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ASSESSMENT OF COMMUNITY AWARENESS TOWARDS TUBERCULOSIS AS A REEMERGING DISEASE, CROSS-SECTIONAL STUDY, KSA

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ABSTRACT

Objective: The aim of this study is to assess the awareness of TB infection, its complications, and the importance of TB vaccination and healthy lifestyle practices.
Material and methods: This study has been approved by Hail University ethical committee, a cross-sectional study in different regions in KSA from the 1st of January 2023 till the 30th of April 2023. A sample size of 917 included people above 18 years old, males and females, and all levels of education.
Results: A total of 917 participants were included in this study; 62.2% of them were female, 64% were between 18-36 years old, 93.8% were Saudis, and 51.5% were college graduates. The results related to the knowledge of the participants showed that 81.6% had heard about tuberculosis, with the majority relying on educators, relatives, and media as primary sources of information (33.9%, 27.6%, and 15.5%, respectively). 86.6% of respondents considered TB as a very serious disease. Regarding participants' TB practices, 38.5% of them would seek help by visiting a healthcare facility if they got TB, 28% would go to pharmacies, and 14.7% would pursue self-treatment options. Most of those who chose options other than healthcare facilities explained that their behavior was due to not knowing where to go. Women were less likely to have poor knowledge in comparison to men (0.61, 95% CI, 0.43-0.89). Participants over 60 years, non-Saudi residents with lower educational levels had less knowledge compared to others.
Conclusion: Although of the good level of knowledge about Tuberculosis among population, there is gap on their practice. Upcoming public health campaigns should focus about what is right action the patient need if he got TB.

Keywords: Orientation, Tuberculosis, Reemerging Disease, Cross-sectional Study, KSA

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INTRODUCTION

Tuberculosis (TB) is a life-threatening disease of a global burden. Studies have demonstrated that TB is a disease that cannot be controlled by vaccination alone. The challenge is compounded by factors like overcrowded populations and the continuous stream of millions visiting KSA for Hajj and Umrah throughout the year [1]. Over the past two decades, TB has shown a re-emerging trend in both reported cases and resistance all over the world. Factors such as demographics, socio-economic instability, and high morbidity rates [2]. Because it's a reemerging disease, WHO End TB Strategy (2015-2030) aimed to eradicate the disease.

Tuberculosis is a chronic disease caused by Mycobacterium tuberculosis, a rod-shaped, non-spore-forming, aerobic bacterium [3]. transmission is by inhalation of the bacteria containing air droplets that bypass the mucociliary system, invade the alveolus, and are engulfed by macrophages. [2,4]. Active TB infection presents predominantly with respiratory symptoms such as cough, hemoptysis chest pain, respiratory insufficiency, and systemic symptoms like weakness, fever, loss of appetite, and night sweats [1,3,5]. In 15% of patients, there can be extrapulmonary TB infection involving the pleura, liver, lymph nodes, spleen, musculoskeletal system, heart, brain, meninges, genital-urinary system, peritoneum, and skin [2,6]. These extrapulmonary presentations often require a longer and more intensive drug regimen [7]. Diagnosis of TB can be made via multiple laboratory techniques, including direct stained sputum smear and culture and susceptibility testing, along with newer techniques, including the Nucleic Acid Amplification technique (NAAT) such as Polymerase Chain Reaction (PCR) [2,3,8]. Mycobacterium Tuberculosis poses a significant public health threat as one of the most prevalent airborne infections worldwide, potentially leading to life-threatening complications. This study aims to assess the knowledge, attitude, and practice towards TB infection in Saudi Arabia.

MATERIAL AND METHODS

Study Design: This is a descriptive cross-sectional study to assess the general population's knowledge, attitude, and practice towards TB infection in Saudi Arabia.

Study population: A sample size of 917 was calculated by OpenEpi version 3.0, and included people above 18 years old, males and females, citizens and residents, and all levels of education. Participants who did not finish the entire questionnaire were excluded.

Sample collection and processing: Data was obtained by distributing an online questionnaire on social media from the 1st of January 2023 till the 30th of April 2023. The questionnaire, designed by Google Forms,

consists of 29 questions divided into two sections, and it covers the following:
Section 1: sociodemographic-related information: gender, nationality, marital status, educational level, and district.
Section 2: disease-related information: This section has a series of questions designed to evaluate the knowledge, attitude, and practice towards TB infection.

Study sampling: A total of 917 participated in this study. Statistical Analysis: Data analysis was performed using Statistical Package for Social Sciences SPSS (version 22) program at a significance of > 0.05 and Microsoft Excel-2016 software.

Ethical Consent: Informed Consent was addressed during this study; Ethical approval was obtained from the ethical committee at the University of Hail (Number H-2023-235). The purpose of the study was explained to all participants, and only those who provided informed consent were included in the study. All participants were guaranteed that their confidentiality would be maintained, and no personal information was requested on the questionnaire.

RESULTS

The survey included 917 participants. Sociodemographic characteristics are presented in Table 1. Among the participants, females predominated (62.2%). Most of the participants were in the age groups 18-36 years and 37-56 years (64% and 31.5%, respectively), and Saudi nationals made up 93.8% of the participants. In addition, (3.2%) of the participants had no formal education, (4.5%) had an education at the elementary school level, 9.5% finished a middle school education, (31.2%) had a secondary education, and (51.5%) were college graduates.

Table 1: Sociodemographic characteristics of study participants.

Characteristics	Number	Percentage (%)
Gender		
Male	347	37.8
Female	570	62.2
Age (years)		
18-36	587	64.0
37-56	289	31.5
60+	41	4.5
Nationality		
Saudi	860	93.8
Non-Saudi	57	6.2
Marital state		
Widowed	434	47.3
Married	399	43.5
Single	41	4.5
Divorced	26	2.8
Separated	17	1.9
Educational level		
No formal education	30	3.2
Elementary school	41	4.5
Intermediate school	87	9.5
High school	286	31.2
Graduate level	472	51.5

The results related to the knowledge of the participants showed that (81.6%) had heard about tuberculosis and had good knowledge in general, with the majority relying on preachers and teachers, family and friends, media and leaflets, and posters as their primary source of information (33.9%, 27.6%, and 15.5%, 9.7% respectively). Only 13.3% of participants rely on the healthcare providers. Additional data about participants' knowledge is presented in Table 2.

Table 2: Participants' knowledge of Tuberculosis

Knowledge	Number	Percentage (%)
Population type		
Non- Tuberculosis cases	854	93.1
Tuberculosis cases in the family	16	1.7
Tuberculosis cases	47	5.1
District		
Northern area	112	12.2
Southern area	199	21.7
Middle area	193	21.0
East area	216	23.6
West area	197	21.5
Have you heard about Tuberculosis?		
Yes	748	81.6
No	169	18.4
Source of information		
TV/Radio/Newspaper	142	15.5
Leaflets/Poster/Signboard/Billboard	89	9.7
Friend/Relatives/Family Member	253	27.6
Health professionals	122	13.3
Religious leaders/teacher	311	33.9
Can Tuberculosis be transmitted?		
Yes	555	60.5
No	50	5.5
I don't know	312	34.0
Tuberculosis infection could be related to life style		
Yes	568	61.9
No	349	38.1
Tuberculosis Transmissions		
Air when choughing or sneezing	193	21.0
Sharing utensils	48	5.2
Touching a person with TB	467	50.9
Some types of Food	5	.5
sexual contact	116	12.6
Mosquito bites	88	9.6
Cause of Tuberculosis		
Infection by Bacteria	761	83.0
Cold air	28	3.1
Shortage of food	26	2.8
Smoking	58	6.3
Dust	16	1.7
Sunlight	14	1.5
Hot climate	14	1.5
Signs/symptoms of Tuberculosis		
Cough for two weeks	58	6.3
Sputum with blood	257	28.0
Weight loss/Loss of appetite	353	38.5
Fever and sweating	114	12.4
Chest pain	115	12.5
I don't know	20	2.2

Table 3: Participants' attitudes and stigmatization of tuberculosis and patients with tuberculosis.

Attitude	Number	Percentage (%)
Tuberculosis can be cured		
Yes	455	49.6
No	50	5.5
I don't know	412	44.9
Treatment method		
Herbal remedies	228	24.9
Home rest without treatment	230	25.1
prescribed antibiotics	261	28.5
Self-treatment	98	10.7
I don't know	90	9.8
Can Tuberculosis be prevented?		
Yes	270	29.4
No	89	9.7
I don't know	558	60.9
If yes what is the preventive methods		
Vaccination	66	7.2
Avoid shaking hands	242	26.4
Face mask	609	66.4
What age is the tuberculosis immunization scheduled (BCG) in KSA		
6 months	426	46.5
9 months	491	53.5
In your opinion, how serious disease is Tuberculosis?		
Very serious	794	86.6
Not serious	123	13.4
Are you afraid to get infected with Tuberculosis?		
Yes	722	78.7
No	195	21.3

When investigating the attitude and stigma related to TB, most of the respondents considered TB to be a very serious disease (86.6%). see Table 3.

Regarding participants' TB practices, most respondents said they would seek help by visiting a healthcare facility if they experienced symptoms of TB (38.5%), while others said they would go to pharmacies or pursue self-treatment options (28% and 14.7%, respectively). Most of those who chose options other than healthcare facilities explained that their response was due to not knowing where to go. More data on practice is provided in Table 4.

Participants' gender played a major role in the results, as women were less likely to have poor knowledge than men (0.61, 95% CI, 0.43-0.89). Participants over 60 years old had substantially less knowledge about TB compared with participants 18-28 years old (7.03, 95% CI, 3.81-9.47). In addition, non-Saudi residents had less knowledge than Saudi residents (56.71, 95% CI, 22.13-119.68). Level of education also played a substantial role; university graduates had the most knowledge about TB compared with participants with no formal education and other education levels (0.041, 95% CI, 0.01-0.39). For more data on variables predicting poor TB knowledge, see Table 5.

DISCUSSION

This study showed that 81.6% of the participants had good knowledge about TB, which is higher than other studies done on a cross-sectional study conducted in the western regions of Saudi Arabia, indicating poor knowledge of TB among (64.7%) of the participants [9]. There are other studies in both Eastern and Western regions in Saudi Arabia [10, 11] and another study in Eastern Amhara regional state, Ethiopia [12], showing poor knowledge results about tuberculosis. Regarding the cause of the

Table 4: Participants' practices related to tuberculosis.

Practice	Number	Percentage (%)
Will you keep it secret when any family member gets Tuberculosis?		
Yes	307	33.5
No	610	66.5
Would you be willing to work with someone previously treated for Tuberculosis		
Yes	575	62.7
No	342	37.3
What is your feeling towards people with Tuberculosis disease?		
Compassion and desire to help	53	5.8
Compassion, but stay away from them	246	26.8
It is their problem	387	42.2
I fear them because they may infect me	165	18.0
I have no particular feeling	66	7.2
What would be your reaction If you found out that you have Tuberculosis		
Go To Pharmacy	257	28.0
Go To Health Facility	353	38.5
Go To Traditional Healer	58	6.3
Pursue Self-Treatment Options (Herbs, Etc.)	135	14.7
Other (Specify)	114	12.4
If you had symptoms of Tuberculosis, at what point would you seek medical help		
When treatment on my own does not work	751	81.9
When symptoms last for two or more weeks	166	18.1
Who would you talk to about your illness if you had Tuberculosis?		
A doctor or medical worker	193	21.0
Spouse	48	5.2
Parent	467	50.9
Close friend	93	10.1
No one	116	12.6
Do you think some people more likely to become infected with Tuberculosis than others		
Yes	682	74.4
No	42	4.6
I don't know	193	21.0
If yes, who is more likely to be infected		
Children	193	21.0
Men	48	5.2
Women	467	50.9
Both gender	5	.5
Old people	116	12.6
People with specific conditions (diabetes, kidney failure, liver disease etc.	88	9.6
In your opinion, TB vaccination and a healthy lifestyle can prevent infection by TB		
Yes	682	74.4
No	42	4.6

disease, the majority of the participants in this study had heard of TB (81.6%) and knew that bacteria causing it (83%), compared to a study conducted in the western region of

Table 5: Variables predicting poor knowledge of tuberculosis

OR: odds ratio; AOR: adjusted odds ratio; R: reference category; CI: confidence interval
*: P-value <0.05

Variable	OR (95% CI)	AOR (95% CI)
Gender		
Male	R	R
Female	0.61 (0.43-0.89)*	0.37 (0.18-0.51)*
Age (years)		
18-36	R	R
37-56	4.49 (3.39-7.47) *	2.17 (0.97-4.78)
60+	7.03 (3.81-9.47) *	3.45 (1.43-6.82) *
Nationality		
Saudi	R	R
Non-Saudi	56.71 (22.13-119.68)*	30.44 (11.43-87.09) *
Marital state		
Widowed	R	R
Married	1.42 (0.08-24.43)	4.19 (0.21-79.21)
Single	1.52 (0.13-17.86)	2.61 (0.20-34.51)
Divorced	0.19 (0.021-1.30)	0.72 (0.11-6.17)
Separated	0.032 (0.01-0.31) *	0.31 (0.02-3.28)
Educational level		
No formal education	R	R
Elementary school	1.32 (0.05-23.23)	4.09 (0.18-76.11)
Intermediate school	1.42 (0.11-15.56)	2.35 (0.17-32.41)
High school	0.21 (0.023-1.60)	0.89 (0.13-7.19)
Graduate level	0.041 (0.01-0.39) *	0.44 (0.03-4.31)

Saudi Arabia that revealed that only (65.6%) of the participants knew the cause of TB [9]. Regarding the risk factors for poor TB awareness, our results showed an association between poor TB awareness and age and educational level. People over the age of 60 are generally poorly knowledgeable about TB compared with participants under 28 of age, and people with a higher level of education tend to be knowledgeable about TB. That is consistent with several studies showing similar results in Saudi Arabia and other countries that have reported an association between having a good level of knowledge and younger age and higher levels of education [9, 11-13]. In this study, we found that women were less likely to have poor knowledge, which is consistent with studies showing similar results in the Western Region of Saudi Arabia [9]. In contrast, in a study conducted among women in Tabuk, Saudi Arabia, more than two-thirds of the studied population had poor knowledge of TB [14]. The participant's understanding of TB symptoms was inadequate. Less than half of the respondents were aware of the typical TB infection symptoms, which include (a chronic cough lasting more than three weeks, a high fever, nightly sweating, and weight loss). These

results are consistent with similar studies conducted in Saudi Arabia and Lesotho [10, 15]. When investigating the attitude and stigma related to TB, we found that 86.6% of study respondents considered TB a very serious disease, and 78.7% of respondents feared TB; these findings are consistent with studies done in Saudi Arabia and other countries. [11, 16, 17]. Also, half of the participants in this study were aware of the curability of the disease; this is consistent with other global studies in Brazil, India, and Tanzania [18-20]. About the treatment method of TB, only 28% of participants know that it is treated with antibiotics, and half of them think that home rest without treatment or the use of herbal remedies is a method of treatment (25.1% and 24.9%, respectively). These results are similar to the study conducted in Ethiopia, where (45.3%) considered TB a self-limiting disease [12]. Unlike the study done in Jeddah, where 50% of the participants considered modern medication as treatment [9]. Regarding participants' TB practices, 38.5% of respondents said they would seek help by visiting a healthcare facility if they experienced symptoms of TB. The result is similar to that of the study in Saudi Arabia and Ethiopia [10, 21]. Our participant has a knowledge gap regarding who is most likely to get an infection. Few of the respondents consider old people and people with specific conditions to be at high risk of being infected with TB (12.6% and 9.6%, respectively). However, (50.9%) of them consider women to be at higher risk of getting infected. However, the study done in India indicates direct contact as the highest risk factor [22].

Limitation of study

The aim of this study was to generalize our study to the entire population of the Kingdom of Saudi Arabia. However, some limitations have appeared. First, only 4.5% of our participants are above 60 years old. Second, non-Saudi participants in our study are only 6.2%. Moreover, we depended mainly on online questionnaires and didn't use another assessment tool to collect our data.

CONCLUSION

This study revealed that poor knowledge appears to be more prevalent among men than among women and individuals over the age of 60. In addition, more non-Saudi residents have poor knowledge, attitudes, and practices related to tuberculosis. The level of education is an important factor that may control the level of education. Therefore, it is important to increase the level of awareness of tuberculosis among the general population in Saudi Arabia, which will be done through the efforts of family physicians, general practitioners, media, and teachers in schools.

Recommendation

Education of the elderly community and volunteers who are serving pilgrims and Umrah performers, especially in Makkah and Madinah, through workshops, leaflets, posters, and screen boards. It is also recommended to be in different languages for pilgrims to help control the transmission and show them how to deal with such cases. The prevention and management of Tuberculosis are based on good knowledge and education in society. Therefore, Health authorities should intensify their efforts and arrange specific educational programs on the

reemerging disease, the consequences of the spread of infection among a large sector of the population, and the importance of seeking the proper treatment and vaccinations.

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DISCLOSURE

The authors report no conflicts of interest in this work

REFERENCES

1. Zaman K. Tuberculosis: a global health problem. Journal of health, population, and nutrition. 2010 Apr;28(2):111.

2. Ducati RG, Ruffino-Netto A, Basso LA, Santos DS. The resumption of consumption: a review on tuberculosis. Memórias do Instituto Oswaldo Cruz. 2006;101:697-714.

3. Knechel NA. Tuberculosis: pathophysiology, clinical features, and diagnosis. Critical care nurse. 2009 Apr 1;29(2):34-43.

4. Glickman MS, Jacobs WR. Microbial pathogenesis of Mycobacterium tuberculosis: dawn of a discipline. Cell. 2001 Feb 23;104(4):477-85.

5. Maher D. 13 The natural history of Mycobacterium tuberculosis infection in adults. Tuberculosis E-Book: A Comprehensive Clinical Reference. 2009 Mar 24:129.

6. Shajahan R, Navaratnam P, Kasinathan G, Kadirvelu A, Pillai N. Predictors of re-emerging tuberculosis: a review. Open Access Library Journal. 2016 Mar 31;3(3):1-8.

7. World Health Organization. Global tuberculosis report 2015. World Health Organization; 2015.

8. Lauzardo M, Ashkin D. Phthisiology at the dawn of the new century. Chest. 2000 May 1;117(5):1455-73.

9. Almalki ME, Almuqati FS, Alasmari R, Enani MJ, Bahwirith AA, Alloqmani AA, Alqurashi A, Hassan-Hussein A, Bahwirith A, Alloqmani A. A Cross-Sectional Study of Tuberculosis Knowledge, Attitude, and Practice Among the General Population in the Western Region of Saudi Arabia. Cureus. 2022 Oct 6;14(10).

10. Almuhanna MM, Busaleh MJ, Alkhalaf HA, AlMalak YT, Alhussain ZA, Almustafa MA, Ashor NM, Alhomaid TA, Aldubaykhi MM, Alshammasi MS, Alhuthali MJ. Evaluation of tuberculosis awareness in eastern and western Saudi Arabia. The Egyptian Journal of Hospital Medicine. 2017 Oct 1;69(1):1661-7.

11. Aseeri AA, Turkestani RA, Alamri MA, Algabr GA, Alobaysi SA, Alghazal Z, Alghamdi AM, Abdulmotaali WA, Almane MA, Asiri SH. Assessment of knowledge, attitudes and practices regarding pulmonary tuberculosis among Saudi Arabia community in 2017. The Egyptian journal of hospital medicine. 2017 Oct 1;69(5):2421-5.

12. Esmael A, Ali I, Agonafir M, Desale A, Yaregal Z, Desta K. Assessment of patients' knowledge, attitude, and practice regarding pulmonary tuberculosis in eastern Amhara regional state, Ethiopia: cross-sectional study. The American journal of tropical medicine and hygiene. 2013 Apr 4;88(4):785.

13. Mushtaq MU, Majrooh MA, Ahmad W, Rizwan M, Luqman MQ, Aslam MJ, Siddiqui AM, Akram J, Shad MA. Knowledge, attitudes and practices regarding tuberculosis in two districts of Punjab, Pakistan. The international journal of tuberculosis and lung disease. 2010 Mar 1;14(3):303.

14. Sayed H, Shalabi A, Shaqran T, Younis M, Alatawi A. Knowledge, attitude and preventive behavior of Saudi women regarding tuberculosis at Tabuk City. Med Sci. 2020;103:1614-27.

15. Luba TR, Tang S, Liu Q, Gebremedhin SA, Kisasi MD, Feng Z. Knowledge, attitude and associated factors towards tuberculosis in Lesotho: a population based study. BMC infectious diseases. 2019 Dec;19:1-0.

16. Esmael A, Ali I, Agonafir M, Desale A, Yaregal Z, Desta K. Assessment of patients' knowledge, attitude, and practice regarding pulmonary tuberculosis in eastern Amhara regional state, Ethiopia: cross-sectional study. The American journal of tropical medicine and hygiene. 2013 Apr 4;88(4):785.

17. Irani L, Kabalimu TK, Kasesela S. Knowledge and healthcare seeking behaviour of pulmonary tuberculosis patients attending Ilala District Hospital, Tanzania. Tanzania Journal of Health Research. 2007;9(3):169-73.

18. Silva LS, de Sousa JG, de Paiva LO, Roberto O, Pinheiro LF. Knowledge about tuberculosis among Brazilians. J Clin Respir Dis Care. 2016;2(106):2472-1247.

19. Vidhani M, Vadgama P. Awareness regarding pulmonary tuberculosis-a study among patient taking treatment of tuberculosis in rural Surat, Gujarat. National Journal of medical research. 2012 Dec 31;2(04):452-5.

20. Kilale AM, Mushi AK, Lema LA, Kunda J, Mukasi CE, Mwaseba D, Range NS, Mfinanga GS. Perceptions of tuberculosis and treatment seeking behaviour in Ilala and Kinondoni Municipalities in

Tanzania. Tanzania Journal of Health Research. 2008 Jun 23;10(2):89-94.

21. Kwedi Nolna S, Kammogne ID, Ndzinga R, Afanda B, Ntonè R, Boum Y, Nolna D. Community knowledge, attitudes and practices in relation to tuberculosis in Cameroon. The International Journal of Tuberculosis and Lung Disease. 2016 Sep 1;20(9):1199-204.

22. Bäckdahl T, Sharma M. Knowledge and transmission risk awareness of tuberculosis among the pilgrims attending a religious mass gathering in India: a cross-sectional study. BMC Public Health. 2021 Dec;21:1-2.