

LEVEL OF KNOWLEDGE REGARDING TUBERCULOSIS AMONG THE RESIDENTS OF AN APARTMENT IN KG PANDAN, KUALA LUMPUR

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ABSTRACT

Introduction: Tuberculosis (TB) is an infectious airborne disease caused by *Mycobacterium tuberculosis* which is transmitted through droplets. However, despite Tuberculosis being a curable and preventable disease, TB is a major cause of morbidity and mortality in Malaysia. Recently there had been a rise in the number of suspected TB cases in health clinics in Kg Pandan, Kuala Lumpur. Therefore, there is a need to know the resident's level of knowledge on Tuberculosis as this disease is a communicable disease.

Objectives: The purpose of this study is to determine the level of knowledge regarding Tuberculosis among residents of an apartment in Kg Pandan, Kuala Lumpur and to determine whether there are any significant differences between demographic variable and level of knowledge regarding TB among residents of an apartment in Kg Pandan, Kuala Lumpur. **Methodology:** This is a cross sectional descriptive study on 352 residents of an apartment in Kg Pandan, Kuala Lumpur through simple random sampling. A validated 41-item questionnaire was used to determine the knowledge of TB according to causes, mode of transmission, symptoms, risk factors and prevention. Total scores range from 0 to 41. **Result:** Finding showed that the participants had an overall mean score of 28.45 ± 5.18 out of a total score of 41. There are no significant differences between level of knowledge on TB and demographic variable except for level of education.

Conclusion: Findings indicated that there is a need to provide measures to create better awareness of the community especially on the mode of transmission of TB as prevention is better than cure.

Keywords: *Knowledge; Tuberculosis; Causes; Mode of Transmission; Symptoms; Risk Factors and Prevention*

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* which is spread via droplets. However, despite Tuberculosis being a curable and preventable disease, TB is a major cause of morbidity and mortality in Malaysia. Recently there had been a rise in the number of suspected TB cases in health clinics in Kg Pandan, Kuala Lumpur (Lisut, Razali & Arshad, 2017). According to the Director General of Health Malaysia (2019), 25,837 TB cases were reported in 2019. TB death rate in 2018 was 6.6 per 100,000 populations and an increase of 6.5 per 100,000 populations in 2017 (WHO, 2020). In many developing countries such as Malaysia, TB is a public health issue that need to be concerns. The worldwide healthcare system is in trouble with an increasing number of Tuberculosis (TB) cases and leading mortality cases

across the worlds. Globally, TB is one of the top ten cause of death and the leading cause from a single infectious agent other than Acquired Immunodeficiency Syndrome (AIDS). Millions of people continue to fall sick with TB every year. According to World Health Organization (2017), there is an estimate of 10.0 million people infected by TB disease globally in 2017. Out of it, 6.4 million cases were newly diagnosed, officially notified to national authorities and reported to the World Health Organisation, (2018). Nowadays the extrapulmonary cases involve other systems of the body, such as the lymphatic system, circulatory system, central nervous system. TB can spread from one system to another if not treated immediately.

Therefore, there is a need to know the resident's level of knowledge on Tuberculosis as this disease is a communicable disease.

METHODOLOGY

Study Design, Setting and Sample: A cross sectional descriptive study design is used to determine the level of knowledge on Tuberculosis among the residents of an apartment at Kg Pandan, Kuala Lumpur and if there are any significant differences between the demographic variables and level of knowledge on Tuberculosis. Residents of this 1894-unit apartment in Kg Pandan, Kuala Lumpur are the target population of this study. Kg Pandan, a village covering 70 acres, is located in the Titiwangsa constituency in eastern Kuala Lumpur surrounded by Ampang, Maluri, Pudu and Bukit Bintang. Approximately 45% of the residents are foreigners, they are staying in rented houses from the locals for the past 15 years.

Sample size is calculated by using Raosoft calculator based on 5% margin error, 95% confidence level and 50% distribution rate. The estimated sample size required is 352 after taking into consideration 10% attrition rate.

The inclusion criteria for this study are the residents of this apartment who are 18 years old and above. Participants who were excluded from this study were non-residents of this apartment, less than 18 years old, mentally not fit, ill person and resident who are not keen to participate.

Ethical Consideration: Ethical approval from the IMU Joint-Committee on Research and Ethic, International Medical University obtained to conduct the study. Permission for the data collection obtained from management office of this apartment. Participants' written consent was also obtained prior to study. The participant has been explained on their right to refuse prior to commencement of the study. The master copy of the questionnaire was kept in a locked cupboard and soft copy were saved in a pen drive secured with password to maintain the confidentiality of the participants.

Measurement and Instrument: A set of self-administered questionnaires using a yes or no scale is used in this study. The questionnaire was adapted from Salleh *et al.*, (2018). Permission was obtained from the author.

The questionnaire consists of two parts. Part I: Demographic data consisting of 6 items, Part II: Knowledge on TB which comprises of 6 sections. Section A: consist of 4 items that will focus on

knowledge on causes of TB, Section B: consist of 11 items that will focus on knowledge on mode of transmission of TB, Section C: consist of 10 items that will focus on knowledge on symptoms of TB, Section D: consist of 8 items that will focus on knowledge on risk factors of TB infection, Section E: consist of 6 items that will focus on knowledge of TB investigation, and Section F: consist of 2 items that will focus on knowledge on TB prevention.

Each correct answer was given 1 point and the total score range is 0 to 41 points. The higher the total score, the higher the knowledge of tuberculosis among the residents.

Validity and Reliability Testing: A pilot study was conducted in this apartment, Kg Pandan, Kuala Lumpur with a total of 30 residents after permission was obtained from the management office, Joint Management Body (JMB) and resident's committee representative. A verbal explanation about the research title and purpose was given to the participants. Prior to the pilot study, consent was obtained from participants. Reliability will be determined using Cronbach alpha value 0.70 and above as the acceptable value (Polit & Beck, 2014). The clarity of the question was also been tested in this pilot study to identify the estimated time required for each participant to complete the questionnaire. The internal content validity was determined by a three-member panel of experts one each from the management office, Joint Management Body (JMB) and resident's committee representative.

Data Analysis: The questionnaire was coded and entered using IBM SPSS statistics version 25.0. Descriptive statistic using frequency, mean, standard deviation, percentages were used to analyze the demographic and the research variable. Tables, graphs and charts were used to illustrate the finding of the study according to American Psychological Association (APA) format.

RESULTS

Demographic Data: Demographic data of the participants were revealed in Table 1 in order to provide an insight to the backgrounds of the participants data such gender, age, ethnicity, level of education and occupation. Out of the 352 residents of the apartment who participated in this study, 49.1% of the participants are male while the rest 50.9% of the participants are females. The mean age of the residents was 48.08 (SD = 16.84) years old (Refer Table 1).

Table 1: Demographic Data (n = 352)

Variables		Frequency n	Percentage (%)	M±SD
Gender	Male	173	49.1	NA
	Female	179	50.9	
Age (Years)	18-29	60	17.0	48.08 ± 16.84
	30-39	66	18.8	
	40-49	53	15.1	
	50-59	70	19.9	
	60 above	103	29.3	
Ethnic	Malay	176	50.0	NA
	Chinese	114	32.4	
	India	58	16.5	
	Other	3	9.0	
Highest education level	No formal education	7	2.0	NA
	Primary school	51	14.5	
	Secondary School	74	21.0	
	Undergraduate	114	32.4	
	Postgraduate	106	30.1	
Occupation	Health related	47	13.4	NA
	Non-Health - related	305	86.6	

Knowledge on Causes of Tuberculosis: A total of 97.2 % of the participants knew that bacteria are the cause of Tuberculosis, 39.8% knew that Tuberculosis is not transmitted through contaminated drink. 37.5% are aware that contaminated food does not transmit tuberculosis, while 14.8 % are aware that Tuberculosis is not caused by genetic inheritance (Refer Table 2).

Table 2: Knowledge on Causes of Tuberculosis (n = 352)

	Item	Answered correctly n (%)	M±SD
A1	Bacteria	342 (97.2)	
A4	Contaminated drink	140 (39.8)	
A3	Contaminated food	132 (37.5)	
A2	Genetic inheritance	52 (14.8)	
	Total score of 4 items		3.04 ± 1.19

Knowledge on Mode of Transmission of Tuberculosis: A total of 98.3% of the participants knew that Tuberculosis can be transmitted through cough while 91.5% knew that tuberculosis can be spread through sneezing. Approximately half of the total of the participants (56.3%) knew that Tuberculosis can be spread through talking, 44.6% agreed that using the

same toothbrush can transmit Tuberculosis, and 31.8% are aware that laughing can spread Tuberculosis (Refer Table 3).

Table 3: Knowledge on Mode of Transmission of Tuberculosis (n = 352)

	Item	Answered correctly n (%)	M±SD
B1	Cough	346 (98.3)	
B6	Genetic	328 (93.2)	
B2	Sneezing	322 (91.5)	
B7	Sexual intercourse	316 (89.8)	
B9	Using the same toilet	299 (84.9)	
B3	Spitting	262 (74.4)	
B11	Shaking hand	260 (73.9)	
B8	Sharing clothes, bed or towels	244 (69.3)	
B4	Talking	198 (56.3)	
B10	Using the same toothbrush	157 (44.6)	
B5	Laughing	112 (31.8)	
	Total score of 11 items		8.09 ± 2.07

Knowledge on Symptoms of Tuberculosis: A total of 95.7% of the participants knew that the infected person will have a symptom of urination during night, 90.1% are aware that persons with Tuberculosis will have persistent cough while 82.1% knew that the infected person will feel tired. Feedback from 68.8% of the participants implied that they are aware that those with Tuberculosis will have chest pain, loss of weight (67.6%) and night sweat (49.7%) (Refer Table 4).

Table 4: Knowledge on Symptoms of Tuberculosis (n = 352)

	Item	Answered correctly n (%)	M±SD
C3	Urination at night	337 (95.7)	
C1	Persistent cough	317 (90.1)	
C10	Tiredness	289 (82.1)	
C9	Loss of appetite	286 (81.3)	
C6	Fever	276 (78.4)	
C2	Haemoptysis (Coughing out blood)	268 (76.1)	
C5	Shortness of breath	253 (71.9)	
C4	Chest pain	242 (68.8)	
C7	Weight loss	238 (67.6)	
C8	Drenching night sweat	175 (49.7)	
	Total score of 10 items		7.58 ± 1.81

Knowledge on Risk Factors of Tuberculosis Infection: A total of 77.8% of the participants were aware that those infected with Human Immunodeficiency Virus (HIV) will have higher risk of getting Tuberculosis, while 76.7% agreed that a person with compromised immune systems will have a higher risk of getting infected with Tuberculosis. Those who are tobacco smoker were perceived to have a lower risk of having Tuberculosis infection if exposed (57.7%) while those with diabetes mellitus (DM) were not perceived to be at risk of Tuberculosis infection (35.2%) while 19.6% agreed that alcohol consumption will not increase the risk of Tuberculosis infection. A total of 18.8% of the participants felt that a person with chronic kidney disease (CKD) will not increase the risk of Tuberculosis infection (Refer Table 5).

Table 5: Knowledge on Risk Factors of Tuberculosis Infection (n = 352)

	Item	Answered correctly n (%)	M±SD
D1	Human immunodeficiency virus	274 (77.8)	
D8	Compromised immune systems	270 (76.7)	
D7	Tobacco smoking	203 (57.7)	
D6	Cancers	184 (52.3)	
D5	Extreme aged	153 (43.5)	
D2	Diabetic mellitus	124 (35.2)	
D3	Alcohol consumption	69 (19.6)	
D4	Chronic Kidney disease	66 (18.8)	
	Total score of 8 items		3.93 ± 1.52

Knowledge of Tuberculosis Investigation: A total of 84.7% of the participants knew that chest x-ray will help in diagnosing Tuberculosis. Most of the participants knew that urine analysis (78.4%) and stool examination (75%) will not help in diagnosing Tuberculosis. However, most of the participants were aware that blood investigation (73%) and sputum test (70.5%) are used to diagnose Tuberculosis. Only 29% of the participants were unaware that skin test is used to diagnose Tuberculosis (Refer Table 6).

Table 6: Knowledge of Tuberculosis Investigation (n = 352)

	Item	Answered correctly n (%)	M±SD
E3	Chest x-ray	298 (84.7)	
E4	Urine analysis	276 (78.4)	
E5	Stool examination	264 (75)	
E2	Blood investigation	257 (73)	
E1	Sputum test	248 (70.5)	
E6	Skin test	102 (29)	
	Total score of 6 items		4.07 ± 0.97

Knowledge on Tuberculosis Prevention: A total of 98.3% of the participants were aware that taking Panadol (Paracetamol) will not prevent a person from being infected with Tuberculosis if exposed while 88.6% were aware that BCG vaccination can prevent Tuberculosis (Refer Table 7).

Table 7: Knowledge on Tuberculosis Prevention (n = 352)

	Item	Answered correctly n (%)	M±SD
F2	By taking Panadol (Paracetamol)	346 (98.3)	
F1	Through BCG vaccination.	312 (88.6)	
	Total score of 2 items		1.87 ± 0.39

Tuberculosis: A total of 88.4% of the participants have correctly answered all the items on Tuberculosis prevention, 56% answered correctly all the items on causes of Tuberculosis, 13.9% answered correctly all the items on mode of transmission of Tuberculosis, 10.8% for all the items on symptoms of Tuberculosis, 5.1% on all the items on investigation for tuberculosis while only 1.4% of the participants have correctly answered all the items on risk factors on Tuberculosis infection. The mean overall score of the participant is 28.45±5.18 out of the total of 41. Overall score ranged from 0 to 39 where 44 % (n=155) scored less than the mean overall score of 28 (Refer Table 8).

Table 8: Level of Knowledge on Tuberculosis (TB) (n = 352)

Subdomains of knowledge of TB	Score range	M±SD	% answered all correctly
Knowledge on TB prevention	0-2	1.87 ± 0.39	88.4
Knowledge on causes of TB	0-4	3.04 ± 1.19	56.0
Knowledge on mode of transmission of TB	0-11	8.09 ± 2.07	13.9
Knowledge on symptoms of TB	0-10	7.58 ± 1.81	10.8
Knowledge on TB investigation	0-6	4.07 ± 0.97	5.1
Knowledge on risk factors on TB infection	0-8	3.93 ± 1.52	1.4
Overall score of 41 items	0-41	28.45 ± 5.18	

The differences between the Demographic Variable and Level of Knowledge on TB: The results from the analysis showed no significant differences between level of knowledge on TB and demographic variable including gender, ethnic and age. However, there is a significant difference between the level of education and knowledge score of TB ($t=4.63$; $p<0.05$). Non-degree

respondents had higher scores (29.96±4.69) as compared to those with degree (27.47±5.25).

Therefore, the null hypothesis is accepted. There are

no significant differences between demographic variables and level of knowledge regarding Tuberculosis among residents of an apartment in Kg. Pandan, Kuala Lumpur (Refer Table 9).

Table 9: Differences between Demographic Variables and the Level of Knowledge on TB (n = 352)

Characteristic	Variable	n	M±SD	t	P
Gender	Male	173(49.10)	28.35±5.38	0.32	0.75
	Female	179(50.90)	28.54±5.00		
Ethnic	Malay	170(48.30)	28.27±5.02	-0.62	0.54
	Non- Malay	182(51.70)	28.61±5.33		
Age groups (years)	≤49	179(50.90)	28.81±5.65	1.34	0.18
	≥50	173(49.10)	28.07±4.64		
Highest Level of Education	Non-Degree	141(40.10)	29.96±4.69	4.63	0.00*
	Degree	211(59.90)	27.47±5.25		

DISCUSSION

Sociodemographic: A total of 352 participants were recruited in this study with the majority (50.9%) being females as compared to males (49.1%). Similarly, in a study done by Salleh *et al.* (2018) who conducted a study on knowledge, attitude and practice (KAP) on TB among community of Kulim, Kedah. The respondents were mainly 67.6% females while 32.4% were males. The mean age of the participants in this study were 48.08±16.84 years old. In contrast, in the same study of Salleh *et al.* (2018) showed that the mean age of the participants was 38.91±13.24 years old. This implied that the participants of this study are mainly from the middle-aged group.

Level of knowledge on Tuberculosis (TB)

Knowledge on Causes of Tuberculosis: Findings showed that 97.2% of the participants knew that bacteria were the cause of TB. This finding was supported by a study by Salleh *et al.* (2018) on KAP towards TB in Kulim, Kedah. It was reported that 88.2% of the participants knew that bacteria were the cause of TB. This implied that majority of the participant knew that TB is caused by a bacterium. While in contrast, in a study on 403 residents of an outpatient department at Mecha district reported that nearly half of participant knew that TB caused by bacteria (Kasa, Minibel & Bantie, 2019). In a study done in Tamil Nadu, only

10.6% of subjects were aware that TB is caused by microorganisms (Easwaran *et al.*, 2015). In another study by Kasa, Minibel & Bantie (2019), more than half (56%) of the study participants stated that bacteria are the responsible agent in causing TB. whereas 2% replied that heredity as the mode of transmission of the disease.

Knowledge on Mode of Transmission of Tuberculosis: A total of 98.3% of the participants knew that cough was the mode of transmission of TB. Similarly, as reported in a study done by Lin *et al.*, (2017) on TB knowledge among members of a rural community in Myanmar, 95.50% knew that TB can be transmitted through coughing while 91.2 % of the respondent in a study done by Salleh *et al.*, (2018) on KAP towards TB among Community of Kulim Municipal Council, Kedah also perceived that coughing can transmit TB. This finding implies that majority of the participant knew that coughing can transmit TB by releasing microscopic droplet that contains TB bacteria into the air. Kasa, Minibel & Bantie (2019), reported that from 403 study participants in Ethiopia who had information about TB, 74% mentioned that droplet inhalation as the main mode of transmission of the disease. A study by Easwaran *et al.* (2015) on 2030 participants in Tamil Nadu found that only 26.1% of them knew that TB is transmitted by cough. Another study done in Klang District, reported that only 20% of residents answered correctly said that inhaling Mycobacterium tuberculosis can cause

tuberculosis (Kumar & Jagatheeswary, 2018). This study also revealed that approximately 71.1% of respondent were aware of typical factors on how the TB can be transmitted from person to person.

Knowledge on Symptoms of Tuberculosis: A good number of participants of 90.1% identify that persistent cough is one of the symptoms of Tuberculosis. This was supported by a study by Gelaw (2016) in Ethiopia on association of socioeconomic factors on knowledge of TB, where 71.4% knew that persistent cough is a symptom of Tuberculosis. In contrast, a study by Luba *et al.* (2019) in Lesotho on attitude, associated factors and TB knowledge, found that 55.5% of the respondents knew that persistent cough is one of the symptoms of TB while in Tamil Nadu, only 34.4% of the participants knew at least one of the symptoms of TB (Easwaran *et al.*, 2015). Regarding sign and symptoms of TB, Kasa, Minibel & Bantie (2019), found that 39.4% mentioned that cough for greater than or equal 2 weeks is the clinical manifestation of a client with TB. Another study by Sanusi, Talip & Mohamed (2017) found that more than half (78.1%) of the respondents were aware of haemoptysis as a clinical symptom of TB, followed by chest pain (78.1%), coughing for over 2 weeks (77.8%), difficult breathing (67.4%), weight loss (55.6%) and loss of appetite (41.5%).

Knowledge on Risk Factors of Tuberculosis Infection: Findings of the study showed that 77.8% of the participants knew that compromised immune systems is one of the risk factors of TB infection. Similar findings were reported by a study done by Salleh *et al.* (2018) on KAP towards TB in Kulim, Kedah where 70.6% of the respondents knew that compromised immune systems is one of the risk factors of TB infection. On the other hand, a study by Sanusi, Talip & Mohamed (2017) found that HIV/AIDS (71.1%) was recognised by majority of the respondents as one of the risk factors of TB, but diabetes mellitus which is second to HIV/AIDS as the risk factor of TB was known by less than half of the respondents (37.8%) as the risk factors of TB.

Knowledge of Tuberculosis Investigation: A total of 84.7% of the participants knew that chest x-ray is an investigation for Tuberculosis. It was supported by a research done by Salleh *et al.* (2018) on KAP towards TB in Kulim, Kedah stated that 75.5% also knew that chest x-ray was used in the investigation of Tuberculosis.

Knowledge on Tuberculosis Prevention: A total of 88.6% of the participants knew that BCG vaccination

can prevent Tuberculosis infection. This was supported by a study by Salleh *et al.* (2018) on KAP towards TB that 75.5% of the respondents also knew that BCG vaccination can be used in the prevention of TB. According to Kasa, Minibel & Bantie (2019), forty-nine (12.2%) study participants in their study in Ethiopia thought that TB is not a preventable disease.

Overall Level of Knowledge on Tuberculosis: The mean overall score of the participants is 28.45 ± 5.18 which implied that the participants had only fair knowledge on TB. A study conducted on 300 participants from Klang district revealed that knowledge towards tuberculosis within the population is average (Kumar & Jagatheeswary, 2018). Similarly, another study involving 102 respondents from Kulim Municipal Council, Kedah also found that the respondents had moderate knowledge on TB (Salleh *et al.*, 2018).

Differences between Demographic Variables and Level of Knowledge on TB: The results from the analysis showed no significant differences between level of knowledge on TB according to gender and ethnic. Studies by Ghosh (2019) and Salleh *et al.*, (2018) showed that there are no significant differences between level of knowledge on TB and demographic variable including gender, ethnic and age. In contrast, the results from the analysis showed significant difference between level of knowledge on TB and level of education. Those with degree qualification seem to have lower scores as compared to those with degree qualification. Therefore, the null hypothesis is accepted as there is no significant differences between demographic variables and level of knowledge regarding Tuberculosis among residents of an apartment in Kg. Pandan, Kuala Lumpur. groups. However, Hassan *et al.*, (2017) reported that respondents with tertiary education had the highest proportion (81%) of TB knowledge. This implied that young persons between the ages of 16 to 29 years had access to information on TB compared with the older categories. In addition, more persons in this age group mostly belong to the tertiary education category where high TB knowledge was observed ($p=0.001$).

Based on the finding of this study, there seems to be a lack of knowledge on TB among the residents of the apartment. Areas that need prioritised interventions to improve communication and information dissemination on Tuberculosis include causes, symptoms, diagnostic investigations, mode of transmission and risk factors

contributing to TB.

CONCLUSION

In summary, the level of knowledge on Tuberculosis among the residents is fair with a total score of 28.45 ± 5.18 . Majority of them did not know about causes, symptoms, diagnostic investigations, mode of transmission and risk factors contributing to TB. Therefore, there is an urgent need to create more awareness on Tuberculosis among the community in this area. It is suggested that more effort through collaboration between healthcare providers and housing management committee be carried out to communicate and improve the resident's knowledge on TB through more health teaching activities to create awareness and improve their knowledge on TB.

Limitation

The limitation of this study is that only one apartment in Kg Pandan, Kuala Lumpur, were involved in this study. Thus, the finding of this study cannot be generalised.

Conflict of Interests

The authors declare that they have no conflict of interest.

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