

# Assessment of Tuberculosis Related Knowledge and Its Association with Treatment Adherence among Tuberculosis Patients Attending Follow up in Chiro Hospital, West Hararge Zone, Oromia Regional State, East Ethiopia, 2016

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## Abstract

**Background:** Tuberculosis is an infectious disease caused by Tubercle bacillus, known as mycobacterium tuberculosis, whose host is human and is transmitted through the air or by ingesting infected milk or meat (bovine TB) and it is both preventable and curable. People who have pulmonary tuberculosis can infect others through droplets infections when they cough, sneeze or talk. Little studies have been done in the area of knowledge related patient factors of non adherence in tuberculosis prevention and control programs. **Methods:** A facility based cross sectional study design was used to review record and a structured questionnaire was used to collect quantitative data from all TB patients in Chiro hospital from May 15-30/ 2016. Then the collected data were cleaned, compiled, organized, interpreted and presented to give the necessary information. All data processing and analysis procedures were operated using SPSS and finally calculation of frequencies and percentage was done. Then data were presented in tables. Associations between variables were analyzed and presented using chi-square test. **Result:** From the total of 87 TB patients interviewed, 59(67.3%) were knowledgeable on TB while 28(32.7%) of them were not knowledgeable. Among all respondents the level of adherence to treatments was 75(86.4%) and the level of non adherent to treatments was 12(13.6%). This study found out that there was a significant association between TB related knowledge and treatment adherence ( $X^2$  value=23.599, p value=0.000). **Conclusions:** Among the study participants only 67.3% have basic knowledge with regard to the cause, transmission, symptoms, prevention and treatment of Tuberculosis and the overall level of adherence to TB treatments is in the acceptable level. Chi square test revealed that the overall TB related knowledge and level of treatment adherence were found to have statistically significant association. Thus, the hospital and managers at all levels should strengthen IEC/BCC and supportive supervision activities.

**Keywords:** Tuberculosis, Knowledge, Treatment adherence,

## Introduction

Tuberculosis (TB) is an infectious disease caused by Tubercle bacillus, known as Mycobacterium tuberculosis, whose host is human & is transmitted through the air or by ingesting infected milk or meat (Bovine TB) and it is both preventable and curable and People who have pulmonary tuberculosis (TB disease in the lungs) can infect others through droplet infection when they cough, sneeze or talk. <sup>1-3</sup>

Tuberculosis is the leading communicable disease among the ten cause of global mortality. <sup>4,5</sup> The well-known risk factors & unresolved challenge in TB control is the treatment completion. Treatment will only be effective if the patient completes the regimen which includes a combination of drugs recommended by health professionals. Poor compliance contributes to the worsening of the TB situation by increasing incidence and initiating drug resistance. Resistance to anti- TB drugs has also emerged as an important obstacle in the control of the disease. Thus, the following thematic areas related with TB prevention & control like: the level of treatment adherence of TB patients, TB related knowledge of patients, the relationship between knowledge and treatment adherence & perceived reasons for stopping/missing TB treatment among TB- patients was assessed by this study. <sup>6-8</sup>

Tuberculosis causes significant mortality and morbidity globally and with the advent of the human immune deficiency virus (HIV) epidemic, TB is regarded as a worldwide public health challenge. Studies show that in both developed and developing countries the rising incidence of TB due to the effect of HIV is well recognized. <sup>4,9,10</sup> It was reported that the highest prevalence and estimated annual risk of TB infection are in sub-Saharan Africa and Southeast Asia & TB is one of the most widespread diseases affecting 8-10 million new cases annually and nearly 3 million deaths occur worldwide each year. <sup>4,10,11</sup> Other studies also show that about one-third of the world population is latently infected with Mycobacterium tuberculosis while 8 million new cases emerged annually; about 5,000 persons were infected per day. <sup>5,7,6,12</sup> In Ethiopia due to low health services coverage and poorly developed health information system in the country TB is among the leading cause of mortality and morbidity & over one third of the population has been exposed to TB, and it has becoming a disease of major public health importance. <sup>13,14,15</sup> According to the Federal Ministry of Health Guidelines for clinical and programmatic management of TB, TB/HIV and Leprosy in Ethiopia (2013), "Ethiopia is one of the

22 HBCs. The national population based TB prevalence survey conducted in 2010/11 revealed that the prevalence of smear positive TB among adults and all age group was found to be 108 and 63 per 100,000 populations, respectively.<sup>16</sup>

TB treatment presents particular challenges for adherence because the treatment is long and involves taking a number of medications, side-effects are common and the patient usually feels better long before treatment has been completed. TB treatment usually consists of 2 phases: an intensive phase with a combination of four drugs for 2 months and a continuation phase with 2 drugs for 4 to 6 months. In Africa the cure rate is lower than the global cure rate (54%-74% in Africa for smear positive pulmonary TB as compared to 84% worldwide) due to adherence issues and the emerging of multi-drug resistant strains of Mycobacterium tuberculosis. Poor compliance and patients defaulting anti TB treatment contribute to the increase of multi-drug resistant mycobacterium in the continent. Default is defined by the WHO as a treatment interruption of two consecutive months or more after at least one month on treatment but the definition of defaulters can vary within national programs.<sup>17</sup>

Non-adherence to treatment is a problem in Tuberculosis (TB) management as with other long term illnesses. A study in Uganda has found the prevalence of non-adherence was 21.2 – 32.9 %.<sup>13</sup> Patients with TB are expected to have adherence levels greater than 90% in order to facilitate cure & failure for cure increases the risk of development of drug resistant strains, spread of TB in the community and this in turn increases morbidity and mortality. The problem would be worse with the Multi-Drug (MDR) and Extensively Drug resistance (XDR) TB cases that are likely to develop with non-adherence and yet are difficult to treat.<sup>13</sup> Further, studies indicated that worldwide patient compliance with anti-TB therapy, with an estimate of as low as 40% in developing countries, remains the principal cause of treatment failure & so, the critical aspect of management is ensuring compliance with a full course of chemotherapy (4,5). The World Health Organization recommends at least 85% cure rate of all diagnosed TB cases & to achieve this cure rate, compliance needs to be in the order of 85-90%.<sup>4,5</sup>

## **Methodology**

### **Study setting and period**

The study area was in Chiro Hospital, West Hararge Zone, Oromia regional state, East Ethiopia. Chiro Hospital is one of the two hospitals in West Hararge Zone found in Chiro town which is the capital city of West Hararge Administrative Zone and it is located at 326 km away from Addis Ababa. Chiro Hospital is providing: inpatient, outpatient, emergency, preventive and promotive health services. The TB clinic in the hospital provides free anti tuberculosis drugs and free medical laboratory service. The study period was conducted from May 1-15/2016. Facility based cross-sectional study design was used.

### **Population**

The source population was all patients who were diagnosed and started treatment for TB in Chiro Hospital. The source population were all patients who were diagnosed and started treatment for TB in Chiro Hospital. The study population were all 87 TB patients who was on both in intensive & continuation phase treatment in the study period

### **Variables**

Independent variables were, Socio-demographic variables: age, sex, education, employment, distance, and income. Dependent variable were: level of adherence and TB-related knowledge

### **Data collection instrument and procedure**

Data collection tools were adapted after review of relevant literatures. The check list and statement are grouped and arranged according to the particular objectives that they can address. After giving training to TB focal data was collected using face to face interview and from existing records by a structured questionnaire. Data were collected from May, 1- 15/2016. Then Continuous supervision was conducted through-out the whole data collection period by the investigators. During data collection process questionnaire was examined for accuracy, consistency and completeness and incomplete questionnaires was returned to the data collectors to be re-examined.

### **Data Processing & Analysis**

Then the collected data was cleaned, compiled, organized, interpreted & presented to give the necessary information. Participants were judged to have sufficient knowledge of TB if he/ she scores 70% and above out of the total question related to TB knowledge.<sup>18</sup> Each option of the answer assumed equally to have a score of 1. All data processing & analysis procedures was operated using SPSS soft ware & finally Calculation of frequencies, percentages & summary statistics and presenting them in tables or graphs was done. Association between variables was also performed using chi- square test.

The questionnaire was translated to Afan Oromo & retranslated back to English language to check consistency & pre-tested on 10 TB patients in Chiro town health center to check the reliability of the questionnaire. Reliability is a system to perform its required function under stated condition for a specified period of time. Training was also be given to data collectors and during the data collection period, the investigators were undertaken close supervision to check completeness, consistency, and validity in a daily base.

### **Operational Definitions**

For the purpose of this study the following concepts was defined operationally as follows:

**Tuberculosis-** refers to an infectious disease mostly affecting bronchi and lungs caused by M. Tuberculosis (16)

**Patient-** people who are suffering from TB and registered in the hospital<sup>18</sup>

**Knowledgeable-** the person judged to have sufficient knowledge of TB if he/ she scores 70% and above out of the total question related to TB knowledge.<sup>18</sup> Each option of the answer assumed equally to have a score of 1.

**Not knowledgeable** – if he/she scores less than 70% out of the total question related to TB knowledge.<sup>18</sup>

**Adherent** – When a patient with TB takes at least 85% of the administered drugs.<sup>17</sup>

**Non Adherent** – When a TB patient takes less than 85% of the administered drug.<sup>17</sup>

**Perceived reasons** – Refers to issues or cause which the patients listed as a reason for stopping or missing the administered drugs.<sup>18</sup>

### **Ethical Considerations**

The study was conducted after official approval letter obtained from the Haramaya university college of public health and medical sciences. Permission was obtained from hospitals' management to proceed the study. Verbal consent was also obtained from all study participants after describing to them all the issue related to the study in detail. Data was kept carefully and all efforts was done to maintain confidentiality related to the information provided and recorded in the data sheet.

### **Result**

#### **Socio-demographic characteristics**

Among 89 TB-patients who were included in the study 87 of them participated with a response rate of 97.7%. Among the 87 respondents 50(57.1%) were males and 37(42.9%) were females. The majority of the patients 30(34.7%) were in the age group of 25-34 years and followed by 23(26.5%) with the age group of 35-44 years. 47 (54%) of respondents reported that they attended formal education and the rest 40(46%) were not educated. From all respondents 62(71.4%) were married, 20(22.4%) single, 4(4.1%) divorced and the rest 2(2%) were widowed. Majority of the respondents 59(67.3%) were Muslim, 23(26.5%) orthodox and 5(6.1%) were protestant. Regarding occupation 15(17.2%) of the respondents were farmers, 25(28.7%) merchants, 15(17.2%) employed and 32(36.7%) were daily laborers and students. Among all respondents 37(42.9%) of them had an income of 500-1000 Birr and 30(34.7%) of them had an income of less than 500 Birr per month. Majority of the respondents 78(89.7%) were urban residents (**Table 1**).

**Table 1:** Socio demographic characteristics of the respondents in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Variables		Number	Percent
Sex (N=87)	Male	50	57.1
	Female	37	42.9
Age category in years (N=87)	5-14yrs	5	6.1
	15-24yrs	16	18.4
	25-34yrs	30	34.7
	35-44 yrs	23	26.5
	45-54 yrs	9	10.2
	>=65 yrs	4	4.1
Level of Education(N=87)	Illiterate	40	45.9
	Elementary(1-8 grade)	34	38.8
	Secondary(9-12 grade)	9	10.2
	College	4	4.1
Marital status (N=87)	Married	61	70.1
	Single	20	22.4
	Divorced	4	4.1
	Widowed	2	2.0
Occupational status (N=87)	Farmer	15	17.2
	Merchant	25	28.7
	Employed	15	17.2
	Others(Daily laborer, student,)	32	36.7
Religion (N=87)	Muslim	59	67.3
	Orthodox	23	26.5
	Protestant	5	6.1
Monthly income(Birr) (N=87)	<500	30	34.7
	500 -1000	37	42.9
	1000 – 1500	11	12.2
	1500 – 2000	4	4.1
	> 2000	5	6.1
Residence (N=87)	Rural	9	10.3
	Urban	78	89.7
Distance from HFs(N=87)	0-3 KMs	78	89.7
	4-6 KMs	9	10.3

### TB-related knowledge

Among the total respondents 38.8% know TB is caused by bacteria, 42.9% attributed to cold air and 18.4% didn't mention any cause. 64 (73.5%) of respondents know that TB is transmitted by coughing/sneezing and 36.7% of respondents knew that TB is prevented by covering mouth and nose when coughing and 22.4% said by avoid drinking raw milk (**Table 2**). Overall 59(67.3%) of respondents were knowledgeable about TB while 28(32.7%) of them were not knowledgeable.

Knowledgeable - those respondents who answered 70% and above out of the total questions related to TB knowledge and not knowledgeable-scores less than 70% out of the total question related to TB knowledge (18). Where each options of the answer was given equally a score of 1.

**Table 2:** Knowledge on TB cause, transmission, sign & symptoms and prevention among TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Variable	Frequency	%
Source of infection		
Bacteria	34	38.8
Cold air	37	42.9
Don't know	16	18.4
<b>Total</b>	<b>87</b>	<b>100.0</b>
Means of transmission		
Coughing /sneezing	64	73.5
Sharing dishes	2	2.0
Cold air	4	4.1
Drinking raw milk	14	16.3
Don't know	4	4.1
<b>Total</b>	<b>87</b>	<b>100.0</b>
Signs & symptoms		
Cough > 2 weeks	46	53.1
Coughing up blood	9	10.2
Night sweating	12	14.3
Shortness of breathing	7	8.2
Fever	7	8.2
Others(severe headache ,loss of appetite, chest pain)	5	6.1
<b>Total</b>	<b>87</b>	<b>100.0</b>
Prevention		
Covering mouth& nose when coughing	32	36.7
Avoid drinking raw milk	20	22.4
Avoid sharing dishes	16	18.4
Good nutrition	7	8.2
Closing window	7	8.2
Dot know	5	6.1
<b>Total</b>	<b>87</b>	<b>100.0</b>

#### Adherence to anti- TB treatment

Among all respondents the level of adherence to treatments was 75(86.4%) and the level of non adherent to treatments was 12(13.6%)(Table 3). Adherent – When a respondent/ patient with TB takes at least 85% of the administered drugs and Non Adherent – When a respondent/TB patient takes less than 85% of the administered drugs (17).

**Table 3:** Level of adherence to treatment among TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Adherence	Frequency	%
Adherent	75	86.4
Non adherent	12	13.6
<b>Total</b>	<b>87</b>	<b>100.0</b>

#### Association of TB- related knowledge and treatment adherence

This study found that there was a significant association between TB related knowledge and treatment adherence( $X^2$  value=23.599, p value=0.000) (Table 4).

**Table 4:** Association of TB- related knowledge and treatment adherence among TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Adherence	Knowledge				Total		X <sup>2</sup> test	P-value
	Knowledgeable		Not knowledgeable					
	No	%	No	%	No	%		
Adherent	56	64.6	19	21.8	75	86.4	23.599	0.000
Non Adherent	3	2.7	9	10.9	12	13.6		
<b>Total</b>	<b>59</b>	<b>67.3</b>	<b>28</b>	<b>32.7</b>	<b>87</b>	<b>100.0</b>		

### Reasons for stopping/missing TB treatment

The major reasons given by non adherent respondents for missing or stopping treatment were patients beginning to feel better 25%, lack of knowledge 25%, side effect of TB drugs 16.7%, distance 25% and lack of family support 8.3 % ( **Table5**).

**Table 5:** Perceived reasons for patients stopping or missing anti TB drugs among TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Reasons	Frequency	%
Due to a feeling of getting better	3	25.0
Lack of knowledge	3	25.0
Side effects of TB drugs	2	16.7
Lack of Family support	1	8.3
Distance residence from Health facility	3	25.0
<b>Total</b>	12	100.0

### Record Review

Among the registered 87 patients, 75(86.4%) of them took their drug every day, 3(3.4%) every other day and 9(10.2%) took weekly. 86.4%, 5.4% and 8.2% of registers were all updated, partially updated and not updated respectively. On the other hand 86.4% of patient's information was completed and 13.6% was not completed. Only 13.6 % ( 12) patients missed doses of drugs in less than 4 weeks (**Table 6**).

**Table 6:** Record review of TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia, 2016

Variables	Frequency	%
<b>Patient coming condition</b>		
Every day	75	86.4
Every other day	3	3.4
Weekly	9	10.2
<b>Registers</b>		
All updated	75	86.4
Partially updated	5	5.4
Not updated	7	8.2
<b>Patients missed daily dose of drugs</b>		
< 4 weeks	12	13.6
4-8weeks	0	0.0
>8 weeks	0	0.0
<b>Patient information</b>		
Complete	75	86.4
Not complete	12	13.6

### Discussion

In this study it was attempted to assess TB related knowledge and its association with treatment adherence among TB patients in Chiro hospital, West Hararge Zone, Oromia, East Ethiopia.

The survey revealed that overall 59(67.3%) of respondents were knowledgeable on TB while 28(32.7%) of them were not knowledgeable. The finding is not similar with findings of the studies done in Nigeria<sup>18</sup> which found that 76.4% of patients were knowledgeable and 23.6% were not knowledgeable and Zambia<sup>10</sup> which found 49% were knowledgeable and 51% were not knowledgeable. The possible explanation for this difference might be due to 21.4% of the questions used to assess TB knowledge were on MDR-TB which those previous studies might not include it in those countries. This implies that majority of TB patients in the study area have basic knowledge with regard to the cause, transmission, symptoms, prevention and treatment of tuberculosis. Knowledge on modes of transmission and methods of prevention requires revisiting as the patients seemed to have knowledge that did not relate the disease to environment (that TB caused be transmitted through the air). They believed in physical contact with objects, for instant sharing dishes and cold air with TB patients. This result is consistent with finding from a study in Zambia<sup>10</sup> which states different misunderstanding of TP patient regarding cause, transmission, prevention and treatment.

The study identified that overall level of adherence to TB treatments was 75(86.4%) and the level of non adherent to treatments was 12(13.6%). In previous studies done in Uganda and Malaysia<sup>4,13</sup> and Nigeria<sup>5</sup> it was identified that the level of adherence was 75% and 55.6% respectively which are not similar to this study. The difference of the findings might be due to the difference in study period which adherence was assessed. However, the findings of studies in Zambia<sup>10</sup> and Nepal<sup>3</sup> with level of adherence 80.8% and 86.8% respectively were found almost similar findings. According to the WHO cut of point value ( $\geq 85\%$  level of adherence) this



study indicated that there was acceptable level of adherence to anti TB treatment in the study area.

This study showed that TB-related knowledge had association with the level of treatment adherence among the patient. It shown that most knowledgeable patients founded to be adherent and those who were non adherent founded to be less knowledgeable than those who were adherent. A research in Uganda also revealed that among factors associated with non adherence, knowledge of TB was significantly associated with non adherence. A study in Lusaka, Zambia <sup>4</sup> which was done on PTB reported a positive relationship between adherence and knowledge indicating that as the level of knowledge increase adherence level also increase. <sup>10</sup>

Chi square tests revealed that the overall TB related knowledge and level of treatment adherence was found to have statistically significant association (p- value 0.000). The finding of this study was similar with a study in Uganda which showed that there was statistically significant association between overall TB related knowledge and level of treatment adherence among TB patients (P-value=0.03).

### Conclusion and recommendations

Majority of TB patients had knowledge regarding cause, transmission prevention and treatment. Also identified number of gaps in the area of transmission, prevention and treatment. TB related knowledge had significant association with level of adherence. Knowledgeable patients founded to be adherent than those who were not knowledgeable. The major reason for stopping or missing TB drugs listed by patients were feeling better (25%), lack of knowledge on completing a course (25%) and adverse effects of drugs (16.7%) Having these findings from the study, the following recommendations were forwarded: Health professionals at health facility level as well as health extension workers at the community level should strengthen IEC/BCC programs to enhance the awareness of the community about TB prevention and control and TB treatment adherence. Moreover, health professionals especially TB focal persons in the health centers should give emphasis for completeness and updating of information on TB prevention and control program registers. Managers at the Chiro Hospital/Chiro town/Zonal health office level should strengthen supportive supervision to the health centers to support the TB prevention and control program by providing necessary materials and supplies for IEC/BCC services. In this study as well as in previous studies little is known about TB related knowledge, adherence and their association, so further studies are suggested.

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