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EVALUATING THE ROLE OF KNOWLEDGE IN KAP MODEL ON SELF-PREVENTIVE HEALTHCARE: EVIDENCE FROM TUBERCULOSIS PATIENTS IN MALAYSIA

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Abstract:

Malaysia aims to end the Tuberculosis (TB) epidemic by the year 2035. However, to ensure a successful program for TB control, it is still a challenge to instil good self-preventive healthcare among patients. Therefore, the study seeks to address the knowledge gap among TB patients and their level of prevention practices which have not been studied extensively in Malaysia. Using questionnaires, this cross-sectional study was conducted among 1606 registered TB patients in selected states of Malaysia from May 2014 to March 2015. General knowledge of TB among TB patients was high - patients from Penang, who resided in suburban areas and self-employed revealed to have high TB knowledge than the others. Thus, by identifying how TB patients view their transmission risk and prevention, practices may contribute to an improved future screening option and enhanced education efforts for medical practitioners to develop more customized programs for TB patients.

Keywords:

Knowledge; Tuberculosis; TB Patients; Self-Preventive Healthcare; KAP Model; Malaysia

Introduction

Tuberculosis (TB) is increasingly recognised as a serious and major worldwide public health concern (Rahman & Mokhtar, 2015). It is an airborne infectious disease caused by *Mycobacterium tuberculosis* which affects the lungs with high rates of morbidity and

mortality. TB is transmitted from a person to another via droplets released from the throat and lungs of people with the active respiratory disease. Even though TB is contagious, it is not easy to be infected by it. Yet, people who spend a lot of time with TB patients such as their friends and co-workers as well as those who are living with them are highly prone to be infected (Mokhtar & Rahman, 2017; WHO, 2017).

Past studies highlighted that patients with high level of TB knowledge may correspond with positive practices of preventive healthcare (Abebe et al., 2010; Mokhtar, Rahman, Shariff, & Nor, 2012; Bisallah et al., 2018). In fact, Bisallah et al. (2018) mentioned that knowledge reinforces preventive behaviour skills. For instance, during the intervention module, patients were gathered with a group of experts for consultation in preventive medicine and behaviour modification. From there, the patients were assessed regarding health education. The comparison of preventive practices between patients in the intervention group and the control group revealed that patients in the intervention group showed an increased level of knowledge which subsequently improved their preventive practices of TB. On the same note, Abebe et al. (2010) noted that poor knowledge of TB has been associated with high transmission and delay in health-seeking behaviour. Without proper knowledge on TB, the infected person is unaware of the severity of TB and indirectly postpones the treatment which caused infection to others.

In Malaysia, the burden of TB was critical with the mortality rate of 6.5 per 100,000 population in 2017 (Ahmad, 2018). There were 26,168 recorded cases of TB in 2017 which indicate an increase of eight percent from 24,220 cases in 2015. Even though the government had been equipped with more advanced modern medicine, the number of TB cases still increased because most of the patients were late in seeking treatment. In addition, Bakar (2018) who is the Deputy Director-General (Public Health) from Ministry of Health Malaysia (MOH) also emphasized on the importance of knowledge and awareness on TB as to encourage early detection and improve the preventive measures (see Abas, 2018). Sullivan, Esmaili, and Cunningham (2017) affirmed that TB is preventable, treatable, and is a curable disease yet, it is highly contagious if not given proper treatment at the early stages.

Despite TB being very infectious, the lack of knowledge is continuously echoed as an increasing concern to educate patients and their contacts such as family and friends to be equipped with an improved knowledge on personal hygiene care and guide them with proper preventive practices (Mokhtar & Rahman, 2017; Zheng, Hu, & Gao, 2017; Sagir, Islam, Rashid, Hossain, & Haque, 2018; Long et al., 2020). With this in mind, the study aims to assess the level of TB knowledge among patients in selected states of Malaysia based on the Knowledge, Attitude, and Practice (KAP) model.

Methodology

Research Design and Study Setting
This quantitative study is cross-sectional in nature with the focus on the TB knowledge among TB patients. The sample consisted of 1606 TB patients in seven states of Malaysia namely; Penang, Kuala Lumpur, Selangor, Kelantan, Johor, Sabah, and Sarawak. These states were selected based on the high number of TB patients recorded from the Ministry of Health Malaysia (2014). Also, considering their access to TB treatment, the knowledge on TB is crucial to determine their awareness and to what extent they are able to carry out self-

preventive behaviour from spreading TB to others. Data were collected from May 2014 to March 2015 using questionnaires comprising pre-coded questions.

To ensure the validity and status of the respondents, the data was triangulated with the database from Ministry of Health (Malaysia) patient's registry. Respondents were considered as patients if they had been diagnosed and confirmed to have TB symptoms as well as undergoing TB treatment. In this study, majority of the respondents were under treatment during the data collection period.

Ethical Consideration
For the purpose of transparency and protection of human subject, this study had officially obtained the ethical approval from the Ministry of Health (NMRR-11-658-9825). Also, written consent was requested from each of the respondents prior to the initiation of the data collection process. Confidentiality of respondents was maintained by using codes (ID: P001, P002, P003, *etc*.) instead of personal details. All respondents participated in this study were on a voluntary basis and were given consolation gifts for their contribution as a token of appreciation.

Questionnaire Development
The questionnaire was designed based on a study by ul Haq, Hassali, Shafie, Saleem, Farooqui, and Aljadhey (2012). Several modifications were made to fit the local context. The primary version of the questionnaire was developed in the Malay language, the mother tongue of the respondents. Prior to the data collection, the pilot study was carried out with 150 respondents for its clarity and consistency. From there, few changes were made such as minimal medical jargon usage, modification of double-barrelled questions, and the elimination of confusing statements.

SPSS Method
Data collected were entered into Statistical Package for the Social Sciences (SPSS) version 24 for further analysis. Categorical variables were summarized and tested for descriptive statistics, while test of independence was done using Chi-Square test due to non-normal distribution of data (Nasirin & Asrina, 2020). The p-value of less than 0.05 was considered as statistically significant. In this study, results for reliability test was found to be in acceptable ranges (α=0.754). According to Nunnally (1978), the alpha value equals to or greater than 0.70 ($\alpha \geq 0.70$) is considered as a sufficient condition for reliability test. Roni (2014) asserted that the purpose of establishing reliability and validity is essential to assure the quality of the instrument as well as ensuring data are sound, replicable, and the results are accurate.

Results and Discussion
A total of 1600 questionnaires were distributed and 13 were excluded due to the monotone responses and excessive missing values. A total of 1587 valid questionnaires were received with a response rate of 99.19%. The response rate is calculated by using the total number of questionnaires received divided by the number of questionnaires sent out.

Profile of Respondents
Table 1 summarizes the profile of the respondents. Majority of them were male (59.5%) and aged 51 years old and above (30.1%). Patients from Selangor showed the highest percentage (27.6%) which indicates overcrowded areas with potentially higher number of immigrants

infected by TB, followed by Kelantan with 25.1% which explains their limited access to TB treatment. More than 70% of patients were coming from low income group; as in Malaysia, they are defined as the B40 group. B40 group refers to the bottom 40% of households with monthly income of RM 3,900 and below. Overall, the respondents in this study is a representation of the actual global data on TB patients with majority of them were male, aged 51 and above, resided at urban area, and earned low household income (Yen et al., 2014; Perriot, Underner, & Peiffer, 2018). Some of the questions were left unanswered such as questions on gender, age, education, locality, and monthly income. However, the percentage of no answer is lower than 10% and not involving questions on key variables, thus, it does not influence the overall data.

Table 1: Profile of Respondents

Characteristics	n	%
Gender		
Male	944	59.5
Female	629	39.6
No answer	14	0.90
Locality		
Urban	796	50.2
Suburban	277	17.5
Rural	451	28.4
No answer	63	3.97
Monthly Income		
< RM 2,000	1137	71.6
RM 2,001 – RM 4,000	264	16.6
>RM 4,001	23	1.45
No answer	163	10.3

TB Knowledge

Knowledge on TB was assessed by asking questions about TB knowledge, TB symptoms, TB infection, and TB treatment. Responses to the TB knowledge questions indicate that a majority of respondents (74.3%) have heard about TB before they are infected with the disease and 72.9% of them admitted that they did know the general information about TB. Only 20.2% from the sample knew other TB patients, while the rest declared they only knew TB patients from their family members and relatives. In answering the way TB spread (refer to Table 2), many respondents answered correctly; cough (95.3%), sneezing (76.9%), talking (54.6%), and spitting (52.6%) while for the cause of TB, they responded that germ or bacteria (81.9%), virus (56.5%), ancestry (28.5%), and contaminated food/drink/water (23.2%).

Even though the correct answer for cause of TB is mainly from the germ or bacteria, the respondents showed relatively fair knowledge on the way TB spread and its causes. In terms of TB symptoms, majority of the respondents answered correctly namely; cough up sputum (88.5%), bad cough that lasts 3 weeks or longer (93.5%), fever that lasts 3 weeks or longer (81.6%), and cough up blood (87.5%). In short, the respondents have good knowledge on TB and understand TB in general, such as its symptoms, infections and treatments.

Table 2: Knowledge on TB and Its Symptoms

Knowledge on TB and its symptoms	Yes n (%)	No n (%)
How TB spread?		
Cough	1512 (95.3)	75 (4.73)
Contaminated food/drink/water	475 (29.9)	1112 (70.1)
Sexual intercourse with TB patient	292 (18.4)	1295 (81.6)
Ancestry	485 (30.6)	1102 (69.4)
Spitting	834 (52.6)	753 (47.4)
What caused of TB?		
Virus	896 (56.5)	691 (43.5)
Contaminated food/drink/water	368 (23.2)	1219 (76.8)
Germ / bacteria	1300 (81.9)	287 (18.1)
What is TB symptom?		
Cough up sputum	1405 (88.5)	182 (11.5)
A bad cough that lasts 3 weeks or longer	1484 (93.5)	103 (6.50)
Fever that lasts 3 weeks or longer	1295 (81.6)	292 (18.4)
Sweating at night	1037 (65.3)	550 (34.7)
Chest pain	1199 (75.6)	388 (24.4)
Extreme tiredness or fatigue	1132 (71.3)	455 (28.7)
Weight Loss	1182 (74.5)	405 (25.5)

Table 3 shows a summary of knowledge on TB infection and TB treatment. Majority of the patients responded that TB is infectious (n=1419; 89.8%) and 1262 from them believed that TB can be avoided while about 88.3% positively agreed that TB can be cured (n=1394). Interestingly, regarding the duration for TB treatment, most of the respondents answered accurately, which is six months (n=1017; 64.1%) for usual treatment. Nevertheless, some medical practitioners believed that TB treatment should be nine months (n=430; 14.5%) because there was a significantly lower bacteriologic recurrence rate within nine months, instead of six months (Swaminathan et al., 2010; Menzies et al., 2018). Thus, those patients who answered nine months as duration of TB treatment is also considered as a correct answer.

Table 3: Knowledge on TB Infection and TB Treatment

Knowledge on TB infection and TB treatment	n	%
Is TB infectious?		
Yes	1419	89.8
No	162	10.2
Is TB can be avoided?		
Yes	1262	79.7
No	321	20.3
Is TB can be cured?		
Yes	1394	88.3
No	184	11.7
How long is TB treatment?		
1 month	11	0.70
2 months	13	0.80
3 months	85	5.40

6 months	1017	64.1
9 months	230	14.5
Not sure / do not know	230	14.5

Level of TB Knowledge

Figure 1 depicts the level of TB knowledge among TB patients in selected states within Malaysia. Majority of the respondents deemed to have high level of TB knowledge (88.2%). High TB knowledge was composed from questions on general TB awareness, symptoms of TB, TB infection, and TB treatment. There were nine questions on nominal scales to be accumulated to determine high or low level of TB knowledge. As mentioned before, more than five correct answers were regarded as high level of TB knowledge and less than five correct answers were regarded to have low level of TB knowledge.
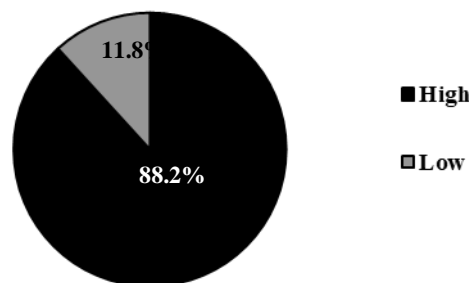

Figure 1: Level of TB Knowledge

Difference of TB Knowledge Between Male and Female Patients

The Kolmogrov-Smirnov normality test revealed that data for this study do not follow a normal distribution (p>0.05). Thus, a non-parametric test was used for inferential statistics such as Chi-Square. The Chi-Square test for independence was used to explore the relationship between two categorical (nominal) variables with each having two or more categories (Pallant, 2013). For instance, in order to examine the difference between gender (male/female) and level of knowledge (high/low), thus, there should be (2x2) contingency table to explain the intended differences (Kent State University Libraries, 2018). Since the p-value is greater than the significance level (p>0.05), it can be concluded that there is insufficient evidence to suggest an association between gender and level of knowledge [$\chi^2(1)=2.057$, p=0.174]. Likewise, age also showed no significant difference with the level of knowledge [$\chi^2(4)=6.1517$, p=0.188] (see Table 4).

In brief, this study revealed that gender and age were not significant with the level of TB knowledge which explained that the variables were not related. Gender and age are also factors not related to level of TB knowledge. Male and female patients possess fairly comparable knowledge on TB. Likewise, Abebe et al. (2010) reported that knowledge was not affected by gender since both genders exhibited similar responses to healthcare seeking behaviour related to TB.

Table 4: Chi-Square Analysis on Gender and Age

Variable		%		n	p-value	χ^2
		Low	High			
Gender	Male	12.7	87.3	944	0.174	2.057
	Female	10.3	89.7	629		
Age	Less than 20	9.40	90.6	128		
	21-30	10.7	89.3	393		
	31-40	11.3	88.7	301	0.188	6.151
	41-50	9.30	90.7	259		
	51 and above	14.5	85.5	477		

Table 6 presents the differences in the level of knowledge by several groups namely; based on education level, states, locality, and occupation. From the table, it can be concluded that there were statistically significant difference in level of TB knowledge among different states [$\chi^2(5)=12.953$, p=0.024], locality [$\chi^2(2)=24.537$, p<0.001], and occupation [$\chi^2(4)=16.625$, p=0.003]. This study showed that level of TB knowledge varied across different states, locality, and types of occupation. Results revealed that there were significant differences in level of TB knowledge between the different states in Malaysia with the highest mean rank is Penang, resided in suburban, and self-employed (refer Table 5). In other words, these results demonstrated that TB patients from Penang showed the highest level of TB knowledge, followed by Sarawak, Selangor, Kelantan, Sabah, and Kuala Lumpur. In terms of locality, TB patients lived in suburban were reported to have higher level of TB knowledge compared to those who lived in urban and rural areas.

Table 5: Chi-square Analysis on States, Locality, and Occupation

Variable		n	Mean Rank	df	p-value	χ^2
States	Penang	93	879.68	5	0.024	12.953
	Kuala Lumpur	240	769.93			
	Selangor	438	794.71			
	Kelantan	398	790.22			
	Sabah	250	786.20			
	Sarawak	168	799.69			
Locality	Urban	796	761.44	2	0.000	24.537
	Suburban	277	821.80			
	Rural	451	727.95			
Occupation	Public sector	161	687.25	4	0.003	16.265
	Private sector	433	755.62			
	Self employed	423	773.71			
	Housewife	175	745.27			
	Others	395	740.08			

This statistic is different from previous studies (Thapa, Prasad, Chadha, & Tonsing, 2016; Mousawi & Alwash 2017) which mentioned that TB patients were mostly situated in rural areas and due to their lack of access to information lead to the low level of TB knowledge.

However, the results revealed that patients living in suburban possess high TB knowledge than patients residing in urban and rural areas. The reason is related to their access to urban areas regularly to go to work or shop. They are prone to be infected and spread the disease to others without realising it through the travelling on the daily basis. When it comes to types of occupation, the self-employed TB patients demonstrated to have better knowledge of TB compared to those who work at the private sector and the housewives. Interestingly, TB patients who worked in public sector showed the lowest level of TB knowledge among others.

Conclusion

This study has shown that knowledge regarding TB is very crucial to educate patients on how TB spreads, what treatment they need, and most importantly, equipping themselves on how to safeguard their loved ones with proper self-preventive healthcare. Future studies are advised to carry out a larger scale research with a different socio-economic background to compare the level of knowledge acquired before and after the patients are diagnosed with TB. To the author's knowledge, there are a limited amount of studies which have been focused on the knowledge of TB based on KAP model especially in Malaysian case studies. More evidence on the level of knowledge could benefit TB prevention and possibly save lives, with a proper self-preventive healthcare. Therefore, this study warrants less TB transmission and identifies barriers to TB knowledge to allow a more unified and effective TB control on a national level. With that, Malaysia's aspiration to end the TB pandemic by the year 2035 will eventually come true.

Acknowledgements

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