

Knowledge, Attitude and Practices towards Tuberculosis Disease among Health Sciences Undergraduate Students: A Cross-sectional Study

Tengku Nilam Baizura Tengku Ibrahim¹, Siti Nurshahida Nazli¹,
Amir Heberd Abdullah¹, Wan Ismahanisa Ismail¹, Mohamad
Azhar Mohd Nor¹, Siti Norashikin Mohamad Shaifuddin²,
Sheiladevi Sukumaran³, Nadiatul Syima Mohd Shahid¹

¹Faculty of Health Sciences, Universiti Teknologi MARA, Cawangan Pulau Pinang, Kampus Bertam, 13200 Kepala Batas, Pulau Pinang, Malaysia, ²Centre of Environmental Health and Safety, Faculty of Health Sciences, Universiti Teknologi MARA, Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor, Malaysia, ³Faculty of Education, Languages and Psychology, Segi University, Kota Damansara, 47810 Petaling Jaya, Selangor, Malaysia.

To Link this Article: <http://dx.doi.org/10.6007/IJARPED/v11-i3/15508>

DOI:10.6007/IJARPED/v11-i3/15508

Published Online: 28 August 2022

Abstract

Tuberculosis (TB) has become one of the significant public health concerns with increasing mortality and morbidity rate in Malaysia. Undergraduate students of Health sciences are considered at high risk of getting TB. Lack of understanding about the source and transmission of the disease, as well as attitude and practices of the students may be a contributing factor. Therefore, this study aimed to assess the knowledge, attitude, and practices towards tuberculosis (TB) among Health Sciences undergraduate students studying in a public university in Penang, Malaysia. This study was conducted among undergraduate students from UiTM Penang Branch, Bertam Campus. A quantitative method was used to collect the data. Results show that the majority of the respondents were aware of TB causal agents, symptoms, mode of transmission and the curability of TB as well as the effectiveness of BCG vaccination in preventing TB. Furthermore, it was discovered that a huge number of them were having misconceived ideas regarding TB and that was shown through their attitude towards TB disease. Overall, findings indicate good knowledge but moderate level of attitude and practices on tuberculosis disease. These findings emphasize the need for educating health sciences undergraduate students on tuberculosis disease to improve the risk and their attitude and practices.

Keywords: Knowledge, Attitude and Practices (KAP), Tuberculosis, Undergraduate Students.

Introduction

Tuberculosis (TB) is one of the most common infectious diseases worldwide and continues to be a major public health concern in low and middle-income countries (Da Silva et al., 2022). In 2020, according to the World Health Organization (WHO), tuberculosis incidence reached

10 million people annually, with around 2 million deaths and 7 million new cases (WHO, 2022). About one-quarter of the world's population is estimated to be infected by TB bacteria. Only 5-15% of these people will fall ill with active TB disease. The rest are infected with TB infection but are not ill and can transmit the disease. TB is caused by the airborne *Mycobacterium tuberculosis* that can be transmitted from person to person. Everyone is highly susceptible and at risk to be infected by TB as it possesses highly contagious characteristics (Salleh et al., 2018).

Globally, despite improvements in rates since 1999, Brazil remains one of the 22 nations with the largest number of cases (Da Silva et al., 2022). However, currently, many cases occur from Southeast Asia (46%) with India having the highest number of cases, followed by China and Africa (24%). Apart from that, Bangladesh, Indonesia, Myanmar, and Thailand are included in the list of SEA nations with a high TB burden (Zamri et al., 2022). The increasing TB cases in Malaysia is mainly due to the Human Immunodeficiency Virus (HIV) pandemic, complacency, negligence towards the disease and international travel. Thus, TB is ranked as a second killer among infectious diseases after the advent of Human Immunodeficiency Virus infection (HIV). TB was frequently characterized by its symptoms (chronic cough or coughing with blood) as dry cough or becoming thin. In an effort to eradicate TB, Malaysia has established its first National TB Control program in 1961, however, TB infections continue to exist despite a number of control measures being implemented (Abd Rahman & Mokhtar, 2015).

Students in the Health sciences are particularly vulnerable to acquiring TB infection, for instance, nursing students who encounter patients suffering from an infectious disease including TB. In the meanwhile, to manage and prevent the spread of TB cases, environmental health students must learn how to investigate TB cases and inspect patient homes. Despite the frequent contacts Health sciences students are expected to have with patients having TB, the risk of TB infection among them remains unknown in Malaysia. However, research has shown that latent TB infection among nursing students in Japan and Germany were low (Nishimura et al., 2018; Schablon et al., 2013).

In Malaysia, studies demonstrated antibiotic susceptibility and drug-resistance among local population of *M. tuberculosis* (Ismail et al., 2014; Zamri et al., 2022). Even in certain states in this country, there is still a widespread belief that TB may be treated with medicinal herbs (Rundi, 2010). Globally, prior research have focused on attitude or behavioral issues such as substance misuse, alcoholism, and smoking, which were conducted among immigrants, HIV patients, the community, prisoners, and others (Khalili et al., 2022; Harstad et al., 2022). However, while most studies focused on clinical research associated with human and bacteria itself (Rajendran et al., 2020). TB issues are highly impacted by knowledge and behaviour, which requires community engagement in TB preventive efforts (Ramadhany et al., 2020). Therefore, in addition to building a foundation for public awareness particularly among students, assessing the level of KAP is seen as a tool for determining if students are aware of the measures to reduce the risk of TB and whether the government is effectively disseminating information about TB to university students. In fact, previous research by Jamaludin et al (2019) revealed that the level of knowledge and awareness regarding TB among undergraduate students is relatively low. Especially for those in the field of health sciences, students must acquire sufficient knowledge and improve their attitude and practices related to TB to ensure they graduate with the appropriate knowledge, skills, and attitudes

that is essential to the effective management of tuberculosis (Hassan & Said, 2019). Therefore, the objective of this study is to assess the knowledge, attitude and practices towards tuberculosis disease (TB) among health sciences undergraduate students.

Methodology

Study Design and Participants

This study is a cross-sectional survey conducted in Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Penang Branch, Bertam Campus, Malaysia. The campus was selected because it had six health sciences programs, most of which requiring practical attachment in private and government hospitals as well as district health offices. Respondents are students who enrolled in the six programs: Environmental Health, Medical Laboratory Technology, Nursing, Physiotherapy, Occupational Therapy and Pharmacy with different backgrounds. A total of 228 undergraduate students participated in the online survey using a validated self-administered questionnaire. Respondents were invited to participate on a voluntary basis.

Questionnaire Design and Data Collection

The survey consists of 4 sections including socio-demographic information, tuberculosis knowledge (5 items), attitudes (5 items) and practices (5 items). The socio-demographic profile was used to collect data on gender, age, program, ethnicity and residence state. The knowledge sections had 5 items which assessed the undergraduate student's knowledge about TB disease, TB symptoms, how it spreads, as well treatment and prevention. The second part, which covers the attitude section, had five more items assessing the undergraduate student's attitude regarding personal hygiene, close contact with TB patient, sharing meals with TB patient and fear of infection among family members. The final practices section explores other factors such as smoking habits, medical check-ups, willing ness to seek medical help, sneezing etiquette and BCG vaccine for children.

Data Analysis

A summary of respondents' socio-demographic information and their knowledge, attitudes and practices were obtained using descriptive statistics.

Results

Sociodemographic Variables of Respondents

The summary of sociodemographic is depicted in Table 1. In this study, 87.3% (n=199) were female subjects and 12.7% (n=29) were male subjects. The age group of respondents was 18-20 91% (n=208), 21-23 8.3% (n=19), and 24-26 0.4% (n=1) years old. The respondents' distribution of ethnicity was Malay 97.4% (n=222) and others 2.6% (n=6). Reviewing the respondents' program, 25.4% (n=58) are from Pharmacy, 8.3% (n=19) from Nursing, 13.6% (n=31) from Medical Lab Technology, 32.9% (n=75) from Environmental Health, 12.3% (n=28) from Occupational Therapy, and 7.5% (n=17) from Physiotherapy. The distribution of respondents' residence state is Kelantan at 11% (n=25), Johor at 11.4% (n=26), Penang at 6.6% (n=15), Kedah at 14.5% (n=33), Selangor at 18.9% (n=43), Melaka at 0.9% (n=2), Perlis at 1.3% (n=3), Putrajaya at 1.3% (n=3), Kuala Lumpur at 3.5% (n=8), Pahang at 9.6% (n=22), Sabah at 3.1% (n=7), Negeri Sembilan at 5.3% (n=12), Perak at 3.9% (n=9), Terengganu at 8.3% (n=19), and Labuan at 0.4% (n=1).

Table 1

Sociodemographic variables among respondents

Demographic characteristic (n = 228)	n	%
Gender		
Male	29	12.7
Female	199	87.3
Age group		
18 – 20	208	91
21 – 23	19	8.3
24 – 26	1	0.4
Ethnicity		
Malay	222	97.4
Others (Bumiputera Sabah, Bugis, Dusun, Kadazan dusun)	6	2.6
Programme		
Pharmacy	58	25.4
Nursing	19	8.3
Medical Lab Technology	31	13.6
Environmental Health	75	32.9
Occupational Therapy	28	12.3
Physiotherapy	17	7.5
State		
Kelantan	25	11
Johor	26	11.4
Penang	15	6.6
Kedah	33	14.5
Selangor	43	18.9
Melaka	2	0.9
Perlis	3	1.3
Putrajaya	3	1.3
Kuala Lumpur	8	3.5
Pahang	22	9.6
Sabah	7	3.1
Negeri Sembilan	12	5.3
Perak	9	3.9
Terengganu	19	8.3
Labuan	1	0.4

The Level of Knowledge Related to TB Disease

Table 2 shows the knowledge, attitude, and practices related to TB among respondents. Regarding the respondents' knowledge towards TB, 86% (n=196) knew that TB is caused by

bacteria while most respondents [94.7% (n=216)] recognized that continuous cough is one of TB symptoms. Additionally, 82.9% (n=189) of respondents were aware that TB can be spread through the respiratory route and about 77.2% (n=176) of them realized that TB is a curable disease. Moreover, more than a half [57% (n=130)] believed that Bacillus Calmette-Guerin (BCG) vaccination can prevent TB.

Attitude of Undergraduate Students toward TB Disease

Regarding the respondents' attitude towards TB (Table 2), almost all [99.6% (n=227)] respondents agreed that any information about personal hygiene is important. Furthermore, most [87.7% (n=200)] respondents believed that they might get infected if they have had a close contact with TB patients. Apart from that, 79.4% (n=181) will try to avoid touching the TB patients or any of their stuff while only 5.7% (n=13) would not share their meals with TB patient(s). Lastly, most [83.8% (n=191)] state that they would be terrified if any of their family members is infected with TB.

Practices of Undergraduate Students toward TB Disease

Regarding the respondents' practices towards TB disease is shown in Table 2, only 3.1% (n=7) are smokers and 24.1% (n=55) of them decided to have a medical check-up for TB at least once a year. Additionally, a majority [96.5% (n=220)] stated that they will go to healthcare facilities if they are having prolonged cough or experiencing any of TB symptoms. Additionally, 91.7% (n=209) of them are practicing a proper cough and sneeze etiquette, while 91.2% (n=208) agreed to give their children the BCG immunization.

Table 2

Knowledge, Attitude, and Practices towards TB disease among respondents

Questions	Yes answers (%)	No answer (%)
Knowledge on TB disease		
TB is caused by bacteria?	86	14
Continuous cough is one of the TB symptoms?	94.7	5.3
TB can be spread through the respiratory route?	82.9	17.1
TB is a curable disease?	77.2	22.8
BCG vaccination can prevent TB?	57	43
Attitude on TB disease		
Information on personal hygiene is important?	99.6	0.4
I may be infected if I have close contact with TB patients.	87.7	12.3
I try to not touch TB patients and any of their stuff.	79.4	20.6
Would you share your meals with TB patients?	5.7	94.3
I am terrified if any of my family member is infected with TB.	83.8	16.2
Practice on TB disease		
Are you smoking?	3.1	96.9
Will you have a medical check-up for TB for at least once a year?	24.1	75.9
Will you go to any healthcare facilities if you have a prolonged cough or experience TB symptoms?	96.5	3.5
Do you practice a proper cough and sneeze etiquette?	91.7	8.3
Will you get your children the BCG immunization?	91.2	8.8

Discussion

Among all the undergraduate students, health sciences students play significant responsibilities in preventing and controlling TB in health care environment and institution. These responsibilities are influenced by their knowledge, attitude, and practices regarding TB. When undergraduate students in health sciences show low levels of tuberculosis knowledge, attitude, and practices, their responsibilities in educating patients, investigating cases of TB and advising patients in getting treatments may be affected. Not only that, but they could also even misjudge their own symptoms, resulting in delayed medical care.

Previous research indicates that the level of health sciences students, particularly nursing students, is higher than that of students in other disciplines (Akin et al., 2011; Emili et al., 2002). However, there are still areas that need to be enhanced. According to this study, there were more female participants than male participants, and the majority of them were Environmental Health students. Typically, Environmental Health students have learnt in one of their courses, such as Communicable disease control (CDC), regarding the source of tuberculosis, its transmission, and its investigative and control procedures. However, it is obvious that other medical programs, such as physiotherapy, occupational therapy, and medical laboratory technologies, still require caution since they may encounter patients infected with TB. For example, Selangor has the greatest number of TB cases in Malaysia

(Mohidem et al., 2021), and the majority of students who participated in this study presently reside there.

The overall knowledge of undergraduate students in health sciences on tuberculosis was good, with most (> 80%) have fundamental understanding of the disease's origin, transmission, cure rate and treatment. However, knowledge on vaccination is still low (< 60%). This study suggests that more than half of the students may have received TB disease knowledge through lectures during their program. This level of knowledge is high, especially when compared to Easwaran et al (2015), who stated that just 10.6% of respondents were aware of tuberculosis's causes. In addition, another study showed that nursing students had a modest degree of general knowledge of tuberculosis, misperceived how the disease is transmitted, and had poor views of their vulnerability to it (Chang et al., 2007). According to another survey, although 91.4% of health professions students recognized that TB was spread by aerosols, nearly one-third were unaware of how to administer tuberculin (Jackson et al., 2007). Researchers also agreed that there is a higher risk of contracting the disease for medical students who may interact or work with TB patients (Emili et al., 2002).

The overall attitude of the respondents towards tuberculosis disease is moderate. Most of them (> 80%), chose "Yes" for the question on whether they may get infected if they had close contact with TB patients. This may be because some of them knew that tuberculosis can be spread through air droplets. As for touching TB patients' stuff, a number (79.4%) stated that they tried not to touch belongings of TB patients proving lack of knowledge in this matter. In fact, a previous study by Salleh et al (2018) also reported that only 17% of their respondents did not mind touching TB patients' stuff. Not only that, 94.3% of the respondents also stated that they will not share their meals with TB patients.

The findings of the current study highlight that the overall practice of health sciences undergraduate students towards tuberculosis disease is moderate. While most respondents did not smoke, only 24.1% of the respondents in our study agreed to go for a tuberculosis medical checkup once a year. In fact, in a study by Salleh et al. (2018) using a similar question, only 10.8% of their respondents agreed to do it. Additionally, for the question regarding their willingness to go to the healthcare facilities if they have prolonged cough or TB symptoms, 96.5% are willing. Similarly, a previous study in Kulim, Kedah also reported that 68% of their respondents will go to the health facilities if they have prolonged coughing. Apart from that, this study indicates that more than 90% practice proper cough and sneezing etiquette. Finally, 91.2% respondents agreed to get their child BCG in the future, indicating high level of awareness on the importance of vaccination.

Conclusion

The results of this study indicate that the level of knowledge about tuberculosis is good, but attitudes and practices are only moderate. It suggests that there is a need for a health sciences curriculum or educational program that focuses specifically on TB management and related issues to improve the students' attitudes and practices toward the disease. Future research should also thoroughly assess the knowledge, attitude, and competence of nursing and environmental health students in delivering the right care for patients as well as in investigating TB cases.

Acknowledgement

We acknowledge funding assistance from Universiti Teknologi MARA Cawangan Pulau Pinang for this article.

Corresponding Author

Nadiatul Syima Binti Mohd Shahid (PhD)

Department of Environmental Health, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Cawangan Pulau Pinang, Kampus Bertam, 13200 Kepala Batas, Pulau Pinang, Malaysia.

Email: nadiatul@uitm.edu.my

References

- Abd Rahman, N. H., & Mokhtar, K. S. (2015). Challenges of national TB control program implementation: the Malaysian experience. *Procedia-Social and Behavioral Sciences*, 172, 578-584.
- Al Khalili, S., Al Yaquobi, F., Al Abri, B., Al Thuhli, K., Al Marshoudi, S., Al Rawahi, B., & Al-Abri, S. (2022). Assessing Oman's knowledge, attitude and practice regarding tuberculosis: a cross-sectional study that calls for action. *International Journal of Infectious Diseases*. <https://doi.org/10.1016/j.ijid.2022.06.002>
- Akin, S., Gorak, G., Unsar, S., Mollaoglu, M., Ozdilli, K., & Durna, Z. (2011). Knowledge of and attitudes toward tuberculosis of Turkish nursing and midwifery students. *Nurse education today*, 31(8), 774-779. <https://doi.org/10.1016/j.nedt.2010.12.019>
- Da Silva, E. H., Lima, E., Dos Santos, T. R., & Padoveze, M. C. (2022). Prevalence and incidence of tuberculosis in health workers: A systematic review of the literature. *American Journal of Infection Control*. <https://doi.org/10.1016/j.ajic.2022.01.021>
- Emili, J., Scott, F., Upshur, R. E. G., Schmuck, M. L., & John, K. R. (2002). Attitudes toward tuberculosis of final year medical students from Canada, India, and Uganda. *Teaching and Learning in Medicine*, 14(3), 168-174.
- Rundi, C. (2010). Understanding tuberculosis: perspectives and experiences of the people of Sabah, East Malaysia. *Journal of health, population, and nutrition*, 28(2), 114-123. <https://doi.org/10.3329/jhpn.v28i2.4880>
- Harstad, I., Raen, A. R., Selseng, S., & Sagvik, E. (2022). Knowledge, attitudes and practices on tuberculosis among screened immigrants in Norway. A cross-sectional study. *Journal of Clinical Tuberculosis and Other Mycobacterial Diseases*, 100326. <https://doi.org/10.1016/j.jctube.2022.100326>
- Nishimura, T., Ota, M., Mori, M., Fujiwara, H., Takano, Y., Kato, S., Kawabe, H., & Hasegawa, N. (2018). Risk of tuberculosis infection among health care workers and nursing students in Japan. *Journal of Infection and Chemotherapy*, 24(11), 921-924. <https://doi.org/10.1016/j.jiac.2018.08.006>
- Salleh, S. F. M., Rahman, N. A., Rahman, N. I., & Haque, M. (2018). Knowledge, attitude and practice towards tuberculosis among community of Kulim municipal council, Kedah, Malaysia. *International Medical Journal*, 25(5), 299-303.
- Jackson, M., Harrity, S., Hoffman, H., & Catanzaro A. (2007). A survey of health professions students for knowledge, attitudes, and confidence about tuberculosis, 2005. *BMC Public Health*, 7, 219.

- Jamaludin T. S. S., Ismail, N., & Saidi, S. (2019). Knowledge, awareness, and perception towards tuberculosis disease among International Islamic University Malaysia Kuantan students. *Enfermería Clínica*. 29, 771-775. <https://doi.org/10.1016/j.enfcli.2019.04.116>
- Hassan, R. A. R., & Said, B. A. Knowledge, attitude, and practice regarding tuberculosis: Community-based study in Baghdad. *International Journal of Advanced Research in Medicine*; 1(2), 33-37. <https://doi.org/10.22271/27069567.2019.v1.i2a.16>
- Zamri, H. F., Ruzan, I. N., Ramli, S. R., & Ahmad, N. (2022). Predominance of the East-Asian Beijing genotype in a Mycobacterium tuberculosis drug-resistant population in Central Malaysia. *Journal of Global Antimicrobial Resistance*.
<https://doi.org/10.1016/j.jgar.2022.06.009>
- World Health Organization. In: global tuberculosis report. Geneva: WHO; 2017.
Available at:
<http://apps.who.int/iris/bitstream/handle/10665/259366/9789241565516>.
- Easwaran, M., Ramachandran, D., Ramasamy, R., George, N., Mathew, M., Bazroy, J., & Singh, Z. (2015). Knowledge, attitude, and practice regarding tuberculosis among rural population in Tamil Nadu. *International Journal of Medical Science and Public Health*, 4(12), 1681.
- Mohidem, N. A., Osman, M., Hashim, Z., Muharam, F. M., Mohd Elias, S., & Shaharudin, R., (2021). Association of sociodemographic and environmental factors with spatial distribution of tuberculosis cases in Gombak, Selangor, Malaysia. *PloS one*, 16(6), e0252146.
- World Health Organization. Global Tuberculosis Report: WHO, Geneva. (2019). Accessed May 8, 2022.<https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf?ua=1>