

# ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PREVENTIVE BEHAVIOR OF PULMONARY TUBERCULOSIS AMONG MYANMAR REFUGEES IN BAN MAI NAI SOI TEMPORARY SHELTER, MAE HONG SON, THAILAND

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**ABSTRACT:** The World Health Organization (WHO) has declared that more than 85% of refugees originate from and subsist in high tuberculosis (TB) burden area. There was an estimated that over 50% of refugee population might be infected with TB. Mae Hong Son province is one of the high TB burden areas in the northern part of Thailand. It has variety of populations, the geographical features here are facilitating mobility of migrant and refugee from Myanmar. Therefore, the high mobility and migration of Myanmar sub-tribes population who are living along Thailand-Myanmar border have created impact on communicable diseases. This cross-sectional descriptive study was to assess knowledge, attitude, and preventive behavior of pulmonary tuberculosis among Myanmar refugee in Ban Mai Nai Soi temporary shelter, Mae Hong Son province, Thailand. Four hundred and thirty eight male and female Myanmar refugees, age from 18 years old and above were respondents. Face-to-face interviews with a structured questionnaire were carried out in March 2013. Chi-square test was used for analysis of variables relationship. Based on 70% cutoff point from total expected score, knowledge score was categorized into low level/need an improvement and high level of knowledge. Attitude and preventive behavior score were categorized into low level, moderate level and high level base on the range of score on average. Relationships between variable by Chi-square test were considered statistically significant at P-value less than 0.05. The study showed that mean of knowledge score was  $17.7 \pm 4.9$  and 74.2% of the participants referred to low level of knowledge. Mean score of attitude was  $51.6 \pm 8.1$  and 47.9% of respondents were categorized as a high level of attitude and 177 (40.4%) respondents were categorized as moderate level of attitude. About 51 (11.6%) of respondents were accounted for low level of attitude on pulmonary tuberculosis. Regarding preventive behavior, mean score was  $28.3 \pm 5.3$  and 55.5% had high level, 32% had moderate level and 12.6% had low level of preventive behavior respectively. Chi-square test revealed significant relationship between knowledge and attitude level, knowledge and preventive behavior level and attitude and preventive behavior level ( $p < 0.001$ ). This study highlighted the gap of knowledge among the respondents which it needs for information, education and communication (IEC) programs on pulmonary tuberculosis among this population. All evidences from this study should be taken to implement educational programs together with behavior change communication strategy (BCC) to remove the gap and create sustainable awareness and behavior regarding pulmonary tuberculosis.

**Keywords:** Pulmonary tuberculosis, Tuberculosis, Myanmar refugee, KAP

## INTRODUCTION

Tuberculosis (TB) is a bacterial infectious disease which it is caused by bacilli bacteria belonging to *Mycobacterium tuberculosis complex*. Being contagious and airborne, it basically affects lungs and introduces TB disease in lungs as pulmonary TB (PTB) [1]. Nonetheless, TB can also affect other

sites such as lymphatic, blood vessels or any organ of the body [2]. These refer to extra-pulmonary TB. TB is a curable disease, even though it causes morbidity and mortality among vulnerable people. So TB still remains a major health problem especially in refugees and migrants. Communicable Disease Department, the World Health Organization (WHO) has declared that more than 85% of refugees originate from and subsist in high TB burden area. In addition, there was an estimated

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that over 50% of refugee population might be infected with TB [3]. TB becomes an important health problem in many refugee settings once the emergency phase is under control.

Regarding the evidence of PTB prevalence, the cross-sectional survey was conducted in Tham Hin Temporary Shelter, Ratchaburi province, Thailand in 2009 which is one of nine refugee shelters in Thailand. The study covered 5,122 medical records of refugees who were living in Tham Hin temporary shelter and found that 264 out of 5,122, 5.15% were infected with TB and 263, 5.13% were infected with PTB during two years of research [4]. Moreover, the report of Center for Disease Control and Prevention, 10<sup>th</sup> presented the absolute rates of prevalence rate and the mortality in 2011. These data were conducted to assess the achieving of TB control in eight provinces. Mae Hong Son, the one province with four vital refugee temporary shelters was reported that the mortality rate caused by TB was 8.54 per 100 000 population and the prevalence rate of TB equivalent to 81.84 per 100 000 population [5]. Additionally, Mae Hong Son Province is one of the high TB burden areas in the northern part of Thailand [6]. Mae Hong Son has variety of populations, the geographical features here are facilitating mobility of migrant and refugee from Myanmar. Therefore, the high mobility and migration of Myanmar sub-tribes population who are living along Thailand-Myanmar border have created impact on communicable diseases. Muang District is the particular area with high incidence of PTB new cases every year. In 2008, the study had collected data from TB clinic at Srisangwan general hospital, Muang district, Mae Hong Son Province. The records of TB clinic in Srisangwan hospital was found that 829 TB patients were registered to receive health care service between 2001 and 2007, including Thai and non-Thai populations who are living in government-run temporary shelter, Ban Mai Nai Soi [6]. During the period of 2001-2007 there were 194 Myanmar refugees were diagnosed as TB patients out of 829 total TB cases in Srisangwan hospital [6]. While the incidence rate of PTB is high among refugees in Ban Mai Nai Soi according to the report from Srisangwan hospital, the failure of treatment still reported significantly and the finding was strongly support lacking of knowledge on treatment among these PTB patients [6].

## METHODOLOGY

A cross sectional was conducted in March 2013, to determine the PTB preventive behaviors as it related to characteristics of socio-demographic,

knowledge levels and attitude levels towards PTB.

The study samples were selected from the clusters/sections, which there were 20 sections in Ban Mai Nai Soi temporary shelter, Mae Hong Son province, Thailand [7]. The study required 440 voluntary participants to response series of questions in the questionnaire, 22 households from each section were accounted. The random sampling technique was applied and the households were randomized regarding the list of household no. which the shelter committee administered. Additionally, only a family member who meets with the inclusion criteria and willing to participate to this study was later given an interview process.

Myanmar refugees who were 18 years and older, both male and female were included this study. People who know they have TB and were currently on treatment were excluded as well as Myanmar refugees who were blind and deaf or severely ill and unable to speak during the interview. Data were collected by face-to-face interviews in Myanmar language by research assistants in coordination with researcher. Well-trained research assistant provided information of the study such as purpose on the study and objectives to eligible respondent before the interview. Conducting information was started after when respondent agrees to take part and answer questionnaire. Eventually, a copy of correct information was provided to respondent after interview. Each interview lasted between 15 to 30 minutes.

All of the items in the questionnaire were scored regard to the criteria. Independent variables were described by part A socio-demographic, part B knowledge, part C attitude on PTB and Part D prevention practice was the dependent variable.

The overall score of the respondent in questionnaire part B was categorized into two levels. High level means good with a score of equal or more than 70% of overall score in each part. Need improvement describes the low level that score is less than 70%. Low level of knowledge/need an improvement, included respondents who had 0 to 21 and respondents who scored 22 to 32 points were considered high level of knowledge/good. Part C and D were described by 3 levels, high, moderate and low as followed. Ranges of possible score 1-3 points (high level), 2.34-3.00 (moderate level) and 1.67-2.33 (low level). In the structured questionnaire part C, there were 32 items of attitudes towards PTB, 3 for Agree, 2 points for Neutral and 1 point for disagree. Total scores were eventually categorized by dividing with 32 of items. Regarding part D, there were 12 items of prevention behavior which 3 points for Always, 2 points for

**Table 1** Summary of socio-demographic distribution and knowledge, attitude and preventive behavior score

| Socio-demographic                              | n   | Knowledge score |      | Attitude score |       | Preventive behavior score |      |
|------------------------------------------------|-----|-----------------|------|----------------|-------|---------------------------|------|
|                                                |     | Mean            | ±SD  | Mean           | ±SD   | Mean                      | ±SD  |
| <b>Gender</b>                                  |     |                 |      |                |       |                           |      |
| Male                                           | 181 | 17.93           | 4.67 | 50.87          | 8.57  | 28.46                     | 5.37 |
| Female                                         | 257 | 17.54           | 5.07 | 52.22          | 7.83  | 28.31                     | 5.30 |
| <b>Marital status</b>                          |     |                 |      |                |       |                           |      |
| Single                                         | 69  | 16.88           | 4.60 | 51.44          | 6.61  | 28.31                     | 4.55 |
| Married                                        | 323 | 18.05           | 5.05 | 51.60          | 8.68  | 28.41                     | 5.60 |
| Divorced                                       | 10  | 15.80           | 2.93 | 53.8           | 4.91  | 29.6                      | 4.71 |
| Widow                                          | 28  | 16.64           | 4.32 | 51.82          | 7.31  | 27.57                     | 4.73 |
| Separated                                      | 8   | 16.50           | 3.96 | 52.62          | 4.40  | 29.00                     | 3.11 |
| <b>Age</b>                                     |     |                 |      |                |       |                           |      |
| 18-20                                          | 59  | 16.57           | 4.94 | 52.10          | 6.97  | 27.88                     | 4.37 |
| 21-30                                          | 134 | 18.06           | 4.97 | 52.05          | 7.40  | 28.97                     | 5.22 |
| 31-40                                          | 110 | 17.50           | 4.88 | 51.05          | 8.54  | 27.85                     | 5.62 |
| 41-50                                          | 67  | 18.38           | 4.96 | 51.29          | 9.30  | 28.23                     | 5.51 |
| 51-60                                          | 41  | 17.95           | 4.66 | 52.07          | 8.40  | 28.95                     | 5.64 |
| >60                                            | 27  | 17.11           | 4.72 | 51.51          | 9.62  | 28.25                     | 5.68 |
| <b>Education</b>                               |     |                 |      |                |       |                           |      |
| No school                                      | 243 | 17.24           | 5.07 | 51.11          | 8.56  | 27.97                     | 5.58 |
| Primary school                                 | 64  | 18.40           | 4.68 | 52.43          | 8.75  | 28.84                     | 5.09 |
| High school                                    | 106 | 18.10           | 4.60 | 51.88          | 6.81  | 28.91                     | 4.93 |
| College                                        | 10  | 20.80           | 4.07 | 53.80          | 7.43  | 30.20                     | 4.51 |
| Professional/post graduate                     | 3   | 20.33           | 4.72 | 56.66          | 1.52  | 31.66                     | 1.15 |
| Religion school                                | 3   | 17.33           | 1.15 | 54.00          | 6.55  | 26.66                     | 5.13 |
| Other                                          | 9   | 16.22           | 5.69 | 53.66          | 10.02 | 27.55                     | 5.74 |
| <b>Ethnicity</b>                               |     |                 |      |                |       |                           |      |
| Burmese                                        | 14  | 17.92           | 4.42 | 53.35          | 8.07  | 30.00                     | 5.43 |
| Dawei                                          | 2   | 18.00           | 4.24 | 55.50          | 4.94  | 30.00                     | 7.07 |
| Mon                                            | 2   | 22.50           | 4.94 | 40.00          | 14.14 | 24.00                     | 8.48 |
| Karen                                          | 411 | 17.66           | 4.96 | 51.67          | 8.17  | 28.32                     | 5.34 |
| Karen                                          | 5   | 17.00           | 3.00 | 54.60          | 3.84  | 29.20                     | 4.65 |
| Shan                                           | 4   | 20.80           | 1.92 | 59.0           | 3.31  | 34.00                     | 1.22 |
| <b>Recent job</b>                              |     |                 |      |                |       |                           |      |
| Agriculture                                    | 35  | 16.40           | 4.12 | 51.77          | 6.41  | 27.25                     | 5.05 |
| Housewife                                      | 134 | 17.67           | 4.82 | 52.72          | 7.54  | 28.76                     | 4.87 |
| Day labor                                      | 88  | 18.15           | 4.90 | 49.69          | 9.73  | 28.47                     | 6.33 |
| Student                                        | 24  | 17.87           | 3.59 | 54.54          | 6.29  | 30.33                     | 4.50 |
| No job                                         | 157 | 17.73           | 5.30 | 51.40          | 8.12  | 27.96                     | 5.21 |
| <b>Registration status</b>                     |     |                 |      |                |       |                           |      |
| Registered                                     | 246 | 17.02           | 4.57 | 51.48          | 7.08  | 27.48                     | 4.85 |
| Unregistered                                   | 192 | 18.57           | 5.18 | 51.89          | 9.38  | 29.54                     | 5.69 |
| <b>Religion</b>                                |     |                 |      |                |       |                           |      |
| Buddhism                                       | 108 | 18.38           | 4.86 | 51.81          | 8.47  | 28.83                     | 5.17 |
| Christian                                      | 159 | 18.20           | 4.64 | 52.18          | 7.65  | 29.29                     | 4.94 |
| Hinduism                                       | 2   | 23.00           | 4.24 | 45.00          | 21.21 | 32.50                     | 4.94 |
| Animist                                        | 169 | 16.60           | 5.05 | 50.92          | 8.28  | 26.98                     | 5.60 |
| <b>Duration of staying in shelter in years</b> |     |                 |      |                |       |                           |      |
| 1-5                                            | 68  | 18.01           | 4.89 | 51.77          | 8.48  | 28.17                     | 5.75 |
| 6-10                                           | 68  | 17.35           | 4.53 | 51.47          | 7.42  | 29.23                     | 5.12 |
| >10                                            | 302 | 17.71           | 5.00 | 51.68          | 8.27  | 28.24                     | 5.27 |
| <b>Number of family member</b>                 |     |                 |      |                |       |                           |      |
| No family member                               | 16  | 17.12           | 4.93 | 49.12          | 9.33  | 25.62                     | 6.00 |
| 1-2                                            | 60  | 17.03           | 4.02 | 51.8           | 8.03  | 27.53                     | 5.52 |
| 3-5                                            | 245 | 18.18           | 4.93 | 52.19          | 8.01  | 29.09                     | 5.06 |
| 6-10                                           | 116 | 17.12           | 5.22 | 50.76          | 8.37  | 27.75                     | 5.48 |
| >10                                            | 1   | 16.00           | -    | 55.00          | -     | 24.00                     | -    |

**Table 1** Summary of socio-demographic distribution and knowledge, attitude and preventive behavior score (cont.)

| Socio-demographic                  | n   | Knowledge score |      | Attitude score |       | Preventive behavior score |      |
|------------------------------------|-----|-----------------|------|----------------|-------|---------------------------|------|
|                                    |     | Mean            | ±SD  | Mean           | ±SD   | Mean                      | ±SD  |
| <b>Expose to HIV/AIDS patient</b>  |     |                 |      |                |       |                           |      |
| Do not know                        | 348 | 17.47           | 4.92 | 51.56          | 8.09  | 28.43                     | 5.37 |
| Family member                      | 25  | 17.48           | 5.01 | 53.16          | 8.51  | 28.60                     | 4.85 |
| Friend                             | 44  | 17.34           | 4.59 | 51.63          | 8.59  | 27.88                     | 5.62 |
| Other                              | 21  | 18.09           | 5.53 | 51.52          | 8.45  | 28.33                     | 5.33 |
| <b>Expose to PTB patient</b>       |     |                 |      |                |       |                           |      |
| Do not know                        | 380 | 17.81           | 4.88 | 51.86          | 8.15  | 28.71                     | 5.30 |
| Family member                      | 6   | 15.66           | 4.22 | 54.50          | 4.32  | 27.83                     | 2.13 |
| Friend                             | 26  | 19.15           | 4.88 | 47.76          | 10.26 | 25.88                     | 6.21 |
| Other                              | 26  | 15.15           | 4.63 | 52.03          | 5.50  | 26.19                     | 4.14 |
| <b>Monthly income in Thai Baht</b> |     |                 |      |                |       |                           |      |
| <500                               | 298 | 17.63           | 4.91 | 51.65          | 8.28  | 28.27                     | 5.45 |
| 500-1,000                          | 96  | 17.70           | 4.93 | 51.42          | 8.20  | 28.26                     | 5.15 |
| >1,000                             | 44  | 18.13           | 4.92 | 52.27          | 7.32  | 29.43                     | 4.82 |

SD=Standard Deviation, HIV=Human immunodeficiency virus, AIDS=Acquired Immune Deficiency Syndrome

**Table 2** The relationship of knowledge levels and prevention behavior levels (n=438)?

| Level of knowledge         | Level of preventive behavior |             |             | p-value |
|----------------------------|------------------------------|-------------|-------------|---------|
|                            | Low level                    | Moderate    | High level  |         |
| Low level/Need improvement | 15 (4.6%)                    | 126 (38.8%) | 184 (56.6%) | <0.001  |
| High level/Good            | 40 (35.4%)                   | 14 (12.4%)  | 59 (52.2%)  |         |

Some time and 1 point for Never. Arranging score from 1 to 3 categorized respondents into 3 groups based on range, low level of preventive behavior, moderate level of preventive behavior and high level of preventive behavior

The data analysis was performed in each part. Results of questionnaire were coded in a database and analyzed by using the Statistical Package for Social Sciences (SPSS version 17) window software (licensed for Chulalongkorn University). The descriptive statistics, for example frequency and percentage, were used to describe the results, the relationship between independent variables and dependent variables described by Pearson Chi-Square ( $\chi^2$ ) in order to explain the correlation regarding the hypothesis, depending on the normal distribution characteristic of data. Nonparametric test, Kruskal-Wallis test was used to determine whether there were any statistically significant differences between the variables [8].

### ETHICAL CONSIDERATION

The study was submitted to and received an approval from the Ethical Committee of Chulalongkorn University prior to the interview.

### RESULTS

A total of 440 participants were approached and 438 responded to the study. Socio-demographic

characteristics of respondents, along with their knowledge scores, attitude score and prevention practice score are presented in Table 1.

Mean score of knowledge was  $17.7 \pm 4.9$ , mean score of attitude was  $51.6 \pm 8.2$  and mean score of their prevention practice was  $28.2 \pm 5.2$  respectively. It was found that 325 (74.2%) out of 438 respondents who volunteered on this study had low level of knowledge of PTB.

Over all, the majority group were 210 (47.9%) who were categorized as a high level of attitude and 177 (40.4%) respondents were categorized as moderate level of attitude. It was obviously found that 51 (11.6%) of respondents were accounted for low level of attitude on PTB.

The majority group of respondent were 243 (55.5%) who were categorized as a high level of preventive behavior and 140 (32.0%) respondents were categorized as moderate level of preventive behavior. It was obviously found that 55 (12.6%) of respondents were accounted for low level of preventive behavior on PTB.

The result of Chi-square test was shown in Table 2, 3 and 4. All expected cells frequencies were greater than five. According to the significant that showed in the 2 table, there was a relationship between knowledge level and preventive behavior level on PTB. Relationship between both variables was identified as statistically significant ( $p < 0.001$ ). In

**Table 3** The relationship of attitude levels and preventive behavior levels

| Level of attitude | Level of preventive behavior |            |             | p-value |
|-------------------|------------------------------|------------|-------------|---------|
|                   | Low level                    | Moderate   | High level  |         |
| Low level         | 40 (78.4%)                   | 3 (5.9%)   | 8 (15.7%)   | <0.001  |
| Moderate level    | 13 (7.3%)                    | 84 (47.5%) | 80 (45.2%)  |         |
| High level        | 2 (12.6%)                    | 53 (32.0%) | 155 (73.8%) |         |

**Table 4** The relationship of knowledge levels and attitude levels

| Level of knowledge         | Level of attitude |             |             | p-value |
|----------------------------|-------------------|-------------|-------------|---------|
|                            | Low level         | Moderate    | High level  |         |
| Low level/Need improvement | 3 (0.9%)          | 163 (50.2%) | 159 (48.9%) | <0.001  |
| High level/Good            | 48 (42.5%)        | 14 (12.4%)  | 51 (45.1%)  |         |

Table 3, the study found that there was a relationship between attitude level and preventive behavior level on PTB with a statistically significant ( $p < 0.001$ ).

The study used Chi-square test to measure relationship that exists between knowledge level and attitude level of PTB. In Table 4, the study found that there was a relationship between knowledge level and attitude level on PTB with a statistically significant ( $p < 0.001$ ).

## DISCUSSION

The study focused on socio-demographic characteristics distribution, knowledge level, attitude level and prevention practice level of respondents as well as the relationship among these variables.

### Socio-demographic characters

The data from this study showed that around 60% of the respondents were female (257, 58.7%). The majority was respondent who age between 21 to 40 years old. There were 323 (73.7%) respondents with married status. Additionally, half of them had never attended any of school (243, 55.5%), while one third of respondents graduated from high school and college (116, 26.5%) and only 3(0.7%) respondents had professional/post graduate education. Religion was mostly distributed among Buddhism (108, 24.7%), Christian (164, 37.4%) and interestingly some of the respondent were animism (165, 37.6%), it is a religion that common in tribe people, it is so fundamental believing in spiritual essence, natural and plant. In addition, almost all of Animism were Karenni (411, 93.8%) who basically came from Kayah state in Myanmar, they were contributed to the majority group of this survey.

United Nation High Commissioners for Refugees (UNHCR) was one variable to determine the character of respondents in the shelter whether they had been registered to be refugee status officially or

not. There was a wide gap between them because 246 (56.2%) of respondents carried registered status. Interestingly, 302 (68.9%) respondents have been living in this shelter more than 10 years, 68 (15.5%) 1-5 years and 6-10 years was 68 (15.5%). Furthermore, the survey revealed 298 (68%) had no monthly income. Only 44 (10%) of respondents earned monthly income more than 1,000 Baht and 96 (21.9%) had 500 to 1,000 Baht per month. The recent variable could describe itself, by living in the shelter which was a closed community. Refugees are not able to go outside of the shelter and of course, they are not allowed by the local administrative office. Therefore, another socio-demographic character which was being affected and made respondents a low socio-demographic profile was their recent job. More than one third of respondents 157 (35.8%) were unemployed (no job), this seemed to be an inconsistent with the study among Myanmar migrants in Phuket, Thailand in 2008 regarding preventive behavior of TB [9] because more than half of them had income and job.

### Knowledge of PTB

Regarding the overall knowledge of PTB among this population, researcher used the questionnaire with 32 items of knowledge such as causes, mode of transmission and prevention and symptom, diagnosis and treatment. Score was a total number of items they answered correctly. Out of expected total 32 points, the mean of knowledge score was  $17.7 \pm 4.9$  points.

It was found that 325 or 74.2% out of 438 respondents who volunteered on this study had low level of knowledge of PTB. In other words, this result was consistent with previous study that Thwin [9] had been published regarding knowledge of TB among Myanmar migrants in Phuket, Thailand, the finding was 69.9% of the participants either referred to low level of knowledge. Meanwhile, the rest were considered high level of

knowledge/good. In addition, the finding from studying among guardians of patient at the pediatric out-patient department, Siriridhorn Hospital, Bangkok revealed that almost 60% of respondent were accounted for low level of knowledge even though it was not the same characteristic population [10]. The similar study which was done in Tajikistan showed only 20% of migrant workers were estimated to have sufficient knowledge of TB [11]. The community based cross-sectional study demonstrated that there was a wide gap of PTB among the respondents [12]. Almost half of all respondents had misconception of PTB transmission and treatment. Deficiencies in public health knowledge about PTB symptom, diagnosis and treatment were presented among slum populations of Uganda [13]. Additionally, the study in Yangon, Myanmar recommended more effective communication strategies towards PTB to increase knowledge about transmission and treatment due to the deficiency of knowledge Myanmar workers [14]. The results of Chi-square test between knowledge levels and socio-demographic characteristics found that registration status had a relationship with knowledge level with a statistically significant ( $\chi^2=14.77$ ,  $p<0.001$ ). According to the relationship, it was likely that person who has registered status tend to have low level of knowledge of pulmonary tuberculosis.

Additionally, another finding presented a negative relationship between knowledge level and attitude level on pulmonary tuberculosis with a statistically significant ( $p<0.001$ ). Finally, the result Chi-square test presented relationship between knowledge level and preventive behavior level on pulmonary tuberculosis. The negative relationship between both variables was identified as statistically significant ( $p<0.001$ ). This was similar to the finding of a study among Myanmar migrants in Phuket province, Thailand, it was found a relationship between knowledge and attitude with a statistically significant at  $p<0.001$  [9].

To emphasize the relationship between knowledge and prevention practice, there was a study which presented the negative relationship between knowledge score and prevention practice score with the statistically significant result of Chi-square test at  $p<0.001$  [10].

#### **Attitude on PTB**

Mean score of attitude was  $51.6 \pm 8.1$ . Individual score then was categorized based on range from 1 to 3 points into 3 groups of respondent mainly. Overall, 210 (47.9%) of respondents were categorized as a high level of attitude and 177

(40.4%) respondents were categorized as moderate level of attitude. It was obviously found that 51 (11.6%) of respondents were accounted for low level of attitude on PTB. Unlike current study, the study from Myanmar migrants that was done in Phuket found 54.7% had low level of attitude, [9]. This implied that Myanmar refugees in Ban Mai Nai Soi temporary shelter had a better attitude than Myanmar migrants in Muang district, Phuket, Thailand.

According to health belief model, this survey found positive relationships of four aspects of perceptions which concerned perceived susceptibility, perceived seriousness, perceived benefit of prevention practice and perceived barrier, and preventive behavior level. The result presented a relationship between perceived susceptibility and preventive behavior level with statistically significant ( $\chi^2=154.12$ ,  $p<0.001$ ). The result was likely suggested that respondents who had moderate level of perceived susceptibility tend to had high level of preventive behavior. There was a relationship between perceived seriousness and preventive behavior level with statistically significant ( $\chi^2=245.51$ ,  $p<0.001$ ). It was likely that respondents who had high level of perceived seriousness tend to had high level of preventive behavior. Relationship between perceived benefit of prevention practice of pulmonary tuberculosis and preventive behavior level had a statistically significant with  $\chi^2=173.84$ ,  $p<0.001$ . The relationship could explain that respondents who had high level of perceived benefit tend to had high level of preventive behavior. Another finding of this study identified a significant relationship of perceived barrier and preventive behavior ( $\chi^2=162.92$ ,  $p<0.001$ ) was existed and the result of Chi-square test implied that respondents who were categorized as high level of perceived barrier tend to had high level of preventive behavior. Similar to this study at Phuket province, Thailand, the finding revealed positively association between perception and prevention behavior of tuberculosis as a significant but perceived barrier was not consistently associated with preventive behavior [9].

With the attitude level of respondent towards PTB, it expressed relationship to all socio demographic characters, history of exposing PTB patients and HIV/AIDS patients, resulting non-statistically significant between socio-demographic characters and attitudes levels. In contrast, the study among migrant worker in Tajikistan found that there were a statistically significant between gender and attitude [11]. The study also revealed that there was an association between education level and attitude

level where respondents with lower education had much positive attitude compared to those with higher level of education [11].

The result with statistically significant supported the hypotheses of this study that there was a relationship between attitude levels and preventive behaviors among Myanmar refugees in Ban Mai Nai Soi temporary shelter, Mae Hong Son Province, Thailand.

### **Preventive behaviors of PTB**

To describe this dependent variable, the study provide mean of prevention practice or preventive behavior, it was found that mean score was  $28.3 \pm 5.3$  from expected total score of 36 points. The result, which described level of preventive behavior following, presented half of respondent (55.5%) had high level of preventive behavior, 32% had moderate level of preventive behavior and 12.6% had low level of preventive behavior respectively. This could describe that more than half of respondent have had high level of preventive behavior of PTB. Previous study in 2008 showed that more than two third of Myanmar migrants (62%) had good level of preventive behavior [9]. This could lead researcher to understand the difficulties of Myanmar refugee living in such a remote area.

In addition, it was noted that there were relationships between preventive behavior and attitude on PTB with statistically significant ( $p < 0.001$ ). This result is consistent with the findings of the study in 2008 among Myanmar migrants in Phuket in which a significant association was found between knowledge and preventive practice of TB [9].

### **RECOMMENDATION**

This study is a representative of Myanmar refugee population who are living in Ban Mai Nai Soi temporary shelter, Mae Hong Son province, Thailand to collect what is believed, known and done in term of public health and pulmonary tuberculosis in particular. This should be a guide for health program or every organization who involved with these vulnerable populations to conduct advocacy, communication, and social mobilization activities in order to protect them from the disease onwards.

Finding from this study may not be the resource to serve as a definitive TB program or health care service but could be study tool for the further surveys. Regarding the gap of knowledge, identifying the factors related to their knowledge or source of information should be applied. This is therefore suggested that a qualitative study and

focus group discussion should be considered to understand and determine barrier of educational message/information transmission and to find out the way to remove them.

The fact that knowledge and attitude have relationships with prevention practice or preventive behavior among Myanmar refugees, this means their prevention behavior regarding pulmonary tuberculosis will be influenced by individual characteristics, such as knowledge and attitude/belief at the individual level. It is the most basic one in view of health promotion practice, so Myanmar refugees will be able to understand correctly regarding pulmonary tuberculosis if knowledge of pulmonary tuberculosis is provided properly, they will have attitude to evaluate their own self-practice/prevention behavior in the future.

For further study and research, using findings from this study as a foundation for developing of health invention study should be considered. One of the challenge for those concerned with pulmonary tuberculosis prevention is identifying and learning the source of information that people are having and be able to access as well as which determinants, factors or source have more influence to this population.

On the final note, this study has found the individual characteristic which influence preventive behavior among Myanmar refugees, in depth study on interpersonal level to addressing factor influencing their preventive behavior, such as family, friends and peers that provide social identity should be taken place as well as addressing factors from community level, such as rules, regulations, policies and norm which might constrain or promote prevention behavior due to the fact that not only knowledge and attitude that influence their behavior. Qualitative research methods which contains semi-structure tools and require small group of participant should be considered. Focus group discussion will explore opinions of Myanmar refugee regarding the disease. Individual interview by using a semi-structure topic guide is basically provide an individual experiences as well as opinion regarding pulmonary tuberculosis this can be conducted with them to learn about their actual attitude and prevention practices. Participant observation will provide information on actual prevention behaviors, the result form observation would help researcher to understand and discover how Myanmar refugees interact with the disease and what information or factor that influence their knowledge, attitude and preventive behavior on pulmonary tuberculosis and might explore about their relationship eventually.

### LIMITATION OF THE STUDY

This study was the cross sectional study and so it may not include the changes among the refugee population overtime.

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