Knowledge of Women about Tuberculosis and the Role of Health Extension Workers among Households in East Hararghe Zone, Ethiopia

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Abstract

Background: Tuberculosis (TB) is still one of the major public health problems in Ethiopia. This is mainly due to lack of knowledge about its cause, mode of transmission, symptom, and appropriate treatment, which in turn affect the health seeking behavior. Little is known about the women's knowledge of TB and Health Extension Workers (HEWs) contribution on information dissemination about TB.

Objective: To assess knowledge of women about tuberculosis and the role of Health Extension Workers among households in East Hararghe Zone, Eastern Ethiopia.

Methods: A community based cross-sectional quantitative study was conducted from February to March, 2014 on 2,319 households selected by multistage stratified sampling technique from six districts in East Hararghe Zone. Twelve trained data collectors collected the data from household women using a structured questionnaire. Data were analyzed using descriptive statistics and predictors were identified with logistic regression.

Results: One thousand six hundred eighty seven (86%) study participants were interviewed to assess the comprehensive knowledge of TB. Frequent visits to disseminate health information about TB made by Health Extension Workers were significantly higher among rural study participants (94.4%) than urban study participants (76.6%). Being age > 45 years (AOR=2.08; 95%CI: 1.37, 3.16), divorced marital status (AOR= 3.49; 95%CI: 1.37, 8.91), 5-8th grade student (AOR=2.72; 95%CI: 1.25, 5.91), 9-10th grade student (AOR= 4.12; 95%CI: 1.19, 14.19) and unemployed (AOR=0.74; 95%CI: 4.64, 16.47) were predictors of comprehensive knowledge of household women. Meanwhile, out of 2319 study participants, 91.8% household women reported that the HEW had visited their house regularly.

Conclusion: Study participants' comprehensive knowledge about TB was satisfactory. However, significant proportion of the respondents had less knowledge about major symptoms and main routes of transmission. Thus, Health Extension Workers should strengthen targeted health information on TB focusing on the route of transmission and prevention.

Key words: *Community, Health Extension Workers, Knowledge, TB*

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Introduction

Tuberculosis (TB) is caused by bacteria, *Mycobacterium tuberculosis*, that most often affect the lungs. It spreads from person to person through the air when people with pulmonary TB cough, sneeze or spit, they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected. People infected with TB bacteria have a 10% lifetime risk of falling ill with TB. However, people with compromised immune status, such as living with HIV, malnutrition or diabetes, or people who use tobacco, have a much higher risk of falling ill. In 2014, 9.6 million people fell ill with TB and 1.5 million died from the disease and 480 000 people developed Multidrug Resistant TB (MDR-TB). Over 95% of TB deaths occur in low- and middle-income countries. The disease is curable and preventable (WHO, 2006; WHO 2016). Ethiopia is one of the 22 High

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Burden Countries (HBCs). According to the 2014 WHO report, the prevalence and incidence of all forms of TB are 211 and 224 per 100,000 of the population, respectively (WHO, 2014).

It has been said that HIV/AIDS, smoking and malnutrition are substantial contributors to the epidemiological burden of active TB (Murray *et al.* 1990; Cegielski and McMurray 2004; WHO 2009). Meanwhile, poverty and lack of awareness are the most important factors that increase the risk of exposure to TB (Lienhardt, 2001; Lienhardt *et al.*, 2005), and that lack of knowledge about the cause, mode of transmission, symptoms, and appropriate treatment of TB affect not only the health-seeking behavior of patients, but also the controlling strategy, thereby sustaining the transmission of the disease within the community (Auer *et al.*, 2000; Yimer *et al.*, 2005; Mesfin *et al.,* 2009). For these reasons, creating general awareness about tuberculosis among communities and initiating community participation in the control of the disease make up one component of the six basic components of the "Stop TB Strategy" of the World Health Organization (WHO) (WHO, 2006).

In 2003, in response to the country's health problem, the Ethiopian Federal Ministry of Health (FMoH) launched a new health care plan: the "Accelerated Expansion of Primary Health Coverage" through a comprehensive Health Extension Program (HEP). The program has introduced 16 packages in four areas of care, one of which is Disease Prevention and Control (HIV/AIDS, TB and malaria) (Banteyerga, 2011). The major task of HEWs who are young women who took a one-year course of skill oriented basic training on HEP packages, is increasing the knowledge and skills of communities and households to deal with preventable diseases and be able to access services available at the nearby health institutions (Sebhatu, 2008; Banteyerga, 2011). However, little has been achieved (Yimer *et al.*, 2009). The limited studies that have tried to discover the underlying reasons why information is not widely and effectively disseminated by HEWs are the workers' limited access for updated information, low level of comprehensive knowledge, and community's misconceptions about HEWs (Mesfin *et al.,* 2005; Yimer *et al.,* 2009; Abebe *et al.*, 2010).

Though much emphasis is given on prevention and control of TB and the role of HEWs in averting the burden of the disease, little is known about community perception and awareness in management of tuberculosis. Therefore, this study was intended to assess knowledge of women about tuberculosis and the role of Health Extension Workers (HEWs) among households in East Hararghe Zone, Eastern Ethiopia.

Material and Methods

Study Area and Period

The study was conducted from February to March, 2014 in East Haraghe Zone, which is one of the 20 Zones in Oromia Regional State and which is divided into 19 districts and many kebeles (CSA, 2011). Kebele is the smallest administrative unit which consist at least five hundred families, or 3,500 to 4,000 persons. According to Zonal Health Bureau, in each rural kebele, two HEWs have been assigned since 2003.

Study Population and Sample Size Determination

To calculate the required sample, a single population proportion formula was used. As a result the calculated sample size was 2,343 households. A household woman who was above 18 years old, able to speak and hear at the time of the interview, not critically ill, and volunteer to participate on the study was legible for the study. The research focused on household women heads because the health extension program itself focused on female and all the HEWs are female.

Sampling Procedure and Data Collection Technique

To select the required households, multi-stage stratified simple random sampling technique was used. Among 19 districts of East Hararghe Zone, six districts were selected using simple random sampling technique. Then, kebeles of the districts were stratified into urban and rural kebeles; and two kebeles were randomly selected from each randomly selected district. Finally. the households were proportionally allocated to each kebele based on the total number of households in each kebele. The study participants were household women and the data were collected through a face to face interview using structured questionnaire by 12 high school graduate women who were given training for the purpose. Three experienced public health officers supervised the data collection process.

Data Processing and Analysis

In this study, the outcome variable was knowledge about TB, composed comprehensive TB knowledge questions. The independent variables were residence, age, marital status, religion, ethnicity, educational status, occupation, availability of health facility, distance of health facility, and frequency of HEWs visit.

The questionnaire, which was adopted from numerous literatures, consisted 24 items: 12 items are about socio-demographic, 6 items are related to TB knowledge, and 6 items are related to HEWs and health facility. Each item had alternative responses. A score of one was given for each correct answer and a zero for an incorrect and 'I don't know' answers. The knowledge levels of the participants were dichotomized based on their overall knowledge level about TB. Accordingly, those who answer all questions asked to assess the overall knowledge about TB were considered as knowledgeable, whereas those who did not answer all questions asked to assess the overall knowledge about TB were considered as less knowledgeable. The data were cleaned and double entered into EpiData Version 3.1 and analyzed using STATA version 11.0. Adjusted Odds Ratio (OR) with 95% CI was used to determine the association between the outcome variable (knowledge about TB) and the predictor variables.

Ethical Considerations

The study was reviewed and approved by Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University, College of Health and Medical Sciences. Written consent was obtained from each study participant prior to the commencement of data collection. Study participants were represented by coded identifiers to maintain confidentiality,

Results

Socio-demographic Characteristics of the Study Participants

Of the 2,343 legible household women assumed, 2,319 participated in the study, which was with a response rate of 99%. Their mean age was 36.7 years (SD± 14.02). One hundred eighty two (85.5%), 2036 (87.8%), 2,024 (87.3%), and 2,070 (89.3%) were rural dwellers, married, Muslim, and Oromo ethnic group, respectively (Table1).

Knowledge of Study Participants about Tuberculosis

Most of the respondents, 1,972 (85%), reported that they had heard about TB before, of whom 1,687 (86%) correctly answered to all questions asked about TB. Additionally, 1,338 (67.8%) mentioned HEWs as a source of information about TB (Figure 1), 1,885 (95.6%) identified cough greater than two weeks as the major symptom of TB, and 99.4% described TB as a transmittable disease. Moreover, among the respondents who had heard about TB, 1,861 (95%) reported that TB can be transmitted through droplets during sneezing and coughing, 1,843 (93.5%) mentioned that TB as a preventable disease, and 1,909 (96.8%) as a curable disease.

Table 1. Socio-demographic characteristic of study participants in East Hararghe, Ethiopia, 2014.

Variable	Category	Freq.	%
Residence	Urban	337	14.5
	Rural	1,982	85.5
Age in years	18-30	1,044	45.0
	31-45	804	34.7
	>45	471	20.3
Marital status	Married	2,036	87.8
	Single	115	5.0
	Divorced	106	4.6
	Separated	61	2.6
Religion	Christian	291	12.5
	Muslim	2,024	87.3
	Others	4	0.2
Ethnicity	Oromo	2,070	89.3
	Amhara	242	10.4
	Other	7	0.3
Educational status	Unable to Read/Write	1,657	71.4
	Read/Write	152	6.6
	1-4th Grade	167	7.2
	5-8th Grade	196	8.5
	9-10th Grade	110	4.7
	11-12 Grade	4	0.2

The proportion of urban study participants (97.9%) who had heard about TB before ($p<0.005$) and who replied TB as a curable disease (99.4%) was significantly higher than that of the rural study participants ($p= 0.003$). The number of rural study participants who mentioned HEWs as a source of information about TB 1,196 (72.8%) were higher than that of the urban study participants ($P< 0.005$) (Table 2).

Based on multivariate results, being age > 45 years (AOR=2.08; 95%CI: 1.37, 3.16), divorced marital status (AOR=3.49; 95%CI: 1.37, 8.91), 5-8th grade student (AOR=2.72; 95%CI: 1.25, 5.91), 9-10th grade student (AOR=4.12; 95%CI: 1.19, 14.19), and being unemployed (AOR=0.74; 95%CI: 4.64, 16.47) were identified as predictors of comprehensive knowledge level of household women (Table 3).

Role of Health Extension Workers to Disseminate Information about TB

Out of 2,319 study participants, 2,128 (91.8%) of the study participants reported that the Health Extension Workers had visited their house regularly to disseminate health information about TB and many of whom were rural study participants. Thus, frequent visits to disseminate health information about TB made by Health Extension Workers were significantly higher among rural study participants (94.4%), than urban study participants (76.6%) ($p<0.005$) (Table 4).

Table 2. Study participants' knowledge about TB in East Hararghe, Ethiopia, 2014.

Variables	Respondent's residence		
	Urban n (%)	Rural n (%)	Total n (%)
Ever heard about TB before			
Yes	330 (97.9)*	1,642 (82.8)*	1,972 (85)
No	7 (2.1)	340(17.2)	347 (15)
Cough greater than two weeks as a major symptom of TB			
Yes	318 (96.4)	1,567 (95.4)	1,885 (95.6)
No	12 (3.6)	75 (4.6)	87 (4.4)
TB is transmittable disease			
Yes	329 (99.7)	1,631 (99.3)	1,960 (99.4)
No	1 (0.3)	11 (0.7)	12 (0.6)
Air droplets during sneezing & coughing as main route of transmission			
Yes	319 (97)	1,542 (94.5)	1,861 (95)
No	10 (3)	89 (5.5)	99 (5)
TB is preventable			
Yes	305 (92.4)	1,538 (93.7)	1,843 (93.5)
No	25 (7.6)	104 (6.3)	129 (6.5)
TB is curable			
Yes	328 (99.4)*	1,581 (96.3)*	1,909 (96.8)
No	2 (0.6)	61 (3.7)	63 (3.2)

*Note: *p<0.05*

Table 3. Factors associated with TB knowledge among households in East Hararghe, Ethiopia, 2014.

Variable		Overall knowledge about TB			
		High, n (%)	Low, n (%)	COR(95% CI)	AOR (95%)
Residence	Urban	287 (17)	42 (15.4)	1	
	Rural	1,400 (83)	231 (84.6)	0.89 (0.62-1.26)	1.54 (0.97-2.44)
Age	18-30	735 (43.6)	128 (46.9)	1	
	31-45	587 (34.8)	107 (39.2)	0.95 (0.72-1.26)	1.27 (0.94-1.71)
	>45	365 (21.6)	38 (13.9)	1.67 (1.14-2.45)*	2.08 (1.37-3.16)*
Marital status	Married	1,474 (87.4)	241 (88.3)	1	
	Single	78 (4.6)	18 (6.6)	0.71 (0.42-1.20)	0.64 (0.35-1.17)
	Divorced	92 (5.5)	5 (1.8)	3.01 (1.21-7.48)*	3.49 (1.37-8.91)*
	Separated	42 (2.5)	9 (3.3)	0.76 (0.37-1.59)	0.85 (0.39-1.84)
Religion	Christian	255 (15.1)	21 (7.7)	1	
	Muslim	1,429 (84.7)	251 (91.9)	0.47 (0.29-0.75)*	0.84 (0.38-1.82)
	Others	3 (0.2)	1 (0.4)	0.25 (0.02-2.48)	0.14 (0.01-1.77)
Ethnicity	Oromo	1,462 (86.7)	258 (94.5)	1	
	Amhara	218 (12.9)	15 (5.5)	2.56 (1.49-4.34)	1.93 (0.79-4.69)
	Others	7 (0.4)	0 (0)		
Educational status	Illiterate	1,124 (66.6)	219 (80.2)	1	
	Read /write	111 (6.6)	25 (9.2)	0.86 (0.55-1.37)	0.77 (0.47-1.28)
	1-4 Grade	134 (7.9)	14 (5.1)	1.86 (1.06-3.29)*	1.18 (0.65-2.17)
	5-8 Grade	179 (10.6)	8 (2.9)	4.36 (2.11-9.00)*	2.72 (1.25-5.91)*
	9-10 Grade	106 (6.3)	3 (1.1)	6.88 (2.16-21.88)*	4.12 (1.19-14.19)*
	11-12 Grade	3 (1.8)	1 (0.4)	0.58 (0.60-5.64)	0.39 (0.03-4.77)
	>12 Grade	30 (1.8)	3 (1.1)	1.95 (0.59-6.44)	1.38 (0.31-6.08)
Occupation	Farmer	990 (58.7)	237 (86.8)	1	
	Daily laborer	182 (10.8)	21 (7.7)	2.07 (1.29-3.33)*	1.62 (0.91-2.87)
	Gov't employee	56 (3.3)	4 (1.5)	3.35 (1.20- 9.33)*	2.13 (0.57-7.96)
	Unemployed	459 (27.2)	11 4)	9.99 (5.40-18.47)*	8.74 (4.64-16.47)*
Availability of health facility	Yes	1,665 (98.7)	268 (98.2)	1	
	No	22 (1.3)	4 (1.5)	0.88 (0.30-2.59)	1.28 (0.42-3.89)
Distance from health facility	≤1 hour	1,665 (98.7)	267 (97.8)	1	
	> 1 hour	22 (1.3)	6 (2.2)	0.59 (0.24-1.46)	0.82 (0.29-2.29)
†Frequent visit done by HEWs	Yes	1,567 (92.9)	249 (91.2)	1	
	No	120 (7.1)	24 (8.8)	0.79 (0.50-1.26)	0.64 (0.38-1.07)

Note: †*More than one visit within a month; *p<0.05; COR= crude odds ratio; AOR= adjusted odd ratio; CI: Confidence interval*

*Note: *p<0.005*

Table 4. Health related characteristics among households in East Hararghe, Ethiopia, 2014.

Variables	Respondent's residence		
	Urban, n (%)	Rural, n (%)	Total, n (%)
Presence of health institution (any type)			
Yes	334 (99.1)	1,932 (97.5)	2,266 (97.7)
No	3 (0.9)	50 (2.5)	53 (2.3)
Type of health institution			
Health post	138 (40.9)*	1,486 (75)*	1624 (70)
Clinic	142 (42.1)*	62 (3.1)*	204 (8.8)
Pharmacy/ rural drug vender	112 (33.2)*	45 (2.3)*	157 (6.8)
Health center	90 (26.7)	552 (27.8)	642 (27.7)
Hospital	4 (1.2)	13 (0.7)	17 (0.7)
Walking distance for health institution			
≤1 hour	312 (92.6)	1,976 (99.7)	2,288 (98.7)
>1 hour	25 (7.4)	6 (0.3)	31 (1.3)
HEWs frequent visits			
Yes	258 (76.6)*	1,870 (94.4)*	2,128 (91.8)
No	79 (23.4)	112 (5.6)	191 (8.2)
Frequency of HEWs visit			
≥ once in a month	246 (95.3)	1,829 (97.8)	2,075 (97.5)
< one in a month	12 (4.6)*	41 (2.3)*	53 (2.5)

Discussion

The study demonstrated that there is a knowledge gap between urban and rural respondents regarding previous experience on TB. In this study, 85% of the respondents had information about TB, and this is compatible to similar study findings reported from South West Ethiopia (83.0%) (Abebe *et al.,* 2010), Malaysia (96%) (Koay, 2004), and rural south east part of China (99.2%) (Wang *et al.,* 2008), where the respondents had heard about TB. It is also similar with findings in South-west Ethiopia (Abebe *et al.,* 2010), North Ethiopia (86.8%) (Mesfin *et al.,* 2005; Yimer *et al.*, 2009), and in Afar Regional State (95.6%) (Legesse *et al.*, 2010), where the study participants had heard about pulmonary tuberculosis.

Unlike the finding in Lahore, where for 41% of the respondents' mass medias were their main source of information about TB (Bacay-Domingo and Ong-Lim, 2009), and in Iraq, where physicians (27.5%) and television (23.2%) were the most important sources of the information (Hashim *et al.*, 2003), in the current study HEWs were source of the information for 1,338 (67.8%) of the 1972 respondents who had had information about the disease. This might be due to community's improved access to primary health care units and success of health extension program on disseminating health information for the community member about diseases prevention. However, our finding is in agreement with the one in Mwanza region, Tanzaina, where the primary Health workers are the main source of information about TB (Wandwalo and Mørkve, 2000).

Despite a higher proportion of the study participants mentioned that cough greater than two weeks is the major symptom of the disease and inhaling respiratory droplets are the main route of disease transmission, the comprehensive knowledge of study participants regarding TB is low. The study result regarding major symptoms of PTB is in agreement with the findings of other studies conducted in pastoral communities in the middle and Lower Awash Valley of Afar region, Ethiopia which revealed that a larger proportion of participants from the Dubti area mentioned persistent cough as a major symptom of Pulmonary TB (PTB) than participants from the Amibara. However, unprotected

coughing/breathing (80.8%) and sharing cups with a patient (77.6%) were the most frequently mentioned routes of transmission by participants from both areas (Legesse *et al.,* 2010). This might be due to good information dissemination strategy applied by HEWs.

In the present study, the study participants reported that PTB is treatable and curable with modern drug, and this is compatible with the findings of previous studies in other parts of Ethiopia (Mesfin *et al.*, 2005, Legesse *et al.,* 2010), and in Iraq (Hashim *et al.,* 2003). This might be due to improved access to primary health care units, and the frequent visits to the households by HEWs, and the success of Health Extension Program in disseminating health information for the community.

This cross sectional survey may be subjected to recall bias. However, its effect was minimized by reducing the recall period during interview. It would be also more appropriate to use analytical approaches to assess the roles of HEWs on the level the community's knowledge; and to complement the study with qualitative data.

Conclusion and Recommendations

Based on the findings of the study, study participants' overall knowledge about TB was satisfactory and frequent visit of households by HEWs has been observed. However, significant proportion of the respondents had less knowledge about symptoms and routes of transmission. Thus, HEWs should strengthen targeted health information on TB focusing on the route of transmission and prevention.

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Conflict of Interests

The authors declare that they have no competing interests.

Authors' contributions

The study was conceived and designed by AS, who also retrieved the data sets for analysis and drafted the manuscript. KU and TG participated in study design, analysis, write-up, and manuscript revision. All authors approved the final manuscript.

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