

## Full Length Research Paper

# Assessment of community knowledge about Tuberculosis and its treatment in rural areas of Shashemane, Southern Ethiopia

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Tuberculosis (TB) is a chronic infectious disease caused by *Mycobacterium tuberculosis*. Poverty, malnutrition and crowded living conditions have been recognized for decades to increase the risk of developing TB. In addition, lack of knowledge about TB could affect the health-seeking behavior of patients and sustain the transmission of the disease within the community. A community based cross-sectional study was conducted in 4 randomly selected rural kebeles around Shashemane area to assess the community's knowledge about TB between March and May, 2011. A total of 422 voluntary residents were included. The study participants were interviewed about the cause, symptoms, mode of transmissions, treatment and preventive methods of tuberculosis. Despite the fact that higher proportion of the study participants 243 (58.8%, 95% CI, 51.6 to 63.1%) had good level of knowledge about TB almost all (90.2%) of them did not know the causative agent of TB. Farmer participants (OR = 2.18; 95% CI: 1.07 to 4.42) had low level of overall knowledge on TB. Almost all (98.98%) of the participants mentioned that TB is a treatable disease. The majority (96.44%) of the participants knew that TB can be transmitted from a patient to another person. The results of this study revealed that the community members in the present study area had little knowledge of the causative agent of TB and hence implementation of appropriate community-based health education is important to raise community's knowledge about TB.

**Key words:** Community knowledge, tuberculosis, Southern Ethiopia.

## INTRODUCTION

Tuberculosis (TB) is a chronic infectious disease caused in most cases by *Mycobacterium tuberculosis* (M.Tb), an acid fast rod-shaped bacillus. Tuberculosis still affects

mainly Asian and African countries, and Ethiopia is one of the top five affected countries in Africa (World Health Organization, 2010). In developing countries, about 7% of

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all deaths are attributed to TB which is the most common cause of death from a single source of infection among adults. Despite the measures taken, the burden of the disease is still high, especially in developing countries including Ethiopia. It is estimated that by 2020, there will be over 1 billion new TB infections and 200 million people will succumb to clinical disease and about 35 million will die if TB control is not further strengthened (World Health Organization, 2005). Poverty and lack of awareness are considered the most important factors that increase the risk of exposure to TB. Lack of knowledge about the cause, mode of transmission, and symptoms, as well as appropriate treatment of TB, not only affect the health seeking behavior of patients, but also could affect control strategy, thereby sustaining the transmission of the disease within the community (Legesse et al., 2010).

A study conducted in Kenya showed that TB is well known in the communities and perceived as a contagious 'sensitive' disease difficult to diagnose and treat. Community members believed that TB should be diagnosed and treated in a hospital or by a medical doctor and not at the periphery level. On the same study, traditional treatment was considered a valid alternative to modern treatment and believed to be as effective and takes much shorter time. Tuberculosis was attributed to be caused by factors such as smoking, alcohol, hard work, exposure to cold and sharing with TB patients. In contrast, many participants believed that TB was hereditary (Liefoghe et al., 1997).

Study conducted elsewhere in Ethiopia gave an idea about misconception on the cause, mode of transmission and prevention of TB. Furthermore, the knowledge of the participants was found to be influenced by the level of education, area of residence, and having health education at health institutions (Alemayehu, 2007; Mesfin et al., 2005; Abebe et al., 2010; Legesse et al., 2011). This part of the study looks for community perception and knowledge on TB and provides some solution for TB prevention strategies in communities within Shashemene area, Ethiopia.

## METHODOLOGY

### Study area and population

A cross-sectional study was conducted in Shashemene area, Ethiopia, to assess the community's knowledge about TB between March and May, 2011. Shashemene is located in West Arsi Zone of the Oromia National Regional State, approximately 250 km south of Addis Ababa, Ethiopia. It has ten urban kebeles and 37 rural kebeles. In the urban area of Shashemene, the ethnicity is diversified but in the rural area most people belong to Oromo ethnic group. The town is economically important and expanding quite rapidly compared to other towns. This is perhaps due to its location as a crossroad and a junction point for most towns located in the southern part of the country. According to Shashemene woreda health office report, the total population of Shashemene area was 239,011.

Sample size (n) was determined based on the assumption of 50% overall level of good knowledge of the community about TB,

0.05 expected margin of error (d) and 95% confidence level ( $Z_{\alpha/2}$ ) and 10% contingency for non-response. A total of 422 participants were included in the study. The total number of households was proportionally allocated to four rural kebeles based on the number of households within each kebele. The households in each kebele were selected using systematic random sampling technique, taking the list of households as the sampling frame. Any individual who was the resident of the area, age over 18 years old, apparently healthy and willing to volunteer to be interviewed during the study period was included in the study. Accordingly, the number of study subjects selected in each kebele was 79 from Turufe Kechema, 125 from Kerera Filicha, 118 from Fajii and 100 from Harabate kebele

The data was collected using structured questionnaire that was administered by data collectors (12th grade complete individuals) who were trained for this purpose. The participants were interviewed in their own local language (Oromiffa). Data consistency and completeness was checked throughout the data collection period, data entry and analysis. Data were coded and entered into computer using Stata version 16.8 Software. In the analysis, chi-square logistic regression analysis was performed to explore the association between outcomes and predictor variables. Overall knowledge of the study participants about TB was assessed using questioners. Overall knowledge of the study participants about TB was assessed using questions, such as source of information about TB, able to mention cause of TB, sign and symptoms of TB and mode of transmission of TB. For each question, a score of one was given to correct response and score of zero was given to the "do not know" response and incorrect answers. The overall knowledge score was obtained by summing these responses. The composite score was dichotomized using mean obtained from the data (that is, mean = 7.44). Individuals who have scored above and equal to the mean were categorized as having good level of knowledge and those who have scored below the mean knowledge score were classified as having poor level of knowledge.

The study protocol was approved by Akililu Lemma Institute of Pathobiology (ALIPB) Institutional Review Board (IRB). The aim of the study was described to each study participant and verbal consent was obtained.

## RESULTS

### Socio-demographic characteristics of the study participants

A total of 422 participants from the four rural kebeles (age range 18 to 90, mean age 31.8 years) were interviewed and the response rate was 100%. Of these 79 (18.72%), 125 (29.62%), 118 (27.96) and 100 (23.7%) of participants were from Turufe Kechema, Kerera Filicha, Fajii and Harabate kebele, respectively. Of these, 213 (50.4%) were males and 209 (49.6%) were females. Fifty percent of the participants were between the age group of 15 to 29 years. The predominant ethnic group was Oromo (82.7%) and Muslims were the majority (65.4%). The majority of the participants were primary school (40.05%) and farmers (77.73%) by occupation (Table 1).

### Knowledge about the mode of transmission and preventive methods of TB

Out of the 422 participants, 399 (94.6%) responded that

**Table 1.** Socio - demographic characteristics of the participants, and communities overall knowledge on TB Shashemene area, Southern Ethiopia, 2011.

Background characteristics		Number (%)	Level of knowledge score (max 13) good score ( $\geq 7.54$ )		P value	OR
			Know (%)	No know		
Sex	Male	213 (50.47)	122 (57.27)	91 (42.72)	0.00	1.13 (0.77, 1.67)
	Female	209 (49.6)	126 (60.28)	83 (39.72)		1
Age (in year)	18-30	252 (50)	143	109	0.44	0.51 (0.18, 1.47)
	31-40	91	63	28		0.23 (0.96, 0.91)
	41-50	44 (34.6)	25	19		0.51 (0.15, 1.67)
	51-60	20 (10.43)	11	9		0.55 (0.14, 2.12)
	60 <sup>+</sup>	15 (4.98)	6	9		1
Marital status	Married	335 (79.38)	197	51	0.11	0.99 (0.62, 1.6)
	others	87 (20.38)	138	36		1
Educational status	Illiterate	155 (36.73)	88	67	0.05	6.09 (0.74, 49.89)
	Read and write	21 (4.98)	8	13		13 (1.36, 124.29)
	Primary school	169 (40.05)	98	71		5.79 (0.71, 47.38)
	Secondary school	68 (16.11)	46	22		3.82 (0.45, 32.52)
	College	9 (2.13)	8	1		1
Occupation	Farmer	242 (57.3)	135	107	0.00	2.18 (1.07, 4.42)
	Merchant	10 (2.37)	5	5		2.75 (0.68, 11.2)
	Daily laborer	35 (8.29)	21	14		1.83 (0.71, 4.71)
	Gov't employee	4 (0.95)	2	2		2.75 (0.35, 21.75)
	House wife	86 (20.37)	52	54		1.79 (0.82, 3.96)
	students	45 (10.66)	33	12		1

they have heard about TB and the sources of information for the respondents were mainly from health workers 215 (53.9%) and from TB patients 73 (18.3%). Concerning their Knowledge on the transmission of the disease, only 39 (9.8%) participants mentioned that bacteria/germs are the

causative agents of TB the rest of the participants mentioned other factors such as cold air 76 (19%), shortage of food 31 (7.8%) and smoking 18 (4.5%) as the cause of the disease (Table 2). There was no significant difference between the proportion of male and female study participants

about knowledge on transmission of the disease ( $p = 0.56$ ). More than 96% of the participants knew that TB is transmissible. The majority (68.9%) suggested cough for more than 2 weeks as the major symptom of TB (Table 2). There was no significant difference between the proportions

**Table 2.** Community knowledge about the cause and symptoms of TB, rural Shashemene, Southern Ethiopia, 2011.

Variable	Male No (%)	Female No (%)	Total No (%)	p-value
<b>Have you heard about TB</b>				
Yes	203(95.3)	196(93.8)	399(94.6)	0.490
No	10(4.7)	13(6.2)	23(5.4)	
<b>Cause of TB</b>				
Bacteria	16(7.5)	23(11)	39(9.2)	>0.05
Cold air	32(15.02)	44(21.05)	76(18.00)	
Shortage of food	20(9.9)	11(5.8)	31(7.9)	
Smoking	12(5.9)	6(3.1)	18(4.4)	
Alcoholism	22(10.8)	17(8.7)	39(9.8)	
Poverty	27(12.67)	28(14.3)	54(15.9)	
Dust	8(3.75)	7(3.35)	15(3.55)	
Climate change	8(3.75)	0(0)	8(1.9)	
Other	17(10.8)	15(10.2)	32(10.5)	
Do not know	47(22.06)	57(27.27)	104(26.64)	
<b>Sign and symptoms of TB</b>				
Cough for more than 2 weeks	137(67.8)	138(72.3)	275(70.0)	0.338
Sputum with blood	28(13.9)	25(13.1)	53(13.3)	
Weight loss	17(7.98)	6(2.87)	23(5.45)	
Loss of appetite	10(4.69)	4(1.9)	14(3.31)	
Fever/sweat	18(8.45)	18(8.45)	36(8.53)	
Chest pain	2(.93)	0	2(0.47)	
Do not know	4(1.87)	2(.96)	6(1.42)	

of male and female study participants who reported that the major sign and symptom of TB was cough for more than 2 weeks (67.82% vs. 72.25%,  $X^2 = 0.9168$ ,  $P = 0.338$ ). On the other hand, only 2 (0.51%) participants mentioned that chest pain is the symptom of TB. Furthermore, the others mentioned other signs and symptoms of the disease such as sputum with blood 53 (13.5%), weight loss 23 (5.9%) and fever/sweat 36 (9.2%) (Table 2).

Concerning the treatability of TB, the majority 389 (99%) of the participants knew that TB is treatable with modern drugs 366 (94.1%). Twenty three (5.9%) of the participants have suggested traditional medicine as the effective treatment for TB. Moreover, 94 (23.92%) participants reported that either themselves or their families had previously got TB and were treated with modern drugs at health facilities. High knowledge on the choice of modern drugs as the effective treatment for TB was significantly associated with educational level of the participants (AOR, 6.60; 95% CI, 1.16 to 37.63,  $p = 0.03$ ).

The greater part (96.44%) of the participants knew that TB can be transmitted from a patient to another person:

Breathing (40.1%) and sharing of drinking materials (34.6%) were the major modes of transmissions mentioned by the study participants. Thirty-nine percent of the study participants mentioned covering mouth while coughing as the most important method of preventing and control of TB. About 27% of the participants mentioned that they vaccinate their children with BCG to protect TB. Avoiding of smoking was indicated as a means of preventing TB by 27.2% of the study participants (Table 3).

Most of the study participants (67.2%) considered TB as a major public health problem in their areas. About 52.3% of the participants indicated that TB is becoming a major public health problem in recent years (Table 3). Among individuals who believed there has been a recent expansion of the disease, 23 (13.14%) respondents associated it with the spreading of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) in the community. Others however, mentioned poverty (47.43%), climate change (28%), smoking and drinking (10.86%) and other factors. Most of the participants (69.0%) believed that TB can affect all

**Table 3.** Community's knowledge about mode of transmission and public health importance of TB, rural Shashemene, Southern Ethiopia, 2011.

<b>Variable</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Total (%)</b>
<b>Is TB transmissible</b>			
Yes	192 (95.1)	187 (97.9)	379 (96.4)
No	5 (2.5)	2 (1.1)	7 (1.8)
Do Not know	5 (2.5)	2 (1.1)	7 (1.8)
<b>Mode of TB transmission</b>			
Cough	61 (28.63)	42 (20.09)	103 (24.4)
Sneeze	3 (1.4)	2 (0.96)	5 (1.18)
Breathing	70 (32.86)	82 (39.24)	152 (36.1)
Sharing Cups	67 (31.45)	64 (30.62)	131 (31.04)
Milk	1 (0.47)	0	1 (0.24)
Do Not Know	1 (0.47)	0	1 (0.24)
<b>Is TB health problem</b>			
Yes	134 (62.93)	130 (68.1)	264 (62.55)
Rare	41 (19.3)	29 (13.87)	70 (17.8)
No	21 (10.4)	26 (13.6)	47 (12.0)
Do not know	6 (3.0)	6 (3.1)	12 (3.1)
<b>Preventive methods of TB</b>			
BCG vaccination	61(31.6)	42(22.5)	103(27.2)
Keep Hygiene	5(2.3)	11(5.2)	16(3.8)
Vaccinate the children	54(23.3)	76(36.4)	130(0.8)
Avoid smoking	61(28.7)	53(25.21)	114(27.2)
Avoid drinking raw milk	1(0.46)	8 (3.8)	9(2.3)
Isolate patient with TB	12(5.6)	4(1.9)	16(7.8)
Cover mouth while coughing	69(32.4)	63(30.21)	132(31.27)

age groups.

### Communities' overall knowledge about TB

Despite the fact that higher proportion of the study participants 243 (58.8%, 95% CI, 51.6% to 63.1%) had good level of knowledge about TB, almost all (90.2%) of them did not know the causative agent of TB. Farmer participants (OR = 2.18; 95% CI: 1.07 to 4.42) had low level of overall knowledge on TB. And relatively uneducated than being educated (OR = 13, 95% CI, 1.36 to 124.29,  $p=0.05$ ) had low level of overall knowledge about TB.

### DISCUSSION

The results of this study show that TB is familiar to the

rural communities for about 94.6% of the study participants (Table 2). However, few participants (9.2%) mentioned bacteria as the causative agent of TB. This finding is consistent with the studies conducted in other parts of Ethiopia (Legesse et al., 2010; Liefoghe et al., 1997; Alemayehu, 2007; Abebe et al., 2010) as well as elsewhere (Legesse et al., 2011; Mengesho et al., 2007; Karim et al., 2011). The majority of the respondents associated the cause of TB mainly with exposure to cold air, poverty, starvation, common cold, dust, frequent smoking/drinking alcohol or lack of hygiene. This finding is similar to beliefs found in a previous study in another part of Ethiopia (Legesse et al., 2010). While the community perception about the role of smoking and alcohol as the causative agent of the disease not neglected (Legesse et al., 2011), misconception about the correct cause of the disease could affect patient attitude towards health-seeking behavior and preventive methods (Liefoghe et al., 1997; Alemayehu, 2007;

Mesfin et al., 2005). Particularly, smoking could affect the care seeking behavior of smokers, as the smokers may perceive their prolonged cough as the cause of smoking, but not TB which could lead to delayed diagnosis and treatment.

On the other hand, most of the study participants in the present study area (Shashemene rural area) had adequate awareness about the symptoms, mode of transmission and treatment of TB. This finding is in agreement with the results of the studies conducted in Ethiopia (Legesse et al., 2010; Liefoghe et al., 1997; Abebe et al., 2010) and in other countries (Legesse et al., 2011; Karim et al., 2011). The study participant's knowledge regarding the treatment of the disease using modern medicine was also very high compared to the results of previous studies conducted in other parts of Ethiopia (Legesse et al., 2010; Alemayehu, 2007), Tanzania (Mengesho et al., 2007) and Kenya (Legesse et al., 2011). Tuberculosis may be perceived by a community as a non-treatable disease due to inadequate knowledge about its appropriate treatments, which could lead to delayed diagnosis and treatment (Mengesho et al., 2007). However, based on the information obtained from the individual study participants' knowledge of early diagnosis and treatment, it seems to be poor in the communities in this study. This might be due to the fact that people may not suspect that early symptoms (coughing, fever, and sweating) are due to TB, unless accompanied by other severing symptoms (Legesse et al., 2010; Kaye and Frieden, 1996).

Moreover, the respondents from the study areas indicated that TB is one of the most important public health problems (67.1%) of the present study areas (Table 3), which is in consistency with the findings of the community based studies from other parts of Ethiopia (Legesse et al., 2010; Alemayehu, 2007; Abebe et al., 2010), as well as from Tanzania (Mengesho et al., 2007), Bangladesh (Karim et al., 2011), Kenya (Legesse et al., 2011), Vietnam (Hoa et al., 2009), and Tarlac city (Maria et al., 2009).

In this study, it was also noticed that rural communities' knowledge about the mode of transmission and preventive method of TB was high compared to previous findings (Legesse et al., 2010; Alemayehu, 2007; Abebe et al., 2010; Mengesho et al., 2007). Knowledge about those factors favoring TB transmission is important in protecting individuals living around TB patients. About sixteen percent of the respondents considered poverty as a factor favoring TB transmission, which was higher compared to other factors like alcoholism and smoking. This result indicates that the majority of the respondents have wrong perception about factors that favor TB transmission. Although, the present study provides information on the level of community awareness about TB, it has limitations. One of the limitations is that the study was not supported by qualitative study which could provide additional information about the level of knowledge of the studied community about TB. The

results of this study would be used as a baseline for further study to be conducted by the same researchers or other interested in a wider scope.

## Conclusion

The findings of the study indicated that the majority of the rural community members in the study area had a basic awareness about TB. Nevertheless, there is a gap about the cause, mode of transmission, and preventive method of TB. Therefore, implementation of appropriate community-based health education is important to raise community's knowledge about TB. For this we recommend that the community awareness program about TB transmission through different communication media and health education program is necessary to raise communities' awareness about TB. Community workers should focus more on awareness creation programs through outreach activities to address knowledge about TB. As a shortcoming on this study we would like to recommend further qualitative study focusing on community knowledge of TB is important.

## Conflict of interest

The authors have no conflict of interest

## REFERENCES

- Abebe G, Deribew A, Apers L, Woldemichael K, Shiffa J, Tesfaye M, Abdissa A, Deribie F, Jira C, Bezabih M, Aseffa A, Duchateau L, Colebunders R (2010). Knowledge, Health Seeking Behavior and Perceived Stigma towards Tuberculosis among Tuberculosis Suspects in a Rural Community in Southwest Ethiopia. *PLoS one* 5:10-13.
- Alemayehu M (2007). Knowledge about tuberculosis among patients attending tuberculosis treatment in north western Ethiopia. *Ethiop J. Health Sci.* 17:33-35.
- Hoa NP, Chuc NTK, Thorson A (2009). Knowledge, Attitude, and Practices about Tuberculosis and Choice of Communication Channels in Rural Community in Vietnam. *Health Policy* 90:8-12.
- Karim F, Johansson E, Diwan VK, Kulane A (2011). Community perceptions of tuberculosis: A qualitative exploration from a gender perspective. *J. Public Health* 125:84-89.
- Kaye K, Frieden TR (1996). Tuberculosis control: the relevance of classic principles in an era of acquired immunodeficiency syndrome and multidrug resistance. *Epidemiol. Rev.* 18:52-63.
- Legesse M, Ameni G, Mamo G, Medhin G, Bjune G, Abeba F (2011). Knowledge of cervical tuberculosis lymphadenitis and its treatment in pastoral communities of the Afar region, Ethiopia. *BMC Public Health* 11(1):157.
- Legesse M, Ameni G, Mamo G, Medhin G, Shawel D, Bjune G, Abebe F (2010). Knowledge and perception of pulmonary tuberculosis in pastoral communities in the middle and lower Awash Valley of Afar region, Ethiopia. *BMC Public Health* 10(1):187.
- Liefoghe R, Baliddawa JB, Kipruto EM, Vermeire C, De Munynck AO (1997). From their own Perspective. A Kenyan Community's Perception of Tuberculosis. *Trop. Med. Int. Health* 2:809-21
- Mengesho PE, Shayo E, Makunde WH, Keto GBS, Mandara CL, Kamugisha ML (2007). community knowledge, Attitudes and practice towards tuberculosis and its treatment in Mpwapwa District, Central Tanzania. *Tanzanian Health Res.* 9:38-43.

Mesfin MM, Tasew TW, Tareke IG, Mulugeta GWM, Richard MJ (2005). Community knowledge, attitudes and practices on pulmonary tuberculosis and their choice of treatment supervisor in Tigray, Northern Ethiopia. *Ethiop. J. Health Dev.* 19:21-27

World Health Organization (2010). *Global tuberculosis control*. Geneva, Switzerland.

World Health Organization (2005). *Global tuberculosis control*. Geneva, Switzerland.