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Treatment Adherence and Factors Associated Among Tuberculosis Patient in West Hararghe Zone, Oromia Regional State

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Abstract
Background: TB is a chronic bacterial infection caused by micro bacterium tuberculosis that primarily affect the lung and may involve almost every part of the body. It is transmitted from person to person mainly through respiratory route, when tubercle bacilli in respiratory secretions from nuclei or droplets are expelled during coughing, sneezing and vocalizing and occasionally through ingestion of cow's milk. **Methods:** A cross sectional community based study was conducted to identify tuberculosis treatment adherence and factors associated with among TB patients currently on treatment at health facility in Bedesa town, Oda Bultum Woreda, West Hararghe. Data was collected by using a structured close and open ended questionnaire. Then, the collected data was edited, cleared, checked and analyzed manually by using scientific calculator. We presented a descriptive analysis of anti TB adherence and factors associated with.**Results:** A total of 247 tuberculosis patients were interviewed; 57.48% were males and nearly 21.45% were urban dwellers. Adherence to anti TB drug was 78.95% and that of non adherence was 21.05%. About 78% of participants know the risk of missing a dose, 82.59% know about keeping specific time of administration and 61.16% know about not stopping even when feeling well. About 24.69% participants missed their medicine due to poor relationship with care givers, 2.85% missed due to side effects and 17.8% missed or stop their due to any discrimination or stigma faced.**Conclusion**: Non-adherence from TB treatment is a complex, dynamic issue with various factors impacting on treatment taking behavior. Non-adherence among TB patients was high. Poor relationship with care giver, and discrimination or stigma faced from family or relatives were the most frequent reasons for missing the anti-TB pills.
Keywords: Tuberculosis, Adherence, Anti-TB drugs

Introduction

TB is a significant and substantial problem for the public health care systems of the world. The estimated global burden of disease caused by TB in 2009 was 9.4 million (1).Tuberculosis continues to cause a large burden of disease in the world. It is fueled by poverty, poor public health system and increasing HIV/AIDS prevalence. Tuberculosis continues to be a persistent challenge for global health and development (2). Globally, TB is the second to HIV/AIDS as a cause of illness and death of adults, accounting for nearly 9 million cases of active disease and 2 million deaths every year. From 11% of the TB burden on the world population, Africa accounts today for more than quarter of the global burden with an estimated 2.4 million TB cases and 540,000 TB deaths annually (3). Ethiopia is one of the most populous countries in Africa. The country is among the least developed in the world located in eastern Africa. Ethiopia ranks seventh among the world's 22 high burden tuberculosis countries. According to WHO global TB report 2009, the country has an estimated incidence rate of 378 cases per 100,000 populations (2).

According to 2014 WHO Global TB report in Ethiopia the prevalence and incidence rate of all forms of TB are 211 and 224 per 100 000 population respectively. The number of TB cases is likely to increase as Ethiopians HIV/AIDS epidemic expands, or while 16% of notified TB patients tested for HIV, 40% are HIV positive (4). Tuberculosis requires prolonged treatment and poor adherence to prescribed treatment which increases the risk of morbidity, mortality and spread of disease in community (5).

A 2003 world health organization report on the topic emphasizing adherence, adherence is simultaneously influenced by several factors. Individual patient characteristic is only one factor that impacts on adherence. Other most important influences include socioeconomic factors, the quality of patient provider communication and nature of social support that the patient receive (6).

In general it seems that, lack of proper knowledge and adherence practice of TB is one of the important cause of unsuccessful control programs. In our country, the ministry of health is responsible for controlling infectious diseases including TB. Thus the major things to be done to solve TB problem is to increase the general knowledge level and to improve the practice of adherence toward TB.

Therefore, the aim of this study was to assess tuberculosis treatment adherence and factors associated with among TB patients currently on TB treatment in Bedessa Town, West Hararghe zone, Oromia Regional State.

Methods

Study area and period

This study was conducted in Bedessa Town and surrounding Health Center, TB pt who are attending TB clinic. Bedesa Town is one of west Hararghe Administrative Zone of Oromia Regional state. The Administrative Town is located at a distance of about 341km from Addis Ababa to the east part of Ethiopia and surrounded by Oda Bultum woreda (have 37 rural kebeles & a total population of 200533). The study was conducted from September 2015 to June 2016. Facility based cross- sectional study was conducted to TB patients visiting TB treatment follow up unit at Bedessa, Kara, and Burka Health center during the study period.

Population

The source population were all form of TB cases that are targeted for the treatment in Bedessa, Kara, and Burka health center, in the Administrative Town and Oda bultum woreda. The study population was all TB patients who were in intensive phase and continuation phase treatment in the study period was included in the study. Sample size was calculated using single population proportion sample size calculation formula and was 247. A total of 247 TB patients were enrolled in the study. All people whose age greater than or equal to 18 years was considered to be interviewed. Critically and mentally ill patients were excluded from the study.

Study variables

Independent variables were**:** Age, sex, education, employment, distance, income, feeling of wellbeing, and TB-related knowledge. The dependent variable was level of adherence.

Data collection methods and materials

A structured close and open ended questionnaire was originally developed in English. Then translated into Afan Oromo and back translated to English by other person to check for its consistency. The questionnaire was pre-tested before actual data collection. Data collectors were trained on the content of the questionnaire and the process of data collection. Data was collected by two diploma nurses and one supervisor through face to face interview of the respondents and revising existing records by a structured questionnaire. Supervisor and Principal investigator made frequent check up on the data collection process to ensure the completeness and consistency of the data to be gathered. Before the actual data collection was commenced, pre test was conducted in adjacent woreda health facility on 5% of respondents to ensure the validity of the survey tools and to standardize the questionnaire. Supervisors and the principal investigator made frequent check on the data collection process to ensure the completeness and consistency of the data to be gathered. Any error that was found during the process was corrected immediately.

Data processing and analysis

The collected data was cleaned, edited, compiled, and organized by graphs, charts and tables and interpreted to give the necessary information. The data was analyzed manually using calculator based on the set variables and objectives of the study.

Ethical consideration

The research proposal was submitted to Haramaya University research and publication office for ethical consideration. The official letter was obtained from Haramaya University, School of Nursing and Midwifery. This official letter was submitted to the Town Administrative Oda Bultum woreda health office. The purpose and objective of the study was explained to the participants before the starting of interview and informed consent was obtained from them. Participation in the study was on voluntary bases. Participants who were unwilling to participate in the study and those who wish to quit from the study at any point in time was informed to do so without any restriction.

Operational definition

Adherent- A patient who adhere to TB medication as prescribed 95% of the time are said to demonstrate high compliance.

Non Adherent – When a TB patient takes less than 80% of the administered drug.

Patient - People who are suffering from TB and registered in the center.

Adherence- Implies an adaptation of TB patients with:-keeping an appointment, taking medication correctly, following prescription.

Results

Socio-demographic characteristics of study participants

Most of the respondents were from the rural residence 193 (78%). The study subjects were predominately males 142 (57.48%). Most of respondents were married 157 (63.56%), followed by being single 63(25.5%). Almost majority of the study participants were from the Muslim group 162 (65.58%) and 85(34.41%) is Christian. About 37.65% of the respondents can read and write. The current educational status of the respondents were none, primary, secondary and tertiary education
102(41.29%), 93(37.65%), 44(17.8%) and 8 (3.23%) respectively **(**Table-1).

Table 1: Socio-demographic characteristics of respondents at Bedessa, Kara & Burka, health centers, June, 2016

Socio-demographic characteristics	Frequency	Percent
Residence		
Rural	194	78.54%
Urban	53	21.45%
Sex		
Male	142	57.48%
Female	105	42.5%
Age		
18-25	26	10.52%
26-33	42	17%
34-41	21	8.5%
42-49	85	34.4%
50-57	63	25.5%
58-65	5	2%
>65	3	1.21%
Marital status		
Married	157	63.56%
Single	63	25.5%
Divorced	19	7.69%
Widowed	8	3.23%
Religion		
Christian	85	34.41%
Muslim	162	65.58%
Others	0	0%
Language		
Oromifa	219	88.66%
Amharic	18	7.28%
Somali	0	0%
Other	0	0%
Current educational status		
None	102	41.29%
Primary	93	37.65%
Secondary	44	17.8%
Tertiary	8	3.23%
Employment Status		
Employed	39	15.78%
Self-employed	167	67.6%
Unemployed	41	16.60%

Health care System and Other Related Characteristics

About ninety one (91.09) percent of TB patients are less than 5 kilo meters from the health facilities or from the area where daily treatment collected and followed by a distance far from treatment collected area (5-10kms) (8.9%%) and there is no any patients go more than 10kms from the area they live in. According to transportation cost (95.5%) of patients no transportation cost and patient pay less than 10 birr is (4.45%). (Table 2).

Table 2: Healthcare system and other related characteristics of respondents at Bedessa, Kara & Burka health center, June, 2016

Characteristics	Frequency	Percent
Distance travel to collect medicine		
<5kms	225	91.09%
5-10kms	22	8.9%
11-15kms	0	0%
>16kms	0	0%
Cost of transportation		
Nothing	236	95.5%
<10birr	11	4.45%
10-15birr	0	0%
>15birr	0	0%
Waiting time in the health facility		
<1hours	247	100%
1-2hours	0	0%
>2hours	0	0%
Availability of medicine		
Always available	247	100%
Sometimes not available	0	0%
Patients place to collect TB medicine		
Bedessa health center	78	31.5%
Kara health center	32	12.95%
Burka health center	85	34.4%
Nearest health posts	52	21.05%

Patient Related Characteristics

Almost 74% of the respondents were reminded to take their treatments by family or friends.

Almost greater than half of (55.87%) participants had good knowledge about TB. All of TB patients (100%) in the current study disclosed their illness to their relatives and only 11.74% of the participants were felt discriminated. About 93.5% of the participants had family support. From the total participants 17%, 92.7% and 61.13% had history of taking alcohol, chewing chat and cigarette smoking respectively. (Table-3)

Table 3: Patient related factors associated with TB adherence status, Bedessa, Kara & Burka health center June, 2016

Characteristics	Frequency	Percent
Family member or friend to remind pt to take RX		
Yes	183	74%
No	64	25.9%
Do you have Knowledge of TB & its Rx		
Yes	138	55.87%
No	109	44.13%
TB status disclosure to the family		
Disclosed	247	100%
Not disclosed	0	0%
Family support		
Supported	231	93.5%
Not supported	16	6.47%
Felt discriminated by family/Community		
Discriminated	29	11.74%
Non discriminated	218	88.26%
Alcoholism		
Yes	42	17%
No	205	82.99%
Smoking		
Yes	151	61.13%
No	96	38.86%
Chewing chat		
Yes	229	92.7%
No	18	7.28%

TB Disease and Treatment Related Characteristics

About 105(42.51%) of participants complained of minor adverse effects, some of the TB patients who participated in the study reported some kind of anti-TB medication adverse effects. Greater than fifty percent (53.33%) of the participants were side effect of numb feet or hand and 46.66% headache & dizziness. From total participated patients PTB-SM+ is 128 (51.8%), PTB-SM- 75(30.36%) and EPTB 44 (17.8%). Almost all (100%) of the TB patients were screened for HIV and only five respondents (2.02%) of them were positive. From those who were HIV positive 2(40%) not yet started anti retro viral drugs (Table 4).

Table 4: Anti-TB therapy and diseases related characteristics of TB patients at Bedessa, Kara & Burka health center June, 2016

Characteristics	Frequency	Percent
Experience of side effects		
Yes	105	42.51%
No	224	90.68%
Type of Side Effect experienced		
Dihrrehoea & vomiting	0	0%
Headache & dizziness	49	46.66%
Skin rash	0	0%
Numb feet or hand	56	53.33%
Duration of medicine take before you felt better		
<2 months	238	96.35%
2-4 months	7	2.83%
5-6 months	2	0.8%
Did not felt better		
Types of TB		
PTB-SM+	128	51.8%
PTB-SM-	75	30.36%
EPTB	44	17.8%
Not indicated	0	0%
HIV screening status		
Screened	247	100%
Not screened	0	0%
HIV status		
Positive	5	2.02%
Negative	242	97.97%
Not known	0	0%
Other medicine beside TB		
Yes	8	3.24%
No	239	96.76%
Type of medicine beside TB treatment		
HAART	3	37.5%
Psychiatric	0	0%
Anti hypertensive	0	0%
Others	5	62.5%

Adherence to anti TB drug was 78.95% and the remaining 21.05% did not adhere to their anti TB drug.

Table 5: Treatment adherence and non adherence characteristics of patients at Bedessa, Kara, & Burka health center, June, 2016.

I. Patients adherence characteristics	frequency	Percent
Time of medication taken		
Morning	247	100%
Afternoon	0	0%
Evening	0	0%
Bed time	0	0%
Health education on risk of discontinuing TB medicine		
Never missing a dose	193	78.13%
Keeping to specific time of administration	204	82.59%
Taking the right way	0	0%
Not stopping even when feeling well	151	61.13%%
Used adherence aids		
Yes (pill box or calendar)	91	36.84%
No(pill box or calendar)	156	63.16%
Missing TB medicine within the last 10 days		
Yes	52	21.05%
No	195	78.94%
Miss your anti TB medication in the last week		
Yes	48	19.43%
No	199	80.56%
II. Reason for non adherence characteristics		
Stop medication due to side effect of drugs		
Yes	3	2.85%
No	102	97.14%
Relationship with care givers		
Poor	61	24.69%
Fair	47	19%
Good	109	44.12%
Excellent	30	12.14%
Any discrimination or stigma faced		
Yes	44	17.8%
No	203	82.2%

Almost all participants (100%) take their medication in the morning and health education on risk of discontinuing TB medicine 78.13% of participants know the risk of missing a dose, 82.59% about keeping specific time of administration and 61.16% not stopping even when feeling well. Participants missing their TB medicine within the last 10 days are 21.05%. Participants miss or stop their medication due to side effects 2.85%, any discrimination or stigma faced 17.8% and due to poor relationship with care givers 24.69%.

Discussion

Adherence to anti-TB treatment is a major determinant of treatment outcome. In developing countries where inequities in access to health care are high and health resources are scarce the magnitude and impact of poor adherence is assumed to be higher. It is undeniable that many patients experience difficulties in following treatment recommendations (7). Hence, this study assessed the level and describes factors of non-adherence to anti-TB medications. Though a self-reported level of non-adherence is assumed to be underestimated, a high proportion (21.05%) of non-adherence was found in this study. This finding is almost twice that of reported from North West Ethiopia (10%). However, the present non adherence level was approximately equal to the previous reports from Southern Ethiopia (20.8%), Uganda (25%), and slightly twice lower than reports from Kolkata and India (40.5%), and higher than that of the Jiangsu Province of China (12.2%) (8, 9, 10 & 11)

Direct observation of treatment (DOT) has been recommended by WHO's to enhance patients' adherence and is regarded as a main component of the "breakthrough" in TB control programs (12). This is probably due to variations in study populations. About 24.69% non-adherence was due to poor relationship with care giver. Such relationship on part of patients and care giver reflects inadequate dissemination of information and education regarding TB and importance of its treatment by DOTS providers. Other more than 17% non-adherence was due to discrimination or stigma from their family or relatives. Among newly diagnosed patients was a challenge to accept the minor side-effects of the drug due this most patients stop or interrupt their treatment. Thus, it appears that provision of free treatment alone is not sufficient to facilitate adherence. Finding

of this study was more than twice (21.05%) that of India but these findings are consistent with the results reported from studies conducted in other developing countries. In Madagascar, traveling problems to the health facility and concern of transportation cost were significantly associated with non-adherence to treatment.

Non-adherence to TB treatment often results from inadequate knowledge of the treatment regimen and importance of adherence (13). Knowledge of tuberculosis and importance of regular treatment shows the impact of all health educational activities held at DOT centers to which patient is exposed while being treated. There is immense need for continuous, effective and reinforcing health education to the patient and his or her family. In this study finding; 55.87% of the TB patient participants had adequate knowledge about TB and its treatments. This is consistent with study conducted in Uganda (58.3%) (14). Family support received by patients play important role in improving treatment adherence. Lack of family and social support predicts poor treatment adherence (15, 16). In this study, more than 93% of the patients were supported by their family and 74% of the study participants were reminded by family member or friend to take treatments and this is almost twice (50.4%) that of study conducted in Uganda. This might be due socio- demographic and cultural difference. In this study about 100% of the TB patients disclose their Tb status and 11.74% of patients felt discriminated from the family or the community. This study finding is slightly greater than (97%) finding of study from the North West Ethiopia (17) and almost there is great difference (78.7%) study conducted in Uganda (18). This might be due to socio-demographic and geographic difference.

Alcohol consumption is well known risk factor for non-adherence (19). Finding of this study showed 42(17%) alcoholics in our study. This study is twice lower than (33.3%) study in Uganda. As, smoking is most of the times associated with alcoholism, it can also predict poor treatment adherence (20). Out of 247 patients, in this study, there were 151(61.13%) smokers. Similarly, about 92.7% of participants were chat chewer. Under normal circumstances patients whose TB symptoms were resolved quickly may be urged to leave treatment once they started feeling better. A study conducted in Kolkata, India declared that the urge to leave treatment once patient started feeling better was a significant determinant of non-adherence to anti-TB medication. In this study about 51.8% of patients had pulmonary TB, 30.36% of patients had pulmonary negative TB and 17.8% of patients had EPTB. This result is almost similar to study conducted North West Ethiopia PTB-SM+ (54.5%).

From the total patients included in this study 100% were screened their HIV status and this is greater than (97.5%) study conducted North West Ethiopia (14). This could be due to geographic and knowledge difference. The proportion of HIV co-infection among TB patients was 2.02%. This finding is highly lower than that study undertaken North West Ethiopia (14) which is 23.4% and the possible difference could be patients in this study might be rural dwellers. From five HIV positive TB patients three of them were on ART.

Conclusion

Non-adherence from TB treatment is a complex, dynamic issue with various factors impacting on treatment taking behavior. Non-adherence among TB patients was high. Adherence to anti TB drug was 78.95% and the remaining 21.05% did not adhere to their anti TB drug. Poor relationship with care giver, and discrimination or stigma faced from family or relatives were the most frequent reasons for missing the anti-TB pills. In addition to this inadequate knowledge of the treatment regimen and importance of adherence, minor side effects of the treatment, lack of family and social support, minimal treatment supporter by health workers, low counseling receiving habit and dependency on cigarettes and chat were some of the factors for non adherence of anti-TB medications. Although we focused in this study on adherence to TB treatment, we actually addressed in a little bit on ART treatment indirectly in co-infected patients, and it seems like many patients give up both their anti-TB and ART treatments in many cases. Many of the challenges such as pill burden, side effects are also faced by patients who need to take other long term treatments.

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