)
Alcohol consumption		
Daily	15 (12.71)	19 (10.44)
Weekly	18 (15.25)	18 (9.89)
Occasionally	46 (38.98)	62 (34.07)
Never	39 (33.06)	83 (45.60)
If Do, the duration of drinking (years)		
Median (Minimum – Maximum)	29 (3 – 70)	20 (1 – 60)
Using illicit drugs		
Yes, an ex-drug user	5 (4.24)	10 (5.49)
No	113 (95.76)	172 (94.51)
If Yes, the duration of using illicit drugs (years)		
Median (Minimum – Maximum)	8 (1 – 30)	5 (1 – 30)

5.2.3 Knowledge, Recognition, and Stigmatisation about TB characteristic

Knowledge about tuberculosis

From Table 5.3, the median score of knowledge about TB among PTB patients overall was 7. The highest score of both groups was 10 while the lowest score was 3 among the delay group and 1 score of another group.

Table 5.3 Score of basic knowledge about TB of PTB patients

Score of basic knowledge about TB	PTB patients	
	With delay	Without delay
Median (Minimum – Maximum)	7 (3 – 10)	7 (1 – 10)

In Table 5.4, depicting the details of each question among correct answers in the delay group, the participants answering correctly on 'TB disease can be cured', and 'if you have TB infection you may have to take medicine, even if you don't feel sick' were the highest rate at 98.31% while on 'TB infection and TB disease are the same' was the lowest rate at 9.32%.

In terms of the non-delay group, on 'If you have TB infection you may have to take medicine, even if you don't feel sick' was answered correctly at the highest rate at 96.70% while 'Everyone who gets infected with TB bacteria will get sick' was the lowest rate at 18.68%.

Table 5.4 Correct answer in questions associated with basic knowledge about TB of PTB patients

Questions of basic knowledge about TB	PTB patients	
	With delay n (%)	Without delay n (%)
TB is caused by germs called bacteria	86 (72.88)	143 (78.57)
TB can spread from an infected person to another through the air	106 (89.83)	163 (89.56)
Everyone should get tested for TB	20 (16.95)	49 (26.92)
Everyone who gets infected with TB bacteria will get sick	15 (12.71)	34 (18.68)
Some people can get TB disease easier than others	106 (89.83)	167 (91.76)
TB disease can be cured	116 (98.31)	174 (95.60)
TB can affect other parts of the body besides the lungs	101 (85.59)	157 (86.26)
TB infection and TB disease are the same	11 (9.32)	44 (24.18)
TB bacteria have a hard time living in fresh air and sunlight	106 (89.83)	170 (93.41)
If you have TB infection you may have to take medicine, even if you don't feel sick	116 (98.31)	176 (96.70)

Recognition of TB

Table 5.5 shows more than 70% of participants overall did not suspect they had TB representing 85.59% and 74.73 % among participants with and without delay, respectively. Most had no previous knowledge about TB representing 93.22% and 74.73% among participants with and without delay, respectively. Overall respondents considered 'TB is not a very serious disease' representing 48.30% and 37.36% among participants with and without delay, respectively. In addition, participants considered 'TB is not a very serious problem in their area' at 44.92% and 40.66% among participants with and without delay, respectively.

Participants overall understood correctly about 'cough', 'coughing up blood', and 'cough that lasts longer than 3 weeks' being TB signs and symptoms as shown in the delay group at 90.68%, 81.36%, and 89.83%, respectively while the non-delay group understood correctly about these at 89.56%, 79.67%, and 86.81%, respectively. In contrast, in terms of correct understanding about 'weight loss', 'chest pain', 'shortness of breath', 'ongoing fatigue', and 'night sweats' being TB signs and symptoms, 43.22%, 30.51%, 27.97%, 28.81%, and 32.20% answered correctly among participants with delay, and 40.11%, 28.02%, 30.22%, 31.32%, and 30.22% answered correctly among participants without delay, respectively. In addition, a few participants incorrectly considered 'rash', 'severe headache', and 'nausea' as being TB signs and symptoms.

In terms of how a person can become infected with TB 'through the air when TB patient coughs or sneezes' was answered correctly by participants with and without delay at 97.46% and 97.80%, respectively. That a person can avoid TB infection by 'covering mouth and nose when coughing or sneezing' was answered correctly by participants with and without delay at 98.31% and 97.80%, respectively. That 'everybody can be infected with TB' was answered correctly by participants with and without delay at 92.37% and 91.76%, respectively. Whether someone with TB can be cured by 'using specific drugs given by health centre' was answered correctly by participants with and without delay at 97.46% and 96.70%, respectively. However, there were about 27.12% and 34.07% among participants with and without delay, respectively, thought that someone with TB can be cured by 'the directly observed treatment short course (DOTS)' provided by health providers.

Table 5.5 Recognition about tuberculosis of PTB patients

Recognition for TB	PTB patients	
	With delay n (%)	**Without delay n (%)**
Suspected having TB		
Yes	17 (14.41)	46 (25.27)
No	101 (85.59)	136 (74.73)
Had any previous knowledge about TB*		
Yes	8 (6.78)	39 (21.52)
No	110 (93.22)	143 (74.73)
Thought as TB is a serious disease*		
Very serious	40 (33.90)	53 (29.12)
Somewhat serious	21 (17.80)	61 (33.52)
Not very serious	57 (48.30)	68 (37.36)

Recognition for TB	PTB patients	
	With delay n (%)	Without delay n (%)
Thought as TB is a serious problem in their area		
Very serious	39 (33.06)	50 (27.47)
Somewhat serious	26 (22.02)	58 (31.87)
Not very serious	53 (44.92)	74 (40.66)
Thought as these are signs and symptoms of TB		
Rash	9 (7.63)	7 (3.85)
Cough	107 (90.68)	163 (89.56)
Coughing up blood	96 (81.36)	145 (79.67)
Cough that lasts longer than 3 weeks	106 (89.83)	158 (86.81)
Severe headache	10 (8.48)	10 (5.49)
Nausea	10 (8.48)	16 (8.79)
Weight loss	51 (43.22)	73 (40.11)
Fever	19 (16.10)	38 (20.88)
Fever without clear cause that lasts more than 7 days	31 (26.27)	36 (19.78)
Chest pain	36 (30.51)	51 (28.02)
Shortness of breath	33 (27.97)	55 (30.22)
Ongoing fatigue	34 (28.81)	57 (31.32)
Night sweats	38 (32.20)	55 (30.22)
Thought as a person can get TB		
Through handshakes	12 (10.17)	15 (8.24)
Through the air when TB patient coughs or sneezes	115 (97.46)	178 (97.80)
Through sharing dishes	40 (33.90)	69 (37.91)
Through eating from the same plate	37 (31.36)	69 (37.91)
Through touching items in public places (doorknobs, handles in transportation, etc.)	15 (12.71)	18 (9.89)
Thought as a person can prevent getting TB		
Avoid shaking hands	13 (11.02)	21 (11.54)
Covering mouth and nose when coughing or sneezing	116 (98.31)	178 (97.80)
Avoid sharing dishes	40 (33.90)	80 (43.96)
Washing hands after touching items in public places	30 (25.42)	54 (29.67)

Recognition for TB	PTB patients	
	With delay n (%)	Without delay n (%)
Closing windows at home	10 (8.48)	9 (4.95)
Through good nutrition	20 (16.95)	24 (13.19)
By praying	6 (5.08)	8 (4.40)
Thought as these can be infected with TB		
Anybody	109 (92.37)	167 (91.76)
Only poor people	1 (0.85)	0 (0)
Only homeless people	1 (0.85)	0 (0)
Only alcoholics	3 (2.54)	2 (1.10)
Only drug users	3 (2.54)	4 (2.20)
Only people living with HIV/AIDS	2 (1.69)	6 (3.30)
Only people who have been in prison	1 (0.85)	1 (0.55)
Others		
Close contact	0 (0)	4 (2.20)
Weak people	5 (4.24)	3 (1.65)
Smoking people	0 (0)	1 (0.55)
Chemical contacted people	0 (0)	1 (0.55)
Weak/elderly/childhood people	1 (0.85)	0 (0)
Thought as someone with TB can be cured		
Herbal medicine	7 (5.93)	3 (1.65)
Home rest without medicine	3 (2.54)	6 (3.30)
Praying	0 (0)	2 (1.10)
Specific drugs given by health centre	115 (97.46)	176 (96.70)
Directly observed treatment short course	32 (27.12)	62 (34.07)

* P-value < 0.05 in multiple logistic regression test

Stigmatisation about TB

As shown in Table 5.6, the median score of stigmatisation about TB among participants overall was more than 30 representing 34.5 in the delay group and 30 in the non-delay group, respectively.

Table 5.6 Score of stigmatisation about TB of PTB patients

Score of Stigmatisation about TB	PTB patients	
	With delay	Without delay
Median (Minimum – Maximum)*	34.50 (13 – 48)	30 (14 – 43)

* P-value < 0.05 in multiple logistic regression test

Regarding stigmatisation about TB (Table 5.7), the three questions scoring highest in the delay group included 'keep distance from other people to avoid the transmission of TB germs' (3.27; SD = 0.52), 'feel guilty as you may have been affected by TB due to the habit of smoking, drinking alcohol, and not taking care of yourself' (3.10; SD = 0.78), and 'feel guilty because your family carries the burden of taking care of you' (2.92; SD = 0.67), respectively. Similarly, in the group without delay the same items were scored 3.01 (SD = 0.54), 2.85 (SD = 0.83), and 2.83 (SD = 0.73), respectively. The score on 'fear telling your family that you have the disease' was the lowest in both groups scoring 2.10 (SD = 0.87), and 1.94 (SD = 0.69) by participants with and without delay, respectively.

Table 5.7 Questions associated with stigmatisation about TB of PTB patients

Questions of stigmatisation about TB	PTB patients	
	With delay Mean (SD)	Without delay Mean (SD)
Some people who have TB feel guilty because your family carries the burden of taking care of you	2.92 (0.67)	2.83 (0.73)
Some people who have TB keep distance from other people in order to avoid the transmission of TB germs	3.27 (0.52)	3.01 (0.54)
Some people who have TB feel lonely	2.55 (0.71)	2.20 (0.61)
Some people who have TB feel hurt with the way other people react when they learn that you have TB	2.86 (0.68)	2.57 (0.66)
Some people who have TB fear losing friends when you share the information that you have the disease	2.82 (0.62)	2.57 (0.68)
Some people who have TB are worried about the possibility of having AIDS too	2.55 (0.77)	2.21 (0.69)
Some people who have TB fear telling people outside of your family that you have the disease	2.79 (0.68)	2.51 (0.66)
Some people who have TB will choose carefully those people who you will inform about your condition	2.75 (0.72)	2.58 (0.71)
Some people who have TB fear going to TB clinic because other people may see you there	2.71 (0.72)	2.40 (0.63)

Questions of stigmatisation about TB	PTB patients	
	With delay Mean (SD)	Without delay Mean (SD)
Some people who have TB fear telling your family that you have the disease	2.10 (0.87)	1.94 (0.69)
Some people who have TB fear telling other people about your condition because other people may think you have AIDS too	2.66 (0.72)	2.34 (0.63)
Some people who have TB feel guilty as you may have been affected by TB due to the habit of smoking, drinking alcohol, and not taking care of yourself	3.10 (0.78)	2.85 (0.83)

5.2.4 Family and social characteristic

From Table 5.8, the median of family members of participants overall was 3 people or more representing 4 people in the delay group and 3 people in another group, with a range overall between 1 and 11 people. While the median overall of family members living in the same bedroom with patient was 1 with a range between 1 and 7 people. Most of participants overall had no TB patient in their household representing 91.53% and 91.21% among participants with and without delay, respectively, as well as they had no TB patient in their community representing 61.02% and 70.88% among the delay and non-delay group, respectively. Most of them overall were dependent on their couple as the main caregiver representing 39.83% and 46.15% among participants with and without delay, respectively.

Table 5.8 Family and social characteristic of PTB patient

Family and social characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Number of family members		
Median (Minimum – Maximum)	4 (1 – 10)	3 (1 – 11)
Number of family members living in the same bedroom with patient		
Median (Minimum – Maximum)	1 (1 – 4)	1 (1 – 7)
There was any TB case in household		
Yes	10 (8.47)	16 (8.79)
No	108 (91.53)	166 (91.21)
There was any TB case in community		
Yes	46 (38.98)	53 (29.12)
No	72 (61.02)	129 (70.88)

Family and social characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
The main caregiver		
Father/mother	4 (3.39)	23 (12.64)
Husband/wife	47 (39.83)	84 (46.15)
Son/daughter	43 (36.44)	41 (22.53)
Others	24 (20.34)	34 (18.68)

Family and social support

As shown in Table 5.9, the median score of family and social support among participants overall was more than 7 representing a score of 7 among the delay group and 8 score among the other group. While the range of score among participants overall was between 0 and 10.

Table 5.9 Score of family and social support of PTB patient

Score of family and social support	PTB patients	
	With delay	Without delay
Median (Minimum – Maximum)	7 (0 – 10)	8 (0 – 10)

In Table 5.10, the highest number of participants responded positively to 'Is there anyone warning you to close your mouth when coughing or sneezing' representing 85.59% and 87.91% among the delay and non-delay group, respectively. The lowest number of participants responded positively to 'Is there anyone suspecting you as TB infection' representing 17.80% and 29.12% among the delay and non-delay group, respectively.

Table 5.10 Questions associated with family and social support of PTB patients

Questions of family and social support	PTB patients	
	With delay n (%)	Without delay n (%)
There is anyone observing about your chronic cough	61 (51.69)	132 (72.53)
There is anyone suggesting you to have TB screening test	24 (20.34)	82 (45.05)
There is anyone warning you to close your mouth when coughing or sneezing	101 (85.59)	160 (87.91)
There is anyone clean your used sputum container	54 (45.76)	111 (60.99)

Questions of family and social support	PTB patients	
	With delay n (%)	Without delay n (%)
There is anyone clean your used clothes	89 (75.42)	144 (79.12)
There is anyone warning you to avoid from children, older, or other people	98 (83.05)	156 (85.71)
There is anyone providing food and fresh water to you	92 (77.97)	151 (82.97)
There is anyone suggesting you to exercise	86 (72.88)	147 (80.77)
There is anyone warning you to avoid from drinking alcohol or smoking	78 (66.10)	145 (79.67)
There is anyone suspecting you as TB infection	21 (17.80)	53 (29.12)

5.2.5 Health status characteristic

As shown in Table 5.11, one-third of participants overall had chronic disease representing 33.90% and 32.42% in the delay and without delay group, respectively. The most chronic disease was diabetes mellitus representing 67.50% and 50.85% among the delay and without delay group, respectively. Most of participants had been examined for HIV representing 78.81% and 81.32% among the delay and without delay group, respectively. In the delay group, 5.38% were HIV positive and 4.73% in the without delay group. In addition, BMI was 19.14 kg/m^2 and 19.58 kg/m^2 among the delay and without delay group, respectively.

Table 5.11 Health status characteristic of PTB patients

Health status characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Had chronic diseases		
Yes	40 (33.90)	59 (32.42)
No	78 (66.10)	123 (67.58)
If Yes, these are chronic diseases		
Hypertension	14 (35.00)	24 (40.68)
Diabetes mellitus	27 (67.50)	30 (50.85)
Chronic heart failure	0 (0)	1 (1.69)
Chronic obstructive pulmonary disease	0 (0)	3 (5.08)
Asthma	1 (2.50)	3 (5.08)
Chronic kidney disease	0 (0)	3 (5.08)

Health status characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Epilepsy	0 (0)	3 (5.08)
Rheumatoid arthritis	1 (2.50)	3 (5.08)
Others	4 (10.00)	5 (8.47)
Examined for HIV test		
Yes	93 (78.81)	148 (81.32)
No	25 (21.19)	34 (18.68)
If Yes, the result is		
Positive	5 (5.38)	7 (4.73)
Negative	85 (91.40)	133 (89.86)
Unknown	3 (3.22)	8 (5.41)
Body mass index (BMI)		
Weight (kg)		
Median (Minimum – Maximum)	50 (21.5 – 106)	50 (26 – 84)
Height (m)		
Median (Minimum – Maximum)	1.61 (1.40 – 1.85)	1.62 (1.40 – 1.78)
BMI (kg/m^2)		
Median (Minimum – Maximum)	19.14 (10.67 – 35.83)	19.58 (11.56 – 30.67)

5.2.6 Clinical signs and symptoms of TB characteristic

From Table 5.12, the most common clinical sign and symptom of TB in participants overall was cough representing 91.53% and 86.81% among the delay and without delay group, respectively. On the other hand, the least common in the delay group was coughing up blood (11.86%) while blood-tinged sputum was the least common in the without delay group (7.69%).

Table 5.12 Clinical signs and symptoms of TB characteristic of PTB patients

Clinical signs and symptoms of TB characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Cough		
Yes	108 (91.53)	158 (86.81)
No	10 (8.47)	24 (13.19)

Clinical signs and symptoms of TB characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Sputum production		
Yes	74 (62.71)	52 (28.57)
No	44 (37.29)	130 (71.43)
Blood-tinged sputum		
Yes	20 (16.95)	14 (7.69)
No	98 (83.05)	168 (92.31)
Cough up blood (Haemoptysis)		
Yes	14 (11.86)	16 (8.79)
No	104 (88.14)	166 (91.21)
Chills		
Yes	22 (18.64)	19 (10.44)
No	96 (81.36)	163 (89.56)
Low-grade fever		
Yes	33 (27.97)	42 (23.08)
No	85 (72.03)	140 (76.92)
Weakness		
Yes	40 (33.90)	29 (15.93)
No	78 (66.10)	153 (84.07)
Night sweats		
Yes	35 (29.66)	39 (21.43)
No	83 (70.34)	143 (78.57)
Weight loss*		
Yes	69 (58.47)	53 (29.12)
No	49 (41.53)	129 (70.88)
Chest pain		
Yes	22 (18.64)	28 (15.38)
No	96 (81.36)	154 (84.62)
Lack of appetite		
Yes	31 (26.27)	38 (20.88)
No	87 (73.73)	144 (79.12)

* P-value < 0.05 in multiple logistic regression test

5.2.7 Health seeking behavioural characteristic

As shown in Table 5.13, a minority of participants overall had learned about TB before having TB disease representing 16.95% of participants with delay compared with participants without delay (39.56%). While the percentage of self-medication or self-treatment in the delay group was higher than the non-delay group representing 55.93% and 13.74%, respectively. The median duration of self-medication or treatment in the delay group was 60 days and in the non-delay group was 30 days.

In terms of the first contact facility, participants overall preferred going to a government hospital representing 38.14% in the delay group compared with the without delay group (79.12%). Moreover, participants with delay chose to go to a pharmacy store (18.64%) and a private clinic (16.10%). While participants without delay chose to go to a primary health care unit (7.14%) and a private clinic (5.49%). However, a grocery in community was chosen by the delay group (11.02%) when there was no nearby health provider located there.

In case of types of the first provider, most participants overall contacted the public health provider representing 50.00% and 86.26% among participants with delay and without delay, respectively. Easy transportation was the highest chosen as their reason for choosing the first health provider among participants overall representing 66.10% and 60.44% among the delay and without delay group, respectively.

Considering to the number of health providers consulted, the number of health providers consulted among participants overall was between 1 – 2 providers representing the median two providers in the delay group and one provider in the without delay group. As well as the number of visits, the number of visits among all participants was 1 – 2 visits representing the median two visits in the delay group and one visit in the without delay group. Moreover, participants who did not go to the public facility in the first visit explained their reason as 'hoped to recover naturally' (38.98% in the delay group), and 9.89% in the without delay group.

Table 5.13 Health seeking behavioural characteristic of PTB patients

Health seeking behavioural characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Learned about TB		
Yes	20 (16.95)	72 (39.56)
No	98 (83.05)	110 (60.44)

Health seeking behavioural characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Self-medication/self-treatment*		
Yes	66 (55.93)	25 (13.74)
No	52 (44.07)	157 (86.26)
The duration of self-medication / self-treatment (days)		
Median (Minimum – Maximum)	60 (2 – 1,095)	30 (5 – 30)
The first contact facility		
A primary health care unit	15 (12.71)	13 (7.14)
A government hospital	45 (38.14)	144 (79.12)
A private clinic	19 (16.10)	10 (5.49)
A private hospital	2 (1.69)	2 (1.10)
A pharmacy store	22 (18.64)	9 (4.95)
A traditional healer	1 (9.85)	0 (0)
A grocery	13 (11.02)	4 (2.20)
A selling drug car	1 (0.85)	0 (0)
The first health provider		
Public health provider	59 (50.00)	157 (86.26)
Private health provider	28 (23.73)	18 (9.89)
TB specialist	1 (0.85)	1 (0.55)
Pharmacist	15 (12.71)	1 (0.55)
Grocer	15 (12.71)	5 (2.75)
Reason for consultation		
Easy transportation	78 (66.10)	110 (60.44)
Low cost of services	28 (23.73)	27 (14.84)
Good quality of health services	10 (8.47)	54 (29.67)
Good quality of mentioned provider	10 (8.47)	42 (23.08)
Suggestion from others	26 (22.03)	50 (27.47)
Used to be consulted with the mentioned provider	20 (16.95)	43 (23.63)
Number of health providers consulted*		
Median (Minimum – Maximum)	2 (1 – 10)	1 (1 – 4)
Number of visits		
Median (Minimum – Maximum)	2 (1 – 10)	1 (1 – 6)

Health seeking behavioural characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Reason for did not go the public facility		
Hoped to recover naturally	46 (38.98)	18 (9.89)
Economic constrains	9 (7.63)	0 (0)
Fear of diagnosis	17 (14.41)	3 (1.65)
Fear of social isolation	15 (12.71)	5 (2.75)
Poor quality of health services	1 (0.85)	0 (0)
Poor attitude towards the staff	5 (4.24)	0 (0)
Difficulty with transportation	10 (8.47)	0 (0)
Cannot leave work	3 (2.54)	0 (0)
Others	3 (2.54)	2 (1.10)

* P-value < 0.05 in multiple logistic regression test

5.2.8 Accessibility and availability to TB services characteristic

According to Table 5.14, most participants lived in a rural area representing 94.07% and 86.81% among participants with delay and without delay, respectively. The median duration of living in the current area among all participants was over 30 years representing 40 years and 31 years in the delay and non-delay group, respectively. That there were some TB cases in their community among participants representing 38.98% and 29.12% among the delay and without delay group, respectively.

In terms of distance between their current residence and the nearest hospital, the median distance among participants overall was over 5 kilometres representing 13 kilometres in the delay group and 8 kilometres in the without delay group. Regarding types of transportation, motorcycle was chosen as the most popular vehicle among participants overall representing 45.76% and 64.84% among the delay and without delay group, respectively. Moreover, travelling duration overall was between 20 – 30 minutes representing 30 minutes and 20 minutes among the delay and without delay group, respectively, with the longest travelling duration being 90 minutes. In addition, cost for transportation per round trip among participants overall was approximately 50 Baht (£1.17) representing £1.40 and £0.93 among the delay and without delay group, respectively with the highest cost being £11.7. With reference to having a comfortable, this represented 83.05% and 95.05% among the delay and without delay group, respectively.

Table 5.14 Accessibility and availability to TB service characteristic of PTB patients

Accessibility and availability to TB service characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Current residence		
Urban area	7 (5.93)	24 (13.19)
Rural area	111 (94.07)	158 (86.81)
The duration of living in the current residence (years)		
Median (Minimum – Maximum)	40 (0.3 – 77)	31 (0.3 – 87)
Number of TB cases in community (persons)		
No TB case	72 (61.02)	129 (70.88)
Had TB cases	46 (38.98)	53 (29.12)
Median (Minimum – Maximum)	1 (1 – 15)	2 (1 – 10)
Distance from the nearest health care facility (km)		
Median (Minimum – Maximum)	13 (1 – 60)	8 (0.5 – 51)
Get the nearest health care facility*		
On foot	0 (0)	2 (1.10)
Bicycle	3 (2.54)	7 (3.85)
Motorcycle	54 (45.76)	118 (64.84)
Personal car	33 (27.97)	41 (22.52)
Bus	21 (17.80)	11 (6.04)
Taxi	7 (5.93)	3 (1.65)
Time to get the nearest health care facility (minutes)		
Median (Minimum – Maximum)	30 (3 – 90)	20 (1 – 90)
The cost for transportation (Baht)		
Median (Minimum – Maximum)	60 (0 – 500)	40 (0 – 500)
Had a comfortable journey		
Yes	98 (83.05)	173 (95.05)
No	20 (16.95)	9 (4.95)

* P-value < 0.05 in multiple logistic regression test

5.2.9 Satisfaction with health care services characteristic

According to Table 5.15, the mean score of participants' satisfaction with the past health care experiences was 3.37 (SD = 0.54) and 3.28 (SD = 0.52) among participants with delay and without delay group, respectively. In terms of reasons related to satisfaction with the health facility

among participants overall, the quality of health care providers was chosen as the first reason associated with satisfaction with health facility representing 88.98% and 81.87% among the delay and without delay group, respectively. Moreover, providing health education in a health facility was chosen as the second reason related to satisfaction with health facility among participants representing 69.49% and 71.98% in the delay and non-delay group, respectively.

Most of participants had a universal coverage scheme representing 94.07% and 95.05% in participants with and without delay, respectively. In addition, more than 60% of participants thought that TB diagnosis or treatment services were not free representing 74.58% and 63.74% among the delay and without delay group, respectively.

Table 5.15 Satisfaction with health care service characteristic of PTB patients

Satisfaction with health care service characteristic	PTB patients	
	With delay n (%)	Without delay n (%)
Satisfaction with the past health care experiences		
Mean (SD)	3.37 (0.54)	3.28 (0.52)
Reason of satisfying with health facility		
Environment in health facility	28 (23.73)	52 (28.57)
Health education in health facility	82 (69.49)	131 (71.98)
Quality of health care providers	105 (88.98)	149 (81.87)
Number of health care providers	30 (25.42)	71 (39.01)
Free of charge	30 (25.42)	52 (28.57)
Waiting time	12 (10.17)	28 (15.38)
Past treatment outcome	18 (15.25)	26 (14.29)
Type of insurance		
Universal coverage scheme	111 (94.07)	173 (95.05)
Social security scheme	3 (2.54)	6 (3.30)
Government or state enterprise officer	4 (3.39)	3 (1.65)
Thought as TB diagnosis or treatment are free services		
Yes	30 (25.42)	66 (36.26)
No	88 (74.58)	116 (63.74)

5.3 The duration of the first TB sign and symptom among PTB patients

As shown in Table 5.16, chest pain was shown as the first TB sign and symptom with the longest median duration at 90 days while other common signs and symptoms such as cough, sputum production, low-grade fever, weakness, night sweats, and weight loss had the median duration of 60 days among participants with delay. However, some participants who had low-grade fever lasting about 3 years did not go to hospital. In addition, some patients who had cough, sputum production, weight loss, chest pain, or lack of appetite for 2 years did not go to the hospital. Moreover, some patients who had blood-tinged sputum or haemoptysis for one year or half a year did not suspect themselves having TB.

In participants without delay, weight loss was shown to be the first TB sign and symptom with the longest median duration at 3 weeks while the median duration of other common signs and symptoms such as cough, sputum production, chills, low-grade fever, weakness, night sweats and lack of appetite was about 2 weeks. In addition, haemoptysis was found as the first TB sign and symptom with the shortest median duration at 3 days.

Table 5.16 Duration between the first sign or symptom of TB and the first visit at the health care provider in PTB patients

The duration of the first sign or symptom of TB	PTB patients	
	With delay	Without delay
Cough		
Median (Minimum – Maximum)	60 (1 – 730)	14 (1 – 30)
Sputum production		
Median (Minimum – Maximum)	60 (1 – 730)	14.5 (3 – 30)
Blood-tinged sputum		
Median (Minimum – Maximum)	2.5 (1 – 365)	5 (1 – 30)
Cough up blood (Haemoptysis)		
Median (Minimum – Maximum)	2.5 (1 – 150)	3 (1 – 20)
Chills		
Median (Minimum – Maximum)	75 (1 – 365)	14 (2 – 30)
Low-grade fever		
Median (Minimum – Maximum)	60 (1 – 1,095)	14 (3 – 30)
Weakness		
Median (Minimum – Maximum)	60 (7 – 365)	14 (3 – 30)
Night sweats		
Median (Minimum – Maximum)	60 (7 – 365)	14 (3 – 30)

The duration of the first sign or symptom of TB	PTB patients	
	With delay	Without delay
Weight loss		
Median (Minimum – Maximum)	60 (20 – 730)	21 (7 – 30)
Chest pain		
Median (Minimum – Maximum)	90 (10 – 730)	10 (7 – 30)
Lack of appetite		
Median (Minimum – Maximum)	75 (30 – 730)	15 (2 – 30)

5.4 Influencing factors of patient delay

5.4.1 Univariate analysis results

As shown in Table 5.17, the Chi-square test was used to analyse the relationship between each factor with patient delay. Seventy-six variables among the nine characteristics were analysed by Chi-square test. The findings showed that there were only twenty influencing factors of patient delay on univariate analysis which is following.

According to sociodemographic-economic characteristic, three factors were significantly related to patient delay: marital status; the highest educational level; and family financial status. On the characteristics of knowledge, recognition, and stigmatisation about TB, there were three significant factors associated with the delay: suspected having TB; had any previous knowledge about TB; and thought as TB is a serious disease. On family and social support characteristics, there was only one significant factor – the main caregiver – related to patient delay. In terms of clinical signs of TB symptoms, there were five symptoms: sputum production; blood-tinged sputum; chills; weakness; and weight loss, significantly related to patient delay. On the health seeking behavioural characteristic, learned about TB; self-medication/self-treatment; the first contact facility; and the first health provider, significantly influenced patient delay. Representing accessibility and availability to TB service including the current residence, transportation, and had a comfortable journey were significantly associated with patient delay. While there was no relationship between patient delay with health behavioural characteristic and health status characteristic.

Table 5.17 Relationship between patient delay and influencing factors tested by Chi-square test

Influencing factors	PTB patients		χ^2	P-value
	With delay	Without delay		
Marital status				
Single	11	42	11.988	0.007*
Married	82	112		
Widow	15	22		
Divorced	10	6		
The highest level of education				
Illiterate	5	15	20.953	0.001*
Primary education	86	87		
Lower secondary education	12	34		
Upper secondary education	14	33		
Under graduation	1	8		
Post-graduation	0	5		
Family financial status				
Have savings	3	5	7.173	0.028*
Income = Expenses	34	80		
In debt	81	97		
Suspected having TB				
No	101	136	5.097	0.024*
Yes	17	46		
Had any previous knowledge about TB				
No	110	143	11.627	0.001*
Yes	8	39		
Thought as TB is a serious disease				
Very serious	40	53	9.056	0.011*
Somewhat serious	21	61		
Not very serious	57	68		
The main caregiver				
Father/mother	4	23	12.508	0.006*
Husband/wife	47	84		
Son/daughter	43	41		
Others	24	34		

Influencing factors	PTB patients		χ^2	P-value
	With delay	Without delay		
Sputum production				
Yes	74	52	34.253	0.001*
No	44	130		
Blood-tinged sputum				
Yes	20	14	6.104	0.013*
No	98	168		
Chills				
Yes	22	19	4.084	0.043*
No	96	163		
Weakness				
Yes	40	29	13.045	0.001*
No	78	153		
Weight loss				
Yes	69	53	25.564	0.001*
No	49	129		
Learned about TB				
No	98	110	17.214	0.001*
Yes	20	72		
Self-medication / self-treatment				
Yes	66	25	60.315	0.001*
No	52	157		
The first contact facility				
A primary health care unit	15	13	55.900	0.001*
A government hospital	45	144		
A private clinic	19	10		
A private hospital	2	2		
A pharmacy store	22	9		
A traditional healer	1	0		
A grocery	13	4		
A selling drug car	1	0		

Influencing factors	PTB patients		χ^2	P-value
	With delay	Without delay		
The first health provider				
Public health provider	59	157	52.629	0.001*
Private health provider	28	18		
TB specialist	1	1		
Pharmacist	15	1		
Grocer	15	5		
Current residence				
Rural area	111	158	4.066	0.044*
Urban area	7	24		
Types of transportation				
On foot	0	2	20.273	0.001*
Bicycle	3	7		
Motorcycle	54	118		
Personal car	33	41		
Bus	21	11		
Taxi	7	3		
Had a comfortable journey				
No	20	9	11.813	0.001*
Yes	98	173		
Thought as TB diagnosis or treatment are free services				
Yes	30	66	3.866	0.049*
No	88	116		

* P-value < 0.05

According to Table 5.18, the Mann-Whitney U test was used to analyse the relationship between each factor with patient delay because the distribution of all variables was not normal. Characteristic of clinical signs of TB symptoms excepted, twenty-two variables among 8 characteristics were analysed by the Mann-Whitney U test. There were only 10 significant associated factors with patient delay.

The sociodemographic – economic characteristic, older age was significantly associated with patient delay. A lower score on TB knowledge and a higher score on stigmatisation about TB were significantly related to patient delay representing the characteristic of knowledge, recognition, and stigmatisation about TB. With regard to family and social characteristic, the

higher the number of family members and a lower score on family and social support were significantly associated with patient delay. On the health seeking behavioural characteristic, more health care providers and more visits were related significantly to patient delay. Moreover, longer distance, longer travelling duration, and higher cost of transportation between their current residence and the nearest hospital were significantly associated with patient delay. There was no significant relationship between variables on health behavioural characteristic, and health status characteristic with patient delay.

Table 5.18 Relationship between patient delay and influencing factors tested by Mann-Whitney U test

Influencing Factors	Group	N	Mean Rank	Sum of Rank	Mann-Whitney U test	Z	Asymp. Sig.(2 tailed)
Age	With delay	118	170.82	20156.50	8340.500	-3.267	.001*
	Without delay	182	137.33	24993.50			
	Total	300					
TB knowledge score	With delay	118	134.96	15925.00	8904.000	-2.613	.009*
	Without delay	182	160.58	29225.00			
	Total	300					
Stigmatisation score	With delay	118	184.39	21758.50	6738.500	-5.466	.001*
	Without delay	182	128.52	23391.50			
	Total	300					
Number of family members	With delay	118	165.83	19567.50	8929.500	-2.507	.012*
	Without delay	182	140.56	25582.50			
	Total	300					
Family and social support score	With delay	118	122.89	14500.50	7479.500	-4.487	.001*
	Without delay	182	168.40	30649.50			
	Total	300					
Number of health care providers	With delay	118	195.01	23011.00	5486.000	-8.111	.001*
	Without delay	182	121.64	22139.00			
	Total	300					

Influencing Factors	Group	N	Mean Rank	Sum of Rank	Mann-Whitney U test	Z	Asymp. Sig.(2 tailed)
Number of visits	With delay	118	194.29	22926.00	5571.00	-7.826	.001*
	Without delay	182	122.11	22224.00			
	Total	300					
Distance between residence and health facility	With delay	118	176.94	20879.00	7618.000	-4.259	.001*
	Without delay	182	133.36	24271.00			
	Total	300					
Travelling duration	With delay	118	177.61	20957.00	7539.500	-4.437	.001*
	Without delay	182	132.93	24192.50			
	Total	300					
Cost of transportation	With delay	118	175.79	20743.50	7753.500	-4.090	.001*
	Without delay	182	134.10	24406.50			
	Total	300					

* P-value < 0.05

5.4.2 Multiple logistic regression

Multiple logistic regression was used to identify the influencing factors of patient delay among PTB patients. The selected variables were recruited from 30 factors which were analysed by univariate analysis: Chi-square test, and Mann-Whitney U test. The final model was constructed by using forward stepwise likelihood ratio method and accounted for setting to control the design effect. There was no interaction effect entered into the model.

According to the method, the 10 numerical variables including age, total score of basic knowledge about TB, total score of stigmatisation, number of family members, total score of family and social support, number of health care providers, number of visits, distance between residence and health facility, travelling time, and cost of transportation, were analysed directly.

The 20 categorical variables were transformed into dummy variables before analysing by multiple logistic regression. The variables consisted of marital status, the highest educational level, family financial status, suspected having TB, had any previous knowledge about TB, thought as TB is a serious disease, main caregiver, sputum production, blood-tinged sputum, chills, weakness, night sweats, learned about TB, self-medication/self-treatment, the first contact facility, the first health provider, current residence, transportation, had a comfortable journey, and thought as whether TB diagnosis or treatment had been free services.

Table 5.19 shows that there were only nine significant factors associated with patient delay. These were primary education, upper secondary education, had any previous knowledge about TB, thought as TB is a somewhat serious disease, total score of stigmatisation about TB, weight loss, self-medication/self-treatment, number of consulting health providers, and taking motorcycle as transportation.

Having a highest educational level as primary education was significantly associated with patient delay. Patients who graduated in primary education were 3.45 times more likely to have longer duration of patient delay than patients who graduated in other levels and illiterate (95% CI of OR = 1.62 – 7.33). Moreover, upper secondary education was also significantly associated with patient delay as patients who graduated in this level were 2.88 times more likely to be patient with delay group than ones in other levels or illiterate (95% CI of OR = 1.29 – 9.12).

In terms of having learned about TB before being treated, patients who did not learn about TB were 3.42 times more likely to have long period of patient delay than patients who did learn about TB (95% CI of OR = 1.29 – 9.12). However, on their opinion about how serious a disease TB is, patients who thought as TB is a somewhat serious disease were 62.7% less likely to have

long period of patient delay than patient who thought as TB is a very serious or not very serious disease (95% CI of OR = 0.19 – 0.75).

According to total score of stigmatisation about TB, patients who had higher score on stigmatisation about TB were 1.08 times more likely to have a delay than patients who had scored lower (95% CI of OR = 1.02 – 1.14). Regarding TB signs and symptoms, weight loss, patients who had weight loss were 2.37 times more likely to have a delay than patients who did not have weight loss (95% CI of OR = 1.28 – 4.36).

On health seeking behavioural characteristic, patients who had tried self-medication or self-treatment were 3.04 time more likely to have a longer delay than patients who had never tried self-care (95% CI of OR = 1.54 – 6.03). Moreover, the number of consulting health providers was also an influencing factor on patient delay as patients who had more consulting health providers were 2.25 times more likely to have a delay than patients who had fewer providers (95% CI of OR = 1.52 – 3.33).

In terms of transportation from their current residence to the nearest hospital, patients who took their motorcycle to the hospital were 49.3% less likely to have a long period of delay than patients who took other types of transportation (95% CI of OR = 0.28 – 0.93).

Table 5.19 Relationship between patient delay and influencing factors tested by Multiple logistic regression

Factor	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for Exp(B)	
							Lower	Upper
Primary education	1.238	.385	10.366	1	.001	3.449	1.623	7.330
Upper secondary education	1.058	.534	3.931	1	.047	2.881	1.012	8.200
Had any previous knowledge about TB	1.230	.500	6.060	1	.014	3.422	1.285	9.115
TB is a somewhat serious disease	-.986	.356	7.663	1	.006	.373	.186	.750
Total score of stigmatisation about TB	.076	.029	7.166	1	.007	1.079	1.021	1.142
Weight loss	.861	.312	7.629	1	.006	2.367	1.284	4.361
Self-medication/self-treatment	1.112	.349	10.162	1	.001	3.041	1.535	6.026
Number of consulting health providers	.810	.200	16.386	1	.000	2.247	1.518	3.326
Motorcycle	-.680	.312	4.764	1	.029	.507	.275	.933
Constant	-6.286	1.160	29.374	1	.000	.002		

Chi-square (Omnibus Tests of Model Coefficients) Model =136.210, df =9, Sig. = .001

Chi-square (Hosmer and Lemeshow Test) = 13.919, df = 8, Sig. = .084

-2 Log likelihood = 265.919, Cox & Snell R2 = .365, Pseudo R2 (Nagelkerke R2) = .494

5.5 Chapter summary

This chapter has presented the results of quantitative approach which included the duration and influencing factors of patient delay among 300 participants who were surveyed by a structured questionnaire.

In terms of the duration of patient delay, the results showed that there were 118 PTB patients having patient delay (39.33%). An overall median duration of the first sign and symptom of TB among participants was 2 months of which the maximum duration was 3 years and the minimum duration was 1 days.

With regard to the influencing factors of patient delay, there were only nine influencing factors of patient delay among these participants including primary education, upper secondary education, had any previous knowledge about TB, thought as TB is a somewhat serious disease, total score of stigmatisation about TB, weight loss, self-medication/self-treatment, number of consulting health providers, and taking motorcycle as transportation as shown in Figure 5.1.

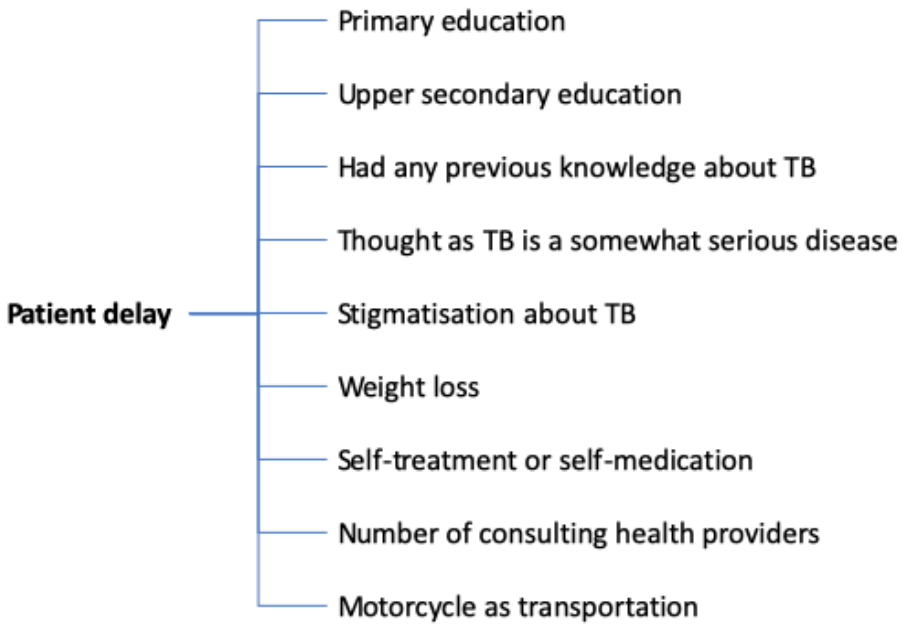


Figure 5.1 Influencing factors of patient delay found in quantitative findings

Chapter 6 Results: Qualitative data analysis

6.1 Introduction

This chapter presents findings from the second part of the study involving the interviews that were conducted among 25 participants. These participants were purposive recruited to the interviews as they were identified with patient delay by the surveys from quantitative phase. The aims of these interviews were to add depth and breadth to the quantitative results obtained from 300 participants and, in addition, to explain and confirm the factors that influenced the patient delay among these participants from the point of view of participants facing with patient delay. Therefore, only participants with patient delay were selected to take part in the interviews to gather more in-depth or hidden information from their real experiences.

Individual in-depth interviews were conducted to each participant which were relied on a semi-structured questionnaire and an unstructured questionnaire. The semi-structured questionnaire was constructed based on literature review and the quantitative results while the unstructured questionnaire was built during the interviews based on participants' answers to gain more in-depth or hidden information related to patient delay. Both types of questionnaires were blended together to maintain the continuity and fluency of the interviews as well as to build the natural atmosphere while the interviews went on.

The findings are shown in 6 themes developed based on the coincidences of each theme including: 1) sociodemographic-economic factors; 2) knowledge, recognition, and stigmatisation about TB factors; 3) family and social factors; 4) health seeking behaviour factors; 5) accessibility and availability to TB service factors; and 6) satisfaction with health care service factors.

6.2 Sociodemographic-economic factors

Economic status

Most participants stated that they had problems about economic status both direct and indirect influencing factors with patient delay. Some participants did not want to come to the hospital because of lack of money:

> I had time to come to the hospital but about money that I did not have. I had begged some money from my children in sometimes. (ID 02092)

> I had to work as a general labour. If I stopped to work, I would not get money. I would lack money about 300 Baht (£7.00) per day, so I decide to do not come to the hospital yet. (ID 02046)

> If we came here, we would stop working due to lack of money. It is about 4-5 thousand Baht (£93.40 – 116.75) per day, or it would be 2-3 thousand Baht (£46.70 – 70.00) in some days. (ID 01023)

> I thought that if I had to come to the hospital, I would have to stop working so I would have no income. It was another reason. (ID 02055)

> I was pitying that money, but I had to come to the hospital. I just wanted to get some money, only money. (ID 02070)

Some participants did not want to get treatment because of the high cost of treatment, especially getting treatment from the private hospital:

> If I was treated at St' Mary Hospital (a private hospital), it would be unable because it was very expensive, high cost. (ID 01028)

> A doctor at the private hospital told me that I had TB. I then had asked him to move to be treated here (Si Khio hospital: a government hospital). There were more expenses, it was very expensive. I could not get treatment there because the cost was very expensive. (ID 02083)

Most participants mentioned that money was a very important factor which influenced their delay in treatment:

> The principle issue that made me come to the hospital late was expenses which I did not have. (ID 02070)

> There was only this factor, money. If I had money, I could hire a taxi-motorcycle to drop me at home. I did not have money for the bus fee. Thus, if I hired the taxi, I might lack some food. It was very expensive about 400 – 500 Baht (£9.34 – 11.67) for transportation fees. (ID 02092)

> Everybody had some abnormal signs that they wanted to come to the doctor. However, due to poor, it made me cannot come. (ID 02092)

> About the expenses, it was one of causes for delaying in coming to the doctor late. (ID 02288)

> Expenses was one part of the reasons. As I am very old, I did not work anymore. So, money was one topic because I did not have any income. If I came to the hospital, I would pay for travelling fees and living costs. (ID 02036)

Some participants said that they had problems with expenses when they had to come to the hospital such as transportation fees or living costs. Thus, they decided that they did not come to get treatment at the hospital:

> There were more expenses for transportation costs and lunch costs which I had to pay about 200 Baht (£4.67) per day. (ID 02046)

> We had to hire the vehicle for a whole day about 300-400 Baht (£7.00-9.34) and it was about living costs so the expenses were still our problems. It costed me about 400 – 500 Baht (£9.34-11.67) in some times which depended on the driver. (ID 02069)

> I hired a rental car to the hospital (in the city) for a thousand Baht (£23.35) per day. I went there in the evening and back home about 1,500 Baht (£35.03) for a round trip. (ID 02083)

> Absolutely, as I had to pay full cost for round trip about 500 Baht (£11.67) so there was a problem about money definitely because of a lot of expenses. (ID 02288)

In addition, there were some participants claiming that the delay might be resulted from multifactor such as financial costs and severity of symptoms:

> The main thing was money that made me do not come to the hospital as well as my symptoms were not severe too. (ID 02070)

> About the expenses, it was one of causes for delaying in coming to meet the doctor late. At the beginning of symptoms, I did not have any TB-related symptoms as well so I did not come to meet the doctor at the hospital. (ID 02288)

Moreover, there was a woman living with HIV who concerned about expenses in the future:

> I will have one more kid. My new baby will have to drink only powdered milk so what should I do? I had to think all the time. In addition, I also worried about I would have to prepare some money for delivering at Maharat hospital such as travelling fees, and living fees. Thus, I had worried about expenses because I had paid for everything all the time for coming to the hospital. (ID 02070)

Working time

Working time may result in patient delay in getting initial treatment as some participants claimed that they had no time to attend a check-up after they had TB-related symptom. Some participants claimed that they had to work for their living and family. In addition, some participants stated that they worked in other places that obstructed them getting a TB screening test. Thus, they could not come to see the doctor although they had severe symptoms:

> I did not have time to check up because I had to work hard. I needed to get some more money for spending in my household (ID 01023)

> I thought that I might use the word of ‘do not have time’ because everybody had to work for life, so I had no time to get remedy. (ID 02087)

> I had to work. I left my symptoms for over a month because I had to work on my farms. I did everything on my own such as planted some rice seeds. When I finished,

> I just came to the hospital so it took about over a month. My reason was I had to work. I wanted to come but I had many works to do. (ID 02027)

> There were lots of works. I had many works to do. If I came to the doctor, I would have many duties so I could not stop working. (ID 02083)

> I suspected that I had TB but I did not have time to come to see the doctor at the beginning of symptoms onset as I had worked in another province. The first reason, I did not have time that I could not leave from my job to come to the hospital. (ID 02287)

Some participants had to stop working while they needed to come to the hospital so this reason was involved with a longer duration of getting treatment initially. If they stopped working, it would affect with their life in terms of lack of money for spending in their family:

> I thought that if I had to come to the hospital, I would have to stop working which resulted in no income. This was another reason to come to hospital late. (ID 02055)

> The principle reason, if I came to the hospital, I would stop working (driving a tractor). If I came to the hospital that meant I would not work. I had stopped to do anything, cancelled to hire others to work as well. (ID 02083)

> If I came to see the doctor, it would cause of lack of income for a day. (ID 07208)

Moreover, some participants might have been expelled from their job while they had to come to the hospital so that they did not want to come to get treatment at the hospital because it might affect their financial status:

> About leaving from my job, it made me have no budget. (ID 02070)

> If I leave from my job, I then would lack income for 300 Baht (£7.00) a day so I did not want to leave. (ID 07208)

> If I came to the hospital, I would lack income. It was about my work that I could not leave. (ID 02083)

> Another reason was about my job that I had left many times. (ID 02050)

Some participants needed to work thus they tried to endure and left their illness for a long time:

> I had to do many jobs so I tried to endure for a month. I had to endure for working because I did not have time and just waited for finishing from working, and then I came to meet the doctor. (ID 02027)

> I needed to work as usual thus I could endure, I just did my job. (ID 02094)

One participant claimed that the delay in getting treatment was involved with his lifestyle and the pattern of working:

> It looked like my lifestyle because I worked in my fields, so I might have not more time. If the symptoms were not really very severe, I did not want to come to the hospital in some times. (ID 02036)

Besides of the above factors, there was a patient who had a problem that led her to have long duration of delay because she faced with the situation which she could not avoid:

> My ex-husband had just passed away suddenly. So, I had to take care his father who was TB patient for a long time. I had to collect his sputum to throw away and contact with his used crockery but I left my symptoms for a long time because I thought that it might not be TB symptoms. (ID 02070)

6.3 Knowledge, Recognition, and Stigmatisation about TB factors

Knowledge about TB

Many participants claimed that knowledge about TB influenced their delay. It made them leave the symptoms related to TB for a long time before coming to seek treatment initially:

> I came to the doctor late because I did not know. At that time, I had a bit of cough along with the rainy season, so I thought that I had flu, just normal fever. (ID 01023)

> I did not know at all and I had never been this. Before being diagnosed, when I cough, there was sound when I breathed in-out but I did not know that I had TB. Thus, it made me do not come to see the doctor. (ID 01007)

> I did not know at all. I did not know what the first symptom starting, how the first symptom being. I did not know before. I thought that it was related to the knowledge about the disease. (ID 02048)

> The main point, I did not know what disease I had because of lack of knowledge. (ID 02065)

> The reason for coming to the doctor too late was that I did not know what my illness was and did not know about the disease. (ID 02076)

> The main point was I did not know that I had TB. The main reason was I did not know that these were TB symptoms. (ID 02080)

> I thought that I would come to hospital but did not come yet because I did not know what it was. I had never known and I did not have any relatives or others being like this that I could have experience or know from them. (ID 02050)

> I thought that I did not have knowledge about TB so I did not come to meet the doctor. (ID 02070)

Meanwhile, knowledge about TB was related to patient delay especially inaccurate knowledge which seemed to underpin a longer duration of delay. Some participants pointed out that they got TB from other sources, or did not contact with TB patients. The wrong knowledge could lead them to take a longer time to seek treatment because it made them have misperception on their disease, and do not realise about TB. Moreover, some participants stated that they did not know about the cause of TB which made them have long duration and do not seek treatment early:

> It might cause from smoking and drinking alcohol. I thought that the main thing, it caused from stone dusts, cigarette, and alcohol which I had consumed. (ID 02080)

> I used to work in a cassava factory where I had contacted with dust for many years. I also did not have any mask to cover my nose. Thus, I had breathed in and got dust into my lungs as well. (ID 01028)

> I thought that I drove only the bus using petrol, then I changed to drive the bus using gas and I could smell the gas inside the bus. So, I thought that it caused from contacting with the chemical substance. (ID 02065)

> I did not know its cause yet… As well as, there was nobody around my house being TB. So, I did not know where I got it from. (ID 02046)

> It would come from dusts or my workplace because there was nobody at home being this. (ID 02046)

According to knowledge about prevention, it may influence patient delay because they did not have the knowledge before being diagnosed. Thus, they might contact TB for a long time before recognising themselves as TB patients or accessing treatment:

> I used to take care father of my ex-husband who was TB patient. As well as I did not cover my nose and I had to collect his sputum to throw away. (ID 02070)

> Previous time, my father used to be a TB patient for long time ago, about 40 years ago. I had looked after him but I did not prevent myself while I looked after him. (ID 02076)

In terms of treatment, it involved with delay because some participants did not know correctly about the way to treat TB. Thus, they might send wrong messages to other people which made others get inaccurate knowledge resulting in a longer duration of delay:

> If I came to see the doctor early, I would not be TB. It would take only three months for treatment if I came to meet the doctor early. (ID 02027)

Moreover, as their lifestyle, some participants stated that they did not care or pay attention to others' illnesses because it was not their business. Thus, the participants did not have previous

knowledge about the disease and ignored their symptoms for a long time before accessing to treatment because they had no experience:

> It just seemed a folk lifestyle as we did not care at all. Whoever was sick or not that it was not other business as we did not care. (ID 02076)

In addition, some participants claimed that they did not have knowledge about the disease especially its signs and symptoms thus it made them have to endure:

> It was about I did not know about TB because I did not learn about it. So, I had to endure and wait for finishing from works and then came to the hospital. When I had blood-tinged sputum then I decided to come. So, it was my reason that made me come to see the doctor and then I just knew. (ID 02027)

> It was about I did not know and my symptoms were not severe. Thus, I could endure. (ID 02094)

> I thought that it was a normal symptom. So, I thought that I was able to live. I did not think that this would be very severe. (ID 07208)

Furthermore, knowledge about TB policy was also related to the delay because the participants did not know about it and also did not access to basic information about the national TB policy such as the information that TB treatment is free of charge:

> I thought that many Thai people lacked knowledge about TB. Although the government had supported or educated but it was focused among some groups. (ID 02048)

Recognition of TB

Recognition of TB was involved with the delay. Participants stated that a failure to recognise TB was a part of reasons which made them delay in seeking treatment. Most participants did not recognise they had TB so they left the symptoms for a long time. Moreover, some participants also claimed that they did not recognise themselves as being TB patients at all:

> I had a bad cough but I did not suspect. I did not suspect that I had TB, so I did not come to the hospital initially. (ID 01007)

> I thought that I did not suspect, I did not think that I would suffer from TB, and it might be related with I did not know about TB as well. (ID 02025)

> I did not suspect at all because I had never been it and known its symptoms. I just knew only that if I had TB, I would have only coughing up blood. (ID 02075)

Some participants claimed that they misrecognised on TB because they thought that age was involved with TB infection especially being old, or the symptoms was involved with their recognition. Thus, they left their symptoms for a long time:

> I thought that I was not TB at all because I still was young and strong. (ID 02048)

> In my feeling, if I saw someone having a bad cough, I would dislike them. However, if they had no cough, so I would not know and would not dislike them. (ID 02087)

TB-related signs and symptoms was associated with the delay. Some participants had no sign or symptom related to TB, thus they did not recognise about TB and then had longer duration of the delay:

> I had no symptoms at all. I just came to check up yearly in November 2017 here, I found that I was infected, but I had no symptoms at all. (ID 02087)

> The first time when I had some symptoms, I had sneezed many times and I then had sputum. I had these symptoms about a week. After I had sneeze, got sick, then I came here soon. (ID 02070)

Moreover, most participants claimed that they had signs or symptoms related to TB such as respiratory system symptoms especially cough, or other system symptoms. Many participants stated that they had these symptoms for a long time:

> In the first time, I had cough and sputum for 2 months. Oh! I lost my weight about 10 kilograms. I had cough and tired for over 1 month until I came to the hospital. (ID 01007)

> I had cough for 3 months. I had cough until the day I came to meet the doctor when I could not stop coughing, had shortness of breath and sputum. (ID 02050)

> The first symptoms, I had cough and lack of appetite. I could not eat anything. I also had sputum and fatigue. I then lost weight about 6-7 kilograms. If it was not necessary to come to the hospital or my symptoms were not really severe, I would not want to come to meet the doctor. (ID 01028)

> I had fever and cough, then both symptoms disappeared and then cough appeared again, cough as non-stop. I also had low-grade fever for a month, and fatigue for a month as well. (ID 02025)

However, misreading the symptoms which looked like other diseases such as fever, common cold, or other respiratory system diseases was claimed as a failure to recognise TB which resulted in patient delay. Participants claimed that misreading about their disease led them to have longer duration in seeking initial treatment:

> I just suspected that I had fever and cough so I came to see the doctor and it would be cured. (ID 01007)

> I thought that I suffered from normal flu because I used to be like this but it was cured. (ID 02046)

> I thought that I would not be anything, just a normal cough. (ID 02050)

> I just thought that it was just cough, only cough, just this. Cough up blood was just resulted from broken capillaries, so I just thought like this. (ID 02076)

> I thought that I just cough until the capillaries at my throat were broken but I did not come to the hospital. I had seen my symptoms occurring continuously, but it would disappear for a week and then it occurred again. Thus, I thought it was a normal cough, so I left it. (ID 02083)

In addition, some participants claimed that they did not recognise on having TB even they had some severe symptoms. As they did not know about the disease, they also expressed that the symptoms made them be worried about their health conditions and thus some participants decided to do not come to see the doctor:

> In the first time, I thought that TB was far away from me. I did not know about it before and did not care at all. As I did not know about TB so I left my symptoms for long time, until I had cough up blood then I just came to the hospital. (ID 02046)

> I did not know as well. I came to check at the hospital and I then was shocked that I got TB. (ID 02094)

> I had cough and cough up blood, the brown blood, but it was not blood as others having. So, I did not think as I had TB because my symptoms were not severe. (ID 02027)

Furthermore, there were some participants suspecting that they might have TB but they still came to get treatment late:

> I had suspected that I had it. I used to be like this, then it was cured and relapsed again. (ID 02092)

> I suspected but I did not have time to come to see the doctor at the beginning of symptoms onset. (ID 02287)

Moreover, due to lack of knowledge and recognition on TB, participants had longer duration between the symptoms onset and getting TB treatment due to endurance or patience. Some participants pointed out that they could endure in the first period for a long time before coming to seek medical help. Some participants stated that they endured because they still had good health or had mild symptoms. Thus, they endured and left their symptoms for a long time:

> It was about myself that I could be patient so I did not come to hospital early. Eventually, it was the end point that I could not live so I came to get treatment at the hospital. (ID 02069)

> I could be patient. However, I could not talk with my friends until the end of conversation in some times because I had a lot of cough. I coughed all the time since the morning until the evening. However, I could endure so I did not come to see the doctor. (ID 02044)

> If it was about my tolerant in the first period, I thought that I could live so I left my symptoms. (ID 02083)

> I thought that it was related to the endurance. The strong of my body was a part of the reasons. (ID 02048)

> It was involved with the endurance of my body as well. The symptoms were not too severe, so I did not come to hospital yet. (ID 02025)

> I could endure until the maximum point that I could not endure, then I came to the hospital… It seemed this, if the symptoms were mild, I would not come to the hospital, would endure, so I would endure in the most of times. This was another reason. (ID 02065)

> I thought that it was a mild symptom and I was able to live. I did not think that my symptoms would be very severe. (ID 07208)

Some participants claimed that they endured their symptoms for a long time until they could not endure anymore because they had severe symptoms due to leaving the symptoms for a long time:

> I thought that I could not live. It looked like I had left the symptoms until I could not live. (ID 02076)

> Eventually, I could not endure, then I decided to come to the hospital. (ID 02065)

Moreover, health behaviour was claimed that it was related to a failure to recognise TB which influenced patient delay in terms of misreading the occurring symptoms. According to the first symptom of TB is quite similar to other diseases symptoms or symptoms caused by bad health behaviours such as smoking, drinking, or using illicit drugs. Most participants believed that they got TB from health behaviours such as smoking and alcohol consumption. Some of them also claimed that they had symptoms related to TB from smoking such as cough which made them do not recognise the TB symptoms. In addition, some participants who consumed alcohol frequently also pointed out that they had symptoms related to TB from drinking alcohol. However, participants who smoked and consumed alcohol thought that they had other diseases, not TB:

> I had bad cough at that time, then I stopped smoking. I thought that it caused from smoking and drinking alcohol. (ID 02027)

> After that, I had these symptoms when I ordained to be a monk because I had smoked. (ID 01028)

> Smoking was related with my symptom because when I smoked, and then the smoke would be into my lungs. Thus, my lungs would be destroyed that it was involved. (ID 02083)

> I thought that my symptom resulted from smoking which it was cumulative. I had smoked previously for many years, so I thought that it caused from smoking, alcohol, dusts, pesticides, many causes. (ID 02092)

Stigmatisation

Stigmatisation influenced many infectious diseases which made participants avoid screening, diagnosis, and also treatment especially for a stigmatised infectious disease such as TB. Many participants claimed that they did not want to come to get TB screening because they would be disliked by other people misunderstanding about TB. Thus, they left their symptoms for a long time:

> I did not want to tell them because I feared that they would not accept me and dislike me. (ID 02046)

> As a communicable disease or a disgusting disease, I was afraid that people surrounding me would think about my illness. They would be good on me or not, they would do something or not, so it made me think carefully. The main reason was that I cared the social and others surrounding me about how they thought about me. (ID 02048)

> As a bus driver, I went to my bus after I was diagnosed with TB but my employee told me to go back home immediately. After that, the blankets for the passengers in the bus were taken out to wash outside because he feared the germs spreading to other people in the company. He told his staffs to pack my clothes into the box. My clothes were separated, packed and token down from my room. He told me again that I was not allowed to come back until the disease was cured. (ID 02065)

> I felt that other people such as nurses or other staffs here did not like me. I felt that I was abnormal. It seemed that they had more cautious when they gave me some treatment. It made me feel what I was. It seemed that I looked like a wicked person. This was my true feeling. (ID 02068)

Stigmatisation on HIV was claimed as it was related to the delay. Some participants who had particular diseases such as HIV or AIDS would wish to keep it confidentially because it was related to stigmatisation about the diseases. Moreover, the relationship between TB and HIV was also an important topic that made them leave their symptoms for a long time. Some participants knew that if they had TB, they also had to get HIV screening which was the biggest

issue in their life because most people did not accept someone living with HIV. According to HIV infection, some participants had a viewpoint about the disease which led them to have a longer duration:

> When the doctor diagnosed me as TB patient, he did not diagnose me only TB and DM but he ordered HIV test as well. Thus, I feared about this, feared about I would be tested HIV screening and then found HIV positive which might result in having more stress. Then my other way was I decided to do not come to see the doctor, just left my symptoms. (ID 02075)

> I worried about other people would know about the disease (HIV). Moreover, I worried about if I delivered my baby and he would be infected the diseases (HIV), so other people might know. So, if other people knew, what should I do? (ID 02070)

> I thought that both (TB and HIV) were related together. (ID 02092)

6.4 Family and social factors

Family and social factors were associated with the duration of getting TB treatment among participants. There were two topics in this aspect: contact with TB patients, and family and social support. Some participants stated that they had never contacted with any TB patient before thus they did not have any experiences about TB. This made them have a long duration of delay in getting treatment:

> I did not have any relatives or others being like this that I could have some experiences or knowledge from them. (ID 02050)

> About TB, I did not know at all because there was nobody at my home having TB, and around my home as well. (ID 02075)

While some participants explained that they had contacted with confirmed TB patients for long time ago thus they did not suspect themselves suffering from TB at the moment. It resulted in having a longer duration of the delay:

> Previous time, I had seen among old generation, my father was a TB patient for long time ago, for about 40 years ago. (ID 02076)

> I knew someone, my brother, but he got sick for long time ago, long time, and he was treated and cured. (ID 02087)

> My grandfather was TB in the past. We are sick as the same time, but he was sick before me. (ID 02287)

Family and social support involved with a longer duration of participants getting TB treatment. Some participants had no caregiver, so they had left their symptoms and came to get treatment late:

> In the first time, I had my wife living with me. We lived at Subsaree village together. After that we divorced, and then she ran away from me to live here. So, I have lived alone since that time. (ID 02036)

> My daughter knew about TB because she is a health volunteer. However, she did not look after me or observe me because she had to work. (ID 02288)

> I stayed alone, so I had to take care my own, take medicines on myself, and do anything on my own. (ID 02287)

6.5 Health seeking behaviour factors

Health seeking behaviour was related to patient delay whereby it could lead participants to have more time during seek appropriate treatment. There were many patterns of health seeking behaviour such as self-medication, government health care facilities, or private health care facilities.

Self-care behaviour

Self-care behaviour, one of influencing factors on patient delay, was related to longer duration of accessing to get TB treatment which was involved with the way of life, belief, and habit especially the belief in self-treatment or self-medication. There were participants who claimed that they did not meet the doctor but chose to do self-treatment because they believed that they could treat themselves like they used to treat themselves with previous illnesses as usual:

> When we got sick, we went to buy medicines by ourselves first. It was our lifestyle to take self-care or self-treatment. We used to do like this and the disease was cured. (ID 02025)

> Most of us bought some medicines by ourselves especially the elderly people who were stubborn. This was our lifestyle, so we tried to buy medicines by ourselves or tried to do self-treatment. If we were better, so we would not come to the hospital. If we were not better or got worst, so we would come to the hospital. I thought it was involved with our lifestyle. (ID 02036)

> I was complacent because every time when I got sick, I normally bought and took medicines by myself, then it was cured. I thought that it would be cured. (ID 02048)

The most common way of self-medication was that buying medicines by themselves. Some participants bought medicines from a private health provider at a drug store or a private clinic:

> I bought some cough medicines from a pharmacy shop before coming to see the doctor here. The shop was located in my community where the owner was a nurse who established her own shop in community. (ID 02025)

> In the first period after I had the symptoms, I went to the pharmacy shop and bought some medicines by myself. I did self-treatment continuously until 'aww!' it was not cured so I came to be checked up with the doctor here. (ID 02048)

> In the first time, I went to the drug store to buy medicines by myself. (ID 02055)

However, there are many participants claiming that they had been to buy medicines from a grocery in the community, or a selling medicine-car where the owner was non-formal health providers:

> I bought only cough medicines such as brown mixture of Leopard brand. I had taken it continuously which I bought from a grocery in my village. (ID 02036)

> Before coming to the hospital, I bought and took medicines by myself continuously. I was not better, but my symptoms disappeared for a short time and then it recovered again. I bought the medicines from a grocery in my community where the owner was just a grocer who did not have knowledge about diseases. (ID 02046)

> This was my reason that I did not need to come to the doctor. I thought that I just bought cough medicines or sore throat medicines to take at home so it would be cured. (ID 02050)

> As someone told that this herb was good, so I bought it for taking on my own but my symptom was not cured. There was someone going to my village by his car to sell this herb medicine. The seller told me that it was from the doctor in the city but I did not know where it was from. (ID 02044)

Seeking health care behaviour

Some participants chose to get treatment in a primary care unit (PCU), the first level of government health facility in Thailand, which was located in the community and nearest to participants' home. Here, there was no TB specialist, so it led to a longer time to get appropriate treatment initially because they were not detected as TB patients or suspected cases:

> I just went to the PCU and got only cough medicines both tablets and syrup. I went to get the medicines at the PCU many times, about 5 times. The health provider gave me only a bottle of cough medicine each time. (ID 02069)

> I went to PCU in the first visit. As I said, I just had cough, so the health provider gave me some basic medicines, just only cough medicines. (ID 02076)

> I did not buy any medicine on my own. I went to the PCU and I got medicines about painkillers and fever reducers. (ID 02288)

The second level, a government district hospital was chosen by some participants as well. Some participants who lived near to the district hospital would choose to come to get treatment from the hospital. However, they also had patient delay in TB treatment because they had left their symptoms for a long time:

> Here, I came here in the first visit, after I had symptoms for over a month. I did not go to get treatment at any hospital in Chaiyaphum province where was not my hometown. I had waited to come to this hospital (Si Khio Hospital). (ID 02287)

> Before coming to see the doctor here, my symptom was intermittent so I did not treat anything. Eventually, when I had haemoptysis so I thought that I could not leave it, and then I came to meet the doctor. (ID 07208)

> I was here at the first visit after I had cough for 3 months. In the first time, I had been suspected as TB case, just suspected case. (ID 02083)

Moreover, some participants chose to get treatment in the private sectors. The most common in this sector was a clinic because they had been treated there previously. However, the participants had longer time after symptoms onset until getting treatment because they were not checked or diagnosed by a TB specialist, just a general doctor there:

> I went to a clinic in Dan Khun Thot twice where the doctor gave me some medicines and injected me but my symptoms were not cured. (ID 01007)

> In the first time, I went to a clinic in Nong Nam Sai village because it was nearby my home. I thought that my symptoms were not too severe, so I went to the clinic first and then went to Thepparat hospital. (ID 02080)

> I came to see a doctor, Dr. Bunpot, at his clinic in Khok Kruat immediately where I visited anytime when I was tired or had other symptoms, once a month. (ID 01023)

In addition, some participants went to get treatment at a private hospital which was considered as a good health facility with higher technology rather than the government hospital. However, they came to get TB treatment late after they had symptoms for a long time:

> The first visit, I went to check up at St' Mary hospital where was mentioned by the abbot after I had the symptoms related to TB for 2 months. A doctor had known that I had TB in the first visit. (ID 01028)

> After I had the symptoms for 3 months, I then went to see the doctor at the hospital in the city first – Bangkok-Ratchasima Hospital – because there were many specialists there. (ID 02083)

> After I had symptoms for 5 weeks, I then decided to see the doctor at St'Mary hospital because my daughter took me there. I thought it made me know the disease fastest. (ID 02094)

6.6 Accessibility and availability of TB services factors

Accessibility and availability of TB service was related to patient delay especially travelling from their home to the nearest hospital. Most of them claimed that they had a problem with the travelling which made them come to see the doctor at hospital late:

> Travelling was one of the reasons of delaying in getting treatment initially. (ID 02036)

> About the travelling, it was not comfortable for me, so it was another reason to come to meet the doctor late. It was about difficult travelling and travelling fees that I had to pay on myself. (ID 02044)

Some participants claimed that they feared or felt bored with a long journey between their home and the nearest hospital which made them avoid coming to the hospital:

> I feared that it would be difficult for me and my relatives because the hospital was far away from my home. It would be difficult on many things. (ID 02065)

> The travelling, it was the distance which made me feel bored. The distance was quite far about more than 10 kilometres. (ID 02076)

In addition, they also pointed out that they had a problem about types of transportation especially some participants who had no own car:

> It was difficult to travel because I did not have my own car. If I came to the hospital, I would need to get the public bus which I had to come together with students on the school bus in the morning. In the evening, I then had to wait for the bus and took it to home with students again. (ID 02046)

> It was not very convenient because I had no own car. I had to come to the hospital by public bus. I thought that it was one of the reasons why I did not come to the hospital. When I had to come to the hospital, I came by bus and had to come in the early morning by the public bus. (ID 02055)

Some of them expressed that they faced with the difficulty of travelling from their home to the hospital which made their journeys longer:

> About travelling, it was… I had to change many buses. So, if I came from my home, I would take a taxi-motorcycle about 50 Baht (£1.17), then took the bus from Klong Phai about 10 Baht (£0.23), and about the return round, I had to take the bus to Klong Phai about 10 Baht (£0.23), then taxi-motorcycle about 50 Baht (£1.17). (ID 02070)

> Oh! It was very difficult. Yesterday, I left from home about 1 pm, my son in law dropped me at the bus stop, then I had waited for the bus for an hour, and arrived at the hospital about 3 pm so I had stayed overnight at the hospital. And there was the last bus from the city to my home about 3.30 pm. If I finished from the hospital

> after 3.30 pm, I would have no bus to go back home so I then had to stay overnight at the hospital for one night more. Thus, my reasons were about travelling and transportation. (ID 02092)

> It was about the distance that was very far from my village to the hospital. I had to take the bus at 8.00 am and would arrive to the hospital at 12.00 pm, and then would arrive my home at 5.00 pm. (ID 02044)

Moreover, participants stated that they had some limitations on travelling, such as inconvenience, thus they endured and ignored their symptoms for a long time:

> About treatment, if there was an inconvenient journey, I would be able to live as I could. I thought I could live and sustain the symptoms, so I lived. I was able to live and did not want to come to hospital. My reason for delaying to meet the doctor was the tolerance of people. And it was about my abilities to live and to fight against the disease until I could not fight. (ID 01028)

> I thought that if I could live so I would do. As well as there was the difficult journey along with my mild symptoms so I left it continuously until I could not be patient. Thus, I then came to see the doctor. If I could endure so I would endure. (ID 02092)

Some participants claimed that they had to choose this facility (PCU) because it was close to their home that they could not choose another better facility:

> The PCU was close to my home about 2-3 kilometres. Thus, I could take the motorcycle there. It was easier for going there than coming to the hospital. (ID 02069)

Moreover, some participants also claimed that they had faced some problems with accessibility to the higher-level health care facilities. The referral system between lower- and higher-level health care facilities caused a delay because they were referred from the first facility to another one. Some of them feared that they might be referred to another higher-level hospital:

> I came to Si Khio hospital, then was referred to Thepparat hospital. I went there where I was given medicine to treat about my cough for many years. However, my symptoms disappeared and then became again thus I came here. (ID 02080)

> I feared about to be referred to Maharat hospital where was the biggest hospital in this region. I feared that it would be difficult for me and my relatives and it was far away from my home. (ID 02065)

Besides the above problems, there was a patient facing with an admission system problem that made him have a long duration of delay:

> The major problem, there was no room for me while the disease was severe. When I came here and got a room but there was nobody observing me, so I then did not allow to be admitted and did not get an appropriate TB treatment. (ID 02068)

6.7 Satisfaction with health care services factors

Satisfaction with health care services was related to patient delay. Some participants who satisfied with health care services would get treatment early. However, some participants who did not satisfied with the services or had some problems with the services would avoid getting treatment. Many problems were claimed by participants such as service system and diagnosis system. Participants who had problems with services claimed that they had received the same treatment in every visit when they came to meet the doctor at the hospital. Some of them stated that they had got only paracetamol when they came to the hospital. Thus, they avoided to come to the hospital because they did not want to face with these problems:

> I came to the hospital because I felt that my health condition was worst. However, when I met nurses or doctors at the hospital, they just gave me only paracetamol and told me going back to take a rest at home. This was one of my reasons that made me feel bored and want to go somewhere else. When I came here, I had got the same services, so I decided to take care myself continuously. (ID 02068)

> In sometimes, I got only paracetamol that I could buy it on my own. Would it be better than coming to the hospital or not? (ID 02287)

In addition, some participants had problems to deal with the diagnosis system. Some of them spent long time to come to get treatment without being diagnosed with TB:

> At Thepparat hospital, I had been there for a year. The doctor did not diagnose what I was. At that time, he gave me some medicines to take at home, about cough medicine. It took me for a year to go there, so I came to this hospital. (ID 02080)

> I went to meet the health provider at PCU and was given medicines about cough medicine for taking at home. The provider there did not suspect me as a TB patient. (ID 02288)

6.8 Chapter summary

This chapter has presented the qualitative data involving the influencing factors of patient delay. 25 participants with patient delay were interviewed using a semi-structured questionnaire and unstructured questions also.

The influencing factors analysed from the content analysis showed that there were many factors influencing with patient delay as multifactor which included six influencing factors as shown in Figure 6.1. For sociodemographic-economic factors, patient delay related to economic status and working time. In terms of knowledge, recognition, and stigmatisation factors, knowledge about TB, recognition on TB and stigmatisation on TB were reported as relevant factors of the delay. To detail of this factor, lack of knowledge and incorrect knowledge were reported to be associated with knowledge. Signs and symptoms and health behaviour were claimed to be

related to recognition on TB. Stigmatisation on TB, HIV, and TB-HIV were also reported to be relevant to stigmatisation. Moreover, family and social support was claimed as an influencing factor in the delay in terms of family and social factors. For health seeking behaviour factors, self-treatment or self-medication and seeking health care behaviour were reported as influencing factors for patient delay which seeking care with non-formal and formal health provider were reported by participants. According to accessibility and availability to TB services factors, distance from their home and the nearest hospital, time duration of travelling, and types of transportation were also claimed as influencing factors for patient delay. Moreover, satisfaction with health care services factors, the health system problems such as service system and diagnosis system were stated as factors of the delay among these participants.

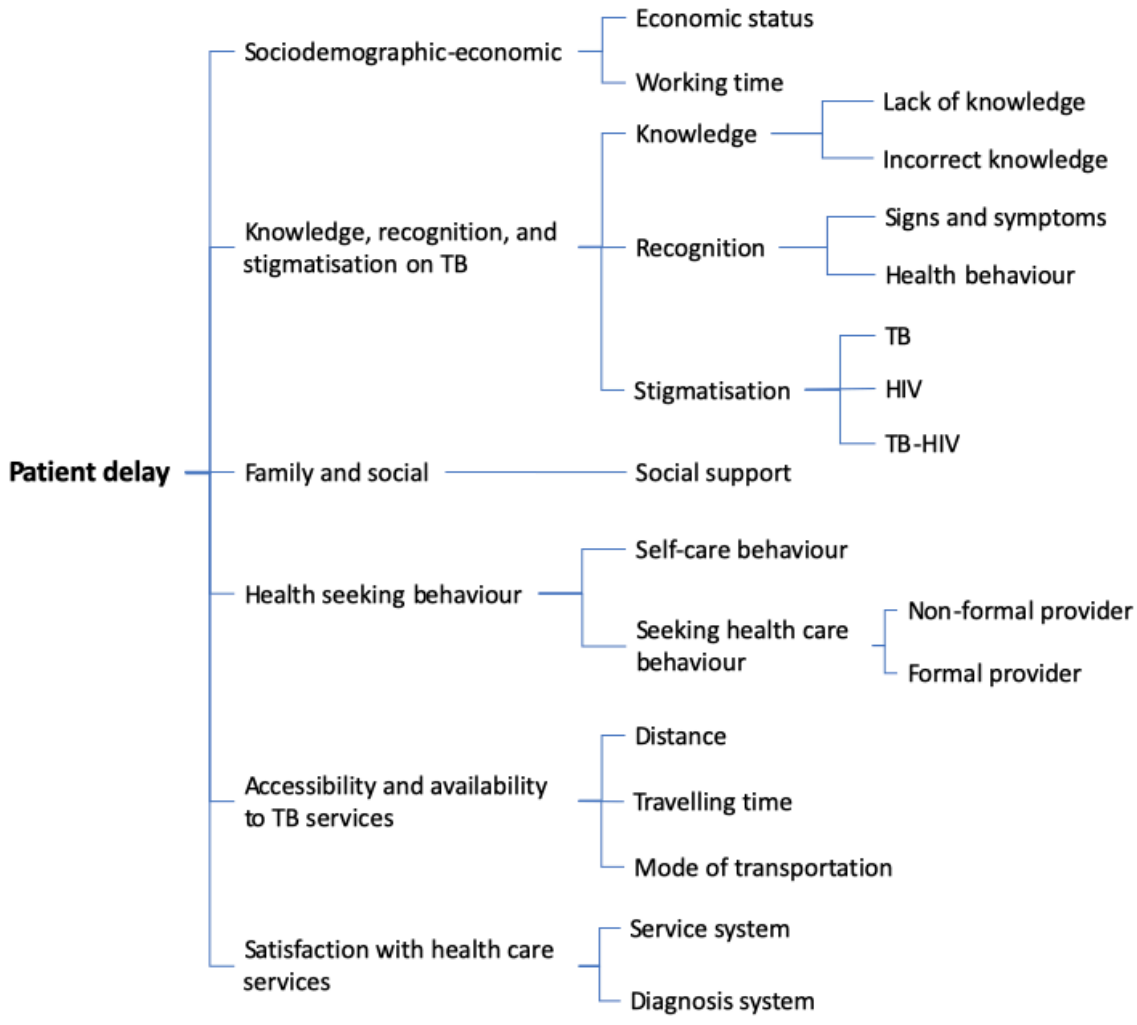


Figure 6.1 Influencing factors of patient delay found in qualitative findings

Chapter 7 Discussion

7.1 Introduction

The purpose of this study focused on to explore the duration and influencing factors of patient delay among PTB patients in a high burden area in Thailand. The objective was achieved by using a self-administered questionnaire and an interviewer-administered questionnaire to collect general data within nine characteristics among 300 participants and semi-structured in-depth interviews to gather more details from participants' experiences among 25 recruited participants with patient delay.

The aim of this chapter is to discuss the key findings emerging from both quantitative and qualitative approaches addressed in this study and to compare and contrast with the existing studies and theories about the duration and influencing factors of patient delay among PTB patients. The association between the both data sets is also considered and combined in this chapter.

7.2 The contribution of the study

This study contributes to the understanding the influencing factors for patient delay among PTB patients. These contributions are:

1. This study illustrates, based on the mixed methods, a unique design to study the influencing factors for patient delay which combines both quantitative and qualitative findings. This is the first complete mixed methods study in this area which can be applied and refined by investigators in other settings to develop our understanding of how PTB patients have longer duration of the delay.

2. This study depicts the influencing factors on the delay based on the limitations of culture and social contexts of the nation. This is the first study which discusses and links the national policies in other area such as the basic education core curriculum, not only health policies, to this delay. This can be adopted by other researchers and health care providers in their work within the relevant culture and social contexts.

3. This study offers further understanding of psychological theories related to intention to perform health-related behaviours. This is the first study implmenting two psychological theories – HBM and TRA – in this area. It can contribute to the empirical evidence for the relationship between theories and delay in treatment which can be applied to other health-related bahaviours.

4. This study provides an empirical example of the relationships between the key influencing factors namely knowledge, financial barrier, residence area, and social support, and other factors – no study has previously studied these relationships. It also contributes to the empirical evidence of the relationship between the key influencing factors and patient delay and the relationships between the key factors and other related factors.

5. This study is unique in terms of setting and the topic which is conducted in the settings. Most of studies about TB in Thailand have been undertaken in other regions while the data show that in this region, especially in Nakhon Ratchasima province, has the highest incidence and prevalence of TB in the country. It can contribute to as an empirical study about the duration and influencing factors of patient delay in the relevant settings.

7.3 The relationship between the quantitative and qualitative data sets

One of the central points in undertaking a mixed methods approach of this study was to explore the factors influencing patient delay among PTB patients. There was only one group of participants recruited into the study: 300 participants for the quantitative part including all PTB patients, and 25 participants for the qualitative part including only participants with patient delay who had done the questionnaire from the first part. Thus, the findings of the qualitative part were used to support the results of quantitative part as this approach, mixed methods, combines the strengths of both approaches and minimises their weaknesses.

In this study, a quantitative approach in the form of a self-administered questionnaire and an interviewer-administered questionnaire (face-to-face) by a structured questionnaire were adopted to explore the factors which could influence the delay among these participants. The influencing factors included in the questionnaire were based on a literature review thus the results from the questionnaire may not completely explain the whole phenomenon of influencing factors of patient delay. Undertaking semi-structured interviews among the participants with the delay was thus addressed to describe the depth or hidden details of this phenomenon by participants' experiences.

7.4 Discussion of the key findings

7.4.1 The percentage of participants with patient delay

Consequences of patient delay

According to findings of this study, it can be shown that there were two main consequences of patient delay namely individual and community level.

Individual level

In terms of individual level, the quantitative findings showed that there were more participants with patient delay having severe symptoms such as haemoptysis or blood-tinged sputum than participants without the delay. This corresponds to Buregyeya et al. (2014) and Cheng et al. (2013) who found that the disease became worse by the delay. In addition, in TB disease area, many studies are congruent with this result that delay resulted in more extensive disease and more difficulties (Ward et al., 2004; Lin et al., 2009; Osei et al., 2015). Moreover, in other disease areas, patients who reported delays had longer hospital stays when were compared with others (Weissman et al., 1991) as well as Luma et al. (2018) found that late presentation to HIV care was significantly related to poor outcome. Additionally, Henry et al. (2016) also stated that delay in diagnosis of patients with leprosy allowed progression of the disease and more severe disability.

The qualitative findings also support the quantitative findings. Participants stated that they had neglected their mild symptoms such as cough, low-grade fever, weakness, night sweats, or lack of appetite for a long time until they had severe symptoms such as coughing up blood. This corresponds to Okutan et al. (2005) pointing out that a characteristic of TB is that the disease progresses insidiously until the symptoms appear thus patients usually were not aware of the disease during this period. Moreover, it can be also shown that participants with delay resulted in more serious illness as they claimed that they might die from leaving their symptoms for a long time. This finding is consistent with previous studies reporting that long delay contributed to severity of illness (Yimer et al., 2009; Sawaboon et al., 2011; Gebreegziabher et al., 2016b). In addition, in TB disease area, it corresponds to a study in France undertaken by Zahar et al. (2001) showing that a duration between symptoms onset and treatment of more than 1 month could predict mortality. Furthermore, many researchers pointed out that the result of having longer delay was associated with higher death rate as shown in previous studies (Nyasulu et al., 2015; Ayuo et al., 2008; Tsai et al., 2008). Additionally, among participants living with HIV, the delay also was claimed as a major cause of death in this study which is consistent with a study of Lusignani et al. (2013) stating that delay might partially explain the high mortality rates among PLHIV. It thus can be confirmed that the delay may lead to increased mortality among patient not TB only but TB/HIV as well. Also, it increased the risk of enhancing drug resistance resulting in increased mortality rate (Gebreegziabher et al., 2016b). Moreover, in other diseases, the delay in diagnosis and treatment of breast cancer could result in an increased death (Jaiswal et al., 2018) as well as Gayet-Ageron et al. (2018) found that immediate treatment could improve survival by more than 70% among patients in acute severe haemorrhage.

Community level

In terms of community level, the quantitative findings showed that there were more participants with patient delay contacting with previous TB cases in their family and community than participants without the delay. This result corresponds to a study of Leutscher et al. (2012) who found that delay was critical due to increased risk of spreading the infection to close contacts as well as it also resulted in an increased duration of infectivity in the community (Yimer et al., 2005). In terms of other disease areas, timely diagnosis and shortening the waiting time for diagnosis could effectively decrease the transmission risk and effectively prevent the endemic of COVID-19 (Rong et al., 2020). In addition, Henry et al. (2016) showed that the delay could increase the transmission of leprosy infection.

Furthermore, the qualitative findings also support the quantitative findings. Participants with delay claimed that they had contacted with previous TB cases and believed that they became infected with the disease from previous TB cases in their family and community. Lusignani et al. (2013) stated that most transmission arose between the onset of coughing and the beginning of treatment. Thus, it can be seen that a greater risk of transmission of the disease depended on a longer duration of patient delay. These findings also are consistent with many previous studies pointing out that the delay increased TB transmission (Huong et al., 2007; Kanyerere & Aase, 2011; Buregyeya et al., 2014). In addition, some studies explained that an untreated patient might infect more than 15 persons annually (World Health Organisation, 1996; Storla et al., 2008) and more than 20 during the whole natural history of the disease until death (Enarson et al., 1978). Also, Tsadik et al. (2019) found that delayed health care seeking might influence the prevention and control effort and alarmed the potential threat to the transmission of STI/HIV.

Therefore, it can be seen that patient delay could result in two major consequences namely individual and community level as Said et al. (2017) and Chaychoowong (2019) stating that delaying treatment of TB had significant consequences for disease control in both individual and community level. Thus, a higher percentage of participants having a longer duration of delay is important in terms of resulting in increased morbidity of new active PTB cases and mortality of PTB patients, and also wider transmission of TB infection in communities.

The percentage of participants with patient delay

According to this study, 30-days was considered as a cut-off point to divide participants into two groups: participants with and without patient delay. A percentage of participants who were defined with patient delay in the quantitative findings was 39.33% which is greater than a study of Chaychoowong and Suggaravetsiti (2009) who studied in the central part of Thailand stating

that the percentage of participants who had the duration of patient delay lasting for more than 30 days was 31.30%. The finding of this current study is close to a study in Tanzania performed by Ngadaya et al. (2009) found that 38.35% of their participants delayed seeking health care for more than 30 days.

Interestingly, from the previous studies, the higher percentage of PTB patients having the delay for more than 30 days was frequently found in low income countries such as Ethiopia (Demissie et al., 2002; Mesfin et al., 2009), Nepal (Mahato et al., 2015; Laohasiriwong et al., 2016b), Ghana (Osei et al., 2015), Nigeria (Fatiregun & Ejeckam, 2010), and Zimbabwe (Takarinda et al., 2015).

Therefore, it can be seen that a high percentage of patient delay is often found in the low- and middle-income countries where have chronic widespread poverty, less economic development, and health risks such as hygiene problems which may lead to limited access to health care facility or increased risk of transmission of the disease. Importantly, the percentage of participants with longer patient delay may be used to assess the success of TB control in terms of active case finding strategy. A low percentage of new TB patients with the delay may be used to assume that health providers may detect presumptive TB cases initially which may result in decreased morbidity, mortality, and transmission.

7.4.2 Duration of patient delay

Duration of patient delay

Regarding the duration between onset of the first symptom and the first visit to health care provider called 'patient delay', the quantitative findings showed that a 60-day was presented as a median duration of patient delay among participants with delay. This is supported by the qualitative findings. Participants also claimed that they had a duration of the delay at around 2 months. These findings are consistent with many previous studies in Ethiopia presenting that the median patient delay was 60 days (Demissie et al., 2002; Mesfin et al., 2005; Gele et al., 2009; Hussen et al., 2012) as well as in other countries such as Gambia (Lienhardt et al., 2001); Mozambique (Saifodine et al., 2013); Nigeria (Odusanya & Babafemi, 2004; Fatiregun & Ejeckam, 2010); and Tanzania (Ngadaya et al., 2009). Moreover, a study in a mountainous province of China undertaken by Lin et al. (2008) also found that the median patient delay in this area was 60 days.

However, the findings of this study are not consistent with any previous studies in Thailand. The longest median duration of patient delay in Thailand, 90 days, was found in the central part of Thailand (Chaychoowong & Suggaravetsiri, 2009) while the shortest median duration of patient delay, 11 days, was found in the northern part of Thailand (Ngamvithayapong et al., 2001).

Moreover, the median duration of patient delay at a month was found in the southern part of Thailand (Rojpibulstit et al., 2006; Pungrassami et al., 2010) as well as in a study at 10 tertiary level care hospitals in Thailand (Rattananupong et al., 2015). Furthermore, a 60-day, a median duration of patient delay of this study, is longer than many studies especially performed in developed countries such as in Argentina (Zerbini et al., 2008); Australia (Ward et al., 2001); France (Tattevin et al., 2012), Hong Kong (Leung, E. C. et al., 2007), Italy (Gagliotti et al., 2006; Pezzotti et al., 2015); Japan (Sasaki et al., 2000), Norway (Farah et al., 2006); Qatar (Ibrahim et al., 2016); Spain (Diez et al., 2004); Taiwan (Chiang et al., 2005), United Kingdom (Sultan et al., 2012; Saldana et al., 2013), and United State (Lambert et al., 2005).

Therefore, the length of patient delay in this area, 60 days, seems to be longer than other regions in Thailand as well as other developed countries. It can be seen that the longer duration is commonly found in the undeveloped and developing countries where there is a high prevalence of people with infectious disease. While the shorter period is also found in developed countries where many residents live in good or very good conditions including more access to education and health care.

Relationship between duration of patient delay and the first symptom

With regard to details of quantitative findings, a median length of patient delay at 2 months was shown among participants with delay who had mild symptoms such as cough, sputum production, low-grade fever, weakness, night sweats, and weight loss. This is supported by qualitative findings as stated by participants that they had cough, sputum, and night sweat for nearly 2 months without visiting any health providers because these symptoms were not severe. These findings correspond to a previous study in Thailand (Rojpibulstit et al., 2006) showing that mild illness was a risk factor for patient delay. Moreover, Wysocki et al. (2013) undertaking research in Brazil also found that presenting with mild symptoms led to a longer patient delay as well as Tobe et al. (2013) studying in China who found that participants with mild onset symptoms were much more likely to have a patient delay. This is consistent with other diseases, according to a study of Khanjani et al. (2018) found that the first symptom was significantly associated with delay in seeking treatment among patient with breast cancer.

In addition, the quantitative findings also showed that severe symptoms such as cough up blood or haemoptysis and blood-tinged sputum were associated with a short median duration of patient delay at less than a week among both participants with and without delay. This is also confirmed by the qualitative findings as participants stated that they tried to meet the health provider after having these symptoms as soon as possible due to being abnormal and severe symptoms. These findings are consistent with Wang et al. (2016) researching in China found that

the onset of haemoptysis was negatively associated with patient delay. Moreover, in West Africa, Lienhardt et al. (2001) found that participants reporting cough up blood as one of their initial symptoms had shorter delay to getting treatment.

Therefore, it can be seen that a length of patient delay may rely on patients' symptoms onset. Mild symptoms may result in a longer duration while severe symptoms may accelerate patients accessing initial treatment.

An acceptable duration of patient delay

In the sense of an acceptable duration of patient delay, it was not investigated in this study. To explore influencing factors of patient delay, a cut-off point for more than 30 days was used to dichotomise participants with and without delay based on a median duration in a pilot study. Moreover, there is no a precise agreement on an acceptable duration of patient delay in the National Tuberculosis Control Programme Guideline, Thailand (Bureau of Tuberculosis, 2018). This is consistent with previous study in Brazil undertaken by Coimbra et al. (2012) stating that there was no suitable cut-off point to define an acceptable delay. Moreover, in the UK, Saldana et al. (2013) also pointed out that there was no a standard consensus of an acceptable length of patient delay to define patient with or without delay.

The Ministry of Public Health, Thailand, has recommended Thai people who have TB-related symptoms especially cough lasting for more than 2 weeks to access TB screening test provided by health providers as soon as possible (Bureau of Tuberculosis, 2016). Moreover, Hussen et al. (2012) suggested that patients having TB-related symptoms should meet the health provider within 2 weeks after symptoms onset which was also recommended by Ngangro et al. (2012a) and Osei et al. (2015). Moreover, Yimer et al. (2014) stated that an appropriate patient delay should be based on local health services and epidemiological situation in each area or country which was suggested by some researchers as well (Schneider et al., 2010; Goel et al., 2011; Deponti et al., 2013; Alavi et al., 2015; Almeida et al., 2015).

7.4.3 The importance of psychological theories in this study

Since the beginning of the era when communicable diseases have become major global health problems, many theoretical and conceptual frameworks have been established, developed, and applied to understand risk behaviours, as well as to predict the behaviour changes related to them. TB is one of communicable diseases affecting much of humankind around the world which is also associated with health behaviours. Although there is no specific framework for understanding TB-related risk behaviours, other theories can be applied to understand several

health-related behaviours on late seeking of TB treatment. The two theories used in this study included the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA).

The Health Belief Model (HBM)

In terms of HBM, the principal aspects of this model lie within the individual's perceptions including susceptibility, severity, threat, benefits, barriers, and self-efficacy. In addition, cues to action and other variables have been considered to be factors influencing the performance of behaviours. These aspects are believed to be useful in performing good behaviours and undergoing the process of change (Cohen, 1997; Fisher & Fisher, 2000; Tola et al., 2016; Solomon et al., 2019). The study findings confirm the criticism of HBM that initial TB treatment seeking behaviour is a complex issue which requires other components such as social support, accessibility to healthcare facility, and TB-related knowledge in order to promote an initial TB treatment seeking behaviour.

Specifically, the study discovered that most participants did not perceive themselves as suffering from TB as they were suspected cases. In addition, most participants did not perceive the severity of seeking TB treatment late as there are many consequences affecting themselves and other people. It also seemed that participants did not perceive the threat due to lack of awareness of TB. Moreover, participants claimed that they had visited many health facilities including public and private facilities; it seemed that they did not perceive the benefits of seeking initial TB treatment which could help them, ultimately, to pay less on non-essential costs. Also, they also perceived barriers that they had faced with some problems resulting from financial status or area of residence. This is consistent with a study by Gebru et al. (2018) stating that delayed initiation for HIV care and variations were related to perceptions of threat and benefit. Furthermore, most participants had experience of self-treatment with previous illnesses such as the common cold. They thus perceived that they had ability to treat themselves when they had TB-related symptoms. This could mean that they misperceived their self-efficacy about TB treatment because the disease needs to be treated by a physician or a specialist, not by themselves. Additionally, mass media or social support were related to performance in seeking TB treatment initially as they are cues to action. Also, other variables (i.e. gender, age, level of education, knowledge) were associated with performing this behaviour. This is consistent with a study of Zein et al. (2017) showing that gender, age, and previous experience significantly increased the likelihood of having a higher level of lay knowledge which was a substantial determinant to estimate belief in the effectiveness of health behaviour and personal health threat.

Therefore, the complexity of seeking initial TB treatment makes it difficult to understand and predict behaviour change using the HBM. It can be seen that initial TB treatment seeking behavioural change requires a multidimensional and a contextual approach. This is consistent with a study by Tola et al. (2017) which showed that there were five major areas that needed to be targeted with health promotion intervention to enhance TB treatment adherence. The HBM could enhance our understanding of initial TB treatment seeking behaviours. However, to gain a comprehensive understanding, a more complex approach is needed.

The Theory of Reasoned Action

For a better understanding of the study findings in the light of the theories, another theory can be used namely the Theory of Reasoned Action (TRA). This theory provides a framework to predict, understand, and change behaviours which are influenced by psychological elements. It focuses on an individual's intentions to perform the behaviours which involves the individual's attitude towards the behaviour and the individual's subjective norms.

Specifically, the findings of this study, in terms of the attitude towards seeking initial TB treatment, revealed that participants had poor attitudes about being TB patients as it considered a 'disgusting' disease which can be spread to other people. In addition, related to subjective norms, participants also claimed that they had been stigmatised by other people. They also stated that they needed social support from their family members, friends, colleagues, or neighbours to maintain their relationships during suffering from the disease. Therefore, it is clear that participants' attitude and subjective norms were associated with the intention to perform the intention behaviour, seeking initial TB treatment. This is consistent with a study by Arevalo and Brown (2019) showing that intentions predicted behaviour, and that attitudes and perceived behavioural control were associated with intentions. For example, Hosseini et al. (2015) found that application of TRA significantly increased the behaviour of breakfast consumption among school children. However, other external variables, such as demographic variables, could have either a direct influence on initial TB treatment seeking behaviour or an indirect consequence through attitude and subjective norms.

In this study, it could be seen that participants' perception towards susceptibility, severity, threat, and self-efficacy related to knowledge as participants claimed that they did not know about the disease or had inadequate TB knowledge. Moreover, their perception towards benefits and barriers was associated with financial barrier and residence area as participants claimed that they had many problems resulting from these aspects. In addition, inadequate knowledge, lack of social support, or high stigmatisation could be considered as other constructs related to cues to action in the HBM and attitude and subjective norms in the TRA. Additionally,

other aspects could be also considered as other variables in the HBM and external variables in the TRA which also influenced the intention to seek TB treatment initially. The influencing factors that emerged from both quantitative and qualitative findings from this study are discussed concurrently as a whole in the following section.

7.4.4 Influencing factors

As demonstrated by various studies, patient delay was found to be resulted from various factors but it was mostly related to individual-level factors (Li et al., 2013; Bogale et al., 2017). According to the quantitative findings, there were 30 factors found to be related to patient delay in univariate analysis. However, multiple logistic regression was adopted to investigate which factors have a major effect on patient delay. The findings from multiple logistic regression analysis showed that there were only 9 factors influencing the delay including primary education, upper secondary education, had previous knowledge about TB, thought as TB is a somewhat serious disease, total score of stigmatisation about TB, weight loss, self-medication, number of consulting health care providers, and taking motorcycle to the hospital.

According to the qualitative findings, participants claimed that there were many factors associated with the patient delay including six main factors namely, sociodemographic-economic factors, knowledge, recognition, and stigmatisation on TB factors, family and social factors, health seeking behavioural factors, accessibility and availability to TB services factors, and satisfaction with health care services factors. However, considered thoroughly by combination between quantitative and qualitative findings, it can be found that patient delay could be directly resulted from four influencing factors namely knowledge, financial barrier, residence area, and social support. Moreover, there were some factors being relevant to the direct factors called ‘indirect factors’ which were associated with the influencing factors as well. As shown in Figure 7.1, all factors are discussed in the following sessions.

Figure 7.1 Influencing factors of patient delay in this study

7.4.4.1 Patient delay related to TB knowledge

Knowledge could be considered as one of the influencing factors of patient delay. This is consistent with many previous studies showing that there was a significant relationship between knowledge and patient delay (Wandwalo & Morkve, 2000; Odusanya & Babafemi, 2004; Kanyerere & Aase, 2005; Asefa & Teshome, 2014). As shown in the final model of quantitative findings, participants who had previous TB knowledge was significantly associated with patient delay. The qualitative findings can be used to explain as participants who had previous TB knowledge claimed that they had known and experienced about TB especially its signs and symptoms when they took care previous TB case in their household. As the previous case had severe symptoms such as cough up blood or blood-tinged sputum while they had only mild

symptoms such as cough, weakness, or low-grade fever. They thus believed that they did not suffer from TB because their symptoms were not similar to the previous case and then neglected their mild symptoms for a long time. This is consistent with a study in Kenya provided by Ayisi et al. (2011) stating that personal TB knowledge and interpretation of health beliefs resulted in attitudes and also health-seeking behaviour significantly.

Moreover, as shown in the qualitative findings, some participants stated that they had a longer duration because of lack of previous knowledge about TB. Some of them had incorrect knowledge about causes of TB which could result in misunderstanding about the disease and increasing a longer duration of patient delay. Similar findings have been shown in many previous studies such as Maamari et al. (2008) who stated that the most important risk factor for patient action about TB was knowledge as well as Said et al. (2017) also reported that patients having inadequate knowledge was related to longer delay. In addition, in terms of other disease areas, Docherty et al. (2007) found that patients who had inadequate knowledge of prostate cancer were associated with delay in contact health providers.

Importantly, knowledge was significantly related to health literacy as shown in the qualitative findings that participants could not seek TB treatment due to lack of knowledge. According to the Kalisman and Rompa (2000) stating that people with low health literacy had less knowledge to manage their illnesses compared with people who had adequate health literacy. Health literacy is important to contribute to having better health conditions as Edward et al. (2018) pointed out that health literacy played an important role in low back pain management including seeking, understanding, and applying health information as well as the American Medical Association (1999) also stated that poor health literacy was more powerful predictor of person's health than sociodemographic factors such as age, income, employment status, education level, and race. Regarding previous studies, Mesfin et al. (2009) found the relationship between patient delay and health literacy as prolonged patient delay was significantly related to literacy. This is also consistent with other areas, according to Humphrys et al. (2019) stated that low health literacy resulted in poor cancer screening uptake, difficulty in making treatment choices, and decreased quality of life after being diagnosed with cancer.

Therefore, it can be seen from this study that knowledge was very important to change behaviour as Finnie et al. (2011) suggested that knowledge and attitudinal factors might serve as the best points of intervention. Also, knowledge may be also related to health literacy which could predict health status of individual. From the findings of this study, it also can be found that knowledge about TB could be formed by level of education, and experience of contacting previous TB case. Moreover, it was also related to various factors as shown in following sessions.

TB knowledge and level of education

The qualitative findings of this study also found that level of knowledge was related to level of education. According to the Ministry of Education in Thailand has provided the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) aiming at the full development of learners (Ministry of Education, 2008). Based on this curriculum, the learners are provided the difficulty of knowledge in each learning area according to the level of education. Health and Physical Education is one of eight learning areas which provides knowledge, skills, and positive attitude regarding strengthening learner's own health and that of others; prevention and appropriate treatment of numerous things affecting learner's health; and life skills. According to this learning area, the learners are educated about health for gaining of knowledge, correct understanding with correct attitude, morality, and acceptable values, as well as practical skills in health for obtaining hygienic behaviours resulting in the accomplishment of a society of quality. Moreover, the learners are provided knowledge about strengthening of health, ability, and disease prevention in both communicable and non-communicable diseases (Ministry of Education, 2008).

Low level of education

With regard to the quantitative findings, it can be found that most patients with delay had graduated in primary educational level which might lead them have low knowledge about both communicable and non-communicable diseases, less awareness on signs and symptoms of diseases, and lack of accessibility to formal health care. This is supported by qualitative findings as some participants with low educational level claimed that they did not know about the disease, lacked recognition of their symptoms, and tried to get traditional treatment such as Thai herbs. Based on the Health and Physical Education learning area (Ministry of Education, 2008), it can be explained that the learners who graduate in primary educational level (Grade 6) are able to analyse the consequences of the transmission of diseases and offer the guidelines to prevent the common diseases in childhood found in Thailand such as flu, dengue fever, skin diseases, and periodontitis. While the learners who graduate in both lower and upper secondary educational level (Grade 9 and 12) are able to analyse and offer the guidelines to prevent diseases that are the major causes of sickness and death among the Thai people such as sexual transmitted diseases, AIDS, Avian influenza, TB, and other non-communicable diseases. Thus, participants who graduated in lower education, based on this curriculum, were not educated about TB which is one of top 10 causes of death in Thailand (Department of Disease Control, 2018). This corresponds to a qualitative study in Uganda showing that there was no formal health education programme regrading TB which resulted in that understanding on TB and its consequences in community was low (Macfarlane & Newell, 2012).

High level of education

Whereas, studying in higher educational level could result in having longer duration of the delay as shown in the quantitative findings. Participants with delay who graduated in upper secondary educational level tended to have adequate knowledge about TB that they might have a greater number of visits to health facilities and a greater score of stigmatisation on TB. This might lead them have a longer duration than other people which can be also explained by qualitative findings. Some participants who graduated from high school stated that they knew about TB but they feared social discrimination due to TB infection. They thus did not want to be diagnosed as TB patients and tried to get treatment in many facilities including public and private health facilities which made them have a longer period before getting an appropriate TB treatment.

According to previous studies, there was no previous researchers investigating and validating the relationship between level of education and the number of visits as well as level of stigmatisation. They have studied and found the relationship between level of education and patient delay as shown in a study in Zambia performed by Needham et al. (2001) that the delay in seeking duration was influenced by low educational level which is also found in China that lack of knowledge regarding typical TB symptoms was associated with patient delay (Wang et al., 2016). In addition, Ngangro et al. (2012a) found that a higher level of education resulted in increasing of self-medication and the rescheduling to visit a health provider which related to a longer duration of patient delay. Moreover, Mesfin et al. (2009) stated that illiteracy was a significant factor related to TB knowledge which resulted in longer duration of patient delay; this result also corresponds to a study in Estonia showing that illiterate people were found to be more liable to extended patient delay (Pehme et al., 2006).

Therefore, it can be seen that level of education thus is importantly related to knowledge resulting in patient delay. In Thailand, people who graduate in at least lower secondary educational level are educated about the top 10 causes of death in Thai people including TB disease. While people who graduate in primary educational level do not learn about TB resulting in lack of knowledge and increased delay. Thus, level of education is vital to gain more knowledge about the common diseases found in Thailand and around the world.

TB knowledge and previous experiences

Besides the level of education, experiences could be considered as being related to knowledge. According to Nakkeeran (2010) stated that people could gain knowledge through the combination between experience and reasoning. The qualitative findings showed that participants who had previous experience in contacting with TB case in their family or

community had a shorter period of the delay because the experience could gain their knowledge and made them recognise about TB-related symptoms. They, therefore, were expected to be knowledgeable and experienced about TB symptoms, diagnosis, and treatment also. This finding is consistent with a study in Turkey undertaken by Guneylioglu et al. (2004) reporting that the duration was shorter for patients having an index case for TB in their household because they had previous knowledge and experience about TB.

While some participants claimed that they did not have previous knowledge or experience about TB thus they did not recognise as they were suffering from TB symptoms. Furthermore, participants claimed that they did not pay attention to previous TB cases who might be close to them such as their neighbours or colleagues because they thought that it was not their business. They thus did not have previous experience and knowledge about TB disease which might lead them do not recognise or suspect about their illness. This is confirmed by a study of Pezzotti et al. (2015) pointing out that patients were probably capable of recognising TB symptoms because of past experiences with relatives and/or friends and subsequently having particular knowledge of TB symptoms which made them seek help early.

Conversely, patients who had learned about TB from their experiences or other patients' experiences were found as having longer duration of delay. This can be explained by qualitative findings as they might have incorrect knowledge or experiences. For example, they claimed that they had seen some TB patients having cough up blood while they had only cough with sputum thus they did not suspect that they were suffering from TB. Indeed, incorrect experiences about TB could result in a longer duration of the delay as found in a study of Said et al. (2017). This is also found in a study of Ford et al. (2009) stated that patients living with other TB patients had more prolonged test-seeking delay due to their previous experience.

Therefore, it can be seen that the experience of participants is involved importantly with acquisition of knowledge. People who are living with TB patients can gain their knowledge about the disease including causes and effects, signs and symptoms, diagnosis, and treatment. While people who are not living with patients do not gain the knowledge from previous experience. They thus do not recognise and access the appropriate treatment initially.

TB knowledge and perception

In terms of perception, as shown in the final model of quantitative findings that participants who perceived that TB is a somewhat serious disease had a shorter duration of patient delay. This can be explained that knowledge was also shown as being significant relevant to perception by qualitative findings. Some participants stated that they thought TB was quite severe disease

affecting with their life. Most of them did not suspect that they might be suffered from TB thus they left their symptoms for a long time. This is consistent with a study of Zhao et al. (2013) found that the primary reason of patients who had the delay was that they do not realise on TB. In addition, Saqib et al. (2011) and Xia et al. (2016) stated that the most common reason for patient delay was about patient did not perceive on their illness. Furthermore, Rajeswari et al. (2002) also pointed out that patients who had low awareness on their symptoms was significantly associated with patient delay as well as low suspicion of TB (Kanyerere & Aase, 2005).

According to the qualitative finding, participants stated that they had misperception due to lack of knowledge and incorrect knowledge. It can be found that participants' perception was influenced by knowledge in this study as participants stated that mild symptoms were related to other diseases such as common cold. This finding corresponds to a study of Cattagni Kleiner et al. (2019) found that there was a positive relationship between knowledge and perception on advance care planning dispositions. Moreover, a study of Mfinanga et al. (2008) showed that correct knowledge was also relevant to correct perception which influenced better health seeking behaviour and shorter duration of patient delay as well as Bhagavathula et al. (2015) found that knowledge was significantly correlated with respondents' perception as family members of PLHIV-AIDS with less knowledge score had more negative perception.

In addition, in qualitative findings, participants also claimed that they believed they could treat TB by themselves because they did not have knowledge about TB treatment. It can be found that knowledge was also relevant to beliefs which related to action in seeking health as Mesfin et al. (2010) found that patients believed that having TB was not the result of contact with TB patients which was resulted from poor perception about TB. Although the Thai government has provided many campaigns to advocate health education about TB for many years ago (Department of Disease Control, 2018), participants in this study stated that they had poor understanding about TB. Thus health education could be considered as a main barrier of getting treatment early in this study as also shown in Macfarlane and Newell (2012).

Perception on health behaviour

In terms of perception on health behaviour, depicted by previous study, health behaviour was found to be an associated factor for patient delay (Diez et al., 2004). However, the quantitative findings of this study found that there was no association between patient delay and health behaviour namely alcohol, cigarette, and drug consumption in both univariate and multivariate analysis. This can be explained by the qualitative finding as participants had misperceptions about TB signs and symptoms as well as its causes. They pointed out some more details that their symptoms were not TB symptoms which they believed these symptoms were caused by

smoking cigarette, drinking alcohol, or using illicit drugs. Some participants also claimed that they had TB because of consuming alcohol, cigarette, or illicit drug so they neglected the symptoms for a long time. Supported by a study of Basnet et al. (2009) found that cough, one of the first symptoms of PTB, was considered as a consequence of smoking. In addition, patients having poor health behaviour might result in lack of health seeking behaviour rather than patients with good health behaviour. This is consistent with a study of Wysocki et al. (2013) showed that patients consuming alcohol might be related to poor perception on their health status as well as lack of habit of seeking medical care. Moreover, Deponti et al. (2013) also claimed that patients using drugs had a greater duration of the delay because they did not seek health care providers initially.

Perception on TB-related signs and symptoms

Furthermore, perception on TB-related signs and symptoms were related to knowledge in this study. The quantitative findings of this study showed that weight loss was related to patient delay which is similar to a study of Deponti et al. (2013). The quantitative findings can be explained by qualitative findings showing that symptoms of participants were associated with TB knowledge that resulted in the delay. Some participants claimed that they had mild symptoms for a long time before having severe symptoms. According to initial signs and symptoms of TB are quite like other illnesses such as common cold or influenza. It thus made people misunderstand about their occurring symptoms as a report by Ayisi et al. (2011) showed that common symptoms at onset did not bring patients to seek health care early. In addition, the qualitative finding also reported that participants who had mild symptoms such as cough, sputum production, weight loss, chills, night sweats, or weakness might neglect their symptoms which they thought they might have only viral infections as reported by Saqib et al. (2011) that cough and fever were non-specific for TB and common in other chest diseases so patients paid less attention on these symptoms. In terms of other diseases, the misperception about the occurring symptoms could result in longer delay as Henry et al. (2016) found that participants with leprosy- related symptoms who supposed their symptoms were not severe had a threefold greater chance of waiting longer before presenting to health provider than those who did.

Moreover, in qualitative findings, due to lack of knowledge about TB signs and symptoms, some participants with delay also claimed that they had severe symptoms such as blood-tinged sputum or haemoptysis when they came to hospital after they left their mild symptoms for a long time. This finding is consistent with Zhao et al. (2013) who showed that patients did not seek health treatment until their symptoms became worse. In fact, as stated by Moller et al (2011), participants lacked awareness and neglected their mild symptoms because they lacked

adequate knowledge and experience about TB signs and symptoms which led them do not recognise the initial symptoms, thus it delayed them in seeking health care.

In addition, revealed by qualitative findings, participants tried to endure their symptoms in the first period of onset until they could not endure their symptoms any longer, thus they decided to go to get treatment. Some patients had severe symptoms such as haemoptysis before getting standard TB treatment because they had abandoned their symptoms for a long time. For these reasons, they claimed that they had no knowledge and experience about TB thus they did not recognise or suspect as they might suffer from TB. This finding is consistent with a study in China showing that lack of knowledge might further increase the barrier to seeking treatment (Toby et al., 2013). Thus, patients without adequate knowledge might try to endure with mild TB-related symptoms for a long time because of lack of recognition about TB signs and symptoms.

Therefore, it can be seen that people with low recognition or lack of awareness is associated with a longer duration of patient delay. In addition, people with poor health behaviour may be more susceptible to the disease due to misperception or misunderstanding on the occurring symptoms as well as it may lead these people lack health seeking behaviour. Furthermore, adequate correct knowledge about the disease is importantly related to increase positive perception and correct beliefs on the disease which also results in increased health seeking behaviour initially. It can be also found that people who are promoted about the signs and symptoms of TB as well as essential relevant topics about the disease have adequate knowledge. This can result in increased their awareness and decreased duration of the delay.

TB knowledge and self-treatment

With regard to self-treatment, it might be considered as being related to knowledge. According to the finding of this study, self-treatment or self-medication was claimed as a common Thai lifestyle in terms of the first step to look after ourselves when we have illnesses. Participants of this study claimed that they tried to treat their current illness by themselves as usual because they did not have enough knowledge about the disease. This finding is consistent with a report of Amarasekara et al. (2016) found that knowledge was related to lifestyle in terms of it could be used to improve lifestyle. Also, a study by Okonta et al. (2014) found that adequate knowledge could be implied to healthy lifestyle.

A previous study showed that self-treatment or self-medication was considered as the first step in the health seeking behaviour process (Ayisi et al., 2011). The final model in quantitative findings found that self-treatment was a significant factor of patient delay which is consistent with a study of Yimer et al. (2005) which showed that patient delay was strongly related to self-

treatment; similarly, Belay et al. (2012) also found that self-treatment was an independent predictor of patient delay. Supported by the qualitative findings, participants stated that they tried to remedy themselves in the first period of illness because they did not have knowledge about from what disease they were suffering. This corresponds to a study of Kanyerere and Aase (2005) showing that patients continuously treated themselves with medicine at the beginning of symptoms onset until their symptoms became serious. Considering, self-treatment might be linked to the knowledge on the severity of the symptoms because patient did not have sufficient knowledge about TB signs and symptoms (Ayisi et al., 2011; Gebreegziabher et al., 2016a).

In addition, it was claimed from some participants that they had tried to do self-treatment before meeting with health provider because of living in remote areas. Due to lack of knowledge, they also stated that they did not have any information and could not access to get a proper treatment at the hospital in the first period of having TB-related symptoms. Therefore, they then tried to treat themselves while their symptoms were not severe. This finding is consistent with a previous study in Kenya (Ayisi et al., 2011) that self-treatment was related to patient delay. Also, Said et al. (2017) stated that self-treatment might be resulted from they cannot afford any potential health facility.

Therefore, it can be seen that people with inadequate knowledge may result in poor lifestyle about self-health care. They may not recognise on their illness due to lack of correct knowledge which may result in prolonged period of patient delay.

TB knowledge and attitude

In terms of attitude about TB, knowledge might be closely related to attitude which could result in practice on behaviour as Rostami et al. (2019) found that there was a significant relationship between knowledge and attitudes among their participants in increased good behaviour of pesticides use. In addition, Yeni et al. (2018) claimed that insufficient knowledge and misconceptions about the disease could result in the development of negative attitudes as well as increase stigmatisation among patients with epilepsy.

Attitude of the disease

According to the qualitative finding of this study, participants with adequate knowledge claimed that they had good attitude on TB as it can be cured thus, they decided to get treatment. This is consistent with a study of Finnie et al. (2011) found that patients tried to get diagnosis as soon as possible because they understood about the disease and had positive attitude with the disease. While most participants, especially who had low level of knowledge about the disease,

had a bad attitude about the disease as it was the most disgusting disease which they could spread to other people that made them fear to tell other people about their illness. This finding corresponds to a study of Mesfin et al. (2009) showing that most patients believed that TB was resulted from evil spirits and God's thus it made them have low self-esteem which resulted in they did not want to be diagnosed as TB patient.

Stigmatisation on TB

In addition, stigmatisation could be considered as resulted from inadequate knowledge and poor attitude as supported by Yeni et al. (2018). According to the final model in quantitative findings, a higher score of stigmatisation resulted in a greater number of length of patient delay which is consistent with Said et al. (2017) showing that people who feared to be stigmatised and discriminated of being sick with TB disease was related to avoid meeting the health providers. In terms of other disease areas, according to Person et al. (2004) who studied about fear and stigma within the SARS outbreak found that people who were afraid and stigmatised on SARS might delay in seeking health care and remain in the community as well as according to Des Jarlais et al. (2006) stated that stigmatisation could considerably increase the distress of people with the diseases including AIDS and SARS.

This result can be supported by the qualitative finding as participants claimed that they thought TB was an awful disease thus it made them try to avoid to be diagnosed as TB patients. Moreover, many participants stated that they did not want to be diagnosed because of social discrimination. They were afraid that they would be disliked by other people in community and feared to be discriminated. These findings are consistent with a statement of Des Jarlais et al. (2006) as people suffered from the disease might avoid seeking of the health care. Also, in other areas, Henry et al. (2016) found that participants who recognised they suffered from leprosy but feared community isolation were 10 times more likely to have longer duration before discussing with a specialist for their symptoms. However, adequate knowledge was important to play a role of decreased stigmatisation according to a study of Neely-Fairbanks et al. (2018) showed that knowledge about mental illness was negatively correlated with stigmatisation as well as James and Ryan (2018) stated that higher knowledge was associated with lower stigmatisation.

Although there were many national events or campaigns to increase correct knowledge and positive perception about TB, participants also claimed that other people still looked on them as disgusting persons. This finding is consistent with a study of Macfarlane and Newell (2012) showing that TB was a stigmatised disease because people feared its infection. In addition, Said et al. (2017) also showed that people still had stigmatisation about TB. Stigmatisation was not found on TB only, but it was also found on HIV-related also. As Mesfin et al. (2005) showed that

the fear of stigmatisation to TB and/or HIV co-infection might contribute to delay which is consistent with many studies (Macfarlane & Newell, 2012; Osei et al., 2015; Chimbatata et al., 2017).

Stigmatisation on TB related to HIV

Besides TB, the qualitative finding of this study also showed that some participants had attitude that TB was strongly related to HIV. As HIV is one of the most famously stigmatised diseases and TB also is commonly linked to HIV (Ngadaya et al., 2009). They thus did not want to know about their TB status because they did not want to be tested HIV. To detail, most participants stated that they might be infected with HIV from TB disease which was resulted from insufficient knowledge about the disease. Moreover, according to the system in Thailand, all TB patients need to be tested HIV status after they are treated with anti TB drugs (Department of Disease Control, 2018), participants claimed that they knew about this TB treatment system which influenced their decision thus it made them avoid to get TB screening test. In addition, they also claimed that they might be suffered from HIV infection thus it made them fear to be stigmatised and discriminated against by other people. This is consistent with a study in Tanzania (Verhagen et al., 2010) showing that TB patients living with HIV feared about the revelation of their HIV status in the hospital.

However, the qualitative findings revealed that TB patients who accepted and revealed their HIV-positive status had a shorter duration of the delay as a recommendation of the National Tuberculosis Control Programme Guideline (Bureau of Tuberculosis, 2018) that PLHIV need to be tested TB infection before they are treated with HIV drugs which corresponds to a study of Ngadaya et al. (2009). Moreover, HIV patients also stated that they were also more educated about TB knowledge thus they had recognised in their symptoms which resulted in shorter duration. This finding is consistent with a study of Saifodine et al. (2013) showing that HIV infection was associated with shorter patient delay.

Therefore, it can be seen that attitude may be related to knowledge which could result in patient delay. People with adequate knowledge about the diseases have better attitude than ones with insufficient knowledge. This may result in having more awareness and recognition about the occurring signs and symptoms. Moreover, stigmatisation about the diseases is still a barrier to access the health care system early. Many people still have stigmatisation on TB and TB-HIV which may be resulted from poor attitude to the disease caused by poor knowledge.

In conclusion, knowledge may be an important influencing factor for patient delay which could be gained from higher level of education and previous experiences. People with adequate

knowledge could result in good perception, good lifestyle, and also good attitude. Moreover, knowledge could be considered to be related to psychological theories as it could contribute to perceptions in susceptibility, severity, threat, and self-efficacy in the HBM. In addition, stigmatisation towards TB which may be related to attitude could be also considered as other aspect related to cues of action in the HBM and attitude and subjective norms in the TRA.

7.4.4.2 Patient delay related to financial barriers

Financial barrier could be considered as an influencing factor of the patient delay in this study. This is consistent with a study of Buregyeya et al. (2014) showing that financial constraints influenced the patient to seek health care as well as Ngangro et al. (2012a) also stated that low economic status was significantly associated with a long patient delay. Although the costs of TB treatment are totally paid by the National Health Insurance (Bureau of Tuberculosis, 2018), people still needed to pay for other costs on their own.

According to quantitative findings, family financial status was investigated as a significant factor for the delay in univariate analysis, but it was not shown in the final model. The qualitative findings can be used to support this result as most participants expressed that they had been obstructed to access an appropriate TB treatment initially due to lack of money. Also, they also claimed that they had to pay for living costs and transportation fees when they came to meet the doctor at the hospital. This finding is common in other disease areas, according to a study of Parikh et al. (2014) showing that financial barriers resulted from lower income and lack of health insurance were independently associated with impaired access to health care among patients with diabetes and coronary heart disease.

Moreover, supported by qualitative findings, participants also explained that they suffered from their economic status. For example, participant, ID 01023, stated that “I did not have time to check up because I had to work hard. I needed to get some more money for spending in my household because I had no enough money”. Some of them had gone into debt to get more money for better treatment. Thus, they tried to save their money by seeking the cheapest treatment such as self-treatment or a traditional healer. All of them wanted to be cured from TB, but they could not avoid the basic aspects of life, especially money, which was the biggest barrier for getting a proper TB treatment initially. These findings are consistent with many studies which showed that low economic status was a risk for longer duration of delay (Ngamvithayapong et al., 2001; Guneylioglu et al., 2004; Cambanis et al., 2005; Lin et al., 2008). In addition, many researchers showed that low income was an influencing factor of the delay (Cheng et al., 2005; Xu et al., 2005; Pehme et al., 2006; Laohasiriwong et al., 2016b; Mistry et al., 2016; Adejumo et al., 2017; Bogale et al., 2017). Moreover, lack of money was also a barrier to get treatment early as shown in studies of Ayisi et al. (2011) and Moller et al. (2011).

Therefore, it can be seen from this study that financial barrier was significantly associated with access to health care as Parikh et al. (2014) suggested that financial limitation reduced chances of medical check-up thus people might be not detected with the disease initially. Additionally, the findings of this study, it can be found that financial barrier related to many factors such as working time, other costs, and health insurance as shown in following sessions.

Financial barriers and working time

In terms of working time, it can be seen that there was a relationship between working time and financial barrier which resulted in patient delay. Although the quantitative findings did not show any relationship between occupation and patient delay in both univariate and multivariate analysis, it can be explained by qualitative findings. Some interviewed patients claimed that delay in seeking care did not depend on being farmer, labour, or other jobs but it depended on patient's working time of each individual. This is consistent with a study in Qatar performed by Ibrahim et al. (2016) showing that patient's occupation was not significantly associated with the delay as well as Tobe et al. (2013) found that working days per week was a significant factor of the delay among Chinese TB patients.

Moreover, from qualitative findings, participants with delay claimed that they wanted to meet the doctor as soon as possible but they could not do that. If they came to the hospital, they would be stopped working or left from their job for a few days. Thus, they decided to leave their mild symptoms for ages until the symptoms became worse. This finding is consistent with a study of Li et al. (2012) stating that some patients working more than 24 days per month was a risk factor for patient delay because these patients did not have time to go to the doctor.

In addition, they also reported that they did not have time to come to the hospital because they had to work for their life. As being agriculturists, some participants claimed that they did not know about their mild symptoms being related to TB thus they abandoned these symptoms for a long time. They also claimed that if their symptoms were not severe, they would pay most attention to do work because work was the most important for their life. This finding corresponds to a study of Mistry et al. (2016) reporting that lack of time was found as a major reason of delay in care seeking as well as Tobe et al. (2013) pointed out that patients working more than 5 days a week tended to have a higher rate of patient delay.

Furthermore, some of them stated that they worked in other place where was far away from their hometown that made them lack accessibility to the health service. According to the National Health Security Office, Thailand, has suggested that people who have common illnesses, not acute illnesses or accident, should visit at registered health facility in their area

(National health Security Office, 2013). Thus, patients who had TB-related symptoms were claimed as having common disease so they could not go to get treatment in other areas.

Therefore, it can be seen that working time was related to financial barrier which resulted in patient delay. Participants were unwilling to be asked to stop working during TB treatment process or leave from their job after being diagnosed with TB disease. Also, it also can be found that working limitations profoundly resulted in health care seeking behaviour and early TB detection.

Financial barriers and other costs

According to the National Health Security Act, B.E. 2545, the Thai government has a responsibility to provide 'public health services' for all Thai people. These services include medical care and public health services for each individual in order to provide health promotion, disease control, diagnosis, treatment, and rehabilitation. The services mostly cover both communicable and non-communicable diseases as well as accidental injuries. TB is one of diseases that its treatment processes including sputum smear tests, chest x-rays, and medications are provided to Thai people for free of charge (National Health Security Office, 2002).

Although the TB treatment is free of charge, the Thais, however, need to pay other costs when they go to get the services at the public health facility on their own. Regarding the finding of this study, it can be shown that most participants had faced with many problems resulted from financial barrier. These participants stated that they wanted to get an appropriate treatment initially but they had been stopped to access the treatment because of lack of money. This is consistent with a study in Pakistan provided by Khan et al. (2005) showing that lack of money and transportation fees were important structural barriers resulting in delay in diagnosis.

In addition, transportation fees and living costs were claimed as participants' problems when they came to the hospital. Participants stated that they needed to pay for both transportation fees and living costs such as meals for them and their family when they came to meet the doctor at the hospital. They could not avoid these expenditures if they would like to access a better remedy which can be found in the hospital, not in a primary care unit. To detail, in case of travelling to the hospital, if participants did not have their own car, they would need to take public transportation or hire some people to take them to the hospital. Thus it made them shoulder all expenditures by themselves which is consistent with a study of Tobe et al. (2013) showing that the cost for accessing general hospitals was much more expensive than one in TB dispensaries as well as Aye et al. (2010) identified the financial costs of seeking health care as

the main barrier of the delay. In addition, it is consistent with a study in China showed that TB might result in increased expenditure as well as the costs of seeking health care might represent an important financial burden (Tobe et al., 2013).

Moreover, the finding also showed that participants needed to save their money by trying to do self-treatment as the first self-health care to release their symptoms as long as possible. To detail, it was claimed from some participants that they had tried to do self-treatment before meeting with health provider because they did not have enough money. This is consistent to a previous study in Kenya (Ayisi et al., 2011) stating that delay in accessing correct treatment was caused by facing with financial problems. Therefore, most participants chose to spend on the cheapest service by buying cough medicines without doctor's prescription. Also, participants also claimed that the used medicines were frequently bought from a drug store or a grocery in their community where was closest to their residence in order to minimise the transportation fees. This is similar to a study of Basa and Venkatesh (2016) showing that the delay was resulted from visiting to traditional healers, cost of treatment and transport.

Therefore, it can be seen that other costs were related to financial barrier which could result in patient delay. Participants needed to pay for other costs such as transportation fees in order to access to the hospital. Also, living costs when they came to the hospital were needed to be spent, not only for themselves but their family also.

Financial barriers and health insurance

As stated above, TB treatment is free of charge provided by the national TB policy to stop TB. The finding by in-depth interviews, however, showed that many participants were worried about their expenses from TB treatment. Some participants claimed that they did not know about TB policy and their health insurance status in which they did not need to pay for the treatment. This is consistent with a study of Sreeramareddy et al. (2014) reporting that inability to pay for health care cost was related with prolonged duration of seeking care. Also, it is consistent with a study of Verhagen et al. (2010) showing that patients worried of the fact that examinations such as chest x-rays were needed to be paid thus they did not want to be treated. Moreover, Yang et al. (2020) also found that medical insurance was significantly associated with delays in diagnosis for TB.

Therefore, it can be seen that the free services of TB treatment programme and the rights of participants' health insurance were not provided more widely among Thai people across the country. These participants still believed that they needed to pay for TB treatment costs thus they did not want to get an appropriate treatment due to lack of money.

In conclusion, financial barriers could be considered as an influencing factor for patient delay in this study. Lack of money could obstruct participants to access the appropriate treatment initially and also lead them have a longer period of patient delay. Moreover, financial barriers could be considered to be related to psychological theories as it also could contribute to perceptions about benefits and barriers in the HBM. In addition, this barrier could be also considered as other construct related to other variables in the HBM and the TRA.

7.4.4.3 Patient delay related to residence area

Residence area could be considered as an influencing factor of the delay in this study. This is consistent with a study in Ethiopia performed by Gebeyehu et al. (2014) showing that place of residence was a predictor of patient delay. Based on the geographic information system, Thailand, the health care facilities under the ministry of public health are divided into three levels namely primary care, secondary care, and tertiary care. Primary care service is the closest service providing to people and communities where focuses on coverage and integrated services including basic medical care treatment, health promotion, disease prevention and control, and rehabilitation (Ministry of Public Health, 2011). A sub-district health promoting hospital or a primary health care unit, located in each sub-district, is set by the ministry of public health to provide the mentioned services for people who live in rural area. While health care facilities in both secondary and tertiary care levels are located in the city of each district or province where are far away from most participants of this study.

According to the qualitative finding of study, most participants claimed that they lived in rural areas where were far away from the nearest district hospital. They also stated that they were limited to access the advance treatment which was provided in the secondary and tertiary care levels. They thus needed to get a basic treatment in primary care level in the first period when they were sick which might result in patient delay. This finding corresponds to Mesfin et al. (2009) showing that rural patients were more likely to have extended delay than urban patients.

Therefore, it can be seen that patient delay was significantly influenced by residence area as Huong et al. (2007) found that area of residence was one of significant risk factors for long delay. In addition, the findings of this study showed that residence area related to other factors such as travelling problems, the first health provider as well as the first health facility.

Residence area and travelling problems

Due to living in rural area, it can be found that these participants thus faced with many problems because of their residence including long distance, long travelling duration, and mode of transportation from their residence to the advance health facility.

Longer distance

As shown in qualitative findings, participants stated that they had to deal with a long distance between their home and the proper health facility such as district hospital or provincial hospital. This finding is consistent with Mesfin et al. (2009) who discovered that patient delay was associated with living in the rural areas where the availability of the facility was also very poor as well as Yimer et al. (2005) depicted in that distance was significantly related to patient delay. Moreover, these participants also claimed that due to a long distance, they were bored to travel thus they neglected their symptoms in the first period for a long time. This finding corresponds to a study of Maamari (2008) pointing out that a long distance was a factor for delay as well as Laohasiriwong et al. (2016b) also stating that prolonged patient delay was significantly associated with distance between a DOTS centre and patients' residence.

Longer travelling duration

Moreover, it can be also found that the longer distance between participants' residence and the hospital was associated with a longer travelling duration as shown in the qualitative finding. There were some patients living in some remote areas where were very far away from the district hospital for more than 60 kilometres. These participants stated that their home was located in the edge of the district where was very far from the city. Thus, they needed to spend their time for travelling to access an advance treatment for more than 2-3 hours by public transportation. This finding is also found in some studies reporting that the delay was associated with travelling duration and distance to the facility (Finnie et al., 2011). Moreover, some of them needed an overnight travel before the appointment day with the doctor due to far away and lack of public transportation. This finding is consistent with a study in Ethiopia undertaken by Cambanis et al. (2005) showing that the delay for more than 4 weeks was significantly associated with overnight travel.

Mode of transportation

In addition, it can be also found that there was a relationship between residence area and mode of transportation in this study. The quantitative findings of this study showed that participants who took their own motorcycle to the hospital had a shorter duration of patient delay than

participants who took other vehicles. The finding can be explained more details by qualitative findings as some participants claimed that they could take their own motorcycle to the hospital because their home was located near to the hospital within 5 kilometres. It thus made them have more comfortable journey resulting in a shorter duration of the delay. While participants who took other vehicles, especially public transportation, to the hospital stated that they could not take motorcycle because their home was too far from the hospital. This finding is consistent with a study of Zerbini et al. (2008) showing that patients who depended on public transportation was associated with a longer patient delay.

Moreover, most participants also stated that they had to come to hospital by public transportation such as public bus or school bus because they had no own vehicle as well as lived far away from the hospital. Some of them needed to get public transportation more than one change from their home to the nearest hospital. They thus claimed that it was a reason that made them leave their TB-related symptoms until their symptoms were worsen. This reason is consistent with a study of Yirgu et al. (2017) showing that the delay was related to public transportation. Furthermore, there were some participants claiming that they had a longer duration of patient delay because of limited public transportation in their residence area which is also found in Malawi (Kanyerere et al., 2005) that lack of transportation was a reason for patient delay.

Therefore, it can be obviously seen that residence area could result in many problems about travelling between participants' home and the nearest hospital including long distance, long travelling time, and mode of transportation. The mentioned problems could obstruct participants to access to a higher level of health facility resulting in a longer duration of patient delay.

Residence area and the first health care seeking

According to the findings of this study, the first health care seeking seemed to be associated with residence area in terms of health care facilities and providers.

The first health care facility

In terms of the first health care facility, the qualitative finding showed that participants living in a rustic area had been limited to voluntarily choose the first health facility. It can be explained by the recommendation of the Thai National Health Insurance Guideline (Ministry of Public Health, 2011). People who have common health problems should first visit a health care facility in the primary level. If people have more severe or complicated problems, a referral system

between the primary level and secondary or tertiary level is then provided to these people to access the advance treatment. In fact, at the health care facility in the primary level, there is no doctor or TB specialist working there in regular time as well as lack of laboratory to detect any disease, thus people who have complex health problems are needed to refer to other facilities in the higher level.

Based on this guideline, it can be found in qualitative findings that most people, especially who lived in rural area, needed to get basic treatment at the sub-district health promoting hospital or primary care unit where was located closest to their home first. Participants claimed that they needed to be treated at the health facility in the first level where was the nearest to their home according to the national guideline. They thus did not have a chance to meet the doctor or specialist in the first visit. This finding is consistent with Yimer et al. (2005) showing that initial visitation at a low-level health care facility was associated with patient delay. Also, the participants stated that they were not screened with TB test such as sputum smear test or chest x-ray because there was no laboratory at the health facility. This finding is consistent with a study of Coimbra et al. (2012) showing that the limited availability of diagnostic method in health facilities with lower complexity was associated with delay. Thus, it can be seen that the level of health care facility was associated with the duration of patient delay as shown in a study of Takarinda et al. (2015) reporting that the different facilities might depict as an important factor to initial diagnosis and treatment. In fact, it might be involved with many reasons such as a suitable detection system as Saifodine et al. (2013) stating that delays in obtaining proper laboratory was a factor of the delay.

The first health care provider

According to the first health care provider, the quantitative findings showed that a greater number of consulting health care provider was an influencing factor for patient delay. This can be explained more reasons by qualitative findings. Participants claimed that according to visiting at the primary care unit, they did not meet the doctor or TB specialist as well as TB laboratory test. Thus, they could not be detected as TB patients in the first visit.

Regarding the geographic information system (Ministry of Public Health, 2011), the Thai government has set a team for working in each health care facility according to level of the facility. For the primary level, there are 3-5 health providers in each primary care unit including registered nurse or technical nurse, public health technical officer or public health officer, dental assistant, and general service officer. It can be seen that there is no doctor or physician who has adequate knowledge about the disease working in the primary level. Thus, participants might be not detected as TB patients in the first visit. This is consistent with a study of Saqib et al.

(2011) showing that patients who consulted with incompetent health providers had a longer duration of patient delay as well as Laohasiriwong et al. (2016b) found that the medical officers and chest specialists was associated with an increase of delay because almost all specialised services were centralised in Nepal. Moreover, Jaiswal et al. (2018) undertaking a study about delay in diagnosis and treatment among patients with breast cancer, found that the patients who presented to a care provider had a longer duration of the delay than patients who met a specialist.

In addition, in the qualitative findings, participants also claimed that they came to get treatment at the primary care unit many times since their symptoms onset until they were referred to get an appropriate treatment at the higher level of health care facility. It can be seen that the number of visits with health care providers had increased because the health provider working in a primary care unit was usually not a TB specialist or physician. This is consistent to a study in Taiwan (Chen et al., 2015) showing that an initial visit to a provider who was not a TB specialist was a factor of patient delay. In fact, these providers might have inadequate knowledge or lack awareness about TB. This might make them fail to recognise that the participants might suffer from TB thus the participants then had more longer duration of delay.

Consulting with non-formal health provider

Furthermore, as shown in qualitative findings, some participants of this study claimed that they had been to consult with non-formal health providers such as village health volunteers or grocers in community due to living in rural area. This is supported by many studies depicting that the difficult accessibility to a higher level of health facility caused a seek for non-formal care provider which also resulted in longer duration (Demissie et al., 2002; Yimer et al., 2005; Trigueiro et al., 2014). The participants expressed more details as it was easier to consult with these providers than formal or public health providers because these providers lived in the same community with them. In fact, both village health volunteers and grocers did not have sufficient knowledge about the disease. Thus, they could not screen and detect the TB signs and symptoms in the first period of participants' symptoms onset. This is consistent with a report by Yimer et al. (2005) stating that patient delay was significantly related to first visit to non-formal health provider as well as Bogale et al. (2017) also reporting that the longer length of patient delay was found among patients seeking health care from informal care provider.

Remedy with traditional medicines

Moreover, in terms of traditional medicines, participants claimed that they had used Thai traditional medicines or herbal medicines for a long time when they had mild symptoms. As

living in rural area, they also claimed that there were some neighbours suggesting them to buy and use these medicines to release TB-related symptoms especially cough. This is consistent with a study of Mesfin et al. (2009) pointing out that traditional medicine was associated with delay in consultation for modern health care. Moreover, Hussen et al. (2017) stated that the first visit with traditional healer was associated with patient delay.

Satisfaction with health care facility

Besides level of health care facility, the qualitative finding also found that participants' satisfaction was associated with choosing the first health facility of participants. Some participants claimed that they had adequate satisfaction with the previous health services in the facility thus it made them choose to come back to get treatment at the same place. This finding is consistent with Bassili et al. (2008) showing that satisfaction with care was significantly associated with the delay. While there were some patients claiming that they experienced with some problems about health care system in the hospital. Moreover, they also complained that a longer waiting time and crowded at the hospital influenced their decision to choose the first health facility. This is consistent with a study of Moller et al. (2011) reporting that long waits at government facilities was a barrier to seeking treatment as well as Saqib et al. (2011) showing that overcrowding at the facilities discouraged them from choosing these facilities. Although most hospitals in Thailand have provided a 'one stop service' for TB patients, there were many participants avoiding to get TB treatment there because they had faced with previous bad experiences for example long waiting time, overcrowding, or more expenditures in getting to the hospital.

Satisfaction with health care provider

Moreover, some participants stated that they satisfied with health care provider at the primary care unit when they went to get treatment in the previous time. In the past, these participants claimed that they were treated and cured from normal diseases by the health providers who can treat only general diseases, not TB. While these participants were suffered from TB at this time and needed special anti-TB drugs which the providers there could not detect and treat it resulting in these participants had a longer duration of the delay. This corresponds to Yimer et al. (2009) showing that health providers working at the mid-level health care facilities and lack of up-to-date training about TB detection was associated with the delay.

Therefore, it can be stated that residence area was an influencing factor for patient delay in this study which resulted in travelling problems and the first health care facility. Living in rural area where the health care facility is limited, participants might be received inadequate services due

to lack of TB specialist at the first level of health care facility and also a proper TB detection system in this facility. Participants living in urban area were more likely to access an advance treatment system than patients living in rural area, thus it might lead the rural participants have a long duration of patient delay. Moreover, residence area could be considered to be related to psychological theories as it also could contribute to perceptions in benefits and barriers in the HBM. In addition, this could be also considered as other construct related to other variables in the HBM and the TRA which resulted in patient delay.

7.4.4.4 Patient delay related to social support

Social support could be considered as one of influencing factors for patient delay in this study as Ayisi et al. (2011) pointed out that social support offered by family often played an important role in encouraging early TB diagnosis as well as Laohasiriwong et al. (2016b) showed that family support was attributed to decline unacceptable delay. Miller and DiMatteo (2013) stated that social support from family offered patients with practical help and could deal with the stresses of living with diabetes, and Zhang et al. (2007) also pointed out that social support from family and friends could help patients with diabetes to remain active in their health care when they faced with some problems including physical, social, and economic problems.

Although, in the final model of quantitative findings, social support was not found as a risk factor for patient delay in multivariate analysis, it could be found as an influencing factor by qualitative findings. Participants claimed that they needed social support from both their family and friends or colleagues surrounding them to deal with their symptoms. This is consistent with Harvey and Alexander (2012) stated that strong social support could help older women maintain independence longer than those who were socially isolated. Social support can be used as a resource provided by others (Cohen & Syme, 1985) which can be grouped into two sources: family and other people who are not family member such as friends, colleagues, or neighbours.

Therefore, it can be seen that participants who had strong social support was related to a shorter duration of patient delay because they had some people understanding and supporting them. Also, social support could be provided by many factors such as family member, and friends or colleagues as shown in following sessions.

Social support and family members

In terms of the number of family members, the quantitative findings in univariate analysis of this study found that a greater number of family member was associated with a longer duration of patient delay. This is consistent with a study of Turner-Musa et al. (1999) found that patients

with end-stage renal disease living in an extended family had double the mortality risk than those living in a nuclear family and were overburdened by needs of their family.

The number of family members

According to Thai family structure, a report of the social indicators of Thailand (Ministry of Digital Economy and Society, 2019) has shown that about one-third of Thai households in 2018 were extended families which there are at least 2 generations living together including grandparents, parents, and children. The qualitative finding also showed that participants, especially older people, lived with their family including 3 – 4 generations. The extended family thus might be considered as being associated with the relationship between family members as shown in this study. Some participants of this study stated that they lived with their family about 7-10 persons including themselves, their children, and their grandchildren. They also expressed that their children needed to look after and spend more time with their grandchildren rather than look after them. Some of them pointed out that their kids needed to work in other area, thus they needed to stay with their grandchildren who were young during a daytime. Therefore, they felt that they lacked social support from their children. This is consistent with a study of Otwombe et al. (2013) who pointed out that people living in small families had lower odds of experiencing the delay.

However, in qualitative findings, there were some participants stating that they lived alone in their house thus they had a longer duration of patient delay because there was nobody looking after them or observing their symptoms. This finding corresponds to a study of Lin et al. (2009) showing that patient who lived alone were more likely to have a longer duration of the delay. In addition, some participants who lived with their nuclear family consisting of parents and unmarried children stated that they had been taken care, observed their symptoms as well as suggested and taken to get treatment at the hospital in early stage of TB progression. Thus, these participants had a shorter duration between their symptoms' onset and the first visit at health care provider. This reason is supported by Asefa and Teshome (2014) who stated that the patients living in nuclear families were less likely to delay from health facility.

The main caregiver

Regarding caregiver, it can be found that the main caregiver was related to social support resulting in the duration of patient delay. According to Naylor et al. (2017) stated that caregiver was a person who had responsibility to promote positive health outcomes throughout periods of acute illness extending from hospital to home, thus the caregiver was an important person in family. From the qualitative finding of this study, some participants stated that they had their

spouse or children looking after them thus they accessed to the hospital initially. While some participants had only relatives looking after them that was not good as their spouse or children resulting in having a longer duration. Moreover, some participants reported that they had no caregiver thus it made them have longer period since their symptoms onset until getting a proper treatment. This is consistent with a study of Lock et al. (2011) showing that discussing about symptoms with family was significantly associated with a shorter patient delay. This is also supported by a study of Buregyeya et al. (2014) stating that lack of family support resulted in patient delay.

Social support and other persons

Besides family members, social support can be gained from other people especially friends or colleagues who have close relationship with patients. According to the qualitative finding of this study, it can be seen that social support from other people was also important for participants. Participants claimed that they also needed social support from other people such as their friends, colleagues, or neighbours. However, some participants stated that they were not sure about the social support received from other people after they discovered about their disease to other people. They also felt that the relationship between them and other people called 'friends' seemed to be changed. Most participants thus tried to keep their illness as a secret topic because they feared to be gossiped and discriminated from their social. This finding is consistent with a study in Uganda as Macfarlane and Newell (2012) stating that many participants chose to do not tell their disease to their friends or neighbours, just told to their family only, because they were afraid about social discrimination.

Therefore, it can be seen that social support especially provided by family and close person was an influencing factor for patient delay in terms of there was someone who looked after or discussed about the occurring symptoms. Participants with high level of social support seemed to have a shorter duration of the delay than ones with low level of social support. The social support from both family members and other persons could help people to recognise and deal with the diseases. Moreover, social support could be considered to be related to psychological theories as it also could contribute to cues to action in the HBM. In addition, this could be also considered as other variables in the HBM and the TRA which resulted in patient delay.

7.5 Addressing of the quality of the findings

An explanatory sequential mixed methods approach was undertaken in this study to explore the influencing factors of patient delay among pulmonary tuberculosis patients in a high burden

area, Thailand. Using a mixed method approach has advantages compared with the use of each method alone as it combines the strengths of two methods and reduces their weaknesses.

In this part of the discussion, the quality of the results and findings of both quantitative and qualitative approach is discussed in the sense of the literature. The argument around the guidelines and the criteria are also considered.

7.5.1 The quality of the quantitative findings

In terms of constructing a structured questionnaire, the questionnaire was first drafted in English, then was translated into Thai. The accuracy of translation between both languages was checked and proved by four bilingual experts. Two of them had checked the accuracy of translation from English to Thai version, and others had checked one from Thai to English version. The questionnaire was final drafted by comparing and amending with all recommendations from the experts to be accurate and constant the meanings of both languages.

In terms of the response rate, according to suggestions of Jaykaran (2011), the participants were notified and invited to take part in this research in advance and they had time to make a decision to participate in this study. Moreover, the aims of the study and means of completing the questionnaire were provided and clearly explained to the participants according to the provided information sheet. In addition, the data collection was undertaken in the waiting time at the hospitals when participants came to meet a doctor. Furthermore, I was at the settings to answer questions raised by participants and to assist some participants who needed an interviewer-administered questionnaire. Therefore, the participants felt that they were willing to take part as a stakeholder and cooperated well in this research study thus the response rate was 100 percent. This corresponds with a study in Thailand found that the response rate was 100 percent because participants cooperated well which was resulted from they were provided adequate information and assistance to answer the questionnaire (Pongdee & Kuhirunyaratn, 2015).

According to the nature of quantitative research is to deal with numerical data and their statistical interpretations under a reductionist, logical and strictly objective paradigm. In terms of the quality of the quantitative results, the structured questionnaire used to collect data was measured for the reliability and rigour before using to collect data. The accuracy of the result can be resulted from the reliability and rigour of the standard tool which can be measured by validity and reliability (Heale & Twycross, 2015).

7.5.1.1 Validity

The validity is defined to the ability of the tool to accurately measure what it is meant to measure (Heale & Twycross, 2015). In this study, the Item-Objective Congruence Index (IOC) (Turner & Carlson, 2003) was used to assess whether the tool covered the whole domains related to the variables. Six experts in the field of nursing and public health had checked and rated the items addressed in the structured questionnaire to determine whether the questionnaire's contents were valid. Although this validity assessment might not be sufficient to measure the validity of instrument construction, there was evidence that it was valid for research purposes and under-studied population. The questionnaire reviewed by the experts was then adjusted and amended with their recommendations to cover the contents better. The adjusted questionnaire was then checked for content validity by the experts again before assessing its reliability. The IOC of each item was between 0.67 – 1.00 which was acceptable value for the validity. In addition, Streiner et al. (2014) stated that demonstrating the construct validity of any tool was a never-ending task to assess the effectiveness of the tool in a variety of settings and in different populations.

7.5.1.2 Reliability

Reliability means the ability of a tool to create stable and constant results whenever and whoever uses it (Bannigan and Watson, 2009). The reliability of the questionnaire was assessed by undertaking a pilot study strategy among 15 PTB patient in the difference group. KR-20 (Kuder-Richardson Formula 20), an index of the internal consistency reliability of a measurement instrument (Thompson, 2010), was used to measure the reliability of the set of questions on TB knowledge and social support which were needed to measure the internal consistency reliability. The KR-20 for both sets of questions were 0.80 and 0.79, respectively which were acceptable values for internal consistency reliability.

7.5.2 The quality of the qualitative findings

In terms of constructing an instrument for qualitative part, a semi-structured questionnaire was first drafted in English based on the literature review. The questionnaire then was checked for content validity to ensure whether it covered all the domains related to the variables by six experts. Moreover, the first-draft questionnaire was amended and added some questions after the quantitative data were reported. Thus, the final semi-structured questionnaire was completely constructed in English covering most topics related to the influencing factors of patient delay and then translated into Thai. The process of the accuracy measurement of the translation was similar to the structured questionnaire used in the quantitative phase. In addition, there were some unstructured questions emerged during the interviews. These questions were reviewed and improved by the researcher to be used in the next interviews.

According to the nature of qualitative research is to make sense of and recognise designs among texts to develop a purposeful picture without compromising its richness and dimensionality. Unlike quantitative research, the qualitative research does not handle numerical information but it deals with phenomenological interpretations which inseparably tie in with human senses and subjectivity (Leung, 2015). Thus, the quality of qualitative research relies on trustworthiness which is defined to credibility, transferability, dependability, confirmability, and reflexivity (Korstjens & Moser, 2018).

7.5.2.1 Credibility

Credibility in qualitative approach is comparable to internal validity in the quantitative approach as it means confidence in the truth of the research findings. According to Lincoln and Guba (1985) stated that credibility is the most important aspect of the trustworthiness of a qualitative study. It can indicate whether the findings represent reasonable information drawn from the participants' original data and correct interpretations from the participants' original views (Korstjens & Moser, 2018). However, the quality of the tool used to collect data can influence in the credibility of the findings.

In terms of recruiting participants, the participants were not chosen to be illustrative of the total population but preferably to represent a crucial component of that group (Marks, 2000). Thus, only PTB patients who had a long period of patient delay were recruited into the in-depth interview process rather than PTB patients with a short duration of the delay to obtain their actual experiences, views, and beliefs related to a longer patient delay.

In terms of collecting data, the data were collected from participants by individual in-depth interviews based on the semi-structured interview guide in Thai language because all participants always use Thai language in their conversation. After the interviews, the audio-recording and field notes were transcribed in Thai version to explore whether the information was complete and maintain the meanings of participants' original statement. The data were then reviewed by the researcher to re-check the understandings which should be consistent with the received information and to verify the accuracy and clarity of the obtained information. The transcripts in Thai version were then translated into English version which were prepared for analysis. Both versions of the transcripts were back translated by the researcher and checked the accuracy of the translation by four bilingual experts before data analysis.

7.5.2.2 Transferability

Transferability means to the applicability of the findings of qualitative research to be transferred to other contexts or settings with other participants. In term of obtaining the rich data from

targets, as the key feature, the researcher involving in this study is credible to have a distinctive influence on collecting data (Bulpitt & Martin, 2010). According to a recommendation of Lincoln and Guba (1985), it can be found in this study that the culture and social contexts surrounding data collection were recorded, reported, and discussed in order to provide the evidence that it could be applicable to other contexts, situations, times, and populations. For example, as shown in methodology chapter, the individual in-depth interviews were undertaken in a private room at the hospital during the time when participants were waiting to see a doctor or a pharmacist. Moreover, other contexts which might be used to generalise to other settings or populations were also shown in this chapter. For example, social context about the level of education in Thailand was discussed as a specific context in the current situation which was related to knowledge. Moreover, the context about level of health care facility could be used to indicate about the limitation of this setting which might be relevant to other settings in Thailand and other countries. In addition, the contexts on culture namely Thai lifestyle and family structure could be found in this study as it could be generalised to other populations.

7.5.2.3 Dependability

Dependability in qualitative research is comparable to reliability in quantitative research. It means the consistency of findings over time and whether the data analysis process is in line with the accepted standards for a specific design (Korstjens & Moser, 2018). According to a statement by Lincoln and Guba (1985), the research design and its implementation were shown that how to plan and carry out in methodology chapter. Moreover, the strategy of data collection was also addressed clearly in the same chapter which was provided the details of what was completed in the field. In addition, the process of transcription and translation between two languages were illustrated in order to ensure about the reliability of the qualitative data. The process of data analysis was also shown in this study which was managed by using the Nvivo.

7.5.2.4 Confirmability

Confirmability means the trustworthiness of the data analysis as well as the existence of the findings in the participants' original meanings which are not influenced by the researcher's preconceptions (Lincoln & Guba, 1985). In this study, the qualitative data were used to explain more details about the influencing factors for patient delay using a thematic analysis. The current study used only one researcher engaging in the process of the data analysis. However, to ensure confirmability, all English interview transcripts were sent to both supervisors as well as all the findings of data analysis were reported to them in order to be advised and received more suggestions from them. They also commented on the initial polls of codes, themes, and categories thus an agreement about the themes and categories could be achieved. The final

themes were discussed in supervisory meetings with both supervisors as shown in Chapter 6 Results: Qualitative data analysis. This process allowed both the student and the supervisors to confidentially confirm that the data analysis was genuinely developed by the participants' accounts.

7.5.2.5 Reflexivity

Reflexivity means the process of critical self-reflection about oneself as researcher and the relationship between the researcher and participants (Korstjens & Moser, 2018). As a key instrument, the researcher cannot do empirical research without data, and they will not have data unless they gather it. While this simple truth seems so obvious, the task of data collecting is anything but simple and obvious (Shank, 2006). According to Marks (2000) stated that "Qualitative research is more of an art than a science". This statement shows that qualitative researchers try to assume this approach with their concepts about reality of existence, rather than attempt to measure it (Savin-Baden & Major, 2013). Thus, the qualitative researcher has to play an important role as a prime instrument in all processes of qualitative research especially the data collection. In this current study, in the same line of most of the qualitative studies, concerned with participants' beliefs, attitudes, feelings, and experiences, thus the role of the researcher needs to be acknowledged.

Role of the researcher

The role of the researcher is an important aspect of the research. In a mixed methods approach, the role of the researcher should be discussed in both strands, especially in the qualitative part.

In the quantitative phase, the researcher's role is theoretically non-existent (Simon, 2011). In this study, participants acted independently of the researcher as a self-administered questionnaire was mainly used in data collection. However, an interviewer-administered questionnaire was applied to some participants who needed which the researcher acted as an assistant to read questions and tick in the questionnaire according participants' answers.

In the qualitative phase, the researcher's role is different to the first phase. The researcher is considered an important instrument of data collection (Denzin & Lincoln, 2008). In this phase, individual in-depth interviews were used to collect data from participants. The researcher asked probing questions related to participants' reasons for patient delay according to the semi-structured questionnaire, then listened, then thought, and then asked more probing questions to get to deeper levels of the conversation. Some interesting topics needed to be discussed including role of the researcher, interaction with research participants, own biases, and other ethical issues.

In terms of the role, in order to obtain rich data from participants, I possibly influenced data collection (Bulpitt & Martin, 2010). Thus, I needed to gain some sense of the topic and apply many skills to the interviews. I needed to capture and understand the interviewee's responses to make a decision about additional exploration. I then needed to reflect rapidly to extract the critical features of the interviews, eliminate irrelevant information, and concurrently express related questions. Also, I needed to make notes about some participant's ideas before replying and asking for more explanation (Legard et al., 2003).

The relationship between the researcher and research participants is very important in terms of trustworthiness data (Eide & Kahn, 2008). I thus communicated to participants with genuineness to build a good relationship. Thus, I was able to collect some sensitive and secret information such as HIV status from the research participants. This issue is very sensitive and stigmatised in Thailand such that most PLHIV try to keep their HIV status secret.

Regrading my own biases, my biases may have influenced the findings of the research (Pannucci & Wilkins, 2010). To avoid bias, I considered all the information gathered and tried to analyse it with a clear and unbiased mind. Moreover, I continually re-evaluated my opinions and reflections to ensure that pre-existing assumptions did not influence the interviews. During the interviews, I asked general questions first, before moving to specific or sensitive questions in order to avoid question-order bias. Furthermore, avoid leading questions and wording bias, I kept the questions simple and avoided words that could introduce bias.

It is also important to consider ethical issues (Stadtlander, 2015). I considered issues such as doing the research within my own work environment. In this case, I did the research on my own under supervision and approval from both supervisors. Moreover, there was no conflict of interest in this research as the research processes were explained to participants before undertaking the research and their consent was obtained.

7.6 Personal development

In my opinion, I can summarise it by saying that I have gained more knowledge and experiences about conducting research since I have started to undertake my project. There are some more specific thoughts what I have learned as shown in below:

1. There were many issues that I already thought I knew, but my knowledge was inadequate, inconsistent, or wrong – which I learned after conducting this study. Research is not always about investigating something new; it is about confirming what others assert is true and extending that into something to investigate further to add to knowledge.

2. I was familiar with quantitative research and had no experience about qualitative research. I thus decided to adopt an explanatory sequential mixed methods approach into this study. I found that it was suitable for this study as the process of data collection which started with surveys and was then followed by interviews offered me a wider research experience.

3. To achieve an appropriate sample size in this study I needed to understand human nature and provide an appropriate approach to reach the targets. Moreover, I needed to provide appropriate information about the research project to participants to help them gain better understanding and be willing to participate in the study.

4. Interviewing was a challenging task as a quantitative researcher. The method of gathering meaningful information needed to be reviewed and improved. After each interview, I had to review the information obtained and my interview approach and to improve it to be better prepared for the next interviews in order to obtain more useful information.

7.7 Chapter summary

This chapter has drawn together the findings from both quantitative and qualitative strand and discussed them in the line of the literature. In some part of this analysis, the current study was consistent with the previous existing findings while there was some more information to describe influencing factors within the current context that supported the study's findings from those in the literature.

This chapter has also offered an assessment of the quality of findings of both stands as well as the contributions and the learning from this study.

Chapter 8 Conclusion

8.1 Introduction

This chapter is divided into 4 sections; the first section provides a thesis summary followed by, the next section, the strengths and limitations of this study. The following section, the recommendations for practice, policy, and future research are offered. Finally, concluding thought and closing remarks are stated at the end of the chapter.

8.2 Thesis summary

The overall objective of this study project was to describe and discover the duration and influencing factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand. The study attempted to compare differences across PTB patients who had and had no the delay, as well as to explain deeply among PTB patients having the delay only.

The findings of the current study discovered that knowledge about TB was still distinguished among PTB patients in Thailand even though the Thai government has provided more information about TB. The findings also showed that financial barrier could be considered as one of the major direct influencing factors in patient delay of TB treatment. Furthermore, the residence area also affected to the delay which results in various indirect factors as well. In addition, social support could also be identified as one of the factors influencing the duration of the delay which could be considered as a factor of social level.

In the subsequent section, the strengths and limitations of the study, the potential implications of the research findings for practice, policy, and future research are also considered.

8.3 Strengths and limitations of this study

8.3.1 Strengths of this study

1. This study has not restricted itself to a simple explanation of the situation in Thailand, it also looked at the most influencing factors for patient delay and tried to examine that in more depth. Thus, the current study, the first mixed methods study in this topic in Thailand, has contributed by deepening an understanding of the phenomenon of patient delay among PTB patients. The findings can be used to answer the relationships between influencing factors and the delay as well as the relationships between the main influencing factors and other related factors.

2. This study also combined quantitative and qualitative findings to identify the influencing factors of the delay. The findings of qualitative part were used to explain the relationships between each factor of the delay. As well as it can be used to explore the real and hidden reasons of participants who have a longer duration of the delay which cannot explained by quantitative

results. The combination of both quantitative and qualitative findings can be used to illustrate a more complete picture of this phenomenon.

3. This study has discovered those factors that influence patient delay among PTB patients in Nakhon Ratchasima Province. It is clear that even if there are similarities across districts and populations, different features of each district and population need to be undertaken to adapt preventive procedures to be appropriate to each setting.

8.3.2 Limitations of the study

1. This study was undertaken using participants' memory and previous experiences thus recall bias may influence the findings of the study. Thus, the researcher tried to minimise the recall bias by recruiting only PTB patients who were diagnosed no more than 2 months before the interviews.

2. This study was conducted in the Thai language, thus there may be some mistranslations with some words which could not be translated into English language. Thus, bilingual experts could help to suggest and feedback on transcripts of both languages.

3. This study has not revealed the consequences of patient delay in terms of the transmission to other people due to the limitation of time. This should be further investigated in the future to explore the relationship between patient delay and transmission rate.

8.4 Recommendations for practice, policy, and future research

This section offers the recommendations that arise from this study for practice, policy, and future research.

8.4.1 Implications for practice

1. Adequate correct knowledge about the disease is needed. It is a responsibility of health providers in each area to provide adequate correct knowledge about the disease to people in their response area. People should be gained and improved their knowledge about the disease in order to improve health literacy which refers to people are able to manage their health conditions including seeking an appropriate health care, understanding their health status, and applying their obtained information to look after themselves. Therefore, adequate correct knowledge can help to minimise the duration of patient delay resulting in decreasing its consequences.

2. The right in getting health care services is necessary. It is a responsibility of health workers to provide more information about the right to get a free treatment provided by the public health

providers. Therefore, understanding about this topic can help to increase the recognition on their right to receive a better health care.

3. Knowledge about TB especially TB detection approach among health providers and village health volunteers is needed to be revised and fulfilled. Gaining more adequate knowledge is useful for health providers and village health volunteers especially in primary care level which can result in an increase of recognition about the TB-related symptoms among TB suspected or presumptive TB cases. As a study in Myanmar (Linn et al., 2018) showed that the services provided by village health volunteers was as good as that provided by basic health staff. Therefore, adequate knowledge and sufficient recognition of health workers can help to detect the disease initially and reduce the duration of the delay.

4. TB screening test by questionnaire (paper-based screening test) should be provided to screen some TB suspected cases among close contacts and risk groups. According to a study of van't Hoong et al. (2012) in Kenya suggested that the combination of a screening questionnaire and chest x-ray had higher both sensitivity (100%) and specificity (65%). Therefore, sequential application of first symptom screen questionnaire followed by chest x-ray confirmation should be applied in this context in order to reduce time and cost of diagnosis methods.

5. Understanding in nature of the disease should be provided to all people in order to gain more social support to each other. Therefore, adequate social support from other people, not only in family but surrounding people also, can help people to be recognised with occurring signs and symptoms as well as to access the treatment early.

8.4.2 Implications for policy

1. The government, through the Ministry of Education, should provide and encourage the next generation of Thai people to be graduated at least in lower secondary educational level (Grade 12) in order to have adequate knowledge about common diseases found in Thailand including TB. In addition, the ministry of Education which has responsibility to provide and fulfil all vital skills for the learners should cooperate with the Ministry of Public Health in order to develop and address the essential knowledge and skills about diseases into the Health and Physical Education learning area.

2. The government, through the Ministry of Public Health, should provide essential information about TB to Thai people especially older and illiterate people who lack the knowledge and recognition about TB which would enable them to manage their health conditions. According to a result of Morony et al. (2018) found that health literacy could be effectively applied in an adult basic learning curriculum to encourage learners to better manage their health.

3. The government, through the Ministry of Labour, should provide the strategy about health education in establishments. For example, the factories should provide a health education board or a health education corner in order to provide information about diseases. Also, annual physical examination should be provided to all workers in the factories in order to detect the diseases initially.

4. The government, through the Ministry of Public Health, should address TB screening system to the National TB policy to solve TB problem. For example, the TB screening test, in the form of questions about the risks of TB infection, should be distributed across the country via paper or online based. Regarding this strategy, people will be improved their health literacy as well as their recognition about the disease.

5. The TB e-referral system from the primary care level namely a sub-district heath promoting hospital or a primary care unit to the secondary or tertiary care level such as district or provincial hospital should be improved and applied in order to refer TB suspected or presumptive TB to get advance TB diagnosis. According to a study of Naseriasl et al. (2015) showed that e-referral system had various advantages such as improving communication, increasing access to care, exchanging information, gaining knowledge, and reducing waiting times.

8.4.3 Implications for future research

1. It is critical to evaluate components of the knowledge to determine which aspects are more influencing and dominant to the delay. Moreover, a relationship between knowledge and health literacy is also important to further study.

2. It is important to investigate how knowledge and recognition of health providers especially in primary care level could help to mitigate and decrease the duration of patient delay.

3. It is crucial to evaluate how the health education could be used to increase recognition and awareness among people.

4. It is interesting to assess the screening test strategy, as well as to determine the effective of TB screening test via paper-based or online test that how it could help to detect TB case.

5. It is necessary to investigate about social stigmatisation in the view of people without TB. The stigmatisation or attitude about being TB patient should be measured in terms of the effective of the campaign.

8.5 Concluding thoughts and closing remarks

The general aim of this study was to find out the factors influencing patient delay among PTB patients in a high burden area, in Thailand and it seems that, in a country such as Thailand, reaching this goal was quite a difficult task. The context of Thailand such as rural society and elderly society might complicate the TB problem. Thus, merely improving knowledge levels about TB, financial problems, social support, or ability related to services especially in primary care level may not be adequate to solve the TB problem.

The knowledge about TB was a major influencing factor of the delay that was gained from many factors such as education and experiences. In addition, the knowledge was also related to a lot of relevant factors which encourage patients to have a longer duration. Increasing adequate correct knowledge about TB may be crucial to be provided for all people, especially patients, close contacts, or risk groups to improve health literacy, recognition, stigmatisation, and social support.

Moreover, financial barrier and residence area were other influencing factors of the delay which influenced patients to have a longer period. Revising and fulfilling knowledge about TB may be crucial to improve among health providers in all health care levels as well as village health volunteers to stimulate the recognition on TB detection initially. In addition, social support was another influencing factor which could result in a longer duration of the delay. Encouraging social support in both family and community level may be useful to minimise the period between the onset of symptoms and the first visit at health care facility.

“To end TB from our world, it should start from now, initial TB detection”.

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Appendix 1: List of authors stating the definition of delays

Author(s)	Patient delay	Health system delay	Total delay	Diagnostic delay	Treatment delay
Adejumo et al. (2017)		Yes			
Adenager et al. (2017)	Yes	Yes	Yes		
Ahmad et al. (2011)	Yes	Yes	Yes		
Alavi et al. (2015)			Yes		
Amar et al. (2016)			Yes	Yes	Yes
Asefa & Teshome (2014)			Yes		
Aye et al. (2010)	Yes	Yes			
Ayuo et al. (2008)	Yes	Yes	Yes		
Basa & Venkatesh (2016)	Yes	Yes	Yes		
Basnet et al. (2009)	Yes	Yes	Yes		
Bassili et al. (2008)	Yes	Yes	Yes	Yes	Yes
Behera et al. (2013)	Yes	Yes	Yes		Yes
Belay et al. (2012)	Yes	Yes	Yes	Yes	Yes
Belkina et al. (2014)	Yes	Yes	Yes		
Bogale et al. (2017)	Yes	Yes	Yes		
Buregyeya et al. (2014)	Yes	Yes	Yes		
Cambanis et al. (2007)	Yes				
Chang & Esterman (2007)	Yes			Yes	Yes
Chaychoowong & Suggaravetsiri (2009)	Yes				
Chen et al. (2015)		Yes			
Cheng et al. (2013)					Yes
Chern et al. (2008)					Yes
Chiang et al. (2005)	Yes	Yes	Yes		
Craig et al. (2009)					Yes
Demissie et al. (2002)	Yes	Yes	Yes		
Deponti et al. (2013)	Yes	Yes	Yes		
dos Santos et al. (2005)			Yes		
Farah et al. (2006)	Yes	Yes	Yes		
Fatiregun & Ejeckam (2010)	Yes				
Gagliotti et al. (2006)	Yes	Yes	Yes		
Gebeyehu et al. (2014)	Yes				
Gebreegziabher et al. (2016a)	Yes	Yes	Yes	Yes	
Gebreegziabher et al. (2016b)			Yes		
Gele et al. (2009)	Yes	Yes	Yes		
Goel et al. (2011)	Yes	Yes		Yes	Yes
Gosoniu et al. (2008)					
Gothankar et al. (2016)	Yes	Yes	Yes	Yes	Yes
Huong et al. (2007)	Yes	Yes	Yes		Yes
Hussen et al. (2012)	Yes	Yes	Yes		
Ibrahim et al. (2016)	Yes	Yes	Yes		
Ilangovan et al. (2015)					Yes
Jagadish et al. (2012)	Yes	Yes	Yes		
Jurcev-Savicevic & Kardum (2011)		Yes			
Kanyerere & Aase (2005)	Yes	Yes			
Karim et al. (2007)	Yes	Yes	Yes		Yes
Kiwuwa et al. (2005)	Yes	Yes			
Konda et al. (2014)	Yes	Yes	Yes		Yes
Kurspahić-Mujčić et al. (2013)	Yes				
Lacroix et al. (2008)	Yes				
Lambert et al. (2005)	Yes	Yes	Yes		
Laohasiriwong et al. (2016a)		Yes			

Author(s)	Patient delay	Health system delay	Total delay	Diagnostic delay	Treatment delay
Laohasiriwong et al. (2016b)	Yes				
Leung et al. (2007)	Yes	Yes			
Leutscher et al. (2012)	Yes	Yes			
Lin et al. (2008)	Yes	Yes	Yes		
Lin et al. (2010)				Yes	Yes
Lock et al. (2011)	Yes				
Lusignani et al. (2013)	Yes	Yes	Yes		
Maamari (2008)		Yes	Yes	Yes	Yes
Machado et al. (2011)	Yes	Yes			
Maciel et al. (2010)	Yes	Yes	Yes		Yes
Mahato et al. (2015)	Yes	Yes			
Mahendradhata et al. (2008)					Yes
Makwakwa et al. (2014)	Yes	Yes	Yes		
Meintjes et al. (2008)	Yes	Yes	Yes		
Mesfin et al. (2005)	Yes		Yes		
Mesfin et al. (2009)	Yes	Yes	Yes		
Meyssonnier et al. (2012)				Yes	
Mfinanga et al. (2008)	Yes	Yes	Yes	Yes	Yes
Mirsaeidi et al. (2007)	Yes	Yes	Yes		
Mistry et al. (2016)	Yes		Yes	Yes	Yes
Nasehi et al. (2012)				Yes	
Ngadaya et al. (2009)	Yes	Yes	Yes		
Ngangro et al. (2012b)	Yes	Yes	Yes		
Odusanya & Babafemi (2004)	Yes	Yes			Yes
Okur et al. (2006)	Yes	Yes		Yes	Yes
Okutan et al. (2005)	Yes	Yes	Yes		
Osei et al. (2015)	Yes	Yes	Yes		
Paul et al. (2012)					Yes
Pehme et al. (2006)	Yes				
Pezzotti et al. (2015)	Yes	Yes	Yes		
Qureshi et al. (2008)	Yes	Yes	Yes		
Rodger et al. (2003)				Yes	
Rodríguez et al. (2016)	Yes				
Sabawoon et al. (2011)			Yes		
Sagbakken et al. (2010)	Yes	Yes		Yes	
Said et al. (2017)				Yes	
Saifodine et al. (2013)	Yes	Yes			
Saldana et al. (2013)	Yes	Yes			Yes
Saly et al. (2006)	Yes	Yes	Yes		
Sendagire et al. (2010)	Yes	Yes	Yes		
Shu et al. (2014)	Yes	Yes		Yes	
Sreeramareddy et al. (2009)	Yes	Yes	Yes		
Sreeramareddy et al. (2014)	Yes	Yes	Yes	Yes	Yes
Takarinda et al. (2015)	Yes	Yes	Yes		
Tamhane et al. (2012)	Yes				Yes
Thakur et al. (2013)	Yes	Yes	Yes	Yes	Yes
Tobe et al. (2013)	Yes				
Uchenna et al. (2012)					Yes
Ukwaja et al. (2013)	Yes	Yes	Yes		
Van Wyk et al. (2011)	Yes	Yes	Yes	Yes	Yes
Verhagen et al. (2010)	Yes	Yes	Yes	Yes	Yes
Virenfeldt et al. (2014)					Yes
Wang et al. (2007)	Yes	Yes			
Wang et al. (2016)	Yes				

Author(s)	Patient delay	Health system delay	Total delay	Diagnostic delay	Treatment delay
Woith & Larson (2008)	Yes				
Wondimu et al. (2007)			Yes		
Xia et al. (2016)	Yes				
Yamasaki-Nakagawa et al. (2001)	Yes	Yes			
Yimer et al. (2005)	Yes	Yes			
Yimer et al. (2014)	Yes	Yes	Yes		

Appendix 2: List of authors stating the value of delay

Author(s)	The defined cut-off value	The value of delay
Adejumo et al. (2017)	Defined by based on other study	HSD>=15 days
Adenager et al. (2017)	Defined by based on other studies	PD>21 days, HSD>7 days
Ahmad et al. (2011)	The median was used as the cut-off point	PD>1 week, PD+DxD>5.4 weeks
Alavi et al. (2015)	Defined by themselves	TTD>4 weeks
Almeida et al. (2015)	The median was used as the cut-off point	PD>=20 days
Amar et al. (2016)	Defined by based on previous study.	PD>30 days, HSD>7 days
Asefa & Teshome (2014)	The median was used as the cut-off point	TTD>45 days
Aye et al. (2010)	No information, used the number of duration for analysing delay with linear regression	
Basa & Venkatesh (2016)	Defined by based on other studies	PD>21 days, HSD>7 days
Basnet et al. (2009)	Defined by themselves	PD>30 days
Bassili et al. (2008)	The median was used as the cut-off point	
Bawankule et al. (2010)	Defined by based on other study	PD>1 month
Behera et al. (2013)	Defined by based on RNTCP guidelines	PD>14 days, DxD>14 days, RxD>7 days
Belay et al. (2012)	The median was used as the cut-off point	PD>20 days, HSD>33.5 days, RxD>1 day, TTD>70.5 days
Belkina et al. (2014)	The median was used as the cut-off point	PD>27 days, HSD>7 days, TTD>50 days
Biya et al. (2014)	Defined by based on other study	PD>4 weeks
Bogale et al. (2017)	No information, used the number of duration for analysing delay with linear regression	
Buregyeya et al. (2014)	Defined by based on other studies	PD>3 weeks, HSD>1 week, TTD>4 weeks
Cambanis et al. (2007)	Defined by themselves	PD>4 weeks
Chang & Esterman (2007)	The median was used as the cut-off point	PD>30 days, DxD>22 days,
Chaychoowong & Suggaravetsiri (2009)	The median was used as the cut-off point	PD>30 dyas
Chern et al. (2008)	Defined by themselves	RxD>7 days
Chiang et al. (2005)	The median was used as the cut-off point	PD>7 days, HSD>23 days
Coimbra et al. (2012)	The median was used as the cut-off point	TTD>41 days
Craig et al. (2009)	Defined by themselves	TTD>8 weeks
Demissie et al. (2002)	Defined by themselves, the local situation.	PD>= 30 days, DxD >=15 days
Deponti et al. (2013)	The median was used as the cut-off point	PD>=30 days, HSD>=18 days
Díez et al. (2004)	The median and 75percentile were used as the cut-off point	PD>=22,57 days
Díez et al. (2005)	The median was used as the cut-off point	HSD>=6 days
dos Santos et al. (2005)	Defined by their analysis from 60 and 90 days.	TTD>60 days

Author(s)	The defined cut-off value	The value of delay
Farah et al. (2006)	No information, used the number of duration for analysing delay with linear regression	
Fatiregun and Ejeckam (2010)	Defined by themselves	PD>=30 days
Gagliotti et al. (2006)	Defined by themselves and median was used as the cut-off point	PD>30 days, HSD>36 days
Gebeyehu et al. (2014)	Defined by WHO recommendation	PD>21 days
Gebreegziabher et al. (2016a)	Defined by based on previous studies	PD>30 days, HSD>15 days
Gebreegziabher et al. (2016b)	The median was used as the cut-off point	TTD>60 days
Gele et al. (2009)	The median was used as the cut-off point	PD>60 days, HSD>6 days, TTD>70 days
Goel et al. (2011)	Defined by based on a committee consisting of DTO and specialist physicians treating TB	PD>30 days, HSD>7 days, DxD>5 days, RxD>2 days, TTD>37 days
Gothankar et al. (2016)	The median was used as the cut-off point (>=median is delay)	PD>=18 days, HSD>=22 days, DxD>=41 days, RxD>=4 days, TTD>=41 days
Hinderaker et al. (2011)	Defined by themselves	TTD>12 weeks
Huong et al. (2007)	Defined by themselves	PD>=6 weeks, HSD>=6 weeks, TTD>=12 weeks
Hussen et al. (2012)	Defined by themselves	PD>2 weeks, HSD>7 days
Ilangovan et al. (2015)	Defined by themselves	RxD>7 days
Jagadish et al. (2012)	Defined by themselves	PD>=30 days, HSD>=1-15 days, 15-30 days, and >30 days
Jurcev-Savicevic & Kardum (2011)	The median was used as the cut-off point	PD>38 days
Jurcev-Savicevic et al. (2013)	The median and 75th percentile were used as the cut-off point	HSD>15 and 42 days
Kanyerere and Aase (2005)	Defined by two hospitals	PD>4 weeks
Karim et al. (2007)	No information, used the number of the duration for analysing delay with linear regression	
Kiwuwa et al. (2005)	Defined by themselves and other study	PD>2 weeks, HSD>4 weeks
Konda et al. (2014)	Defined by themselves	PD>25 days, HSD>25 days, TTD>50 days.
Lacroix et al. (2008)	Defined by themselves	TTD>=100 days
Lambert et al. (2005)	No information, used the number of the duration for analysing delay with linear regression	
Laohasiriwong et al. (2016a)	Defined by based on other study	HSD>7 days
Laohasiriwong et al. (2016b)	Defined by themselves	PD>=30 days
Leung et al. (2007)	The median was used as the cut-off point	PD>20 days, HSD>20 days, TTD>50 days

Author(s)	The defined cut-off value	The value of delay
Leutscher et al. (2012)	Defined by themselves	PD>=3 months, HSD>=1 week, TTD>=3 months
Li et al. (2012)	The median was used as the cut-off point	PD>10 days
Lin et al. (2008)	Defined by based on other study	PD>60 days
Lin et al. (2010)	The 75th percentile was used as the cut-off point (>75th percentile is delay)	DxD>9 days, RxD>2 days.
Lock et al. (2011)	No information, used the number of the duration for analysing delay with linear regression	
Lusignani et al. (2013)	Defined by themselves	PD>30 days, HSD>15 days
Maamari (2008)	The median was used as the cut-off point	PD>31 days, HSD>15 days, DxD>55 days, RxD>1 day, TTD>57 days
Macfarlane & Newell (2012)	Defined by themselves	PD>=30 days
Machado et al. (2011)	Defined by based on other study	HSD>21 days
Maciel et al. (2010)	Defined by themselves for PD, median for HSD, TTD	PD>=30,90 days, HSD>=30 days, TTD>=110 days
Mahato et al. (2015)	Defined by based on previous studies.	PD>=30 days, HSD>=7 days, TTD>=28 days.
Makwakwa et al. (2014)	The median was used as the cut-off point	PD>2 weeks, HSD>2 weeks
Meintjes et al. (2008)	No information, used the number of the duration for analysing delay with linear regression	
Mesfin et al. (2005)	Defined by based on other study	PD>=3 weeks
Mesfin, et al. (2009)	Defined by based on other studies	PD>=30 days
Meyssonnier et al. (2012)	Defined by based on other literature, used two values for defining the delay.	PD+DxD>30, 90 days
Mfinanga et al. (2008)	Defined by themselves	PD>30 days, HSD>2 days, DxD>3 days, RxD> 1 days
Mistry et al. (2016)	Defined by guideline	PD>15 days, DxD>15 days, RxD>7 days, TTD>35 days
Mohamed et al. (2013)	The median was used as the cut-off point	PD>4 days
Nasehi et al. (2012)	The median was used as the cut-off point	PD+DxD>59 days
Ngadaya et al. (2009)	Defined by themselves	PD>30 days, HSD>5 days.
Odusanya & Babafemi (2004)	Defined by based on previous study.	PD>30 days, HSD>15 days
Okur et al. (2006)	Defined by based on other studies	PD>30 days, DxD>1 day, RxD>1 day
Okutan et al. (2005)	Defined by themselves, the significant differences in delay by independent determinants were only found when 30 days was used as the cut-off.	PD>30 days, HSD>30 days.
Osei et al. (2015)	Defined by themselves	PD>30 days, HSD>15 days,

Author(s)	The defined cut-off value	The value of delay
		TTD>45 days
Paul et al. (2012)	Defined by themselves	RxD>7 days
Pehme et al. (2006)	The median and 75th percentile were used as the cut-off point	PD>79, 140 days
Pezzotti et al. (2015)	Defined by based on other study and median	PD>30 days, HSD>15 days
Qureshi et al. (2008)	Defined by themselves and based on other study	PD>20 days, HSD>38 days
Rodger et al. (2003)	The median was used as the cut-off point	TTD>49 days
Rodriguez et al. (2016)	Defined by based on previous study.	TTD>30 days
Rossato Silva et al. (2012)	Defined by themselves	DxD>6 days
Sabawoon et al. (2011)	Defined by themselves	TTD>60 days
Said et al. (2017)	The median was used as the cut-off point	PD+DxD>3 weeks
Saifodine et al. (2013)	Defined by themselves	PD>2 weeks, HSD>4 weeks
Saldana et al. (2013)	The median was used as the cut-off point	PD>29 days, HSD>39 days, TTD>73 days
Saqib et al. (2011)	The median was used as the cut-off point	TTD>56 days
Schneider et al. (2010)	Defined by consultation with physicians and other knowledgeable in the field of TB	PD>3,6 weeks (3weeks for hemoptysis or fever, and 6weeks for cough, fatigue, night sweats, or weight loss)
Sendagire et al. (2010)	Defined by themselves	PD>8 weeks, HSD>6 weeks, TTD>14 weeks
Shu et al. (2014)	The median was used as the cut-off point	PD>5.4 weeks, DxD>0 weeks, PD+DxD>9.9 weeks
Takarinda et al. (2015)	Defined by based on other studies and the assumption of laboratory.	PD>30 days, HSD>4 days
Tamhane et al. (2012)	Defined by themselves	PD>20 days, HSD>14 days
Thakur et al. (2013)	The median was used as the cut-off point	PD>=15 days, HSD>=13 days, DxD>=33.5 days, RxD>=1 day, TTD>=36 days
Tobe et al. (2013)	Defined by themselves	PD>14 days
Trigueiro et al. (2014)	No information, used the number of the duration for analysing delay with linear regression	
Uchenna et al. (2012)	Defined by themselves	RxD>2 days
Ukwaja et al. (2013)	No information, used the number of the duration for analysing delay with linear regression	
van der Werf et al. (2006)	The median was used as the cut-off point	PD>30 days
Van Wyk et al. (2011)	The median in each variable was used as the cut-off point	
Virenfeldt et al. (2014)	No information, used the number of the duration for analysing delay with linear regression	
Wang et al. (2016)	Defined by themselves	PD>28 days
Whitehorn et al. (2010)	Defined by themselves	PD>3 weeks, HSD>2 weeks,

Author(s)	The defined cut-off value	The value of delay
		TTD>3 weeks
Wysocki et al. (2013)	The median was used as the cut-off point	PD>15 days
Xia et al. (2016)	The median was used as the cut-off point	PD>11 days
Yimer et al. (2005)	The median was used as the cut-off point of PD, HSD based on consultation made with treating physicians and using the experience of the previous study	PD>30 days, HSD>15 days
Yimer et al. (2014)	The median was used as the cut-off point and define by the specialist physicians and previous studies	PD>30 days, HSD>14 days, TTD>60 days
Zerbini et al. (2008)	Defined by themselves	PD>30 days, TTD>60 days
Zhao et al. (2013)	The median was used as the cut-off point	PD>14 days

PD = Patient delay, HSD = Health system delay, DxD = Diagnosis delay, RxD = Treatment delay, TTD = Total delay

Appendix 3: List of authors stating the duration of patient delay

Duration of patient delay in Africa region

Year of study	Country	Patient delay	Reference
2002	Ethiopia	60 days	Demissie et al. (2002)
2004	Nigeria	8 weeks	Odusanya & Babafemi (2004)
2005	Ethiopia	30 days	Yimer et al. (2005)
2005	Uganda	1 week	Kiwuwa et al. (2005)
2007	Cameroon	2 weeks	Cambanis et al. (2007)
2008	South-Africa	14 days	Meintjes et al. (2008)
2009	Tanzania	62 days	Ngadaya et al. (2009)
2009	Ethiopia	31 days	Mesfin, et al. (2009)
2009	Ethiopia	30 days	Yimer et al. (2009)
2009	Ethiopia	60 days	Gele et al. (2009)
2010	Tanzania	21 days	Verhagen et al. (2010)
2010	Uganda	4 weeks	Sendagire et al. (2010)
2011	Kenya	3 weeks	Ayisi et al. (2011)
2011	South-Africa	8 days	Van Wyk et al. (2011)
2012	Chad	15 days	Ngangro et al. (2012b)
2012	Ethiopia	63 days	Hussen et al. (2012)
2012	Ethiopia	20 days	Belay et al. (2012)
2012	Uganda	4.5 months	Macfarlane & Newell (2012)
2013	Angola	30 days	Lusignani et al. (2013)
2013	Mozambique	61 days	Saifodine et al. (2013)
2013	Nigeria	8 weeks	Ukwaja et al. (2013)
2013	Sudan	4 days	Mohamed et al. (2013)
2014	Ethiopia	27 days	Gebeyehu et al. (2014)
2014	Ethiopia	30 days	Asefa & Teshome (2014)
2014	Malawi	14 days	Makwakwa et al. (2014)
2014	Morocco	20 days	Akrim et al. (2014)
2014	Uganda	4 weeks	Buregyeya et al. (2014)
2015	Ghana	59 days	Osei et al. (2015)
2015	Zimbabwe	28 days	Takarinda et al. (2015)
2016	Ethiopia	18 days	Gebreegziabher et al. (2016a)
2016	Tunisia	29.54 days*	Amar et al. (2016)
2017	Ethiopia	51 days	Yirgu et al. (2017)
2017	Ethiopia	33.9 days*	Bogale et al. (2017)
2017	Ethiopia	17 days	Adenager et al. (2017)

* mean was used

Duration of patient delay in America region

Year of study	Country	Patient delay	Reference
2005	America	3.6 weeks	Lambert et al. (2005)
2005	Brazil	90 days	dos Santos et al. (2005)
2008	Argentina	31 days	Zerbini et al. (2008)
2009	Peru	61 days	Ford et al. (2009)
2010	Brazil	76 days	Maciel et al. (2010)
2011	Brazil	30 days	Machado et al. (2011)
2012	Brazil	41 days	Coimbra et al. (2012)
2012	Brazil	30 days	Silva-Sobrinho et al. (2012)
2012	Mexico	53.5 days	Salinas et al. (2012)
2013	Brazil	15 days	Wysocki et al. (2013)
2013	Brazil	30 days	Deponti et al. (2013)
2013	Brazil	20 days	Villa et al. (2013)
2014	Brazil	20 days	Trigueiro et al. (2014)
2015	Brazil	20 days	Almeida et al. (2015)
2016	Colombia	36 days	Rodríguez et al. (2016)

Duration of patient delay in Asia region

Year of study	Country	Patient delay	Reference
2000	Japan	17 days	Sasaki et al. (2000)
2001	Nepal	Men 1.5 months, Women 3 months	Yamasaki-Nakagawa et al. (2001)
2001	Thailand	11 days	Ngamvithayapong et al. (2001)
2002	India	20 days	Rajeswari et al. (2002)
2005	China	Jianhu:Funing 31:19 days	Xu et al. (2005)
2005	Taiwan	7 days	Chiang et al. (2005)
2006	India	21 days	Tobgay et al. (2006)
2006	Thailand	4.4 weeks	Rojpibulstit et al. (2006)
2007	Bangladesh	Men: 42 days Women 59 days	Karim et al. (2007)
2007	China	21 days	Wang et al. (2007)
2007	Hong Kong	20 days	Leung et al. (2007)
2007	Malaysia	30 days	Chang & Esterman (2007)
2007	Vietnam	3 weeks	Huong et al. (2007)
2008	China	60 days	Lin et al. (2008)
2008	Pakistan	33 days	Qureshi et al. (2008)
2009	Nepal	50 days	Basnet et al. (2009)
2009	Thailand	60 days	Chaychoowong & Suggaravetsiri (2009)
2010	India	95 days	Bawankule et al. (2010)

Year of study	Country	Patient delay	Reference
2010	Tajikistan	21.5 days	Ayé et al. (2010)
2010	Thailand	26 days	Pungrassami et al. (2010)
2011	Afghanistan	Privilege: 52 days Disadvantaged : 366.5 days	Sabawoon et al. (2011)
2011	India	30 days*	Goel et al. (2011)
2011	Indonesia	1 week	Ahmad et al. (2011)
2011	Indonesia	14 days	Lock et al. (2011)
2011	Vietnam	3 weeks	Hoa et al. (2011)
2012	China	36 days	Meyssonnier et al. (2012)
2012	China	10 days	Li et al. (2012)
2012	China	10 days	Zhou et al. (2012)
2012	Georgia	23.5 days	Rabin et al. (2012)
2012	India	24 days	Jagadish et al. (2012)
2012	India	15 days	Tamhane et al. (2012)
2012	India	7 days	Ananthakrishnan et al. (2012)
2013	China	6 days	Zhao et al. (2013)
2013	China	58 days	Cheng et al. (2013)
2013	China	10 days	Xu et al. (2013)
2013	China	10 days	Tobe et al. (2013)
2013	India	8 weeks	Kulkarni et al. (2013)
2013	India	16 days	Behera et al. (2013)
2013	India	15 days	Thakur et al. (2013)
2014	China	5.4 weeks	Shu et al. (2014)
2014	China	25 days	Chen et al. (2014)
2014	India	25 days	Konda et al. (2014)
2014	Uzbekistan	27 days	Belkina et al. (2014)
2015	Nepal	32 days	Mahato et al. (2015)
2015	Thailand	30 days	Rattananupong et al. (2015)
2016	China	11 days	Xia et al. (2016)
2016	China	28 days	Wang et al. (2016)
2016	India	18 days	Gothankar et al. (2016)
2016	India	24 days	Mistry et al. (2016)
2016	India	24 days	Basa & Venkatesh (2016)
2016	India	37 days	Purty et al. (2016)
2016	Nepal	32 days	Laohasiriwong et al. (2016b)

* mean was used

Duration of patient delay in Europe region

Year of study	Country	Patient delay	Reference
2004	Turkey	31.4 days*	Guneylioglu et al. (2004)
2005	Turkey	4.5 days	Okutan et al. (2005)
2006	Norway	28 days	Farah et al. (2006)
2006	Turkey	30 days	Okur et al. (2006)
2006	Ukraine	30 days	van der Werf et al. (2006)
2008	Russia	4 weeks	Woith & Larson (2008)
2011	Croatia	38 days	Jurcev-Savicevic & Kardum (2011)
2013	Bosnia	6.41 weeks*	Kurspahić-Mujčić et al. (2013)

Duration of patient delay in European Union region

Year of study	Country	Patient delay	Reference
2003	United Kingdom	49 days	Rodger et al. (2003)
2004	Spain	22 days	Díez et al. (2004)
2004	United Kingdom	34.5 days	Paynter et al. (2004)
2006	Estonia	79 days	Pehme et al. (2006)
2006	France	7 days	Gagliotti et al. (2006)
2012	Denmark	123 days*	Leutscher et al. (2012)
2012	France	14 days	Tattevin et al. (2012)
2012	United Kingdom	81.5 days	Sultan et al. (2012)
2013	United Kingdom	29 days	Saldana et al. (2013)
2015	Italy	26 days	Pezzotti et al. (2015)

* mean was used.

Duration of patient delay in Middle East region

Year of study	Country	Patient delay	Reference
2007	Iran	13 days	Mirsaeidi et al. (2007)
2008	Syrian Arab Republic	31 days	Maamari (2008)
2009	Iran	48 days	Shamaei et al. (2009)
2012	Iran	59 days	Nasehi et al. (2012)
2016	Qatar	30 days	Ibrahim et al. (2016)

Duration of patient delay in Oceania region

Year of study	Country	Patient delay	Reference
2001	Australia	29 days	Ward et al. (2001)

Appendix 4: Research tools

ID [ ][ ]-[ ][ ][ ]
Date [ ][ ]-[ ][ ]-[ ][ ]

Questionnaire

The duration and influential factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand

Section 1: Sociodemographic – economic characteristic

1. **What is your gender?**

   [ ] Male [ ] Female

2. **How old are you?** …… Years old

3. **What is your marital status?**

   [ ] Single [ ] Married

   [ ] Widow [ ] Divorced

4. **What is the highest level of education you have completed?**

   [ ] Illiterate [ ] Primary education

   [ ] Lower secondary education [ ] Upper secondary education

   [ ] Under graduation [ ] Post graduation

5. **What is your occupation?**

   [ ] Unemployed [ ] Farmer

   [ ] Labour [ ] Government officer

   [ ] Trader [ ] Student

   [ ] Others: ……

6. **How much is your monthly income?** …… Baht

7. **Are you the main source of family income?**

   [ ] Yes [ ] No

   If No, who is the main source of your family income? ……

8. **What is your family financial status?**

   [ ] Have savings [ ] Income = Expenses [ ] In debt

9. **Have you ever been arrested or charged with any offence?**

   [ ] Yes [ ] No

   If yes, how long have you been arrested or charged? …… Year(s)

Section 2: Health behavioural characteristic

10. **Have you smoked before TB diagnosis?**

    [ ] Yes, I am now a smoker.

    [ ] Yes, I was an ex-smoker.

    [ ] No, I do not smoke.

    If yes, how long have you smoked? …… Year(s)

Questionnaire date of issue May 21, 2018 version 1

11. How often did you drink alcohol before TB diagnosis?

[ ] Daily [ ] Weekly

[ ] Occasionally [ ] Never

If you did, how long have you drink alcohol? …… Year(s)

12. Have you used any illicit drugs before TB diagnosis?

[ ] Yes, I am a now drug user.

[ ] Yes, I was an ex-drug user.

[ ] No, I do not a drug user.

If yes, how long have you used illicit drug? …… Year(s)

Section 3: Knowledge, Recognition, and Stigmatisation about TB characteristic

13. Basic knowledge about TB

13.1 TB is caused by germs called bacteria.

[ ] True [ ] False

13.2 TB can spread from an infected person to another through the air.

[ ] True [ ] False

13.3 Everyone should get tested for TB.

[ ] True [ ] False

13.4 Everyone who gets infected with TB bacteria will get sick.

[ ] True [ ] False

13.5 Some people can get TB disease easier than others.

[ ] True [ ] False

13.6 TB disease can be cured.

[ ] True [ ] False

13.7 TB can affect other parts of the body besides the lungs.

[ ] True [ ] False

13.8 TB infection and TB disease are the same.

[ ] True [ ] False

13.9 TB bacteria have a hard time living in fresh air and sunlight.

[ ] True [ ] False

13.10 If you have TB infection you may have to take medicine, even if you don't feel sick.

[ ] True [ ] False

14. Recognition for TB

14.1 Have you suspected having TB?

[ ] Yes [ ] No

14.2 Have you had any previous knowledge about TB?

[ ] Yes [ ] No

14.3 In your opinion, how serious a disease TB is?

[ ] Very serious [ ] Somewhat serious [ ] Not very serious

14.4 How serious problem do you think TB is in your area?

[ ] Very serious [ ] Somewhat serious [ ] Not very serious

14.5 What are the signs and symptoms of TB? (Please check all that are mentioned.)

[ ] Rash [ ] Cough

[ ] Coughing up blood [ ] Cough that lasts longer than 3 weeks

[ ] Severe headache [ ] Nausea

[ ] Weight loss [ ] Fever

[ ] Fever without clear cause that lasts more than 7 days

[ ] Chest pain [ ] Shortness of breath

[ ] Ongoing fatigue [ ] Night sweats

[ ] Do not know [ ] Others: ……..

14.6 How can a person get TB?

[ ] Through handshakes [ ] Through the air when TB patient coughs or sneezes

[ ] Through sharing dishes [ ] Through eating from the same plate

[ ] Through touching items in public places (doorknobs, handles in transportation, etc.)

[ ] Do not know [ ] Others: ……

14.7 How can a person prevent getting TB?

[ ] Avoid shaking hands [ ] Covering mouth and nose when coughing or sneezing

[ ] Avoid sharing dishes [ ] Washing hands after touching items in public places

[ ] Closing windows at home [ ] Through good nutrition

[ ] By praying [ ] Do not know

[ ] Others: ……

14.8 In your opinion, who can be infected with TB?

[ ] Anybody [ ] Only poor people

[ ] Only homeless people [ ] Only alcoholics

[ ] Only drug users [ ] Only people living with HIV/AIDS

[ ] Only people who have been in prison

[ ] Others: ……

14.9 How can someone with TB be cured?

[ ] Herbal medicine [ ] Home rest without medicine

[ ] Praying [ ] Specific drugs given by health centre

[ ] Directly observed treatment short course [ ] Do not know

[ ] Others: ……..

15. Stigmatisation about TB

Items	Totally agree	Agree	Disagree	Totally disagree
15.1 Do you feel guilty because your family carries the burden of taking care of you?				
15.2 Do you keep distance from other people in order to avoid the transmission of TB germs?				
15.3 Do you feel lonely?				
15.4 Do you feel hurt with the way other people react when they learn that you have TB?				
15.5 Do you fear losing friends when you share the information that you have the disease?				
15.6 Do you worry about the possibility of having AIDS too?				
15.7 Do you fear telling people outside of your family that you have the disease?				
15.8 Do you carefully choose those people who you will inform about your condition?				
15.9 Do you fear going to TB clinic because other people may see you there?				
15.10 Do you fear telling your family that you have the disease?				
15.11 Do you fear telling other people about your condition because other people may think you have AIDS too?				
15.12 Do you feel guilty as you may have been affected by TB due to the habit of smoking, drinking alcohol, and not taking care of yourself?				

Section 4: Family and social characteristic

16. How many people live in your household? …… people

17. How many people sleep in your bedroom? …… people

18. Was there any TB case in your household?

[ ] Yes [ ] No

If yes, how many TB cases in your household? …… case(s)

19. Was there any TB case in your community?

[ ] Yes [ ] No

20. Who is your caregiver?

[ ] Father/Mother [ ] Husband/wife [ ] Son/daughter [ ] Others: ……..

21. Family and social support

21.1 Is there anyone observing about your chronic cough?

[ ] Yes [ ] No

21.2 Is there anyone suggesting you to have TB screening test?

[ ] Yes [ ] No

21.3 Is there anyone warning you to close your mouth when coughing or sneezing?

[ ] Yes [ ] No

21.4 Is there anyone clean your used sputum container?

[ ] Yes [ ] No

21.5 Is there anyone clean your used clothes?

[ ] Yes [ ] No

21.6 Is there anyone warning you to avoid from children, older, or other people?

[ ] Yes [ ] No

21.7 Is there anyone providing food and fresh water to you?

[ ] Yes [ ] No

21.8 Is there anyone suggesting you to exercise?

[ ] Yes [ ] No

21.9 Is there anyone warning you to avoid from drinking alcohol or smoking?

[ ] Yes [ ] No

21.10 Is there anyone suspecting you as TB infection?

[ ] Yes [ ] No

Section 5: Health status characteristics

22. Have you had chronic diseases?

[ ] Yes [ ] No

If yes, what are your chronic diseases?

[ ] Hypertension [ ] Diabetes mellitus

[ ] Chronic heart failure [ ] Chronic obstructive pulmonary disease

[ ] Asthma [ ] Chronic kidney disease

[ ] Epilepsy [ ] Rheumatoid arthritis

[ ] Others: ……

23. Have you examined for HIV test?

[ ] Yes [ ] No

If yes, what was the result? [ ] Positive [ ] Negative [ ] Unknown

24. How is your body mass index (BMI)?

Weight …….. kg Height ……. m^2 BMI…… kg/m^2

Section 6: Clinical signs of TB symptoms characteristic

25. What were the first symptoms related to your current illness that you had experience, and how long were these symptoms before the first visit to health care provider?

[ ] Cough …… day(s)

[ ] Sputum production …… day(s)

[ ] Blood-tinged sputum …… day(s)

[ ] Cough up blood (Haemoptysis) …… day(s)

[ ] Chills …… day(s)

[ ] Low-grade fever …… day(s)

[ ] Weakness …… day(s)

[ ] Night sweats …… day(s)

[ ] Weight loss …… day(s)

[ ] Chest pain …… day(s)

[ ] Lack of appetite …… day(s)

[ ] Other respiratory symptoms: …… …… day(s)

Section 7: Health seeking behavioural characteristic

26. Have you learned about TB?

[ ] Yes [ ] No

If yes, where did you first learn about TB?

[ ] Radio [ ] TV

[ ] Newspapers/magazines [ ] Brochures/posters/other printed materials

[ ] Health providers [ ] Family/friends/neighbours/colleagues

[ ] Village health volunteers [ ] Teachers

[ ] Others: ……..

27. Have you tried self-medication/self-treatment?

[ ] Yes [ ] No

If yes, what type of medication/treatment you have tried? ……..

How long have you tried self-medication/self-treatment? …… day(s)

28. Where did you first contact after any TB symptom appears?

[ ] A primary health care unit [ ] A government hospital

[ ] A private clinic [ ] A private hospital

[ ] A pharmacy store [ ] A spiritual healer

[ ] A traditional healer ……

[ ] Others ……

29. What type of the first health provider you had contacted after any TB symptom appears?

[ ] Public health provider [ ] Private health provider

[ ] TB Specialist [ ] Pharmacist

[ ] Village health volunteer [ ] Others: ……

30. What were your reason for consultation with the mentioned health provider in 29?

[ ] Easy to transportation [ ] Low cost of services

[ ] Good quality of health services [ ] Good quality of mentioned provider

[ ] Suggestion from others [ ] Used to be consulted with the mentioned provider

[ ] Others: ……...

31. How many health providers you had consulted? ……. Person(s)

32. How many visits did you carry to those providers? ……. Visit(s)

33. Why did you not go to health or medical facility after any TB symptom appears?

[ ] Hoped to recover naturally [ ] Economic constrains

[ ] Fear of diagnosis [ ] Fear of social isolation

[ ] Poor quality of health services [ ] Poor attitude towards the staff

[ ] Difficulty with transportation [ ] Cannot leave work

[ ] Go to health facility as soon [ ] Others: ……

Section 8: Accessibility and availability to TB service characteristic

34. Where is your current residence?

[ ] Urban area [ ] Rural area

35. How long have you been in a current residence? ……. year(s)

36. How many TB cases in your community? ……. case(s)

37. How far do you live from the nearest health care facility? ……. km(s)

38. How do you get the nearest health care facility?

[ ] On foot [ ] Bicycle

[ ] Motorcycle [ ] Personal car

[ ] Bus [ ] Taxi

[ ] Others: ……

39. How long do you get the nearest health care facility? ……. Minutes

40. How much do you pay for the transportation (round trip)? ……. Baht

41. Have you had a comfortable journey from your residence to the nearest health care facility?

[ ] Yes [ ] No ……..

If No, what are your reasons? ……..

Section 9: Satisfaction with health care service characteristic

42. How would you rate your past health care experiences before TB diagnosis or treatment?

[ ] Excellent [ ] Satisfactory [ ] Moderate [ ] Unsatisfactory

43. What made you satisfy with this health facility?

[ ] Environment in health facility [ ] Health education in health facility

[ ] Quality of health care providers [ ] Number of health care providers

[ ] Free of charge [ ] Waiting time

[ ] Past treatment outcome [ ] Others: ……...

44. Which type is your health insurance?

[ ] Universal coverage scheme [ ] Social security scheme

[ ] Government or state enterprise officer [ ] Others: ……

45. Did you think whether TB diagnosis or treatment had been free services?

[ ] Yes [ ] No

-Thank you-

Semi-structured questionnaire

The duration and influential factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand

In your opinion,

1. **What are TB symptoms?**
2. **Do you think that you are suspected as TB patient? And why?**
3. **What is the definition of patient delay in TB treatment?**
4. **How long is your duration between TB symptoms onset until first visit at health care facility?**
5. **Why did you choose to go to the first health care facility that you mentioned?**
6. **What are your reasons that make you have patient delay?**
7. **How do other people act with you after they know you having TB?**
8. **How does the patient delay affect with you and other people?**
9. **How do you experience with patient delay?**

ID [ ][ ]-[ ][ ][ ]

Date [ ][ ]-[ ][ ]-[ ][ ]

แบบสอบถามงานวิจัย เรื่อง

ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอด

ในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย

คำชี้แจง

โปรดทำเครื่องหมาย ✓ หรือเติมคำลงในช่องว่างให้สมบูรณ์ที่สุดตามความเป็นจริงเกี่ยวกับท่าน หรือความคิดเห็นของท่าน เพื่อประโยชน์สูงสุดในการพัฒนางานวัณโรคต่อไป

ส่วนที่ 1 ลักษณะด้านประชากรและเศรษฐกิจ

1. เพศของท่าน

   [ ] ชาย [ ] หญิง

2. อายุของท่าน ..... ปี

3. สถานภาพการสมรสของท่าน

   [ ] โสด [ ] สมรส

   [ ] หม้าย [ ] หย่า

4. ระดับการศึกษาสูงสุดของท่าน

   [ ] ไม่ได้รับการศึกษา [ ] ประถมศึกษา

   [ ] มัธยมศึกษาตอนต้น [ ] มัธยมศึกษาตอนปลาย / ปวช.

   [ ] ปวส. / อนุปริญญา [ ] ปริญญาตรี

   [ ] ปริญญาโทขึ้นไป

5. อาชีพของท่าน

   [ ] ไม่ได้ประกอบอาชีพ [ ] เกษตรกร

   [ ] รับจ้าง [ ] รับราชการ

   [ ] ค้าขาย [ ] นักเรียน/นักศึกษา

   [ ] อื่น ๆ .....

6. รายได้ต่อเดือนของท่าน ..... บาท

7. ท่านคือผู้มีรายได้หลักของครอบครัวใช่หรือไม่

   [ ] ใช่ [ ] ไม่ใช่

   ถ้าไม่ใช่ ใครคือผู้มีรายได้หลักของครอบครัวของท่าน .....

8. สถานะทางเศรษฐกิจของครอบครัวของท่าน

   [ ] มีเงินเก็บ [ ] รายรับเท่ากับรายจ่าย [ ] มีหนี้สิน

9. ท่านเคยถูกจำคุกหรือจับกุมจากการกระทำผิดกฎหมายหรือไม่

   [ ] ใช่ [ ] ไม่ใช่

   ถ้าใช่ ท่านถูกจำคุกหรือจับกุมเป็นเวลานานเท่าใด ..... ปี

ส่วนที่ 2 ลักษณะด้านพฤติกรรมสุขภาพ

10. ท่านสูบบุหรี่ก่อนได้รับการวินิจฉัยว่าป่วยเป็นวัณโรคปอดหรือไม่

[ ] ใช่ และปัจจุบันยังสูบอยู่

[ ] ใช่ แต่ปัจจุบันเลิกสูบแล้ว

[ ] ไม่ใช่

ถ้าใช่ ท่านสูบบุหรี่มาเป็นระยะเวลานานเท่าใด ..... ปี

11. ท่านดื่มเครื่องดื่มแอลกอฮอล์ก่อนได้รับการวินิจฉัยว่าป่วยเป็นวัณโรคปอดบ่อยเพียงใด

[ ] ทุกวัน [ ] ทุกสัปดาห์

[ ] บางครั้ง [ ] ไม่เคย

ถ้าดื่ม ท่านดื่มแอลกอฮอล์มาเป็นระยะเวลานานเท่าใด ..... ปี

12. ท่านใช้สารเสพติดก่อนได้รับการวินิจฉัยว่าป่วยเป็นวัณโรคปอดหรือไม่

[ ] ใช่ และปัจจุบันยังใช้สารเสพติดอยู่

[ ] ใช่ แต่ปัจจุบันเลิกใช้สารเสพติดแล้ว

[ ] ไม่ใช่

ถ้าใช่ ท่านใช้สารเสพติดมาเป็นระยะเวลานานเท่าใด ..... ปี

ส่วนที่ 3 ลักษณะด้านความรู้ ความตระหนัก และการตีตราเกี่ยวกับวัณโรค

13. ความรู้พื้นฐานเกี่ยวกับวัณโรค

13.1 วัณโรคเกิดจากเชื้อโรคที่เรียกว่าแบคทีเรีย

[ ] ถูก [ ] ผิด

13.2 เชื้อวัณโรคสามารถแพร่กระจายจากตัวผู้ป่วยไปยังบุคคลอื่นผ่านทางอากาศ

[ ] ถูก [ ] ผิด

13.3 ทุกคนควรได้รับการตรวจวัณโรค

[ ] ถูก [ ] ผิด

13.4 ทุกคนที่ติดเชื้อวัณโรคจะป่วยเป็นวัณโรค

[ ] ถูก [ ] ผิด

13.5 บางคนสามารถป่วยเป็นโรควัณโรคได้ง่ายกว่าบุคคลอื่น

[ ] ถูก [ ] ผิด

13.6 โรควัณโรคสามารถรักษาให้หายขาดได้

[ ] ถูก [ ] ผิด

13.7 วัณโรคสามารถก่อโรคในอวัยวะอื่น ๆ ในร่างกายได้นอกเหนือจากปอด

[ ] ถูก [ ] ผิด

13.8 การติดเชื้อวัณโรคและการป่วยเป็นวัณโรคเป็นสิ่งเดียวกัน

[ ] ถูก [ ] ผิด

13.9 เชื้อวัณโรคอาศัยอยู่ได้ยากในที่ที่มีอากาศบริสุทธิ์และมีแสงแดดส่องถึง

[ ] ถูก [ ] ผิด

13.10 ถ้าท่านติดเชื้อวัณโรค ท่านอาจจะต้องรับประทานยา แม้ว่าท่านจะไม่รู้สึกป่วยก็ตาม

[ ] ถูก [ ] ผิด

14. ความตระหนักเกี่ยวกับวัณโรค

14.1 ท่านเคยสงสัยว่าท่านติดเชื้อวัณโรคหรือไม่

[ ] ใช่ [ ] ไม่ใช่

14.2 ท่านเคยมีความรู้เกี่ยวกับโรควัณโรคมาก่อนหรือไม่

[ ] ใช่ [ ] ไม่ใช่

14.3 ในความคิดของท่าน วัณโรคเป็นโรคที่ร้ายแรงในระดับใด

[ ] ร้ายแรงมาก [ ] ค่อนข้างร้ายแรง [ ] ไม่ร้ายแรง

14.4 ท่านคิดว่าวัณโรคในพื้นที่ของท่านเป็นปัญหาที่ร้ายแรงในระดับใด

[ ] ร้ายแรงมาก [ ] ค่อนข้างร้ายแรง [ ] ไม่ร้ายแรง

14.5 ท่านคิดว่าสิ่งใดต่อไปนี้เป็นสัญญาณและอาการแสดงของวัณโรค (ตอบได้มากกว่า 1 ข้อ)

[ ] ผื่น [ ] ไอ

[ ] ไอเป็นเลือด [ ] ไอนานกว่า 3 สัปดาห์

[ ] ปวดศีรษะรุนแรง [ ] คลื่นไส้

[ ] น้ำหนักลด [ ] มีไข้

[ ] ไข้โดยปราศจากสาเหตุที่ชัดเจนนานกว่า 7 วัน

[ ] เจ็บหน้าอก [ ] หายใจลำบาก

[ ] อ่อนเพลียเป็นประจำ [ ] เหงื่อออกตอนกลางคืน

[ ] ไม่ทราบ [ ] อื่น ๆ .....

14.6 บุคคลจะสามารถติดเชื้อวัณโรคได้อย่างไร

[ ] ผ่านการจับมือ [ ] ผ่านทางการหายใจเมื่อผู้ป่วยวัณโรคไอหรือจาม

[ ] ผ่านการใช้จาน/ชามร่วมกัน [ ] ผ่านการรับประทานอาหารจากจานเดียวกัน

[ ] ผ่านการสัมผัสสิ่งของต่าง ๆ ในสถานที่สาธารณะ (เช่น ลูกบิดประตู ราวจับในรถสาธารณะ เป็นต้น)

[ ] ไม่ทราบ [ ] อื่น ๆ .....

14.7 บุคคลจะสามารถป้องกันการติดเชื้อวัณโรคได้อย่างไร

[ ] หลีกเลี่ยงการจับมือ [ ] ปิดปากและจมูกเมื่อไอหรือจาม

[ ] หลีกเลี่ยงการใช้จาน/ชามร่วมกัน [ ] ล้างมือหลักจากสัมผัสสิ่งของต่าง ๆ ในสถานที่สาธารณะ

[ ] ปิดหน้าต่างที่บ้าน [ ] รับประทานอาหารที่มีประโยชน์

[ ] จากการสวดมนต์ [ ] ไม่ทราบ

[ ] อื่น ๆ .....

14.8 ในความคิดของท่าน บุคคลใดสามารถติดเชื้อวัณโรคได้

[ ] ทุกคน [ ] เฉพาะคนจน

[ ] เฉพาะคนจรจัด [ ] เฉพาะคนติดแอลกอฮอล์

[ ] เฉพาะคนที่ใช้สารเสพติด [ ] เฉพาะคนที่มีเชื้อเอชไอวีหรือเป็นเอดส์

[ ] เฉพาะคนที่เคยถูกจำคุก [ ] อื่น ๆ .....

14.9 บุคคลที่ป่วยเป็นวัณโรคสามารถรักษาให้หายได้ด้วยวิธีใด

[ ] ใช้ยาสมุนไพร [ ] พักผ่อนโดยไม่ต้องรักษาด้วยยา

[ ] สวดมนต์ [ ] ใช้ยารักษาวัณโรคโดยเฉพาะที่ได้จากสถานบริการสุขภาพ

[ ] รักษาภายใต้การสังเกตโดยตรง [ ] ไม่ทราบ

[ ] อื่น ๆ .....

15. การตีตราเกี่ยวกับวัณโรค

คำถาม	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
15.1 ท่านรู้สึกผิดเพราะครอบครัวของท่านต้องรับภาระในการดูแลท่านหรือไม่				
15.2 ท่านรักษาระยะห่างจากบุคคลอื่นเพื่อหลีกเลี่ยงการแพร่เชื้อวัณโรคหรือไม่				
15.3 ท่านรู้สึกโดดเดี่ยวหรือไม่				
15.4 ท่านรู้สึกเจ็บปวดกับวิธีที่บุคคลอื่นตอบสนองเมื่อรู้ว่าท่านมีเชื้อวัณโรคหรือไม่				
15.5 ท่านกลัวที่จะสูญเสียเพื่อนเมื่อท่านบอกว่าท่านมีเชื้อวัณโรคหรือไม่				
15.6 ท่านกังวลเกี่ยวกับความเป็นไปได้ที่ท่านอาจจะเป็นโรคเอดส์ด้วยหรือไม่				
15.7 ท่านกลัวที่จะบอกคนอื่น ๆ นอกจากครอบครัวของท่านว่าท่านเป็นวัณโรคหรือไม่				

คำถาม	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
15.8 ท่านเลือกบุคคลที่ท่านจะบอกเกี่ยวกับการป่วยของท่านอย่างระมัดระวังหรือไม่				
15.9 ท่านกลัวการไปที่คลินิกวัณโรคเพราะบุคคลอื่นอาจเห็นท่านที่นั่นหรือไม่				
15.10 ท่านกลัวที่จะบอกคนในครอบครัวของท่านว่าท่านมีเชื้อวัณโรคหรือไม่				
15.11 ท่านกลัวที่จะบอกคนอื่นเกี่ยวกับอาการป่วยของท่านเพราะคนอื่นอาจคิดว่าท่านมีโรคเอดส์ร่วมด้วยหรือไม่				
15.12 ท่านรู้สึกผิดที่ท่านอาจจะป่วยด้วยวัณโรคเนื่องจากพฤติกรรมการสูบบุหรี่ การดื่มแอลกอฮอล์ และการไม่ดูแลตนเองหรือไม่				

ส่วนที่ 4 ลักษณะด้านครอบครัวและสังคม

16. ผู้ที่อาศัยอยู่ในบ้านหลังเดียวกันกับท่านมีจำนวนกี่คน ..... คน
17. ผู้ที่นอนในห้องนอนห้องเดียวกันกับท่านมีจำนวนกี่คน ..... คน
18. มีผู้ป่วยวัณโรคในบ้านท่านหรือไม่

    [ ] ใช่ [ ] ไม่ใช่

    ถ้าใช่ จำนวนผู้ป่วยวัณโรคในบ้านท่านมีจำนวนกี่คน ..... คน
19. มีผู้ป่วยวัณโรคในหมู่บ้านเดียวกันกับท่านหรือไม่

    [ ] ใช่ [ ] ไม่ใช่
20. ผู้ที่ทำหน้าที่หลักในการดูแลอาการเจ็บป่วยของท่านคือใคร

    [ ] พ่อ/แม่ [ ] สามี/ภรรยา [ ] ลูกชาย/ลูกสาว [ ] อื่น ๆ .....
21. การสนับสนุนทางครอบครัวและสังคม

    21.1 มีผู้สังเกตอาการไอเรื้อรังของท่านหรือไม่

    [ ] มี [ ] ไม่มี

    21.2 มีผู้แนะนำท่านให้เข้ารับการตรวจคัดกรองวัณโรคหรือไม่

    [ ] มี [ ] ไม่มี

    21.3 มีผู้เตือนท่านปิดปากเวลาไอหรือจามหรือไม่

    [ ] มี [ ] ไม่มี

21.4 มีผู้ทำความสะอาดภาชนะใส่เสมหะของท่านหรือไม่

[ ] มี [ ] ไม่มี

21.5 มีผู้ทำความสะอาดเสื้อผ้าที่ใช้แล้วของท่านหรือไม่

[ ] มี [ ] ไม่มี

21.6 มีผู้เตือนท่านให้หลีกเลี่ยงการคลุกคลีกับเด็ก ผู้สูงอายุ หรือบุคคลอื่นหรือไม่

[ ] มี [ ] ไม่มี

21.7 มีผู้จัดหาอาหารและน้ำสะอาดให้ท่านหรือไม่

[ ] มี [ ] ไม่มี

21.8 มีผู้แนะนำท่านให้ออกกำลังกายหรือไม่

[ ] มี [ ] ไม่มี

21.9 มีผู้เตือนท่านให้หลีกเลี่ยงจากการดื่มแอลกอฮอล์หรือสูบบุหรี่หรือไม่

[ ] มี [ ] ไม่มี

21.10 มีผู้สงสัยว่าท่านติดเชื้อวัณโรคหรือไม่

[ ] มี [ ] ไม่มี

ส่วนที่ 5 ลักษณะด้านสภาวะสุขภาพ

22. ท่านมีโรคประจำตัวหรือไม่

[ ] มี [ ] ไม่มี

ถ้ามี ท่านมีโรคประจำตัวอะไร

[ ] ความดันโลหิตสูง [ ] เบาหวาน

[ ] หัวใจล้มเหลวเรื้อรัง [ ] ปอดอุดกั้นเรื้อรัง

[ ] หอบหืด [ ] ไตวายเรื้อรัง

[ ] ลมชัก [ ] ข้ออักเสบรูมาตอยด์

[ ] อื่น ๆ .....

23. ท่านเคยตรวจคัดกรองการติดเชื้อเอชไอวี (HIV) หรือไม่

[ ] เคย [ ] ไม่เคย

ถ้าเคย ผลการตรวจเป็นอย่างไร [ ] บวก [ ] ลบ [ ] ไม่ทราบผล

24. ค่าดัชนีมวลกาย (BMI) ของท่านคือเท่าใด

น้ำหนัก ..... กิโลกรัม ส่วนสูง ..... เมตร BMI ..... กก./ม.^{2}

ส่วนที่ 6 ลักษณะด้านอาการของวัณโรค

25. อาการแรกที่ท่านเป็นและพบว่ามีความเกี่ยวข้องกับการเจ็บป่วยในปัจจุบันของท่านคืออาการใด และท่านมีอาการดังกล่าวเป็นเวลานานเท่าใดก่อนเข้ารับการตรวจครั้งแรกกับผู้ให้บริการด้านสุขภาพ

[ ] ไอ ..... วัน
[ ] มีเสมหะ ..... วัน
[ ] เสมหะมีเลือดปน ..... วัน
[ ] ไอเป็นเลือด ..... วัน
[ ] หนาวสั่น ..... วัน
[ ] ไข้ต่ำ ๆ ..... วัน
[ ] อ่อนเพลีย ..... วัน
[ ] เหงื่อออกตอนกลางคืน ..... วัน
[ ] น้ำหนักลด ..... วัน
[ ] เจ็บหน้าอก ..... วัน
[ ] เบื่ออาหาร ..... วัน
[ ] อาการทางระบบทางเดินหายใจอื่น ๆ .... วัน

ส่วนที่ 7 ลักษณะด้านพฤติกรรมการแสวงหาการรักษา

26. ท่านเคยเรียนรู้เกี่ยวกับโรควัณโรคหรือไม่

[ ] เคย [ ] ไม่เคย

ถ้าเคย ท่านเรียนรู้เกี่ยวกับโรควัณโรคเป็นครั้งแรกจากแหล่งใด

[ ] วิทยุ [ ] โทรทัศน์
[ ] หนังสือพิมพ์ / วารสาร [ ] แผ่นพับ / โปสเตอร์ / สิ่งพิมพ์อื่น ๆ
[ ] ผู้ให้บริการด้านสุขภาพ [ ] ครอบครัว / เพื่อน / เพื่อนบ้าน / เพื่อนร่วมงาน
[ ] อาสาสมัครสาธารณสุข [ ] ครู อาจารย์
[ ] อื่น ๆ .....

27. ท่านเคยซื้อยารับประทานหรือรักษาอาการป่วยนี้ด้วยตนเองหรือไม่

[ ] เคย [ ] ไม่เคย

ถ้าเคย ท่านรับประทานยาหรือรักษาอาการป่วยนี้ด้วยวิธีการใด .....

ท่านรับประทานยาหรือรักษาอาการป่วยด้วยตนเองเป็นระยะเวลานานเท่าใด ..... วัน

28. สถานที่ลำดับแรกที่ท่านเข้ารับการรักษาหลังจากอาการของวัณโรคปรากฏคือแหล่งใด

[ ] โรงพยาบาลส่งเสริมสุขภาพตำบล [ ] โรงพยาบาลของรัฐ

[ ] คลินิกเอกชน [ ] โรงพยาบาลเอกชน

[ ] ร้านขายยา [ ] หมอด้านจิตวิญญาณ/หมอผี

[ ] หมอพื้นบ้าน .....

[ ] อื่น ๆ .....

29. ประเภทของผู้ให้บริการด้านสุขภาพรายแรกที่ท่านปรึกษาหลังจากอาการของวัณโรคปรากฏคือใคร

[ ] ผู้ให้บริการด้านสุขภาพของรัฐ [ ] ผู้ให้บริการด้านสุขภาพของเอกชน

[ ] ผู้เชี่ยวชาญด้านวัณโรค [ ] เภสัชกร

[ ] อาสาสมัครสาธารณสุข [ ] อื่น ๆ .....

30. เหตุผลที่ท่านเข้ารับคำปรึกษากับผู้ให้บริการด้านสุขภาพในข้อที่ 29 คือข้อใด

[ ] เดินทางง่าย [ ] ราคาไม่แพง

[ ] การบริการด้านสุขภาพมีคุณภาพดี [ ] ผู้ให้บริการสุขภาพมีคุณภาพ

[ ] ได้รับคำแนะนำจากบุคคลอื่น [ ] เคยปรึกษากับผู้ให้บริการสุขภาพที่นี่มาก่อน

[ ] อื่น ๆ .....

31. จำนวนผู้ให้บริการด้านสุขภาพที่ท่านเคยปรึกษาคือเท่าใด ..... คน

32. จำนวนครั้งในการเข้ารับบริการกับผู้ให้บริการด้านสุขภาพดังกล่าวคือเท่าใด ..... ครั้ง

33. เหตุใดท่านจึงไม่เข้ารับการรักษาในสถานบริการด้านสุขภาพหรือด้านการแพทย์หลังจากอาการของโรควัณโรคปรากฏ

[ ] คาดหวังว่าจะหายได้เอง [ ] ข้อจำกัดทางเศรษฐกิจ

[ ] กลัวผลการวินิจฉัย [ ] กลัวการถูกแบ่งแยกจากสังคม

[ ] การบริการสุขภาพไม่มีคุณภาพ [ ] ทัศนคติของเจ้าหน้าที่ไม่ดี

[ ] การเดินทางลำบาก [ ] ไม่สามารถลางานได้

[ ] รักษาที่สถานบริการสุขภาพทันที [ ] อื่น ๆ .....

ส่วนที่ 8 ลักษณะด้านการเข้าถึงและการมีอยู่ของบริการสุขภาพ

34. ที่อยู่อาศัยปัจจุบันของท่านตั้งอยู่ในเขตใด

[ ] เขตเมือง [ ] เขตชนบท

35. ท่านพักอาศัยในที่อยู่อาศัยปัจจุบันมานานเท่าใด ..... ปี

36. ผู้ป่วยวัณโรคในหมู่บ้านของท่านมีจำนวนเท่าใด ..... ราย

37. ระยะทางจากที่อยู่อาศัยของท่านถึงสถานบริการสุขภาพที่ใกล้ที่สุดคือเท่าใด ..... กิโลเมตร

38. ท่านเดินทางจากที่อยู่อาศัยของท่านไปยังสถานบริการสุขภาพที่ใกล้ที่สุดอย่างไร

[ ] เดิน [ ] รถจักรยาน

[ ] รถจักรยานยนต์ [ ] รถยนต์ส่วนตัว

[ ] รถโดยสารสาธารณะ [ ] รถแท็กซี่

[ ] อื่น ๆ .....

39. ระยะเวลาที่ท่านใช้เดินทางจากที่พักอาศัยไปยังสถานบริการสุขภาพที่ใกล้ที่สุดคือเท่าใด ..... นาที

40. ท่านเสียค่าใช้จ่ายในการเดินทางไป-กลับถึงสถานบริการสุขภาพเท่าใด ..... บาท

41. ท่านมีความสะดวกสบายในการเดินทางจากที่อยู่อาศัยของท่านไปยังสถานบริการสุขภาพหรือไม่

[ ] ใช่ [ ] ไม่ใช่

ถ้าไม่ใช่ เหตุผลของท่านคืออะไร .....

ส่วนที่ 9 ลักษณะด้านความพึงพอใจในการรับบริการสุขภาพ

42. ท่านมีความพึงพอใจในการได้รับบริการสุขภาพในอดีตก่อนที่ท่านจะได้รับการวินิจฉัยหรือรักษาวัณโรคอย่างไร

[ ] พึงพอใจมาก [ ] พึงพอใจ [ ] พึงพอใจปานกลาง [ ] ไม่พึงพอใจ

43. สิ่งใดทำให้ท่านพึงพอใจต่อสถานบริการสุขภาพแห่งนี้

[ ] สภาพแวดล้อม [ ] การให้ความรู้ด้านสุขภาพ

[ ] คุณภาพของผู้ให้บริการ [ ] จำนวนของผู้ให้บริการ

[ ] ไม่มีค่าใช้จ่าย [ ] ระยะเวลาในการรอ

[ ] ผลการรักษาในอดีต [ ] อื่น ๆ .....

44. สิทธิหลักประกันสุขภาพของท่านคือประเภทใด

[ ] สิทธิประกันสุขภาพถ้วนหน้า [ ] สิทธิประกันสังคม

[ ] สิทธิข้าราชการ/รัฐวิสาหกิจ [ ] อื่น ๆ .....

45. ท่านเคยคิดว่าการวินิจฉัยหรือการรักษาวัณโรคไม่มีค่าใช้จ่ายหรือไม่

[ ] ใช่ [ ] ไม่ใช่

- ขอขอบคุณ -

แบบสอบถามงานวิจัย เรื่อง

ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าของผู้ป่วยในผู้ป่วยวัณโรคปอด

ในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย

ในความคิดของท่าน

1. อะไรคืออาการแสดงของโรควัณโรค
2. ท่านสงสัยว่าตนเองป่วยเป็นวัณโรคหรือไม่ ด้วยเหตุใด
3. อะไรคือนิยามของคำว่าความล่าช้าของผู้ป่วยในการรักษาวัณโรค
4. ระยะเวลาตั้งแต่ที่ท่านมีอาการของวัณโรคจนกระทั่งเข้ารับบริการครั้งแรก ณ สถานบริการสุขภาพเป็นเท่าใด
5. ทำไมท่านจึงเลือกที่จะเข้ารับบริการครั้งแรก ณ สถานบริการสุขภาพแห่งนั้น
6. อะไรเป็นเหตุผลที่ทำให้ท่านมีความล่าช้าในการเข้ารับการรักษา
7. บุคคลอื่นมีปฏิกิริยากับท่านอย่างไรหลังจากที่พวกเขาเหล่านั้นทราบว่าท่านติดเชื้อวัณโรค
8. ความล่าช้าของผู้ป่วยในการรักษาวัณโรคมีผลต่อท่านและบุคคลอื่น ๆ อย่างไร
9. ประสบการณ์ของท่านเกี่ยวกับความล่าช้าของผู้ป่วยในการเข้ารับการรักษาเป็นอย่างไร

Appendix 5: Index of item objective congruence

The results of index of item objective congruence: IOC
for a structured questionnaire and a semi-structured questionnaire on
The duration and influential factors of patient delay among pulmonary tuberculosis patients
in a high burden area, Thailand

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
A structured questionnaire										
Section 1: Sociodemographic – economic characteristic										
1	What is your gender? [ ] Male [ ] Female	1	1	1	1	1	1	6	1.00	Approved
2	How old are you? ..... Years old	1	1	1	1	1	1	6	1.00	Approved
3	What is your marital status? [ ] Single [ ] Married [ ] Widow [ ] Divorced	1	1	1	1	1	1	6	1.00	Approved
4	What is the highest level of education you have completed? [ ] Illiterate [ ] Primary education [ ] Lower secondary education [ ] Upper secondary education [ ] Under graduation [ ] Post graduation	1	1	1	1	1	1	6	1.00	Approved
5	What is your occupation? [ ] Unemployed [ ] Farmer [ ] Labour [ ] Government officer [ ] Trader [ ] Student [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
6	How much is your monthly income? ..... Baht	1	1	1	1	1	1	6	1.00	Approved
7	Are you the main source of family income? [ ] Yes [ ] No If No, who is the main source of your family income?	1	1	1	1	1	1	6	1.00	Approved
8	What is your family financial status? [ ] Have savings [ ] Income = Expenses [ ] In debt	1	1	1	1	1	1	6	1.00	Approved
9	Have you ever been arrested or charged with any offence? [ ] Yes [ ] No If yes, how long have you been arrested or charged? ..... Year(s)	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
Section 2: Health behavioural characteristic										
10	Have you smoked before TB diagnosis? [ ] Yes, I am now a smoker. [ ] Yes, I was an ex-smoker. [ ] No, I do not smoke. If yes, how long have you smoked? ..... Year(s)	1	1	1	1	1	1	6	1.00	Approved
11	How often did you drink alcohol before TB diagnosis? [ ] Daily [ ] Weekly [ ] Occasionally [ ] Never If you did, how long have you drink alcohol? ..... Year(s)	1	1	1	1	1	1	6	1.00	Approved
12	Have you used any illicit drugs before TB diagnosis? [ ] Yes, I am a now drug user. [ ] Yes, I was an ex-drug user. [ ] No, I do not a drug user. If yes, how long have you used illicit drug? ..... Year(s)	1	1	1	1	1	1	6	1.00	Approved
Section 3: Knowledge, Recognition, and Stigmatisation about TB characteristic										
13	Basic knowledge about TB									
	13.1 TB is caused by germs called bacteria. [ ] True [ ] False	1	1	1	1	1	1	6	1.00	Approved
	13.2 TB can spread from an infected person to another through the air. [ ] True [ ] False	0	1	1	1	1	1	5	0.83	Approved
	13.3 Everyone should get tested for TB. [ ] True [ ] False	1	0	1	1	1	1	5	0.83	Approved
	13.4 Everyone who gets infected with TB bacteria will get sick. [ ] True [ ] False	1	1	1	1	1	1	6	1.00	Approved
	13.5 Some people can get TB disease easier than others. [ ] True [ ] False	0	1	1	0	1	1	4	0.67	Approved
	13.6 TB disease can be cured. [ ] True [ ] False	1	1	1	1	1	1	6	1.00	Approved
	13.7 TB can affect other parts of the body besides the lungs. [ ] True [ ] False	1	1	1	1	1	1	6	1.00	Approved
	13.8 TB infection and TB disease are the same. [ ] True [ ] False	1	1	1	1	0	0	4	0.67	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
	13.9 TB bacteria have a hard time living in fresh air and sunlight. [ ] True [ ] False	1	1	1	1	1	1	6	1.00	Approved
	13.10 If you have TB infection you may have to take medicine, even if you don't feel sick. [ ] True [ ] False	1	1	0	1	1	1	5	0.83	Approved
14	**Recognition for TB**									
	14.1 Have you suspected having TB? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	14.2 Have you had any previous knowledge about TB? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	14.3 In your opinion, how serious a disease TB is? [ ] Very serious [ ] Somewhat serious [ ] Not very serious	1	1	1	1	1	1	6	1.00	Approved
	14.4 How serious problem do you think TB is in your area? [ ] Very serious [ ] Somewhat serious [ ] Not very serious	1	1	1	1	1	1	6	1.00	Approved
	14.5 What are the signs and symptoms of TB? (Please check all that are mentioned.) [ ] Rash [ ] Cough [ ] Coughing up blood [ ] Cough that lasts longer than 3 weeks [ ] Severe headache [ ] Nausea [ ] Weight loss [ ] Fever [ ] Fever without clear cause that lasts more than 7 days [ ] Chest pain [ ] Shortness of breath [ ] Ongoing fatigue [ ] Night sweats [ ] Do not know [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
	14.6 How can a person get TB? [ ] Through handshakes [ ] Through the air when TB patient coughs or sneezes [ ] Through sharing dishes [ ] Through eating from the same plate [ ] Through touching items in public places (doorknobs, handles in transportation, etc.) [ ] Do not know [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
	14.7 How can a person prevent getting TB? [ ] Avoid shaking hands [ ] Covering mouth and nose when coughing / sneezing [ ] Avoid sharing dishes [ ] Washing hands after touching items in public places [ ] Closing windows at home [ ] Through good nutrition [ ] By praying [ ] Do not know [ ] Others:	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
	14.8 In your opinion, who can be infected with TB? [ ] Anybody [ ] Only poor people [ ] Only homeless people [ ] Only alcoholics [ ] Only drug users [ ] Only people living with HIV/AIDS [ ] Only people who have been in prison [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
	14.9 How can someone with TB be cured? [ ] Herbal medicine [ ] Home rest without medicine [ ] Praying [ ] Specific drugs given by health centre [ ] Directly observed treatment short course [ ] Do not know [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
15	**Stigmatisation about TB**									
	15.1 Do you feel guilty because your family carries the burden of taking care of you?	1	1	1	1	1	1	6	1.00	Approved
	15.2 Do you keep distance from other people in order to avoid the transmission of TB germs?	1	1	1	1	1	1	6	1.00	Approved
	15.3 Do you feel lonely?	1	1	1	1	1	1	6	1.00	Approved
	15.4 Do you feel hurt with the way other people react when they learn that you have TB?	1	1	1	1	1	1	6	1.00	Approved
	15.5 Do you fear losing friends when you share the information that you have the disease?	1	1	1	1	1	1	6	1.00	Approved
	15.6 Do you worry about the possibility of having AIDS too?	1	1	1	1	1	1	6	1.00	Approved
	15.7 Do you fear telling people outside of your family that you have the disease?	1	1	1	1	1	1	6	1.00	Approved
	15.8 Do you carefully choose those people who you will inform about your condition?	1	1	1	1	1	1	6	1.00	Approved
	15.9 Do you fear going to TB clinic because other people may see you there?	1	1	1	1	1	1	6	1.00	Approved
	15.10 Do you fear telling your family that you have the disease?	1	1	1	1	1	1	6	1.00	Approved
	15.11 Do you fear telling other people about your condition because other people may think you have AIDS too?	1	1	1	1	1	1	6	1.00	Approved
	15.12 Do you feel guilty as you may have been affected by TB due to the habit of smoking, drinking alcohol, and not taking care of yourself?	1	1	1	1	1	1	6	1.00	Approved
Section 4: Family and social characteristic										
16	How many people live in your household? ..... people	1	1	1	1	1	1	6	1.00	Approved
17	How many people sleep in your bedroom? ..... people	1	1	1	1	1	1	6	1.00	Approved
18	Was there any TB case in your household? [ ] Yes [ ] No If yes, how many TB cases in your household? ..... case(s)	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
19	Was there any TB case in your community? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
20	Who is your caregiver? [ ] Father/Mother [ ] Husband/wife [ ] Son/daughter [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
21	Family and social support									
	21.1 Is there anyone observing about your chronic cough? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.2 Is there anyone suggesting you to have TB screening test? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.3 Is there anyone warning you to close your mouth when coughing or sneezing? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.4 Is there anyone clean your used sputum container? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.5 Is there anyone clean your used clothes? [ ] Yes [ ] No	1	1	1	1	0	0	4	0.67	Approved
	21.6 Is there anyone warning you to avoid from children, older, or other people? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.7 Is there anyone providing food and fresh water to you? [ ] Yes [ ] No	1	0	0	1	1	1	4	0.67	Approved
	21.8 Is there anyone suggesting you to exercise? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.9 Is there anyone warning you to avoid from drinking alcohol or smoking? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
	21.10 Is there anyone suspecting you as TB infection? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
Section 5: Health status characteristics										
22	Have you had chronic diseases? [ ] Yes [ ] No If yes, what are your chronic diseases? [ ] Hypertension [ ] Diabetes mellitus [ ] Chronic heart failure [ ] Chronic obstructive pulmonary disease [ ] Asthma [ ] Chronic kidney disease [ ] Epilepsy [ ] Rheumatoid arthritis [ ] Others:	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
23	Have you examined for HIV test? [ ] Yes [ ] No If yes, what was the result? [ ] Positive [ ] Negative [ ] Unknown	1	1	1	1	1	1	6	1.00	Approved
24	How is your body mass index (BMI)? Weight …… kg Height …… m^2 BMI…… kg/m^2	0	1	1	1	1	1	5	0.83	Approved
Section 6: Clinical signs of TB symptoms characteristic										
25	What were the first symptoms related to your current illness that you had experience, and how long were these symptoms before the first visit to health care provider? [ ] Cough …… day(s) [ ] Sputum production …… day(s) [ ] Blood-tinged sputum …… day(s) [ ] Cough up blood (Haemoptysis) …… day(s) [ ] Chills …… day(s) [ ] Low-grade fever …… day(s) [ ] Weakness …… day(s) [ ] Night sweats …… day(s) [ ] Weight loss …… day(s) [ ] Chest pain …… day(s) [ ] Lack of appetite …… day(s) [ ] Other respiratory symptoms: …… …… day(s)	0	1	1	1	1	1	5	0.83	Approved
Section 7: Health seeking behavioural characteristic										
26	Have you learned about TB? [ ] Yes [ ] No If yes, where did you first learn about TB? [ ] Radio [ ] TV [ ] Newspapers/magazines [ ] Brochures/posters/other printed materials [ ] Health providers [ ] Family/friends/neighbours/colleagues [ ] Village health volunteers [ ] Teachers [ ] Others: ……	1	1	1	1	1	1	6	1.00	Approved
27	Have you tried self-medication/self-treatment? [ ] Yes [ ] No If yes, what type of medication/treatment you have tried? …… How long have you tried self-medication/self-treatment? …… day(s)	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
28	Where did you first contact after any TB symptom appears? [ ] A primary health care unit [ ] A government hospital [ ] A private clinic [ ] A private hospital [ ] A pharmacy store [ ] A spiritual healer [ ] A traditional healer ..... [ ] Others	1	1	1	1	1	1	6	1.00	Approved
29	What type of the first health provider you had contacted after any TB symptom appears? [ ] Public health provider [ ] Private health provider [ ] TB Specialist [ ] Pharmacist [ ] Village health volunteer [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
30	What were your reason for consultation with the mentioned health provider in 29? [ ] Easy to transportation [ ] Low cost of services [ ] Good quality of health services [ ] Good quality of mentioned provider [ ] Suggestion from others [ ] Used to be consulted with the mentioned provider [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
31	How many health providers you had consulted? ..... Person(s)	1	1	1	1	1	1	6	1.00	Approved
32	How many visits did you carry to those providers? ..... Visit(s)	1	1	1	1	1	1	6	1.00	Approved
33	Why did you not go to health or medical facility after any TB symptom appears? [ ] Hoped to recover naturally [ ] Economic constrains [ ] Fear of diagnosis [ ] Fear of social isolation [ ] Poor quality of health services [ ] Poor attitude towards the staff [ ] Difficulty with transportation [ ] Cannot leave work [ ] Go to health facility as soon [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
Section 8: Accessibility and availability to TB service characteristic										
34	Where is your current residence? [ ] Urban area [ ] Rural area	1	1	1	1	1	1	6	1.00	Approved
35	How long have you been in a current residence? ..... year(s)	1	1	1	1	1	1	6	1.00	Approved
36	How many TB cases in your community? ..... case(s)	1	1	1	1	1	1	6	1.00	Approved
37	How far do you live from the nearest health care facility? ..... km(s)	1	1	1	1	1	1	6	1.00	Approved
38	How do you get the nearest health care facility? [ ] On foot [ ] Bicycle [ ] Motorcycle [ ] Personal car [ ] Bus [ ] Taxi [ ] Others:	1	1	1	1	1	1	6	1.00	Approved

Item	Detail of each question	Results of experts' assessment						Total	IOC	Result
		1	2	3	4	5	6			
39	How long do you get the nearest health care facility? ..... Minutes	1	1	1	1	1	1	6	1.00	Approved
40	How much do you pay for the transportation (round trip)? ..... Baht	1	1	1	1	1	1	6	1.00	Approved
41	Have you had a comfortable journey from your residence to the nearest health care facility? [ ] Yes [ ] No ..... If No, what are your reasons?	1	1	1	1	1	1	6	1.00	Approved
Section 9: Satisfaction with health care service characteristic										
42	How would you rate your past health care experiences before TB diagnosis or treatment? [ ] Excellent [ ] Satisfactory [ ] Moderate [ ] Unsatisfactory	1	1	1	1	1	1	6	1.00	Approved
43	What made you satisfy with this health facility? [ ] Environment in health facility [ ] Health education in health facility [ ] Quality of health care providers [ ] Number of health care providers [ ] Free of charge [ ] Waiting time [ ] Past treatment outcome [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
44	Which type is your health insurance? [ ] Universal coverage scheme [ ] Social security scheme [ ] Government or state enterprise officer [ ] Others:	1	1	1	1	1	1	6	1.00	Approved
45	Did you think whether TB diagnosis or treatment had been free services? [ ] Yes [ ] No	1	1	1	1	1	1	6	1.00	Approved
Semi-structured questionnaire										
1	What are TB symptoms?	1	1	1	1	1	1	6	1.00	Approved
2	Do you think that you are suspected as TB patient? And why?	1	1	1	1	1	1	6	1.00	Approved
3	What is the definition of patient delay in TB treatment?	1	0	1	1	1	1	5	0.83	Approved
4	How long is your duration between TB symptoms onset until first visit at health care facility?	1	1	1	1	1	1	6	1.00	Approved
5	Why did you choose to go to the first health care facility that you mentioned?	1	1	1	1	1	1	6	1.00	Approved
6	What are your reasons that make you have patient delay?	1	1	1	1	1	1	6	1.00	Approved
7	How do other people act with you after they know you having TB?	1	1	1	1	1	1	6	1.00	Approved
8	How does the patient delay affect with you and other people?	1	1	1	1	1	1	6	1.00	Approved
9	How do you experience with patient delay?	1	1	1	1	1	1	6	1.00	Approved

Appendix 6: The results of KR-20

KR-20

Knowledge about TB Questions.

Subject	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	X	X^2
s1	1	1	1	1	1	1	1	1	1	1	10	*100*
s2	0	1	1	1	0	0	0	0	1	0	4	*16*
s3	0	1	1	1	0	0	0	0	0	1	4	*16*
s4	1	1	1	1	1	1	1	1	1	1	10	*100*
s5	0	0	0	0	1	0	1	0	1	0	3	*9*
s6	1	1	1	1	1	1	1	1	1	0	9	*81*
s7	1	1	1	1	1	1	1	1	0	1	9	*81*
s8	0	1	1	1	1	1	1	1	1	1	9	*81*
s9	1	1	1	1	1	1	0	1	1	1	9	*81*
s10	1	1	1	1	1	1	1	0	1	1	9	*81*
s11	0	0	0	0	1	0	1	1	0	1	4	*16*
s12	0	1	1	1	1	1	1	1	1	1	9	*81*
s13	1	1	1	1	1	1	1	1	1	1	10	*100*
s14	0	0	0	0	1	1	0	1	0	1	4	*16*
s15	0	0	0	0	1	0	0	1	0	1	3	*9*
p	0.47	0.73	0.73	0.73	0.87	0.67	0.67	0.73	0.67	0.80	KR20 =	**0.80**
q	0.53	0.27	0.27	0.27	0.13	0.33	0.33	0.27	0.33	0.20	K=	15
pq	0.25	0.20	0.20	0.20	0.12	0.22	0.22	0.20	0.22	0.16	Σpq=	1.97
											σ^2	7.93

XL

KR-20

Social support Questions.

Subject	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	X	X^2
s1	1	1	1	1	1	1	1	1	1	0	9	*81*
s2	1	1	1	1	1	1	1	1	0	1	9	*81*
s3	1	1	1	1	1	1	1	1	1	1	10	*100*
s4	0	0	1	1	0	0	1	0	1	0	4	*16*
s5	1	1	1	1	1	1	1	1	1	1	10	*100*
s6	0	0	0	1	0	0	0	1	0	1	3	*9*
s7	0	1	1	1	1	1	1	1	1	0	8	*64*
s8	0	1	0	1	0	0	1	1	0	0	4	*16*
s9	0	0	0	1	0	1	1	1	1	0	5	*25*
s10	0	1	1	1	1	1	1	1	1	1	9	*81*
s11	0	1	0	0	1	0	1	1	0	0	4	*16*
s12	1	1	1	1	1	1	1	1	1	1	10	*100*
s13	1	1	1	1	1	1	1	1	1	1	10	*100*
s14	1	0	1	1	1	1	1	1	1	1	9	*81*
s15	0	1	1	0	0	1	0	1	1	0	5	*25*
p	0.47	0.73	0.73	0.87	0.67	0.73	0.87	0.93	0.73	0.53	KR20 =	**0.79**
q	0.53	0.27	0.27	0.13	0.33	0.27	0.13	0.07	0.27	0.47	K=	15
pq	0.25	0.20	0.20	0.12	0.22	0.20	0.12	0.06	0.20	0.25	Σpq=	1.80
											σ^2	6.86

Appendix 7: Letters to the director of the hospitals

UNIVERSITY OF Hull

The Director
Bua Yai Hospital

Faculty of Health Sciences
Professor Roger Watson
Faculty of Health Sciences
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31 July 2018

Dear Director

Kampanart Chaychoowong

This letter is to request your help to my PhD student Kampanart Chaychoowong with permission to conduct his research on your premises. His project is titled "The duration and influential factors of patient delay among pulmonary tuberculosis patient in a high burden area, Thailand". As such you will play a crucial role in the success of the project.

Yours sincerely

Roger Watson PhD RN FRCP Edin FAAN

Professor of Nursing

(นายชาญชัย บุญอยู่)
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เรียน ผู้อำนวยการโรงพยาบาลบัวใหญ่
☐ เพื่อโปรดทราบ
☐ เพื่อโปรดพิจารณา/สั่งการ
☑ เพื่อโปรดพิจารณาอนุมัติ
- ดูแลสัมภาษณ์ คนายชูวงษ์ ยอเล็บ
ข้อมูล เพื่อวิจัยนผู้ป่วยวัณโรค
ภ.บัวใหญ่ ฯลฯ

(ชาติชาย หุตะวัฒนะ)
หัวหน้าฝ่ายสุขาภิบาลและป้องกันโรค

โรงพยาบาลจักราช
เลขที่รับ 19 ส.ค. 2561
วันที่

UNIVERSITY OF Hull

The Director
Chakkarat Hospital

Faculty of Health Sciences
Professor Roger Watson
Faculty of Health Sciences
The University of Hull
Cottingham Road
HULL
HU6 7RX
r.watson@hull.ac.uk
01482 464525

31 July 2018

Dear Director

Kampanart Chaychoowong

This letter is to request your help to my PhD student Kampanart Chaychoowong with permission to conduct his research on your premises. His project is titled "The duration and influential factors of patient delay among pulmonary tuberculosis patient in a high burden area, Thailand". As such you will play a crucial role in the success of the project.

Yours sincerely

Roger Watson PhD RN FRCP Edin FAAN
Professor of Nursing

เรียน ผอก.รพ.จักราช
เพื่อโปรดทราบ

ก.แพทย์ ก.พยาบาล ก.เทคนิค ก.เภสัช

University of Hull
Hull Campus
Hull, HU6 7RX
Campus switchboard
01482 346311
www.hull.ac.uk

157 19 ต.ค. 2561

โรงพยาบาลเฉลิมพระเกียรติ
เลขรับที่ 2497
วันที่ 18 ต.ค. 2561
เวลารับ 08.54 น.

UNIVERSITY OF Hull

The Director
Chaleom Phra Kiat Hospital

Faculty of Health Sciences
Professor Roger Watson
Faculty of Health Sciences
The University of Hull
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- เพื่อโปรดทราบ

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โรงพยาบาลด่านขุนทด
รับที่ 3324/61
วันที่ 6 ส.ค. 2561

UNIVERSITY OF Hull

The Director
Dankhunthod Hospital

Faculty of Health Sciences
Professor Roger Watson
Faculty of Health Sciences
The University of Hull
Cottingham Road
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r.watson@hull.ac.uk
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เรียน ผู้อำนวยการโรงพยาบาลด่านขุนทด
- เพื่อโปรดทราบ
คุณกัมปนาท ฉายชูวงศ์ นักศึกษาปริญญาเอก University of Hull ขอเก็บข้อมูลวิจัยปริญญาเอก เกี่ยวกับระยะเวลาและปัจจัยที่มีผลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอด ในพื้นที่ที่มีอุบัติการณ์สูงในประเทศไทย โดยได้แนบเอกสารโครงร่างวิจัย และหนังสือจาก University of Hull มาด้วย
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จึงเรียนมาเพื่อโปรดพิจารณา
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www.hull.ac.uk

แจ้งฝ่าย........
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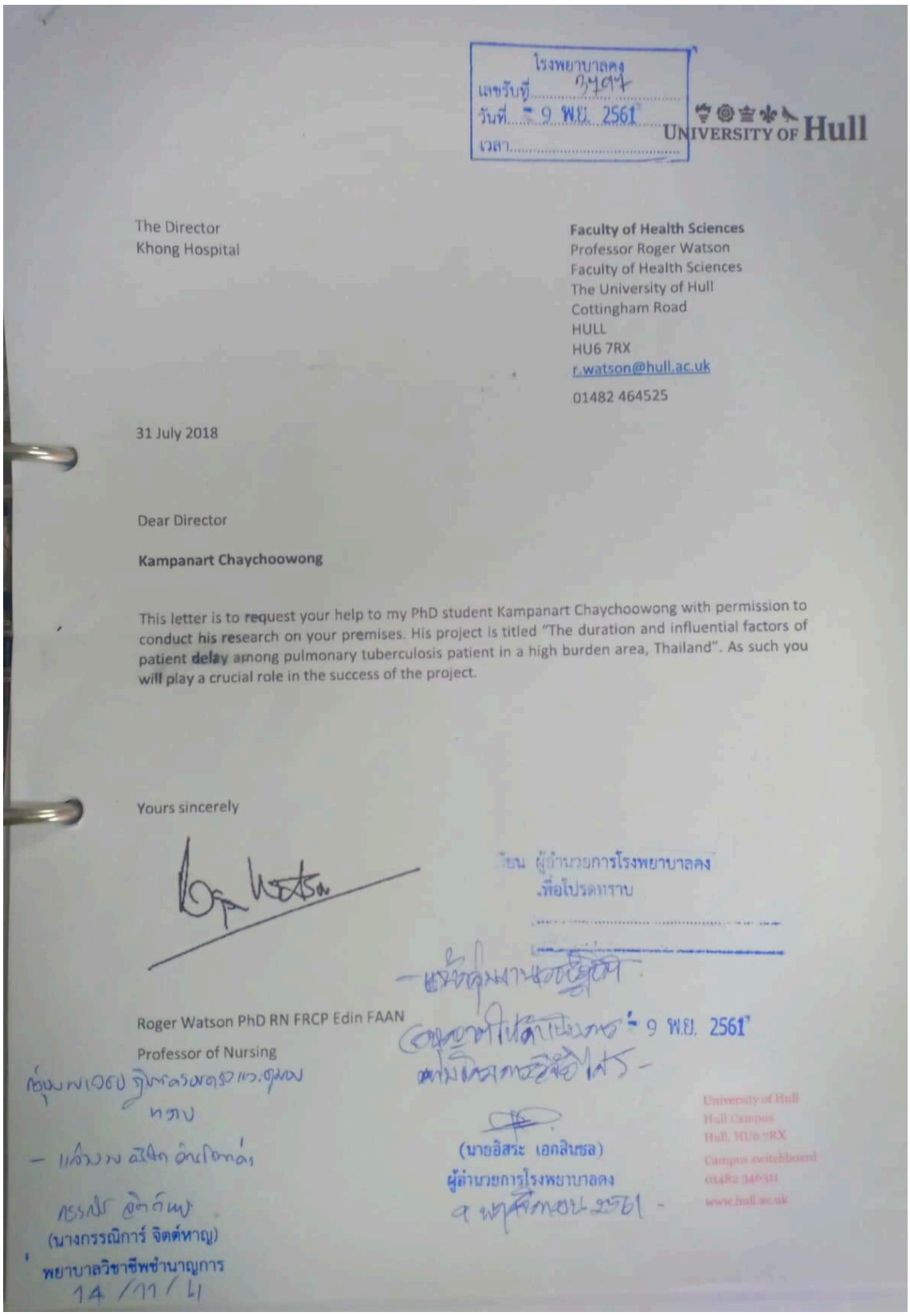

โรงพยาบาลคง
เลขรับที่ ๖๗๙๗
วันที่ ๙ พ.ย. 2561
เวลา

UNIVERSITY OF Hull

The Director
Khong Hospital

Faculty of Health Sciences
Professor Roger Watson
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The University of Hull
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เรียน ผู้อำนวยการโรงพยาบาลคง
เพื่อโปรดทราบ

(นายอิสระ เอกสินชล)
ผู้อำนวยการโรงพยาบาลคง
๙ พฤศจิกายน ๒๕๖๑

(นางกรรณิการ์ จิตต์หาญ)
พยาบาลวิชาชีพชำนาญการ
14/11/61

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โรงพยาบาลโนนไทย
ที่ 3759/ 2561
วันที่ 23 ต.ค. 2561
เวลา

UNIVERSITY OF Hull

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Non Thai Hospital

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เสนอ ผู้อำนวยการโรงพยาบาลโนนไทย
เพื่อโปรดพิจารณาอนุญาต
แพร พยาบาล
22-10-61

Yours sincerely

ทราบ
22/10/61

Roger Watson PhD RN FRCP Edin FAAN
Professor of Nursing

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Professor of Nursing

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Appendix 8: Ethical approval letter

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Hull, HU6 7RX
United Kingdom
T: +44 (0)1482 463336 | **E:** e.walker@hull.ac.uk
w: www.hull.ac.uk

PRIVATE AND CONFIDENTIAL
Kampanart Chaychoowong
Faculty of Health Sciences
University of Hull
Via email

17th July 2018

Dear Kampanart

REF FHS59 - The duration and influential factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand

Thank you for your responses to the points raised by the Faculty of Health Sciences Research Ethics Committee.

Given the information you have provided I confirm approval by Chair's action.

Please refer to the Research Ethics Committee web page for reporting requirements in the event of any amendments to your study.

I wish you every success with your study.

Yours sincerely

Professor Liz Walker
Chair, FHS Research Ethics Committee

UNIVERSITY OF HULL

Liz Walker | Professor of Health and Social Work Research | Faculty of Health Sciences
University of Hull
Hull, HU6 7RX, UK
www.hull.ac.uk
e.walker@hull.ac.uk | 01482 463336
@UniOfHull /UniversityOfHull universityofhull

ที่ นม ๐๐๓๒.๐๐๒/๑/๑๐๙๐๐ สำนักงานสาธารณสุขจังหวัดนครราชสีมา
๒๒๕ ม.๑๑ ต.โคกกรวด อ.เมือง นม.๓๐๒๘๐

๒๘ กันยายน ๒๕๖๑

เรื่อง แจ้งผลรับรองการพิจารณาจริยธรรมวิจัยในมนุษย์

เรียน หัวหน้าโครงการวิจัยฯ

สิ่งที่ส่งมาด้วย เอกสารรับรองโครงการวิจัยฯ จำนวน ๑ ฉบับ

ตามที่ นายกัมปนาท ฉายชูวงษ์ สังกัดคณะวิทยาศาสตร์สุขภาพ มหาวิทยาลัยฮัลล์ สหราช-อาณาจักร หัวหน้าโครงการวิจัย ได้เสนอขอรับรองการพิจารณาจริยธรรมวิจัยในมนุษย์ตามโครงร่างการวิจัย รหัส KHE ๒๐๑๘-๐๔๓ เรื่อง ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอด ในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย เมื่อวันที่ ๒๓ กรกฎาคม พ.ศ. ๒๕๖๑ นั้น

บัดนี้ คณะกรรมการพิจารณาจริยธรรมในมนุษย์ สำนักงานสาธารณสุขจังหวัดนครราชสีมา ได้พิจารณาโครงร่างดังกล่าวตามมาตรฐานการพิจารณาเป็นที่เรียบร้อยแล้ว จึงขอส่งผลการรับรองฯ มายังหัวหน้าโครงการฯ ตามเอกสารรับรองโครงการวิจัยฯ ที่แนบมาพร้อมนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายวชิระ บดีพูลย์)
นายแพทย์เชี่ยวชาญ (ด้านเวชกรรมป้องกัน)
ปฏิบัติราชการ แทนนายแพทย์สาธารณสุขจังหวัดนครราชสีมา

หน่วยพิจารณาจริยธรรมวิจัยในมนุษย์
กลุ่มงานพัฒนายุทธศาสตร์สาธารณสุข
โทร ๐ ๔๔๔๖ ๕๐๑๐ - ๑๕ ต่อ ๓๑๐ , ๓๑๑
โทรสาร ๐ ๔๔๔๖ ๕๖๗๔, ๐ ๔๔๖๕ ๐๒๕๐
ซื่อสัตย์ สามัคคี มีวินัย
องค์กรแห่งการเรียนรู้ สู่ผลสัมฤทธิ์ จิตบริการ ทำงานเป็นทีม แบบอย่างที่ดีด้านสุขภาพ

เอกสารรับรองโครงการวิจัย
โดยคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์ สำนักงานสาธารณสุขจังหวัดนครราชสีมา

เอกสารรับรองเลขที่	KHE 2018 - 043
ชื่อโครงการวิจัย	ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอด ในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย
รหัสโครงการ	NRPH 043
ชื่อหัวหน้าโครงการ	นายกัมปนาท ฉายชูวงษ์
หน่วยงานที่สังกัด	คณะวิทยาศาสตร์สุขภาพ มหาวิทยาลัยฮัลล์ สหราชอาณาจักร
เอกสารที่รับรอง	1. แบบเสนอโครงการวิจัย 2. เอกสารชี้แจงผู้เข้าร่วมการวิจัย 3. หนังสือยินยอมตนในการทำวิจัย 4. แบบการเก็บรวบรวมข้อมูล/โปรแกรม/กิจกรรม
วันที่รับรอง	23 กรกฎาคม 2561
วันหมดอายุ	23 กรกฎาคม 2562

ขอรับรองว่าโครงการดังกล่าวข้างต้นได้ผ่านการพิจารณาเห็นชอบโดยสอดคล้องกับคำประกาศเฮลซิงกิ จากคณะกรรมการพิจารณาจริยธรรมวิจัยในมนุษย์ สำนักงานสาธารณสุขจังหวัดนครราชสีมา

ลงนาม.....

(นายแพทย์วชิระ บถพิบูลย์)

ประธานคณะกรรมการพิจารณาจริยธรรมการวิจัยในมนุษย์

ลงนาม.....

(นายแพทย์นรินทร์รัชต์ พิชญคามินทร์)

นายแพทย์สาธารณสุขจังหวัดนครราชสีมา

Appendix 9: Information sheet and consent form

UNIVERSITY OF HULL | FACULTY OF HEALTH SCIENCES

Information sheet

This information sheet is for pulmonary tuberculosis (PTB) patients who I am inviting to participate in my research. The title of this research is "duration and influential factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand".

Principal investigator

Mr. Kampanart Chaychoowong, a PhD student in Health Studies
Faculty of Health Sciences, University of Hull, United Kingdom

Introduction

I am Kampanart Chaychoowong, a PhD student in Health Studies at the Faculty of Health Sciences, University of Hull, United Kingdom. I am doing study on tuberculosis, which is very common in Thailand. I am going to give you information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research. This consent form may contain some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask me.

Purpose of the research

Tuberculosis (TB) is making many people sick in your area. I want to find ways to stop this from happening. I believe that you can help me by telling me what you experience both duration and factors of patient delay. I want to learn what TB patients know about the factors of patient delay and why some patients get it because this knowledge might help me to learn how to better control TB in this area.

Type of Research

This research will involve questionnaire survey with a structured questionnaire followed by the in-depth interviews or focus group discussions with a semi-structured questionnaire that will take about an hour of each section.

Participant selection

You are being invited to take part in this research because I feel that your experience as a PTB patient can contribute much to my understanding and knowledge of influential factors of patient delay.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you receive at this TB clinic will continue and nothing will change. If you choose not to participate in this research project, you will be offered the treatment that is routinely offered in this clinic for

TB, and I will tell you more about it later. You may change your mind later and stop participating even if you agreed earlier.

Procedures

I am asking you to help me learn more about the duration and influential factors of patient delay in your past experience by inviting you to take part in this research project. If you accept, you will be asked to answer the questionnaire yourself, or it can be read to you and you can say out loud the answer you want me to write down. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The information recorded is confidential, your name is not being included on the forms, only a number will identify you, and no one else except me and my supervisors will have access to your survey.

Then, if you were categorised in the delay group, you will be asked to participate in an in-depth interview or take part in a focus group discussion.

During the in-depth interview, I will sit down with you in a comfortable place at the clinic. If it is better for you, the interview can take place in your home or a friend's home. If you do not wish to answer any of the questions during the interview, you may say so and I will move on to the next question. No one else but the interviewer will be present unless you would like someone else to be there. The information recorded is confidential, and no one else except me will access to the information documented during your interview. The entire interview will be tape-recorded, but no-one will be identified by name on the tape. The tape will be kept as an electronic file in a coded external hard disk. The information recorded is confidential, and no one else except me and my supervisors will have access to the tapes. The tapes will be destroyed after two years.

The focus group discussion will start with me, making sure that you are comfortable. I can also answer questions about the research that you might have. Then I will ask you questions about the duration and influential factors of patient delay and give you time to share your experiences. The questions will be about your opinions on TB and influential factors of patient delay in your experiences. You do not have to share any knowledge or experience that you are not comfortable sharing. The discussion will take place in a private room at the clinic, and no one else but the people who take part in the discussion and myself will be present during this discussion. The entire discussion will be tape-recorded, but no-one will be identified by name on the tape. The tape will be kept as an electronic file in my coded external hard disk. The information recorded

is confidential, and no one else except me and my supervisors will have access to the tapes. The tapes will be destroyed after 2 years.

Duration

The research takes place over a month in total. The questionnaire survey takes place over 30 minutes, and the in-depth interview or the focus group discussion takes place over an hour. During that time, I will visit you once for a questionnaire survey and then once for and in-depth interview or a focus group discussion if you were patient with delay.

Risks

I am asking you to share with me some very personal and confidential information, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question or take part in the survey/in-depth interview/focus group discussion if you don't wish to do so, and that is also fine. You do not have to give us any reason for not responding to any question, or for refusing to take part in the interview.

Benefits

There will be no direct benefit to you, but your participation is likely to help me find out more about how to decrease the duration and prevent influential factors of patient delay among PTB patients in your community.

Reimbursements

You will not be provided any incentive to take part in the research. However, I will give you 100 Baht for your time, and travel expense.

Confidentiality

The research being done in your area may draw attention and if you participate you may be asked questions by other people in your area. I will not be sharing information about you to anyone outside of the research team. The information that I collect from this research project will be kept private. Any information about you will have a number on it instead of your name. Only I will know what your number is and I will lock that information up with a lock and key. It will not be shared with or given to anyone except my supervisors.

I will ask you and others in the group not to talk to people outside the group about what was said in the group. I will, in other words, ask each of you to keep what was said in the group confidential. You should know, however, that I cannot stop or prevent participants who were in the group from sharing things that should be confidential.

Sharing the Results

Nothing that you tell me today will be shared with anybody outside the research team, and nothing will be attributed to you by name. The knowledge that I get from this research will be shared with you and your area before it is made widely available to the public. Each participant will receive a summary of the results. There will also be small meetings in the clinic and these will be announced. Following the meetings, I will publish the results so that other interested people may learn from the research.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so and choosing to participate will not affect your treatment at this clinic in any way. You may stop participating in the survey/interview/discussion at any time that you wish without losing any of your rights as a patient here. I will give you an opportunity at the end of the survey/interview/discussion to review your remarks, and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly.

Who to Contact

If you have any questions, you can ask me now or later. If you wish to ask questions later, you may contact me: Kampanart Chaychoowong, 287 M.5 Dankhunthod Sub-district, Dankhunthod District, Nakhon Ratchasima Province/Tel. +668 8581 4736/ Email: khakam_kc@hotmail.com.

This proposal has been reviewed and approved by the Faculty of Health Sciences Research Ethics Committee, University of Hull, which is a committee whose task it is to make sure that research participants are protected from harm. If you wish to find about more about the REC, contact: FHS-ethicssubmissions@hull.ac.uk.

You can ask me any more questions about any part of the research study, if you wish to. Do you have any questions?

UNIVERSITY OF HULL | FACULTY OF HEALTH SCIENCES

CONSENT FORM

Title of Project: **The duration and influential factors of patient delay among pulmonary tuberculosis patients in a high burden area, Thailand**

Name of Researcher: **Mr. Kampanart Chaychoowong**

Please initial all boxes

1. I confirm that I have read and understand the information sheet dated July 03, 2018 (version 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐
3. I understand that relevant sections of my medical notes and data collected during the study, may be looked at by supervisors of the researcher. I give permission for these individuals to have access to my records. ☐
4. I understand once data has been provided it will still be used up to the point of my withdrawal from the study. ☐
5. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent.	Date	Signature

Consent form date of issue: July 03, 2018
Consent form version number: 2

เอกสารชี้แจงข้อมูล

เอกสารชี้แจงข้อมูลฉบับนี้จัดทำขึ้นสำหรับผู้ป่วยวัณโรคปอดที่ข้าพเจ้าได้ขอเชิญเข้าร่วมโครงการวิจัย ภายใต้หัวข้อ ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอด ในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย

ผู้วิจัยหลัก

นายกัมปนาท ฉายชูวงษ์ นักศึกษาปริญญาเอกหลักสูตรการศึกษาด้านสุขภาพ (PhD in Health Studies)
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บทนำ

ข้าพเจ้า นายกัมปนาท ฉายชูวงษ์ นักศึกษาปริญญาเอก ในหลักสูตรการศึกษาด้านสุขภาพ คณะวิทยาศาสตร์สุขภาพ มหาวิทยาลัยฮัลล์ สหราชอาณาจักร กำลังทำการศึกษาเกี่ยวกับโรควัณโรค ซึ่งเป็นโรคที่พบโดยทั่วไปในประเทศไทย ข้าพเจ้าขอให้ข้อมูลและขอเชิญท่านเข้าร่วมเป็นส่วนหนึ่งของงานวิจัยนี้ ท่านสามารถปรึกษาหรือพูดคุยกับบุคคลที่ท่านรู้สึกสบายใจเกี่ยวกับงานวิจัยนี้ก่อนการตัดสินใจ โดยท่านไม่จำเป็นต้องตัดสินใจในทันทีว่าจะเข้าร่วมในการวิจัยนี้หรือไม่ หากมีบางข้อความในใบแสดงความยินยอมเข้าร่วมงานวิจัยที่ท่าน ไม่เข้าใจ ท่านสามารถขอหยุดเพื่อสอบถามหรือให้ข้าพเจ้าอธิบายเพิ่มเติมในระหว่างการสนทนา ทั้งนี้หากท่านมีข้อสงสัยในภายหลัง สามารถสอบถามข้าพเจ้าเพิ่มเติมได้

วัตถุประสงค์ของการวิจัย

โรควัณโรคเป็นโรคที่ทำให้ประชาชนในพื้นที่ของท่านเจ็บป่วยเป็นจำนวนมาก ข้าพเจ้ามีความต้องการที่จะหาวิธีการยับยั้งการระบาดของวัณโรคในพื้นที่นี้ โดยข้าพเจ้าเชื่อว่าท่านสามารถช่วยเหลือข้าพเจ้าได้ ด้วยการบอกเล่าเรื่องราวเกี่ยวกับประสบการณ์ของท่านที่เกี่ยวข้องกับระยะเวลาและปัจจัยที่ส่งผลให้เกิดความล่าช้าของผู้ป่วยในการเข้ารับการรักษา (ผู้ป่วยที่มีระยะเวลาตั้งแต่เริ่มมีอาการป่วยจนกระทั่งเข้ารับการรักษาครั้งแรก ณ สถานพยาบาลของรัฐ มากกว่า 30 วัน) ข้าพเจ้าต้องการที่จะเรียนรู้เกี่ยวกับสิ่งที่ผู้ป่วยวัณโรคทราบเกี่ยวกับปัจจัยของความล่าช้าดังกล่าว และสาเหตุของความล่าช้าที่เกิดขึ้นในผู้ป่วยบางราย เนื่องจากข้อมูลที่ได้รับจากการวิจัยนี้อาจช่วยให้ข้าพเจ้าทราบถึงวิธีที่จะควบคุมโรควัณโรคในพื้นที่ของท่านได้ดียิ่งขึ้น

รูปแบบของงานวิจัย

งานวิจัยนี้เป็นการสำรวจโดยใช้แบบสอบถามแบบมีโครงสร้าง และการสัมภาษณ์เชิงลึก โดยใช้แบบสอบถามแบบกึ่งโครงสร้าง ซึ่งแต่ละขั้นตอนจะใช้เวลาประมาณ 1 ชั่วโมง

การคัดเลือกผู้เข้าร่วมงานวิจัย

ท่านได้รับเชิญให้เข้าร่วมในงานวิจัยนี้ เนื่องจากข้าพเจ้าตระหนักว่าประสบการณ์ของท่านจากการเป็นผู้ป่วยวัณโรคปอดจะมีส่วนทำให้ข้าพเจ้าเข้าใจและมีความรู้เกี่ยวกับปัจจัยที่มีอิทธิพลต่อความล่าช้าของผู้ป่วยได้เป็นอย่างดี

การเข้าร่วมโดยความสมัครใจ

การเข้าร่วมในงานวิจัยครั้งนี้ เป็นไปโดยความสมัครใจของท่านว่าจะเข้าร่วมหรือไม่ และไม่ว่าท่านจะตัดสินใจเข้าร่วมหรือไม่ก็ตาม การให้บริการทั้งหมดที่ท่านได้รับ ณ คลินิกวัณโรคนี้จะยังคงดำเนินต่อไปโดยไม่มีอะไรเปลี่ยนแปลง หากท่านเลือกที่จะไม่เข้าร่วมในงานวิจัยนี้ ท่านจะได้รับการรักษาตามปกติในคลินิกวัณโรคดังเดิม และข้าพเจ้าจะแจ้งท่านเกี่ยวกับผลการศึกษาในภายหลัง ท่านสามารถหยุดการเข้าร่วมงานวิจัยนี้หรือเปลี่ยนใจไม่เข้าร่วมในภายหลัง แม้ว่าท่านจะตกลงเข้าร่วมงานวิจัยก่อนหน้านี้ก็ตาม

ขั้นตอนการวิจัย

ข้าพเจ้าจะขอความช่วยเหลือจากท่านให้ข้าพเจ้าได้เรียนรู้เพิ่มเติมจากประสบการณ์ที่ผ่านมาของท่านเกี่ยวกับระยะเวลาและปัจจัยที่ส่งผลให้เกิดความล่าช้าของผู้ป่วยในการเข้ารับการรักษา โดยขอเชิญท่านเข้าร่วมในงานวิจัยนี้ ถ้าท่านตกลงและยอมรับที่จะเข้าร่วมงานวิจัย ท่านจะถูกขอให้ตอบแบบสอบถามด้วยตนเอง หรือขอให้ข้าพเจ้าอ่านข้อคำถามให้ท่านฟังและท่านสามารถบอกให้ข้าพเจ้าเขียนคำตอบแทนท่านได้ หากท่านไม่ต้องการตอบคำถามใดที่อยู่ในแบบสอบถาม ท่านสามารถข้ามไปยังคำถามถัดไปได้ ท่านสามารถขอหยุดระหว่างการสนทนา หรือหากท่านมีข้อสงสัย ท่านสามารถซักถามเพื่อให้ข้าพเจ้าอธิบายเพิ่มเติม ข้อมูลที่ถูกบันทึกจะเป็นความลับ โดยที่ชื่อของท่านจะไม่ได้ถูกระบุอยู่ในแบบสอบถาม จะมีเพียงหมายเลขที่จะใช้แสดงแทนตัวท่าน และจะไม่มีใครสามารถเข้าถึงแบบสอบถามของท่านได้ ยกเว้นข้าพเจ้าและอาจารย์ที่ปรึกษาของข้าพเจ้าเท่านั้น

หากท่านถูกจัดอยู่ในกลุ่มผู้ป่วยที่มีความล่าช้าในการเข้ารับการรักษา (มีระยะเวลาตั้งแต่วันที่ท่านเริ่มมีอาการจนถึงวันที่ท่านเข้ารับการรักษาครั้งแรก มากกว่า 30 วัน) ท่านจะถูกขอเชิญให้เข้าร่วมในการสัมภาษณ์เชิงลึกในภายหลังอีกครั้ง

ในระหว่างการสัมภาษณ์เชิงลึก ข้าพเจ้าจะนั่งกับท่านในสถานที่ที่ผ่อนคลายในคลินิกวัณโรค หากท่านต้องการการสัมภาษณ์สามารถทำในบ้านท่านหรือที่บ้านของเพื่อนท่านได้ หากท่านไม่ต้องการตอบคำถามใด ๆ ในระหว่างการสัมภาษณ์ ท่านสามารถแจ้งได้และข้าพเจ้าจะข้ามไปที่คำถามถัดไป จะไม่มีบุคคลอื่นเข้าร่วมในระหว่างการสัมภาษณ์นอกจากข้าพเจ้า เว้นแต่ท่านจะต้องการให้บุคคลอื่นเข้าร่วมด้วย ข้อมูลที่ถูกบันทึกจะเป็นความลับและไม่มีใครสามารถเข้าถึงข้อมูลที่ถูกบันทึกไว้ยกเว้นข้าพเจ้า การสัมภาษณ์ทั้งหมดจะถูกบันทึก

เป็นเทปบันทึกเสียง โดยจะไม่ระบุชื่อบุคคลใดในเทป เทปจะถูกเก็บเป็นไฟล์อิเล็กทรอนิกส์ในฮาร์ดดิสก์ภายนอกที่ใส่รหัสไว้ ข้อมูลที่ถูกบันทึกในเทปจะเป็นความลับและไม่มีใครสามารถเข้าถึงเทปได้ ยกเว้นข้าพเจ้าและอาจารย์ที่ปรึกษาของข้าพเจ้า เทปบันทึกเสียงจะถูกทำลายภายหลังจากเสร็จสิ้นงานวิจัยแล้ว 10 ปี

ระยะเวลาที่ดำเนินการ

การวิจัยนี้จะใช้เวลาทั้งหมดประมาณ 1 เดือน การสำรวจโดยการใช้แบบสอบถามใช้เวลาประมาณ 1 ชั่วโมง และการสัมภาษณ์เชิงลึกจะใช้เวลาประมาณ 1 ชั่วโมง ในช่วงเวลาดังกล่าวนั้น ข้าพเจ้าจะพบท่านหนึ่งครั้งสำหรับการสำรวจโดยใช้แบบสอบถาม และหากท่านเป็นผู้ป่วยที่มีความล่าช้าในการรักษา ข้าพเจ้าจะพบท่านอีกหนึ่งครั้ง สำหรับการสัมภาษณ์เชิงลึก โดยกิจกรรมทั้งสองจะดำเนินการในวันนัดพบแพทย์ของท่าน

ความเสี่ยงที่อาจเกิดขึ้น

ข้าพเจ้าขอให้ท่านแบ่งปันข้อมูลส่วนตัวและข้อมูลที่เป็นความลับบางส่วนของท่านกับข้าพเจ้า ซึ่งหากท่านเกิดความรู้สึกอึดอัดใจเกี่ยวกับบางประเด็น ท่านไม่จำเป็นต้องตอบคำถามหรือมีส่วนร่วมในการสำรวจ หรือการสัมภาษณ์เชิงลึก หากท่านไม่ต้องการ และท่านไม่จำเป็นต้องให้เหตุผลใด ๆ แก่ข้าพเจ้าในการไม่ตอบคำถามดังกล่าวหรือปฏิเสธที่จะเข้าร่วมการสัมภาษณ์

ประโยชน์ที่ท่านจะได้รับ

ท่านจะไม่ได้รับประโยชน์โดยตรงจากการเข้าร่วมงานวิจัยในครั้งนี้ แต่การมีส่วนร่วมของท่านนั้นมีแนวโน้มที่จะช่วยข้าพเจ้าหาข้อมูลเพิ่มเติมเกี่ยวกับวิธีการลดระยะเวลาและป้องกันปัจจัยที่ส่งผลให้เกิดความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอดในชุมชนของท่าน อันจะส่งผลดีต่อการปรับปรุงคุณภาพการบริการและเพิ่มประสิทธิภาพการรักษา

ค่าตอบแทนที่ท่านจะได้รับ

ท่านจะไม่ได้รับสิ่งจูงใจใด ๆ ในการเข้าร่วมการวิจัยในครั้งนี้ อย่างไรก็ตามข้าพเจ้าจะให้ค่าตอบแทนสำหรับเวลาของท่านและเป็นค่าใช้จ่ายในการเดินทาง จำนวน 100 บาท

การรักษาความลับ

ข้าพเจ้าจะไม่แบ่งปันข้อมูลเกี่ยวกับตัวท่านกับทุกคนที่อยู่ภายนอกทีมวิจัย ข้อมูลที่ข้าพเจ้าเก็บรวบรวมจากโครงการวิจัยนี้จะถูกเก็บเป็นความลับ ข้อมูลเกี่ยวกับตัวท่านจะมีหมายเลขแทนชื่อของท่าน เฉพาะข้าพเจ้าเท่านั้นที่จะทราบว่าหมายเลขของท่านคือหมายเลขใด ข้าพเจ้าจะล็อคข้อมูลนั้นด้วยกุญแจ และจะไม่มีการแบ่งปันหรือมอบให้กับบุคคลอื่น ๆ ยกเว้นอาจารย์ที่ปรึกษาของข้าพเจ้า เนื่องจากการวิจัยที่กำลังทำในพื้นที่ของท่าน อาจสร้างความสนใจให้กับบุคคลอื่น ๆ หากท่านเข้าร่วมงานวิจัย ท่านอาจถูกถามคำถามโดยบุคคลอื่น ๆ ในพื้นที่ของท่าน

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การแบ่งปันผลการวิจัย

สิ่งที่ท่านบอกกับข้าพเจ้าในวันนี้จะไม่ถูกแบ่งปันกับบุคคลภายนอกทีมวิจัย และไม่มีข้อมูลใดที่จะสามารถพิจารณาเชื่อมโยงถึงตัวท่านได้ ความรู้ที่ข้าพเจ้าได้รับจากการวิจัยนี้จะถูกนำเสนอในภาพรวมและจะถูกแบ่งปันกับท่านและพื้นที่ของท่านก่อนที่จะมีการเผยแพร่ข้อมูลสู่สาธารณชนอย่างกว้างขวาง ผู้เข้าร่วมงานวิจัยแต่ละคนจะได้รับผลสรุปของงานวิจัยเพื่อให้พิจารณาและแก้ไขเพื่อความสบายใจของท่าน นอกจากนี้ยังจะมีการประชุมที่คลินิกเพื่อประกาศให้ท่านทราบ และหลังจากการประชุมแล้ว ข้าพเจ้าจะเผยแพร่ผลการศึกษาเพื่อให้บุคคลอื่น ๆ ที่สนใจได้เรียนรู้จากการวิจัย

สิทธิในการปฏิเสธหรือถอนตัว

ท่านสามารถปฏิเสธการมีส่วนร่วมในการวิจัยนี้หากท่านไม่ต้องการ และการตัดสินใจของท่านจะไม่ส่งผลกระทบต่อการรักษาของท่านที่คลินิกนี้ไม่ว่าในกรณีใด ๆ ก็ตาม ท่านอาจหยุดการมีส่วนร่วมในการสำรวจ หรือการสัมภาษณ์ในเวลาที่ท่านต้องการ โดยไม่สูญเสียสิทธิใด ๆ ในฐานะผู้ป่วยของสถานพยาบาลแห่งนี้ ทั้งนี้ข้อมูลของท่านข้อมูลที่ได้ให้มาแล้ว จะยังถูกใช้จนถึงเวลาที่ท่านถอนตัวออกจากการศึกษา ข้าพเจ้าจะให้โอกาสท่านในตอนท้ายของการสำรวจหรือการสัมภาษณ์ เพื่อทบทวนคำพูดของท่าน และท่านสามารถขอแก้ไขหรือลบบางส่วนได้หากท่านไม่เห็นด้วยกับบันทึกของข้าพเจ้าหรือข้าพเจ้าไม่เข้าใจท่านอย่างถูกต้อง

บุคคลที่สามารถติดต่อได้

หากท่านมีคำถามหรือข้อสงสัยใด ๆ ท่านสามารถสอบถามข้าพเจ้าได้ในขณะนี้หรือหลังจากนี้ หากท่านต้องการสอบถามข้อมูลในภายหลัง ท่านสามารถติดต่อข้าพเจ้าได้ที่

ผู้วิจัย: นายกัมปนาท ฉายชูวงษ์ 287 หมู่ 5 ตำบลด่านขุนทด อำเภอด่านขุนทด จังหวัดนครราชสีมา / โทรศัพท์ (+66) 8 8581 4736 / Email: khakam_kc@hotmail.com

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อาจารย์ที่ปรึกษาร่วม: ดร.เดวิด บาร์เรต / โทร +441 8246 4683/E-mail: D.I.Barrett@hull.ac.uk

โครงร่างการวิจัยนี้ได้รับการตรวจสอบและอนุมัติโดยคณะกรรมการจริยธรรมการวิจัย คณะวิทยาศาสตร์สุขภาพ มหาวิทยาลัยฮัลล์ ซึ่งเป็นคณะกรรมการที่มีหน้าที่ในการตรวจสอบและอนุมัติเพื่อให้แน่ใจว่าผู้เข้าร่วมการวิจัยได้รับความคุ้มครองจากอันตราย

ท่านสามารถสอบถามคำถามเพิ่มเติมเกี่ยวกับส่วนใด ๆ ก็ได้ของการวิจัยนี้ถ้าท่านต้องการ ท่านมีคำถามเพิ่มเติมหรือไม่

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ใบยินยอมเข้าร่วมการวิจัย

ชื่องานวิจัย: **ระยะเวลาและปัจจัยที่มีอิทธิพลต่อความล่าช้าในการเข้ารับการรักษาของผู้ป่วยวัณโรคปอดในพื้นที่ที่มีอุบัติการณ์ของโรควัณโรคสูง ประเทศไทย**

ชื่อผู้วิจัย: **นายกัมปนาท ฉายชูวงษ์**

โปรดทำเครื่องหมาย ✓ลงใน ☐ ที่ตรงกับคำรับรอง

1. ข้าพเจ้าขอยืนยันว่าข้าพเจ้าได้อ่านและทำความเข้าใจเอกสารชี้แจงข้อมูล ฉบับลงวันที่ 3 กรกฎาคม 2561 (ฉบับที่ 2) เพื่อการวิจัยดังกล่าว ข้าพเจ้ามีโอกาสที่จะพิจารณาข้อมูล ซักถาม และได้รับคำตอบอย่างเป็นที่น่าพอใจ ☐
2. ข้าพเจ้าเข้าใจว่าการเข้าร่วมในการวิจัยของข้าพเจ้าเป็นเรื่องสมัครใจ และข้าพเจ้าสามารถถอนตัวได้ทุกเมื่อโดยไม่ต้องให้เหตุผลใด ๆ และไม่มีผลกระทบต่อการเข้ารับบริการทางการแพทย์หรือสิทธิตามกฎหมายของข้าพเจ้า ☐
3. ข้าพเจ้าเข้าใจว่าส่วนที่เกี่ยวข้องกับบันทึกทางการแพทย์และข้อมูลที่เก็บรวบรวมได้ในระหว่างการวิจัยอาจได้รับการพิจารณาโดยอาจารย์ที่ปรึกษาของผู้วิจัย ข้าพเจ้าอนุญาตให้บุคคลเหล่านี้เข้าถึงข้อมูลของข้าพเจ้าได้ ☐
4. ข้าพเจ้าเข้าใจว่าข้อมูลของข้าพเจ้าที่ได้ให้ไปแล้ว จะยังถูกใช้จนถึงเวลาที่ข้าพเจ้าถอนตัวออกจากการศึกษา ☐
5. ข้าพเจ้าตกลงที่จะเข้าร่วมในการวิจัยข้างต้น ☐

ชื่อผู้เข้าร่วมงานวิจัย	วัน/เดือน/ปี	ลายมือชื่อ
ชื่อผู้ดำเนินการขอความยินยอม	วัน/เดือน/ปี	ลายมือชื่อ

Consent form date of issue: July 3, 2018
Consent form version number: 2

Appendix 10: List of experts

1. Professor Roger Watson

   Faculty of Health Sciences, University of Hull
2. Dr. David I Barrett

   Faculty of Health Sciences, University of Hull
3. Dr. Kamolnud Muangyim

   Sirindhorn College of Public Health Chonburi
4. Dr. Orarat Wangpradit

   Sirindhorn College of Public Health Chonburi
5. Dr. Yananthorn Krabthip

   Sirindhorn College of Public Health Chonburi
6. Dr. Uriwan Sirithammaphan

   Sirindhorn College of Public Health Yala

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21 May 2018

Dear Dr Kamolnud Muangyim

Kampanart Chaychoowong

This letter is to show my appreciation of your help given to my PhD student Kampanart Chaychoowong with the translation of his questionnaire on the duration and influential factors of patient delay among pulmonary tuberculosis patient in a high burden area, Thailand from Thai to English. As such you have played a crucial role in the success of the project.

Yours sincerely

Roger Watson PhD RN FRCP Edin FAAN

Professor of Nursing

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21 May 2018

Dear Dr Orarat Wangpradit

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Dear Dr Yananthorn Krabthip

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21 May 2018

Dear Dr Uriwan Sirithammaphan

Kampanart Chaychoowong

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Appendix 11: An example of transcript translated from Thai to English

Participant: ID 02-070 (Woman)
Age of participant: 37 years old
Marital status: Married
Occupation: Unemployed
Level of education: Primary education

Person	Thai	Dialogue (translated from Thai to English)
KC	วันนี้เป็นไงบ้างครับ	How are you today?
ID 02-070	วันนี้ก็...ก็ไม่เป็นอะไรก็สบายดี แต่ว่ากินข้าวยังไม่ค่อยได้ เพราะว่าช่วงนี้ช่วงกำลังแบบ กินแล้วมันออกเลยหนะ มันแพ้ แพ้ท้อง ตอนนี้หนูจำประจำเดือนไม่ได้อ่ะ แต่ว่ามันก็ตอดๆแล้วแหละ หมอแกว่าประมาณ 3 สัปดาห์ครึ่งอะไรนี้แหละค่ะ	Today, I am well but I can eat a bit food because this period is… if I eat then it will be out soon. I have… morning sickness. I cannot remember about my last mensuration, but I feel like my baby moving. The doctor has told me that it is nearly 3 and half weeks, about this.
KC	ไม่น่าจะใช่ 3 สัปดาห์นะครับ สามเดือนหรือเปล่า เพราะว่ารอบที่แล้วที่เรามาเจอกันนี่ก็ประมาณเดือนสองเดือนแล้วนะครับ	I think it is not 3 and half weeks, maybe 3 months or not? As the last time we met, it was about 2 months ago.
ID 02-070	เน๊าะ น่าจะยังงั้น	Umm, it will be.
KC	ตอนนั้นไม่มีอาการอะไรเลยใช่ไหมครับ	At the beginning, did you have no any symptom?
ID 02-070	ค่ะ	No.
KC	มีอาการไออะไรบ้างไหมครับ	What symptoms did you have?
ID 02-070	ก็รู้สึก ที่เริ่มเป็นครั้งแรกเลยรู้สึกจาม จามบ่อยมา แล้วก็มีเสลดออกมา เป็นมาประมาณอาทิตย์นึงแหละคะ พอรู้ว่าตัวเองจาม ตัวเองเป็นหวัดนี่ก็มาเลยค่ะ	Umm… the first time that I was, I had sneeze, many times then I had sputum. I had these symptoms about a week. After I had sneeze, got sick, then I came here soon.
KC	แล้วมีอาการอย่างอื่นไหมครับ	Did you have other symptoms more?
ID 02-070	น้ำหนักลดค่ะ กินได้ แต่ว่าน้ำหนักไม่ขึ้น ไม่เบื่ออาหาร ก็มันก็ลดลงเรื่อยๆค่ะ ทีละโล ทีละอะไรอย่างเนี๊ยะค่ะ จนตัวเจ้าของแปลกใจว่าเป็นอะไร ก็... ประมาณซักสองเดือนนี่แหละค่ะ เพราะว่าหนูจะผอมจะอันนี้ แล้วมันเป็นพร้อมๆกันกับเอชไอวีเลยค่ะ ก็จะมาพร้อมๆกันเลย	A: Weight loss, I could eat but my weight did not increase. It decreased continuously, a kilogram, about this until I wondered what I was. It… was about 2 months because I was skinny from this (TB) which was along with HIV, they occurred at the same time.
KC	มีอาการอย่างอื่นอีกไหมครับ	Did you have other symptoms?
ID 02-070	หนาวสั่น ก็มีบ้างบางครั้ง ประมาณสองเดือนกว่าที่จะมารักษาวัณโรค ไข้ต่ำๆนั่นแหละค่ะ อ่อนเพลียมีค่ะ เหงื่อออกตอนกลางคืนเป็นบางครั้ง ก็ช่วงระยะเวลาประมาณ 2 เดือนเหมือนกัน ตอนนี้แข็งแรงดีแล้วค่ะ เพราะว่าทำงานหักข้าวโพดทุกวันเลย เพราะแฟนทำคนเดียวไม่พอใช้ (หัวเราะนิดๆ)	I had chill in some times about more than 2 months before getting TB treatment. And I had low-grade fever, tiredness, night sweats in some nights. They occurred for about 2 months as well. Now, I am strong because I work about picking corns every day, because it will be not enough to spend if my husband works alone (a bit laughing).
KC	แล้วตอนที่มีอาการพวกนี้ พี่ได้สงสัยไหมว่าเป็นวัณโรค	At that time, did you suspect that you had TB?
ID 02-070	ยังไม่สงสัย ค่ะ คิดว่าตัวเองนี่จะเป็นหวัดหรือว่าอะไรอย่างนี้แหละค่ะ ที่เราเป็นเสมหะก็น่าจะเป็นจากหวัด	No, not yet. I thought that I would be sick or about this, and having sputum because of flu.
KC	แล้วที่น้ำหนักลดหละครับ	How about your weight loss?

Person	Thai	Dialogue (translated from Thai to English)
ID 02-070	ก็ไม่ได้คิดอะไร คิดว่า เอ่อ เราเป็นหวัด เรากินข้าวไม่ได้เอง	I did not think anything, I thought that I was sick and could not eat.
KC	แล้วคิดว่ามันมาจากที่เราติดเชื้อหรือเปล่าครับ	Did you think that it caused from HIV infection?
ID 02-070	ค่ะ เพราะมันจะมาไล่เลี่ยกันค่ะ แต่ว่าอาการที่ติดเชื้อนี้ หนูจะท้องเสียทั้งวี่ทั้งวันเลย	Yes, because they occurred at the same time, but about HIV infection I had diarrhoea all day.
KC	เรารู้ว่าเราติดเชื้อนี่นานไหมครับ	How long did you know that you got HIV?
ID 02-070	เป็นวัณโรคก่อน แล้วรู้ว่าติดเชื้อทีหลังค่ะ	I was TB patient first, then I knew that I had HIV after.
KC	ก็ตอนนั้นก็คือไม่สงสัยเลยใช่ไหมครับว่าตัวเองเป็นวัณโรคเลย	Did you suspect that you had TB at that time?
ID 02-070	ค่ะ แต่ตอนนี้กังวลอยู่อย่างนึง กลัวลูกติดเอชไอวี แล้วก็กลัวลูกติดวัณโรคด้วย	No, but I worry one thing, fear about my baby will get HIV, and fear about my baby will get TB as well.
KC	แล้วพี่คิดว่า เราติดเชื้อวัณโรคได้อย่างไรครับ	Did you think that how did you get TB?
ID 02-070	หนู คือว่า หนูเคยดูแลปู่ ปู่นี่คือเป็นพ่อของผัวเก่า แกเคยพักอยู่ห้องขัง แล้วแกอยู่กับฝุ่น แกก็เลยเป็นวัณโรค ก็เลยหนูก็เลยต้องไม่ได้คลุมไม่ได้ปิดจมูกอะไรเลยหนะ แล้วทีนี้หนูก็ต้องเก็บเสมหะอะไรของแกไปทิ้ง แล้วก็น่าจะสัมผัสกับถ้วยกับชามอะไรอย่างเนี๊ยะ หนูคิดคิดอย่างนี้อ่ะ แต่ว่าทางญาติฝ่ายหนูไม่มีวัณโรคค่ะ มีแต่เบาหวานอย่างเดียว	I, umm, I used to take care my grandfather, father of my ex-husband. He used to be prison, contacted with dusts, so he was TB patient. As well as I did not cover my nose and I had to collect his sputum to throw away. Moreover, I might contact with his used crockery. I thought like this while all of my relatives did not have TB, just had only DM.
KC	แล้วคิดว่าเราติดมาจากทางอื่นไหมครับ จากฝุ่นจากอะไรอื่นๆ	Did you think that you got from other sources?
ID 02-070	ไม่ค่ะ คิดว่ารับเชื้อมาจากคนป่วย	No, I thought I got it from TB patient only.
KC	แล้วทำไมพี่ถึงทิ้งอาการไว้นานกว่าที่เราจะมาหาหมอหละครับ	Why did you leave your symptoms for a long time before coming to the doctor?
ID 02-070	ก็... มันยังไงหละ ก็คิดว่าแบบ มันคงจะแบบไม่ใช่วัณโรคหนะ ก็แบบเดี๋ยวมันก็หายอะไรงี้ ก็เลยปล่อยตัวละเลยไป พอดีมาท้องเสียพอดีค่ะ ท้องเสียก็เลย เอ๊ะไปอนามัย ไปอนามัยเค้าก็ส่งมาโรงพยาบาล คิดว่าท้องร่วงอะค่ะ แต่ที่ไหนได้เค้าบอกว่าเป็นเอชไอวีด้วย แล้วก็เป็นวัณโรคด้วย แต่ก็คือรู้ว่าเป็นวัณโรคก่อนค่ะ	Because… how to say? I thought like… it might not be TB, it would disappear on itself so I left it. Until I had diarrhoea, got diarrhoea, err.. I went to the PCU, I went there and then was referred to the hospital, thought as diarrhoea. Hence, the doctor told me that I had HIV and TB, but I knew that I had TB first.
KC	ที่เราท้องร่วงมันเป็นอาการของการติดเชื้อเอชไอวี ผมเลยไม่แน่ใจว่าพี่ตรวจโรคไหนก่อนกันครับ	About the diarrhoea, it is a symptom of HIV, so I do not sure that you had been tested which disease first.
ID 02-070	วัณโรคเจอก่อน ส่วนติดเชื้อทีหลัง แต่ก็คือจะมาไล่เลี่ยกัน ห่างกันไม่นาน	TB was found first, then HIV but they occurred at the same time, not too long.
KC	คิดว่าอาการพวกนี้ไม่ใช่อาการของวัณโรค พอท้องเสียเราถึงมาตรวจใช่ไหมครับ	Did you think that these symptoms were not TB symptoms, then when you had diarrhoea so you just came to the hospital?
ID 02-070	ค่ะ แต่ว่าคนที่บ้านก็บอกว่า ทำไมถึงดูซูบไป ผอมไป กินบ่อย แต่ก็ถ่ายบ่อย แล้วก็แบบดูโทรมๆ ก็เลยมาตรวจ ก็เลยพบ (ขำแห้งๆ)	Yes, but other people at my home asked me that why did I look skinny, thin, so I ate a lot but I excreted a lot as well. In addition, I looked down so I came to be tested, and was found (a bit laughing).

Person	Thai	Dialogue (translated from Thai to English)
KC	แล้วเรื่องวัณโรคได้บอกใครไหมครับว่าเราป่วยเป็นวัณโรค	Did you tell others that you had TB?
ID 02-070	วัณโรคเค้ารู้กันหมดแล้วค่ะ	About TB, everyone knew.
KC	แต่เรื่องติดเชื้อไม่ได้บอกใครใช่ไหมครับ	About HIV infection, did you not tell others?
ID 02-070	รู้ค่ะ เค้ารู้หมด	No, everyone knew as well.
KC	แล้วเค้ามีท่าทีกับเรายังไงบ้าง	How about their refection on you after they knew?
ID 02-070	เค้าก็ไม่ค่อยพูดกับหนู หนูก็ทำตัวสบายๆของหนู หนูถือว่า หนูไม่ได้ไปวุ่นวายอะไรกับใคร แต่แฟนหนูก็ไม่ได้รังเกียจ	They did not quite talk with me. I just did everything comfortably as the same. I was not fussy with other people. However, my husband did not dislike me.
KC	แล้วแฟนพี่ติดไหมครับ	How about your husband, did he get HIV?
ID 02-070	แฟนหนูก็ติดค่ะ แต่ลูกทุกคน ลูกทั้งสามคนแรก หมอให้มาตรวจเลือดหมดเลย แต่ไม่มีคนติด วัณโรคก็ไม่ติด เอชไอวีก็ไม่ติด แต่แฟนนะติด แฟนไม่ผ่าน ติดอยู่คนเดียว	He did, but all of my children, the first three children, the doctor told me to take them for blood test. So, they did not get, did not get TB and HIV as well but my husband got it, only him did not pass, just only him got HIV.
KC	พี่ว่ามันมีเหตุผลอื่นไหมครับ ที่ทำให้เรามาหาหมอช้า	Did you have other reasons that made you come to the doctor late?
ID 02-070	ก็เหตุผลก็คือว่า ช่วงนั้นหนูไม่ค่อยมีเงินเท่าไหร่ เรื่องของค่าใช้จ่าย แล้วอีกอย่างแฟนเก่าก็มาตายกระทันหัน ไหนจะต้องดูแลพ่อปู่อีก (หัวเราะเบาๆ) ค่าใช้จ่ายลูกไปโรงเรียนอีก เรื่องเงินคือเรื่องหลักเลย เลยทำให้เราไม่ไป เพราะอาการก็ไม่มีอะไรมากมาย	My reason was… at the time, I did not have some budget, about expenses, as well as my ex-husband just passed away suddenly. So, I had to take care his father (a bit laughing) and about the tuition fee for my children too. The main thing was money that made me do not come to the hospital because my symptoms were not severe.
KC	แล้วเรื่องการเดินทางมีปัญหาไหมครับ	How about travelling, did you have any problem?
ID 02-070	มีค่ะ	Yes.
KC	ยังไงครับ	How?
ID 02-070	การเดินทางคือว่า ต่อรถหลายต่อเหลือเกิน ตอนนี้ไปอยู่บ้านปลาขาว ก็คือ ถ้ามาจากบ้านก็ต้องขี่รถวินมา 50 บาท แล้วต่อจากรถคลองไผ่มาอีก 10 บาท แล้วก็ขากลับก็ต้องขึ้นรถคลองไผ่ไป 10 บาท ขึ้นรถวินอีก 50 บาท (หัวเราะ) แล้วก็ค่าหมอ 30 บาท แล้วก็รวมที่เราอยากกินอะไรเพื่อลูกอีก ประมาณ 200 ก็ไม่รู้จะอยู่หรือเปล่า (หัวเราะ)	About travelling, it was… I had to change many buses. Now I move to Pla Kaow village. So, if I came from my home, I would take a taxi-motorcycle about 50 Baht, then took the bus from Klong Phai about 10 Baht, and about the return round, I had to take the bus to Klong Phai about 10 Baht, then taxi-motorcycle about 50 Baht (laughing), and about medical fee 30 Baht, as well as some food that I wanted to have for my baby, so it was about 200 Baht but I did not sure that it would be enough (laughing).
KC	แล้วมีอย่างอื่นอีกไหมครับ	Anything else?
ID 02-070	ก็ไม่มีค่ะ	Nothing.
KC	เรื่องเกี่ยวกับความรู้ของเราเกี่ยวกับวัณโรคหละครับ	Did you have any knowledge about TB?
ID 02-070	ความรู้เกี่ยวกับวัณโรค ณ ตอนนั้นไม่รู้เลยค่ะ เพราะหมอยังไม่ได้แนะนำเลย มาตอนนี้หมอถึงแนะนำแล้วเค้าก็มีสมุดเล็กๆไปให้อ่าน ที่ต้องแยกแก้ว แยกถ้วย แยกชาม อะไรอย่างนี้ค่ะ หนูก็อ่านแล้วก็ปฏิบัติ	About TB knowledge, at that time, I did not know at all because the doctor did not give me the information. He just advised me after I had got TB and gave me a mini book for learning on my own. For example, I had to separate glass, and crockery like this. I had

Person	Thai	Dialogue (translated from Thai to English)
	ตัว ตื่นขึ้นมาตอนเช้าออกกำลังกาย เค้าก็จะบอกว่ามันจะหิวบ่อย แต่ว่ามันไม่อ้วน เพราะว่าวัณโรคนี้มันกินอาหารในตัวหนะ (หัวเราะเบาๆ) ก็คิดว่าที่เราไม่มีความรู้ก็เลยทำให้เราไม่มาหาหมอ	read and practiced with the provided information. I had got up in the morning and then exercised. He told me that I would be hungry many times, but I would not be fat because TB would eat food in my body. I thought that I did not have knowledge about TB so I did not come to the doctor.
KC	แล้วมีอย่างอื่นอีกไหมครับ	Did you have other reasons?
ID 02-070	ไม่ ตอนนี้หนูสบายใจอย่างนึง คือว่า หนูเข้า 6 เดือนแล้ว เหลืออีกแค่ 4 เดือนหนูก็พ้นวัณโรคแล้ว หนูก็สบายใจไปหนึ่งโรค แต่ว่าหนูก็ (หัวเราะ) อันนั้นก็ตลอดชีวิตแหละค่ะ แต่ว่าก็ถือ เราก็ยังคิดอยู่นะว่า เราก็มียากินอยู่ เราก็ต้องอยู่ต่อไปได้ (หัวเราะเบาๆ) เราไม่เคยขาดยา	No, but now, I worry on an issue. It is… I have taken medicines for 6 months, and I have 4 months left then it will be cured. Thus, I am relaxed on this issue, but I (laughing). Another disease, I have to remedy forever but I think that… I still have medicines for treatment so I have to survive further (laughing) I was not defaulted.
KC	คนอื่นที่เค้ารู้ว่าเราเป็นเฉพาะวัณโรคเค้ามีปฏิกิริยายังไงกับเรา	How did other people who knew that you had only TB reflex on you?
ID 02-070	เค้าก็ไม่กินของร่วมกับหนู เค้าก็พูดห่างๆ	They did not eat some food with me, and talked becoming estranged.
KC	ยังไงนะครับ	How?
ID 02-070	ก็ทักทายห่างๆ คำพูดรู้สึกว่าห่างเหิน ไม่ได้ใส่ใจเราเหมือนก่อนหน้านี้ ถ้าสมมติหนูไปทำงาน หนูก็จะกินข้าวเฉพาะแค่ส่วนตัวของหนู แล้วหนูก็จะห่อน้ำไปของหนูเอง หนูไม่กินกระติกร่วมเค้าค่ะ หนูก็รู้ตัวหนูค่ะ เลยจะแยกกินต่างหาก	They just greeted as keeping a distance, about they said with a remote expression, did not pay attention to me as the same. If I went to work, I would have lunch alone, and brought some water for myself. I did not drink with others. I knew what I was, so I separated eating only me.
KC	แล้วคนอื่นเค้าทำงานกับเราได้ไหมครับ	Did others work with you?
ID 02-070	ได้ค่ะ แต่ว่าไม่ได้มาสุงสิงกับเราเหมือนเดิมค่ะ แต่เค้าก็ไม่ถือว่ารังเกียจนะคะ แต่เค้าก็ อย่างว่าแหละเค้าก็กลัวติดนั่นหนะ เค้าก็ไม่ได้มาคลุกคลีแต่ก็ทักทายได้ ไม่ถึงขนาดที่ว่า อย่าเข้ามาใกล้ฉันนะ แต่ก็มีระยะปลอดภัย เช่น ไม่ทานของร่วมกัน ไม่กินน้ำร่วมกัน	Yes, they did. However, they did not close to me as the previous time, but they did not dislike me. They… as I said, feared to get the disease. They did not close contact, just greeted, but it was not like… 'Do not close to me' but we had some safety space such as, not eat food together, or not drink some water together.
KC	แล้วพี่คิดว่าคนที่เค้ารู้ว่าเราป่วยสองโรคนี้ เค้ามีปฏิกิริยาอะไรมากกว่าเดิมไหมครับ	Did you think that some people who knew you having both diseases had more reflection on you?
ID 02-070	ก็ห่างเหินค่ะ เพื่อนฝูงก็ห่างเหินไปเลยค่ะ	It became estranged, my friends had estranged me.
KC	แล้วเรารู้สึกยังไงบ้างครับ	How did you feel?
ID 02-070	ก็ไม่รู้สึกอะไร ขอให้แค่ครอบครัวรับได้ แล้วเราก็ตั้งใจรักษาตัวเรา ลูกเราก็รู้หมดทุกคนแล้ว ลูกเราก็เอ่อทำใจ ว่าแม่เป็นไปแล้วแม่ก็ต้องรักษาตัวต่อไป ต้องอยู่เพื่อลูก	I did not feel anything, I wished only my family could accept me and I intended to have treatment. My all children knew what I was, and they just controlled their mind as I had TB and HIV so I had to remedy. I had to live for them.
KC	แล้วลูกๆมีปฏิกิริยาอย่างไรไหมครับ	Did your children have any reflection on you?
ID 02-070	ไม่ค่ะ ก็เหมือนเดิม กอด หอม เหมือนเดิมค่ะ	No, they were the same, hug and kiss me as the same.
KC	แล้วพี่คิดว่า ถ้าพี่มารักษาช้ากว่านี้ พี่จะเป็นยังไงบ้างครับ	How did you think that if you came to remedy late then how you would be?

Person	Thai	Dialogue (translated from Thai to English)
ID 02-070	หนูก็คิด หนูก็ยังคิดอะไรไม่ออกเหมือนกันเพราะหนูยังไม่เคยเป็น	I though… I could not think anything because I had never been like this.
KC	แล้วคิดว่าถ้ามาช้ากว่านี้จะเป็นยังไงครับ	How did you think that if you came late so how you were?
ID 02-070	หนูก็กลัวหนูตายหนีจากลูก ห่วงครอบครัวค่ะ (น้ำตาซึมๆ)	I feared that I would die from my children, I worried on my family (a bit crying).
KC	แล้วคิดว่าเรามีโอกาสแพร่เชื้อไปให้ลูกไหมครับ	Did you think that could you spread the disease to your children?
ID 02-070	คิด แต่ว่ามาตรวจ พอหมอให้มาตรวจแล้ว ลูกไม่ติด ก็เลยสบายใจ แต่เผอิญ พอสบายใจที่ลูกสามคนนั้น เนี๊ยะไม่ค่อยสบายใจคนในท้องเท่าไหร่ นอนไม่ค่อยหลับ คิดอยู่เรื่อยเลย คิดค่ะ (ตาดูโบ๋ ไม่ค่อยสดใส สีหน้าวิตกังวล)	Yes, but they came to test, the doctor told me taking them to check-up. They did not get so I was happy. Although, I was relaxed with three kids, I still worried with my foetus. I could not sleep well, thought all times, I thought (her eyes have sunk, not bright, with worried face).
KC	แล้วตอนนี้ทำงานอะไรครับ	What do you do?
ID 02-070	หักข้าวโพดค่ะ เป็นเข่งๆ เข่งละ 10 บาท หนูได้วันละร้อยกว่าบาท อย่างเรามาเนี๊ยะก็ต้องหยุดงาน ก็หายไปเลยร้อยกว่าบาท ก็ให้แต่แฟนทำคนเดียว (หัวเราะ) คือถ้าสองคนช่วยกันทำก็ได้วันละ 2-300 ร้อย	Picking corns, in each basket, 10 Baht per a basket. I got wage about just over 100 Baht per day. If I came to the hospital, I would leave from job so it disappeared about 100 Baht. However, my husband worked alone, but If we helped working together, we would get 2-300 Baht a day.
KC	มีอย่างอื่นอีกไหมครับ ที่เรายังไม่ได้หาหมอดีกว่า	Did you have other reasons that you did not come to the doctor?
ID 02-070	อ่า ไม่มีค่ะ ต้องมาค่ะ	Ahh, nothing, I had to come.
KC	แล้วในความคิดของพี่ พี่เคยเจอเคสที่มีอาการไอแล้วไม่ไปหาหมอบ้างไหมครับ	In your opinion, did you know someone having cough but they did not go to the doctor?
ID 02-070	ไม่ค่ะ	No.
KC	ที่ตัวเราสงสัยว่าเค้าจะเป็นวัณโรคครับ	Did you suspect someone having TB?
ID 02-070	ไม่ค่ะ เพราะว่าหนูแบบจะป้องกันตัวเองกับเค้ามากที่สุดเลย ก็ไม่ได้คลุกคลีสัมผัสกับเค้า	No, because I tried to prevent myself to others, did not close to others.
KC	แล้วมีอย่างอื่นอีกไหมครับ	Anything else?
ID 02-070	ไม่ค่ะ	Nothing.
KC	แล้วในใจตอนนี้เรากังวลไหมว่าเราป่วยทั้งสองโรค	In your mind, did you worry about both diseases?
ID 02-070	กังวล กังวลว่าเค้าจะรู้ แล้วก็กังวลว่า ถ้าเกิดคลอดลูกมาติดขึ้นมาเค้ารู้ เค้ารู้มากกว่านี้จะทำยังไง กังวลค่ะ	Yes, I worried about other would know and worried about if I delivered my baby and he would get the diseases, so other might know. So, if many people knew, how would I do?
KC	ความกังวลของพี่มันแสดงออกทางแววตานะครับ	About your worry is shown on your eyes.
ID 02-070	ค่ะ ก็ทำให้นอนไม่หลับ เราต้องทำงานด้วยตอนกลางวัน แล้วนอนตอนกลางคืนเราก็ต้องคิดค่ะ	Yes, it made me cannot sleep well. I had to work at day, then sleeping time, I thought it again.
KC	เพราะว่าคุยกับพี่ทีไร จะรู้สึกว่าพี่กังวลกับครอบครัว	When I talked with you any times, I feel like you worried about your family.
ID 02-070	ค่ะ ครอบครัวเป็นหลัก เรื่องของตัวเองยังไงก็ได้ เรื่องลูกต้องมาก่อน	Yes, my family is the main thing, myself could be later, my children would be the first. Moreover, the doctor suggested me that my husband had to use condom if he could use because we both were HIV infection. It

Person	Thai	Dialogue (translated from Thai to English)
	แล้วอีกอย่างนึง คุณหมอแนะนำว่า ถ้าเป็นไปได้ก็ให้แฟนใส่ถุงยางด้วย เพราะเป็นทั้งคู่ค่ะ มันจะแบบว่ามันจะไม่อันนี้ซักทีนะคะ แฟนก็ต้องมีถุงยางตลอดค่ะ	would be… it would be not… so my husband had to have condom all times.
KC	แล้วมีอย่างอื่นอีกไหมครับ ความในใจที่อยากจะเล่าให้ฟังครับ	Did you have something to tell me more?
ID 02-070	ก็มี แค่พะวงเรื่องลูกในท้องนี่แหละค่ะ กลัวแต่ลูกจะติดมากเลย แล้วก็อีกอย่างนึงก็คือ เอ้ ขนาดทำสองคนก็ยังไม่มีเงิน แล้วมีลูกอีก ลูกต้องกินนมกระป๋อง เราจะทำยังไงดีน๊า ก็ต้องค่อยๆคิดค่อยทำไป แต่ก็ยังดีที่หนูมีเงินหลวงกินเดือนละ 500 (หัวเราะ) แล้วก็พะวงเรื่องที่ว่า ต้องใช้ หาค่าใช้จ่ายไปผ่าที่มหาราชค่ะ ค่ารถ ค่าเดินทาง ส่วนเรื่องค่าใช้จ่ายก็ใช้สิทธิ 30 บาท แล้วเราก็ไม่รู้ว่าเราจะแข็งแรงตอนไหน หรือยังไง แล้วคนที่เฝ้าเราก็ต้องอยู่ต้องกิน ก็กังวลเรื่องค่าใช้จ่ายต่างๆ เพราะว่ามาโรงพยาบาลแต่ละรอบก็มีค่าใช้จ่าย	It was… I worried about my foetus, feared about he might get HIV. And other thing was… err… we helped working together but we did not have enough money, and then, we will have one more kid, my baby has to drink only powdered milk, what should we do? I had to think any time. However, I had got the money from the government about 500 Baht a month (for people living with HIV). In addition, I worried about I have to prepare some money for delivering at Maharat hospital i.e. transportation fee, travelling fee. About medical fee, I can use from the universal coverage scheme. And I do not know when I will be strong or others, as well as people who will go to observe me at the hospital, they have to eat. Thus, I had worried about expenses because I had paid for everything any times for coming to the hospital.
KC	มีอย่างอื่นอีกไหม	Anything else?
ID 02-070	ไม่ค่ะ	Nothing.
KC	กังวลไหมครับว่า คนที่เค้ายังไม่รู้ว่าเราป่วยเป็นวัณโรค เค้าจะรู้	Did you worry about some people who did not know you having TB, they would know?
ID 02-070	ไม่กังวลแล้วค่ะ แต่ตอนนี้คือว่า กำลังคิดว่า เอ้ มารับยาแล้วก็ อืม เสียดายเงินก็เสียดายนะ แต่เราก็ต้องมาคืออยากได้เงิน เงินอย่างเดียวค่ะ (หัวเราะ)" "ปัจจัยหลักๆที่ทำให้เรามาช้า คือ ค่าใช้จ่ายที่เราไม่มี เรื่องการเดินทางที่ไม่สะดวก เรื่องที่ถ้าเราหยุดงานปุ๊บเราก็ไม่มีค่าใช้จ่าย เรื่องของที่เราไม่รู้ว่ามันคืออาการของวัณโรค	I did not worry. But now, I am thinking about… ehh… I came to get medicines, umm, I was pitying that money, but I had to come. I just wanted to get some money, only money (laughing). The principle issue that made me come to the hospital late was… expenses which I did not have, the difficult travelling, about leaving job that made me have no budget, and about I did not know that these symptoms were TB signs.
KC	บางคนเค้าคิดว่า พอมาตรวจแล้วจะเจอว่าป่วยเป็นวัณโรค พี่คิดยังไงครับ	Somebody thought that if they came to check-up, they would be found that they had TB, how did you think about this?
ID 02-070	ก็กลัวค่ะ ก่อนที่จะมาตรวจก็มีค่ะ หวาดระแวงกลัวกลัวคนอื่นจะรังเกียจเรา กลัวเค้าจะรับไม่ได้	Me too, before coming to check-up, I was like this. I was afraid and suspicious that other would dislike me, did not accept me.
KC	วันนี้พี่สบายใจขึ้นไหมครับ	Are you relaxed today?
ID 02-070	สบายใจค่ะ	Yes, I am.

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