

## Evaluation of Tuberculosis Awareness in Eastern and Western Saudi Arabia

Mahdi M Almuhanha<sup>1</sup>, Mohammed J Busaleh<sup>1</sup>, Hassan A Alkhalaf<sup>1</sup>, Yousif T AlMalak<sup>1</sup>, Zahra A Alhussain<sup>1</sup>, Meshal A Almustafa<sup>1</sup>, Nshwa M Ashor<sup>2</sup>, Tameem A Alhomaid<sup>3</sup>, Muhammad M Aldubaykhi<sup>3</sup>, Muath S Alshammasi<sup>3</sup>, Saleh A alghadouni<sup>3</sup>, Muna J Alhuthali<sup>4</sup>, Hassan M Alradhwan<sup>5</sup>, Mohammed D Alharbi<sup>6</sup>, Hadeel A AlZiyadi<sup>7</sup>, Anas S alsamaani<sup>8</sup>

<sup>1</sup>King Faisal University, <sup>2</sup>KAUH, <sup>3</sup>Qassim University, <sup>4</sup>Umm Alqura University, <sup>5</sup>Wroclaw Medical University, <sup>6</sup>Al Imam Mohammad Ibn Saud Islamic University, <sup>7</sup>Taif University, <sup>8</sup>Qassim Mental Health Hospital

### ABSTRACT

**Background:** Previously, and specifically at the last period of 20th century, TB was one of the major leading cause of death. However, the incidence of TB has been decreased. Around ten million cases have been reported in 2015, 61% of them are recorded in Asia. The yearly incidence rate of TB that is recorded in Saudi Arabia is 12/100,000. Eradicating TB is the future plan for the entire world, and WHO are intending to get free TB world. This plan can't be real if general populations are not aware of TB.

**Aim:** The aim of this study is to assess knowledge, attitude and practice with TB among eastern and western Saudi Arabia community. **Method:** That was cross-sectional study. So, participants have been selected by random sample from public places in eastern and western Saudi Arabia. The tool that we used to collect data is Self-administrated questionnaire contains demographic part and awareness of TB evaluation part. Then we compare evaluations results according to many variables specifically the region by Chi-Square Test. We consider the result of the comparison is significant level once P-value < 0.05.

**Result:** Around 750 participants in this study (Response rate 93.75%) by mean age 32. Only 3.6% have a history of TB and 16.8 % have relative with a history of TB. Only 18.1% of participants have good knowledge, only 15.1% have favorable attitude and most of the participants have a good practice (63.7%). People with high degree educational level have better knowledge than others. People who have relative with a history of TB have better knowledge. Females are better in attitude more than male, western populations have a better attitude than eastern, and people who have relative with a history of TB have a better attitude. People with high degree education have a better practice than others and people who have relative with a history of TB have a better practice.

**Conclusion:** Eastern and western region in Saudi Arabia have a very poor knowledge and Attitude towards TB, and Western populations have better attitude compared to that of Eastern. Participants have high percentage of a good practice which still needs to be improved Level of education is an important factor that may control the level of knowledge about TB.

**Keywords:** Saudi Arabia, Awareness, Tuberculosis, TB.

### INTRODUCTION

Mycobacterium tuberculosis is the bacteria that cause infectious disease that is mostly affecting lungs called Tuberculosis (TB) [1]. Previously, and specifically at the last period of the 20th century, TB was one of the major leading cause of death. And that due to many causes such as the spread of HIV/AIDs (Human Immune Deficiency Virus), socioeconomic status alterations, the growth of populations, migration and many other factors [2]. For the time being, the world is still in challenging to control of TB, however, the incidence of TB has been decreased [3,4]. Around ten million cases have been reported in 2015; 61% of them are recorded in Asia [4].

When we talk about Saudi country, it is considered as the third largest country in the Middle East, and has a large number of population in which they are around 31 million (this is the

last record on 2016 done by Saudi General Authority for Statistics) [5,6]. The yearly incidence rate of TB that is recorded in Saudi Arabia is 12/100,000 according to WHO (World Health Organizations) [7]. Like what happened all over the world, TB incidence has been decreased in Saudi Arabia from 2000 AD till in the present time. For all that what Saudi government does to fight TB, it is still not fully adequate and sufficient. In which WHO's success rate of the treatment target is 85%, and success rate in Saudi Arabia is 62% recorded in 2014 [5,7,8]. Eradicating TB is the future plan for the entire world, and WHO is intending to get free TB world. And they are intending to reduce TB mortality cases 95% and 90% protecting from new cases between the years 2015 AD to 2035 AD [9].

This plan can't be real if the general population is not aware of TB. So, general population should know the definition, causes, transmission mode, and preventive method. In which level of knowledge is an important factor to increase treatment compliance according to and following the previous research results carried out on that dangerous disease. In general, multiple factors are contributing on the level of awareness of TB like social and cultural differences, gender and many factors<sup>[3]</sup>.

We found that there are poor sources of information about TB level of knowledge, attitude, and practice among Saudis.

The aim this study is to assess knowledge, attitude and practice with TB among eastern and Western Saudi Arabia community.

## METHODOLOGY

Saudi Arabia is a country which was dedicated to making this study; we tried to include general population of Eastern and Western regions.

That was cross-sectional study. So, participants have been selected at random. In which we selected public places such as mosques, cafes, malls, clubs and etc. to choose general population randomly by data collector and starting to introduce and explain our study .

The tool that was used to collect data was a Self-administrated questionnaire. It consists of two parts; first one is to collect demographic data about the participants which include age, gender, Job, Nationality, Educational level, Residency, Marital State. While in the second part we included knowledge, attitude and practice toward TB assessment [Table 1]. We gave a score for each question to assess these elements. We categorized each element as good/favorable or poor/unfavorable according to their scores. We have five items to assess knowledge and participant will get poor knowledge once he/she didn't answer all five items as follow; TB is caused by bacteria, transmitted by airborne route, known by a cough more than two weeks as symptom, prevented by covering mouth & nose at sneezing or coughing, has free treatment available. Also, we have three items to assess attitude and participant will get unfavorable attitude once he/she didn't mention all three items as follow; TB is very serious, I prefer to seek health care once I had TB symptoms, I prefer to help TB patients. Lastly, we have only two items to assess

practice and participant will get poor practice once he/she didn't point out both two items as follow; I prefer modern health care for TB treatment and I will visit health care facility once I had TB symptoms.

Then we compare these scores according to many other variables specifically the region by Chi-Square Test. We consider the result of comparison as significant level once P-value < 0.05 .

After preparing our questionnaire we translated to the Arabic language as it is the main language in Saudi Arabia and then we printed around 800 questionnaires to distribute half of them on Eastern region and a half on Western.

Ethical considerations: No one of participants completed the questionnaire before knowing all parts of it and aim of the study.

The study was approved by the Ethics Board of Umm AlQura University.

Data analysis: analysis was done by IBM.SPSS Statistics version 24.

## RESULT

This research is targeted to 800 participants, but there are 50 persons apologized to complete questionnaires (response rate is 93.75%). Mean age of participants was 32, younger one was 12 years and older was 81 years. Female people were most of our participants, in which females were 495 (66.0%) and males were 255 (34.0%). Around a quarter of participants were students (24.4%), percentage 38.5% are employees, 5.3% are retired, 2.1% are self-employed and 29.6% have no job. Saudi people were more than 96% of our participants. By asking about educational level, we found that around 54.9% have a bachelor degree, 8.0% are at primary school level, 32.4% are in high school level, 4.5% have higher than bachelor degree level and remaining (0.1%) did not enter school. Most of the participants are married; they were 480 persons (64.0%). We could not find more than 87 participants from villages (11.6%), remaining 663 persons (88.4%) are from cities. Exactly half of participants are from the eastern region and half were from the western region [Table 1].

Regarding the history of TB, only 27 (3.6%) persons of our participants had a history of TB before. And 126(16.8%) persons of participants had relative with a history of TB [Table 1].

**Table 1:????**

Age Mean: 32	Minimum = 12	Maximum =81
	Frequency (%)	
<b>Gender</b>	Male	255(34.0)
	Female	495(66.0)
<b>Job status of sponders</b>	Student	183 (24.4)
	Employee	289(38.5)
	Retired	40(5.3)
	Free business	16(2.1)
	No Job	222(29.6)
<b>Nationality</b>	Saudi	721(96.1)
	Non-Saudi	29(3.9)
<b>Educational level</b>	Did not enter school	1(.1)
	Primary school	60(8.0)
	high school	243(32.4)
	Bachelor	412(54.9)
	High degrees	34(4.5)
	<b>Marital status</b>	Married
Single		270(36.0)
<b>Region</b>	Eastern	375(50)
	Western	375(50)
<b>Residency</b>	City	663(88.4)
	Village	87(11.6)
<b>Had History of TB</b>	Yes	27(3.6)
	No	723(96.4)
<b>Had relative th History of TB</b>	Yes	126(16.8)
	No	624(83.2)
<b>Total</b>		750(100)

By asking participants seven questions, we evaluated the level of knowledge. In which 242 people (32.3%) mentioned that Bacteria is the cause of TB, but most of the participants (51.2%) answered the question about TB causes by saying "I don't know" and remaining mentioned other causes like cold air, smoking, spoiled soil or poor hygiene. We found an acceptable percentage of participants (53.5%) who mentioned coughing droplets as a mode of transmission of TB, around 40% of participants don't know the mode of transmission and remaining 7% mentioned handshake and sharing dishes as the route of transmission.

About half of our participants (44.4%) don't know whether a cough for more than two weeks is a symptom of TB or not, while also there is a small percentage (4.0%) Deny that idea and most of the participants (51.6%) agreed with this information. Preventive methods according to point of view of our participants were variable, in which 70.7 of participants approved that covering mouth while coughing or sneezing is a preventive method, while there were some wrong beliefs such as those 271 people (36.1%) who suggested avoiding handshaking and 122 people (16.3%) who suggested that closing windows could be a preventive method.

Most of the participants (66.4%) agreed that TB is curable, but still, there is high percentage of people who are either disagree or don't know (1.7% and 31.9% respectively). Around half of the participants only agreed that there is a free treatment for TB and remaining are either disagree or don't know (2.5% and 47.2% respectively) [Table 2].

Table 2: ?????

Knowledge Assessments	Frequency	Percentage	
<b>What is the cause of TB?</b>			
Cold Air	19	2.5	
Smoking	46	6.1	
Bacteria	242	32.3	
Spoiled soil	5	.7	
Poor hygiene	54	7.2	
I don't Know	384	51.2	
<b>What is the mode of transmission TB?</b>			
Handshake	23	3.1	
Coughing droplets	401	53.5	
Sharing Dish	23	3.1	
I don't know	303	40.4	
<b>What are signs and symptoms of TB?</b>			
	<b>Yes (%)</b>	<b>No (%)</b>	<b>I don't Know</b>
Hemoptysis	448(59.7)	19(2.5)	283(37.7)
Weight Loss	323(43.1)	65(8.7)	362(48.3)
Tiredness	422(56.3)	28(3.7)	300(40.0)
Cough for more than 2 weeks	387(51.6)	30(4.0)	333(44.4)
Fever	320(42.7)	56(7.5)	374(49.9)
<b>What are preventions methods of TB?</b>			
Washing Hands	491(65.5)	38(5.1)	221(29.5)
Avoid Handshaking	271(36.1)	177(23.6)	302(40.3)
Cover mouth when coughing/sneezing	530(70.7)	20(2.7)	200(26.6)
Close Windows	122(16.3)	324(43.2)	304(40.5)
Isolating of TB patients	446(59.5)	54(7.2)	250(33.3)
Avoid Sharing Dishes	376(50.1)	89(11.9)	285(38.0)
Vaccinations	530(70.7)	14(1.9)	206(27.5)
Good Nutrition	457(60.9)	60(8.0)	233(31.1)
<b>Is TB curable?</b>	498(66.4)	13(1.7)	239(31.9)
<b>Is there a free treatment for TB?</b>	377(50.3)	19(2.5)	354(47.2)
<b>Risk of defaulting from treatment</b>			
Death	343(45.7)	61(8.1)	346(46.1)
Relapsing	461(61.5)	22(2.9)	267(35.6)
Drug resistance	222(29.6)	99(13.2)	429(57.2)
No Cure	351(46.8)	68(9.1)	331(44.1)

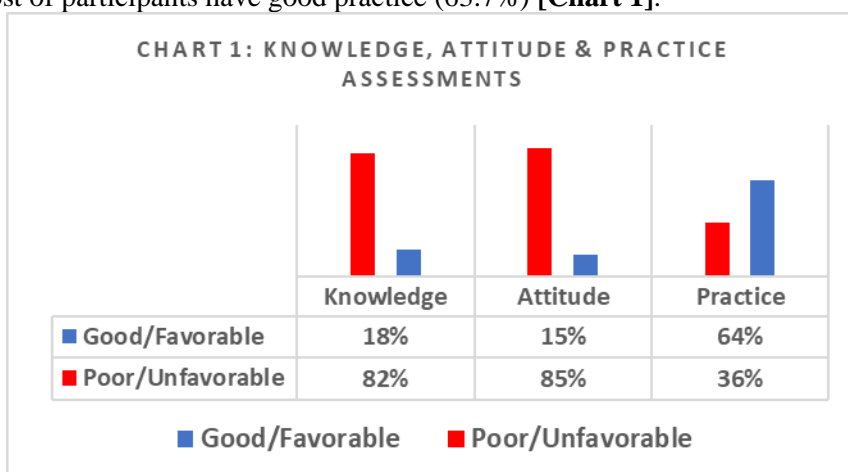
Assessment of attitude and practice of participants were as follow: there were 285 participants (38.0%) only believe that TB is very serious disease, also 32.1% believe that it is somewhat serious, remaining were either don't believe in its seriousness or don't know how to appreciate its seriousness (.7% and 29.2% respectively). Fear was the reaction of more than 13% of participants once they have had any TB symptoms, but most of them (84.4%) prefer to visit health facility once they had TB symptoms. There are only 352 people (46.9%) who have compassion and a desire to help TB patients, about 228 people

(30.4%) have compassion but want to stay away from TB patient, and 96 feel afraid from being infected (12.8%), and around 74 don't have exact feeling toward them (9.9%) [Table 3]. Practice with TB evaluation as follow: most of participants (74.3%) believed that modern health care is the choice of TB treatment and 159 people (21.2%) don't know what the choice of treatment is. Unfortunately, most of participants (83.3) preferred to visit health facility once they have symptoms may related to TB and some of participants (11.2%) prefer to visit health facility after trying their own treatment and it doesn't work [Table 3].

**Table 3: ???????**

Attitude & Practice Assessments	Frequenc	Percent
<b>What is your thought on seriousness of TB?</b>		
Very serious	285	38.0
Somewhat serious	241	32.1
Not serious	5	.7
I don't know	219	29.2
<b>What is your reaction if you had TB symptoms?</b>		
Fear	103	13.7
Shame	5	.7
Sadness/hopelessness	9	1.2
Visit health facility	633	84.4
<b>What is your feeling about TB patients?</b>		
Compassion and a desire to help	352	46.9
Compassion and stay away from them	228	30.4
I fear them because they may infect me	96	12.8
I have no exact feeling	74	9.9
<b>What is your Choice for TB treatment?</b>		
Modern health care	557	74.3
Traditional healers	14	1.9
Holy water	14	1.9
I don't know	159	21.2
I will not treat	6	.8
<b>When you will visit health facility?</b>		
Once my own treatment does not work	84	11.2
Once realizing the symptoms may related to TB	625	83.3
After 3–4 weeks of having symptoms	25	3.3
I will not go to a doctor	16	2.1

Evaluation's scores for knowledge, attitude and practice with TB result are mentioned as follow: Only 136 people (18.1%) of participants have good knowledge and remaining 614 (81.9%) have poor knowledge. About 113 people (15.1%) have favorable attitude and remaining 637 (84.9%) have unfavorable attitude. Most of participants have good practice (63.7%) [Chart 1].



Regarding to Chi-Square test; Retired people are better in knowledge than others (P-value < 0.05), people with high degree level of education are better in knowledge than others (P-value < 0.05), people who live on cities are better in

knowledge than others (P-value < 0.05), married people are better than single in knowledge (P-value < 0.05), people who have relative with history of TB have better knowledge (P-value < 0.05), no differences in knowledge between remaining

variables [Table 4]. By analyzing attitude score, it is clear that females were better in attitude more than male (P-value < 0.05), people with free business are better in attitude than others (P-value < 0.05), western population have better attitude than eastern (P-value < 0.05), people who have relative with history of TB have better attitude (P-value < 0.05), no differences in attitude between remaining variables [Table 4].

Practice scores showed difference in job, in which retired people are better in practice than

others (P-value < 0.05), Saudis are better in practice than non-Saudi people (P-value < 0.05), people with high degree education have better practice than others (P-value < 0.05), people who live in cities are better in practice than others (P-value < 0.05), married people are also better than single (P-value < 0.05), people who have relative with history of TB have better practice (P-value < 0.05), no differences in practice between remaining variables [Table 4].

**Table 4: Chi-Square Test for Knowledge, Attitude & Practice Assessment**

	P – Value When you compare with								
	Gender	Job	Nationality	Educational level	Residency	Region	Marital Status	History of TB	Relative with History of TB
<b>Knowledge Score</b>	.121	.000*	.536	.003*	.001*	.850	.003*	.958	.020*
<b>Attitude Score</b>	.002**	.001**	.468	.122	.502	.032**	.320	.610	.003**
<b>Practice Score</b>	.093	.000***	.003***	.000***	.013***	.129	.000**	.255	.000***

\* Retired people are better in knowledge than others - People with high degree education have better knowledge than others – People who are living on cities are better in knowledge than others – Married people are better than single in knowledge - People who have relative with history of TB have better knowledge.  
 \*\* Females are better in attitude more than male – People with free business are better in attitude than others – Western populations have better attitude than eastern - People who have relative with history of TB have better attitude.  
 \*\*\* Retired people are better in practice than others – Saudis are better in practice than non-Saudi people - People with high degree education have better practice than others – People who are living on cities are better in practice than others - Married people also better than single - people who have relative with history of TB have better practice.

**DISCUSSION**

In this study, we identified gaps in knowledge, attitudes, and practices about TB among the general population of eastern and western regions in Saudi Arabia. The majority of participants (66.4%) agreed that TB is curable. (81.9%) of Participants have poor knowledge about TB, (15.1%) have favorable attitude and more than half had a good practice (63.7%)TB knowledge, level of attitude and practice were all statically significant related to people who have relative with a history of TB.

Regarding the cause of the disease, a study in Jeddah, Saudi Arabia showed that 210 (49.1%) of

the study cases mentioned that the cause of tuberculosis was bacterial but about half, 218 to be precise (51%), denied that it is a noninfectious disease to start with [10]. A study conducted in RAJASTHAN (45.2%) participants had a false impression that TB was a hereditary disease while only (1.6%) workers knew that TB was caused by germs [11]. In contrast, the result in this current study reveals that (32.3%) mentioned that Bacteria is the cause of TB, but most of the participants (51.2%) answered the question about TB causes by saying I don't know and the remaining considered other causes like cold air, smoking, spoiled soil or poor hygiene. Concerning the symptoms of tuberculosis, one study in Southwest Ethiopia showed that a cough for more than 2 weeks (74.4%) and hemoptysis (50.6%) were mentioned as TB symptoms [12]. A study was done in North East Libya revealed that (72.3%) participants reported that one of the most common symptoms of TB is a cough [13]. Moreover, a study that was conducted in king Saud-university, Saudi Arabia showed that (44.9%) of the participants agreed that productive/prolonged cough is a symptom of Tb, while (47.9%) of them considered coughing blood as a symptom of TB [14]. Compared to our study, near to half of our participants (44.4%) don't know whether a cough for more than two weeks is a symptom of TB or not, while also there is small percentage (4.0%) Deny that idea and most of the participants (51.6%) agreed with this information.

A study was done among prisoners in northern Ethiopian that had a reasonable amount of

participants (27.3%) had stigmatizing thoughts towards TB patients [3]. A study was conducted in Cameroon, more than half of the respondents (65.9%) shared their fear of getting infected with TB [15]. In a study that was conducted among prisons and public health services in Brazil, 41.1 of inmates said that many people reject the TB patients [16].

In general, most of our participants (84.4%) were willing to visit health facility once they had TB symptoms, Similar rates were reported in Cameroon and Ethiopia (88.5% and 82.6% respectively) [15,3].

In the other side, our colleagues carried similar comparable study and their results confirm our present results in Riyadh Region and its surroundings and they found did their result somewhat similarly. People who had good knowledge in some researches account 19% vs. 18% in this article. Favorable Attitude is 18% vs. 15% here. A good practice is 68% vs. 65% in this article [17].

## CONCLUSION

Eastern and western region in Saudi Arabia has a very poor knowledge and Attitude towards TB and western have a somewhat better attitude than eastern Populations. Many false ideas spread among people should be changed because it may increase the incidence of infection and may prevent them from seeking for medication because of fear. Also, they prevent them to help people with TB. Participants have a high percentage of good practice which still needs to be elevated. Level of education is an important factor that may control the level of knowledge about TB.

So, it is important to increase the level of awareness of TB among the general population in Saudi Arabia, and this will be done by efforts of family physicians, general practitioner, media and teachers in schools .

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