

Tuberculosis-related awareness among people living in rural areas of Gorgan District: A cross sectional study

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ABSTRACT

Tuberculosis is an infectious disease that caused by Mycobacterium Tuberculosis (TB). Despite the implementation of free treatment, detection rate of TB remains low. Lack of awareness is a main reason for not expressing symptoms in patients. The study aimed to determine the level of awareness about TB among rural areas of Gorgan. This study was cross-sectional research which was conducted in 2014-2015 in Gorgan villagers (age ≥ 15 , non-TB). These individuals were selected by two-staged cluster sampling. The total sample size was 672. The data collection instrument was a researcher-made questionnaire. Face & content validity and also test-retest method were used for validity and reliability, respectively. Participation of individuals in this study was voluntary and with informed consent. The collected data was analyzed using SPSS 16 software. Findings analysis by independent Sample T-Test and Anova test. The mean age of respondents was 33 ± 1.17 . The mean score of villagers' awareness was 30.95 ± 6.16 . The awareness level of 330 participants (49.1%) was high. There was a significant difference between awareness and some variables such as literacy level and age ($p < 0.05$). There wasn't a significant difference between awareness and gender, family size, history of morbidity, and ethnicity. According to results of this study, Level of villagers' awareness about TB was high, but they lacked awareness on some aspects like the ways of transmission and virulence of disease. It seems that increasing awareness and surveying of influential factors on awareness in people who have TB symptoms is necessary.

Keywords: Awareness; Tuberculosis; Rural individuals.

INTRODUCTION

Tuberculosis is a bacterial infective disease caused by mycobacterium tuberculosis. This disease may happen in 2 forms, including pulmonary (85%) and non-pulmonary (15%) infections [1, 2]. Tuberculosis (TB) is the main cause of mortality due to a single factor infection (even more than aids, malaria and measles) and is in the 10th place of disease burden in the world. It is predicted that TB keep its current place until 2020 or even come to the 7th place [1]. Almost one third of the world population (about 2 billion people) is infected with or at risk of TB [3, 4]. The importance of TB control program is such that TB was considered as a global emergency by the world health organization (WHO) in 1993 [5]. The incidence rate of all types of TB in Iran was 14.6 per 100 thousand population in 2011 [6] and this number in Golestan province has been 52.3

per 100 thousand population. In addition, rate of positive smear TB in Iran in 2011 has been 7.38 per 100 thousand populations. In the same year, this number has been 25 to 26.2 people in 100 thousand people in Golestan and Sistan and Blouchestan provinces which means less than 3 times more than the incidence rate in the whole country [7]. The main source of TB infection is a patient with pulmonary TB who coughs [8, 1]. Every TB patient who has not received anti TB medication may contaminate 10 to 15 people on average. An adult TB patient won't be able to work for 3 to 4 months and therefore 20-30% of their annual income will be lost. If this person dies, about 15 years of the family income will be lost [1]. It is obvious that other than economic losses, TB has some indirect negative impacts on patients' and their families' quality of life including isolation of infected women from their

families due to false attitudes or drop out of infected children and so on [9]. In 1992, "Directly Observed Treatment Short-course Strategy" or (DOTS) was proposed by WHO to control TB. Even by treating patients with DOTS method freely, TB causes some deaths which are preventable [10].

The aim of TB case finding is early detection of patients, treating them and to cut the transmission chain. Late TB treatment will lead to an increase in infection, mortality rate and costs [11, 12]. According to the studies, lack of awareness about the disease and fear of TB transmission, being isolated, losing job, absenteeism and social limitations makes symptomatic people to conceal the fact [11, 16]. Young women problems are, finding a partner, or misbehavior of husband's family, abandonment and divorce [13, 17, 18, and 19]. These attitudes, beliefs and lack of awareness will lead to "stigma" (11, 13, 20, and 21). Awareness of TB in the society will lead to early detection of patients and it will increase the rate of successful treatment. One of the important implications in all stages is education and promotion of people's medical and health awareness. To do any planning about health related content of educations, we must know people's awareness of the subject and their needs [22].

A study conducted by Phuong Hoa et al. on TB suspected patients in a rural area in Vietnam in 2000, showed that there is a significant association between people's awareness and their behavior in receiving health care services [22]. Abebe Mail's study on 15 years old TB suspected patients in Ethiopia in 2009 showed that social stigma is associated with the awareness rate [23].

Since assessment of the current status is the base of educational interventions and there has been no study about people's awareness in Gorgan and also because of high prevalence of TB in this province, it looks necessary to investigate people's awareness of TB. Therefore this study is conducted to assess people's awareness of TB in rural areas of Gorgan in 2014 to be used as a base for planning educational interventions.

MATERIALS AND METHODS

The present study is a cross-sectional study. The study population is 15 years and older non-TB patients who had no TB patients in their families at

the time of study and have been living in one of the villages of Gorgan for at least 2 years. They should not tend to move to cities as well. Samples were selected in two stage cluster sampling method. The sample size was calculated by means of the following formula:

$$n = \frac{z^2 p(1-p)}{d^2}$$

6 out of 17 rural health care centers were chosen randomly. From each selected center, 4 health houses and from each health house, 14 men and 14 women were chosen. At the time of sampling, more people were chosen as reserves to be replaced at the time of refuse to respond. With the coordination of TB control team of Gorgan city a team of interviewers was formed in each health care center and they were taught of the way they should fill the questionnaire. For literate participants, questionnaire was filled as a self-report by them but for illiterate ones, interviewers were doing that. At the beginning we trained interviewers to prevent bias in filling the questionnaire for illiterate participants. After getting the consent, questionnaires were filled anonymously and privately by people who were referring to the health houses. The data collection tool was a researcher-made questionnaire which included two parts. The first part was about demographic information and the other part was awareness assessment questions. To determine the content and face validity of the questionnaire we used opinions of 10 of the experts in health education, infectious diseases, statistics and epidemiology and made some corrections according to their opinion. In addition, to determine the reliability of the questionnaire, we selected 10 people, similar to our study populations randomly to answer our questions. After 10 days, we gave them the questionnaire again and asked them to answer questions. Then by using pretest-posttest method, we analyzed the answers. The correlation coefficient was 0.79. To score questions, we gave 2 points to each correct answer, 1 point to "I don't know" and zero to the false answers. The maximum score of awareness part was 46. According to the total score, awareness was classified in 3 levels including: weak (0-15), moderate (16-31) and high (31-46). Collected data

was analyzed by SPSS-16 software and Mann-Whitney and Kruskal-Wallis tests were used.

RESULTS

The number of participants was 672 people and the number of 15 years old and above men and women was equal. The mean age of participants was 33 years (minimum 15 and maximum, 82

years old). 93.3% of them had heard the name of tuberculosis before and their information source was as follows:

21.7% books and magazines, 5.5% radio, 30.2% television, 10.7% friends and relatives and 4% chose all of them as their information source.

Table 1. Participants' demographic characteristics

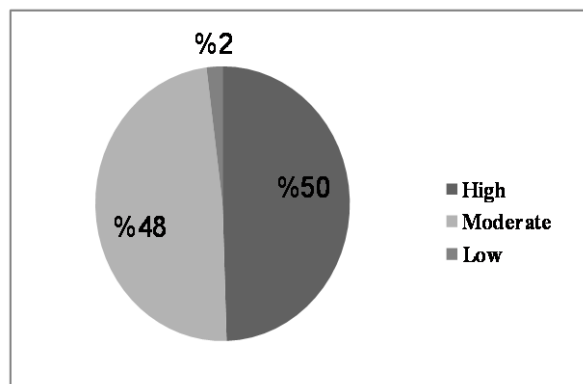
Education level	Illiterate	Primary school	Guidance school	High school & diploma	Academic
	52 (7.7%)	141 (21%)	194 (28.9%)	218 (32.4%)	67 (10%)
Marital status	Single	Married			
	104 (15.6%)	564 (84.4%)			
Age group	15-24	25-34	35-44	45-54	>55
	144 (21.5%)	242 (36.1%)	179 (26.7%)	73 (10.9%)	33 (4.9%)
Employment status (for men)	Employed	Unemployed			
	286 (85.22%)	50 (14.88%)			
Employment status (for women)	Employed	Unemployed			
	64 (19.05%)	272 (80.95)			
Ethnicity	Persian	Non-Persian			
	356 (53%)	316 (47%)			

Table 2. Frequency of participants' answers to the questions

Questionnaire item	True		False		I don't know		
	Number	Percent	Number	Percent	Number	Percent	
1-Is TB a contagious disease?	554	82.7%	54	8.1%	62	9.3%	
2-How long coughing should be considered as being suspected to TB infection?	407	61.6	90	13.6	164	24.8%	
3-Is TB preventable?	603	89.9%	16	2.4	52	7.7%	
4- Awareness of TB causes	The evil eye	546	86.9%	11	1.85	71	11.3%
	Microbe	570	85.8%	53	8%	41	6.2%
	Magic and the devil	551	89%	5	0.8%	63	10.2%
	Smoking or addiction	264	41.5%	283	44.5%	89	14%
	Hard works	84	13.6%	444	71.8%	90	14.6%
	Inheritance	344	71.8%	184	29.5%	96	15.4%
5- Ways of TB transmission	Undesirable nutrition	306	49.4%	213	34.4%	101	16.3%
	Air	410	63.5%	174	26.9%	62	9.6%
	Food or contaminated water	270	42.9%	271	43.1%	88	14%
	Sexual intercourse with a TB patient	325	51.8%	188	30%	114	18.2%
	Raw milk consumption	356	53%	172	25.6%	104	15.5%
	Sharing cloths	353	57%	161	26%	105	17%
	Working in places with poor ventilation	345	54.7%	160	25.4%	126	20%
	Kissing a TB patient	398	62%	170	26.5%	74	11.5%
6-If a TB patient takes anti TB drugs for one month;his disease won't be transmitted to others.	314	46.1%	178	26.7%	175	26.2%	
7-If a TB patient completes an anti TB treatment course; his disease won't be transmitted to others.	463	69.3%	66	9.9%	139	20.8%	
8-We should keep away from a TB patient forever.	548	82.7%	46	6.9%	69	10.4%	
9-A patient with non-pulmonary TB won't transmit the disease to others.	207	31.4%	213	32.3%	240	36.4%	
10-What is the first and simplest way of TB diagnosis?	491	73.1%	140	20.8	41	6.1%	
11-Which organ of the body is more involved with TB?	579	86.2%	46	7%	47	7%	

Table 3. Mean and standard deviation of villagers' awareness according to demographic variables

Variable	Mean score and standard deviation					P-value
	Man	Woman				
Gender	Man	Woman				
	336	336				
	31.2 ± 6.9	30.7 ± 6.3				P=0.12
Education level	Illiterate	Primary school	Guidance school	High school and diploma	Academic	
	52	141	194	218	67	
	31.4 ± 7	29.6 ± 6.1	30.5 ± 6.1	31.2 ± 6.7	33.6 ± 7.6	P=0.002
Marital status	Single	Married				
	104	564				
	30.6 ± 6.4	31.1 ± 6.5				P=0.12
Age group	15-24	25-34	35-44	45-54	>55	
	144	242	179	73	33	
	30.5 ± 5.4	30.8 ± 6.2	30.4 ± 7.5	34.1 ± 6.6	29.6 ± 7	P=0.001
Employment (status for men)	Employed	Unemployed				
	320	16				
	31.4 ± 6.8	27.4 ± 7.2				P=0.13
Employment (status for women)	Employed	Unemployed				
	63	285				
	32.1 ± 7	30.1 ± 6				P=0.06
Ethnicity	Persian	Non-Persian				
	356	316				
	30.9 ± 7	31 ± 6.1				P=0.87

**Figure 1.** frequency of villagers' awareness level of TB

5.7% (38 people) had the history of contracting TB or having a TB patient in their families (1% had been TB patient and 5.6% had had a TB patient in their family). Table 1 shows the demographic characteristics of the participants. Also table 2 shows awareness of causes, ways of transmission and et.al. The mean awareness score was 30.95 ± 6.6 . In the figure 1 shows the lowest score was 10 and the highest one was 45 out of 46. 49.1% of the participants had high, 48.8% moderate and 2.1% had low awareness of TB. Also There was a significant association between

awareness level and education and also age group of the participants ($p < 0.05$), but no significant association between awareness and variables of gender, family size and ethnicity was observed (Table 3).

DISCUSSION

Findings of this study indicate that more than a half of villagers have low and moderate awareness of TB.

In this city, people mentioned that health care personnel are the main source of their information about TB and television was in the second place. This result indicates that other organizations like broadcasting should help health care personnel in training people. The mean awareness score of the population was 30.95 which are at a high level. Results of this study is consistent with results of a study conducted by Qhazi Shafayetul Islam in Afghanistan in 2008 in which the awareness level in studied areas was reported to be high [25]. On the other hand, results of studies conducted by Phuong Hao et al. in Vietnam in 2000 [26] and Koayin Malaysia showed that public awareness of TB is low [20].

82.7% of the participants were agreeing that TB is a contagious disease which is consistent with Abebe Mail's study in Ethiopia. Abebe Mail's study was conducted on TB suspected patients in villages. Although the study population has been different from the current study, the result is the same. 61.6% of the participants believed that coughing for more than 2 weeks is a sign of TB and this result is consistent with the results of Zhang et al.'s study in China. They reported that 60% of participants believed that coughing for more than 2 weeks in the main sign of TB [19].

570 of participants said that a microbe is the main cause of the disease and only 1.8% said the cause of TB is the evil eye and 0.8% said it is because of the magic. However in Abebe Mail et al.'s study in the south east of Ethiopia in 2009, most of the participants believed that the evil eye is the cause of TB [27]. In this study most of the participants had answered this question correctly and it shows that their health awareness is high and their belief in superstitions is lower in comparison with the study population in Ethiopia. 82.4% believed that TB is a contagious disease and 89.9% said that it is preventable which is consistent with the result of Buregyeya et al.'s study conducted in Uganda. Despite of the study conducted in Uganda, in which participants believed that an airborne factor is necessary to transmit the disease, 40% of the participants in our study did not know the way of transmission and it needs to be trained to people. In this study, 41.5% mentioned that smoking and 13.6% said that hard works are causes of TB disease. In Buregyeya et al.'s study, participants believed that causes of TB are hard works, smoking and magic [28].

After analyzing the questionnaire items separately, we found out that awareness rate in men and women has no difference and there is no significant association between gender and awareness and it was consistent with the result of the study conducted by Alavi et al. in Khuzestan province in 2004 [22] and different from the result of Phuong Hoa et al.'s study. It indicates that men and women have received TB training equally.

In this study, there was a significant association between awareness level and education level and also age group, but no significant association

between awareness level and marital status and ethnicity was observed. In Alavi et al.'s study also it was mentioned that literacy level has a remarkable role in having awareness about various aspects of the disease [20]. In this study, the awareness level of those participants with academic degrees is much more than others and it is due to having a higher literacy level and therefore access to more information sources.

In this study, middle age people had a higher awareness level and it is because most of them had diabetes and hypertension and therefore they had to come to the health house for their periodic examinations.

Although people's awareness in rural areas was not low, about one third of them did not know anything about simplest diagnostic tests for TB and they also did not know how long coughing makes a patient suspected to TB. About half of the participants did not know that working in places with poor ventilation, smoking or addiction will make people prone to TB infection. Only half of them thought that inheritance, food, contaminated water, sexual intercourse with a TB patient and consumption of raw milk are not effective in TB infection.

Only one third of people knew that a patient with non-pulmonary TB would not transmit the disease to other people. Many of the participants had chosen "I don't know" for some questions and some of them had not adequate information about ways of transmission of the disease, ways of diagnosing TB, the organs involved in the disease, duration of disease virulence and non-pulmonary TB. It indicates that people in rural areas of Gorgan have the basic information about TB but many of them do not have enough information about places that they can refer to if they have symptoms and how to behave and live with a TB patient. Thus it is necessary to plan some educational interventions about that. It must be mentioned that villagers' lack of information about details of the disease may be due to having low skilled health personnel in the field of education and conducting training classes and that's why they failed to fully achieve goals. To solve this problem, it is necessary to empower health care personnel and raise their skill in the field of conducting training classes and doing face to face educations.

According to the results of this research and the similar studies, it looks necessary to conduct more studies to find out why people don't like to refer to health care centers and health houses. In addition, this study is performed in rural areas of Gorgan and there should be another study in urban areas to complete the assessment.

CONCLUSION

Findings of this study indicates that more than a half of villagers have low and moderate awareness of TB and in this regard, authorities should plan and implement some educational interventions. Villagers' awareness of some of the issues mentioned in the questionnaire was inadequate and it may lead to undesirable

attitudes and behaviors in receiving health services. It is also suggested to assess the awareness of people in urban areas so that based on the results, authorities make general policies and educational interventions are designed and implemented.

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