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ARTICLE

Treatment defaulter rate and associated factors among tuberculosis patients on follow up attending justh tuberculosis clinic	1
Ebissa Bayana Kebede and Melaku Sambu	

Full Length Research Paper

Treatment defaulter rate and associated factors among tuberculosis patients on follow up attending justh tuberculosis clinic

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Tuberculosis is a chronic infections disease caused by *Mycobacterium tuberculosis* attributable to nearly 9.3 million new cases and 2 million deaths a year, most of which occurring in developing countries. Besides its public health impact, tuberculosis continues to be a challenge for holistic development. Lack of proper knowledge regarding treatment of tuberculosis and consequences of defaulting lead to poor adherence in turn resulting to unsuccessful control program. To assess treatment defaulter rate and associated factors among tuberculosis patients on follow up attending Jimma University Specialized Hospital tuberculosis clinic. An institution based cross sectional study was conducted in JUSH, Southwest Ethiopia from March 1st to 30th March, 2016. The study population were tuberculosis patients on treatment during study period. Data was collected using face to face interview and record review using semi-structured questionnaires and checklists. Data was edited and entered to a statistical software, SPSS version 20.0 and then analyzed using of the same software. Chi-square test and p-value were done to show statistical significance of findings and in addition, association among different variables was determined. A total of 138 respondents were participated with a response rate of 95 of whom 83 (60%) were females and 40 (29%) were in 15 to 24 years age group. TB patients under new treatment regimen constitute for 128 (92.8%) and the rest 10 (7.2%) cases were under re-treatment regimen. About 85% (118/138) participants replied that they have heard about TB, and nearly 37% (51/138) stated that direct coughing or sneezing as a means of transmitting TB and 51 (37%) respondents tried at least 2 TB specific symptoms. However, based on assessment of the overall knowledge of TB, only 21(22.3%) of them were knowledgeable about tuberculosis in the context of knowing cause, transmission, prevention and treatment of tuberculosis while 73(77.7%) of were not knowledgeable. The high defaulting rate and the factors associated with defaulting in this study show high prevalence of defaulting rate and also the challenges faced by patients in the course of TB treatment.

Key words: Defaulter, TB and default.

INTRODUCTION

Tuberculosis is a chronic infectious disease caused different strains of mycobacteria but primarily by *mycobacterium tuberculosis hominis* and infection occurs usually due to inhalation of infected droplet nuclei

dominantly affecting lungs. Primary infection is usually asymptomatic and its inflammatory response resolves with the development of acquired immunity. However, surviving bacteria stay become dormant for years and

can eventually progress to active primary disease when immune status of the host is altered (WHO, 1994). Globally, TB is the second cause of illness and death of adults next only to HIV/AIDS, with nearly 9 million cases and 2 million deaths every year. (Africa accounts for more than quarter of global TB burden where estimated 2.4 million cases and 540,000 TB deaths occur annually (FMOH Ethiopia, Guidelines on Programmatic Management of Drug Resistant Tuberculosis in Ethiopia, 2004). Ethiopia is one of the 22 world's high TB burden countries ranking 7th with estimated incidence and prevalence rates of all TB at 224 and 211 cases per 100,000 population, and 30,000 annual deaths or TB specific mortality rate of 32 per 100,000 populations (WHO, 2005). Poverty, overcrowding, malnutrition and weakened immunity are some of the factors that contribute for the spread and increase of TB prevalence; moreover, the HIV/AIDS pandemic is playing major role for the current increase in pandemic of TB (Waisbord, 2004).

Tuberculosis requires prolonged treatment defying both the patient and care provider in relation to adherence. Adherence is defined as the extent to which person's behavior for taking medication corresponds with agreed recommendations from a health care provider. Similarly, adherence to TB treatment implies to strictly following recommend treatment course by taking all prescribed medications for the entire suggested time. In contrary, non-adherence is as the patient's inability or refusal to take TB drugs as prescribed. Poor adherence has several negative consequences including increase in the risk of morbidity, mortality and development of drug resistance TB(USAID, 2012). Adherence is simultaneously influenced by several factors including those related to the patient socioeconomic conditions, health system related factors (WHO, 2010). Lack of proper knowledge and poor adherence practice to TB treatment is important factor affecting success of TB control programs. Improving knowledge and practice of adherence toward TB is a key factor in coming up patients with favorable results and gaining successful program performance, thus combating spread of the disease (WHO, 1994; WHO, 2003).

STATEMENT OF THE PROBLEM

Tuberculosis has long been a major public health problem worldwide especially in developing countries including Ethiopia (WHO, 2003, 1994). TB is curable with prompt treatment and follow-up taking long duration. As to any long duration treatment, one major challenge to TB treatment is the problem of poor or non-adherence.

SIGNIFICANCE OF THE STUDY

Since there is scarcity of study done about TB related knowledge and its association with adherence in Jimma zone, this study has tried to assess TB related knowledge associated with treatment adherence among TB patients currently on follow up treatment JUSH. The findings significantly help in planning and implementing the future strategies for control of the disease and may invite interested bodies for further wide scale investigations.

OBJECTIVES

General objective

To assess treatment defaulter rate and associated factors among TB patients on follow up attending JUSH TB clinic, March, 2016.

Specific objectives

- (1) To determine knowledge of TB patients related to disease and treatment.
- (2) To identify the relationship between knowledge and treatment adherence.
- (3) To determine perceived reasons associated with treatment non-adherence among TB patient.

MATERIALS AND METHODS

Study area and period

Jimma University Specialized Hospital is one of the districts of Jimma Zone, Oromia Regional State Southwest Ethiopia. Its capital is Jimma town, 374 km far from Addis, the national capital. The town has 25 kebeles, the lowest administrative units. Based on the 2007 population census, the projected total population of the district for 2015 is 181,713. Five health centers give both TB diagnostic and treatment service while the other HC and health posts do treatment service only. In addition, health posts do identification and referral of presumptive TB cases (TB suspects) to their nearby diagnostic facilities. The study period was from March 1st to 30th, 2016

Study design

A cross-sectional study design was used.

Population

Source population: All patients seeking health care service in JUSH

Study population: TB patients who were on treatment during the study period in study area.

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Sampling size and sampling technique

Sample size was 152 which was estimated using a formula used in cross sectional study for estimation of single population proportion which is:

$$n = \frac{Z_{1-\alpha/2}^2 * P(1-P)}{d^2}$$

Where, n = is the sample size; $Z_{\alpha/2}$ = is standard normal distribution at 95% confidence interval; $\alpha = 0.05$, is the critical value of the standard normal distribution; P = is the population proportion; and is equal to 0.1, non-adherence rate among TB cases in Health facilities of Addis (Siddaram, 2008):

d = 0.05, the margin of error tolerated.

$$n = \frac{(1.96)^2 * 0.1(1-0.1)}{(0.05)^2} = 138$$

Keeping a non-response rate at 10%, the final sample size was 152.

However, since the number of TB cases on follow up were few, all TB patients who were on treatment during the study period were included in the study.

Inclusion and exclusion criteria

Inclusion criteria

All patients who came for follow-up at TB clinic.

Exclusion criteria

Patients who were:

- (1) Not willing to participate
- (2) Deaf

Study variables

Independent variables

- (1) Age
- (2) Sex
- (3) Education
- (4) Distance
- (5) Income

Dependent variables

- (1) Feeling of wellbeing
- (2) TB-related knowledge
- (3) Adherence Status

Data collection method and instruments

Data was collected using face to face interview and records review with semi-structured questionnaires. The study instrument is a semi structured interview questionnaires, which is in English. However,

the English questionnaire was translated in to Amharic and Afan Oromo. The interview was conducted by 4th year BSc nursing students who can speak both Amharic and Afan Oromo and trained by the investigator about the content of the questionnaire in details.

Data quality assurance

Pretest was conducted at Jimma HC to determine the validity of the data collecting instrument. All filled questionnaires were checked daily for completeness, accuracy, clarify and consistency.

Data processing and analysis

The collected data was cleaned, compiled, organized and interpreted to give the necessary information. The data was analyzed by SPSS version 20.0 based on the set variables and objectives of the study. Association between variables was performed by using chi-square. Finally, after the result was discussed, different comparisons done in relation to other studies and finally recommendation were forwarded to respective bodies.

Ethical consideration

The study was conducted after official letter obtained from SRP of Jimma University to be given to the JUSH administrative bodies. Verbal consent was 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 were made to maintain confidentiality related to the information provided and recorded in the data sheet.

Limitations

- (i) Recall bias
- (ii) Self-report was the only available adherence measurement.

RESULTS

Socio Demographic characteristics

A total of 138 respondents have participated in the study with 90.8% response rate; of whom males are 83 (60.1%) and by age group the 15 to 24 age group account for 29% (40/138). Married respondents constitute for 61(44.2%) and 32% (44/138) were illiterates (Table1). Majority of the participants (87%) were Muslims while farmers constitute for 34.8% (48/138). By disease category New and Re-treatment Category TB patients were 128(92.8%) and 10 (7.2%) respectively and about 73% of the respondents follow their treatment in JUSH TB clinic (Table 2).

Knowledge of respondents about TB disease, symptoms and treatment

Respondents' knowledge was assessed in contrast to their response to questions probing their knowledge

Table 1. Socio Demographic Characteristics of Respondents in JUSH Oromia Region, South West Ethiopia, March, 2016.

Socio demographic variable	Frequency	Percent	
Age Category in Years	<15	24	17.4
	15 – 24	40	29.0
	25 – 34	38	27.5
	35 – 44	12	8.7
	45 – 54	11	8.0
	55 and above	13	9.4
Sex	Male	55	39.9
	Female	83	60.1
Marital Status	Married	61	44.2
	Single	66	47.9
	Divorced	5	3.6
	Widowed	6	4.3
Occupation	Farmers	48	34.8
	Students	28	20.3
	Housewives	18	13.0
	Merchants	16	11.6
	Others	18	13.0
Education	Illiterate	53	38.4
	Read & Write	22	15.9
	Elementary	43	31.2
	High school	20	14.5
TB Disease Category	New	128	92.8
	Re-treatment	10	7.2
Total	138	100.0	

Table 2. Adherence status of patients in JUSH, Oromia Region, South West Ethiopia, March 2016.

Adherence Status	Frequency	Valid percent
BAD	6	4.3
POOR	88	63.8
GOOD	44	31.9
Total	138	100.0

about source of TB infection, mode of transmission, symptoms, treatment, and preventive measures of the disease. About eighty five percent (118/138) participants replied that they have heard about TB and regarding knowledge of symptoms and signs of TB, 51 (37%) respondents tried at least two symptoms of TB saying cough lasting for 2 or more weeks, spitting up blood, chest pain and loss of weight. As for modes of TB transmission, only 46 (33.3%) patients answered that

inhalation of droplets from coughing TB patient and drinking infected raw milk can spread TB disease. Knowing treatment duration among participants was also assessed and accordingly 124 (89%) patients have correctly described their treatment duration of whom 121 are new TB cases on new treatment regimen who described their treatment to last for 6 months and 3 cases are eligible of re-treatment regimen who described their treatment to last 8 months.

Table 3. Cross Tab Showing Factors Associated With Adherence Status of Tb Patients in JUSH Oromia Region, South West Ethiopia, March 2016.

Test Variables		ADHERENCE STATUS		p-value	OR, 95%CI
		POOR	GOOD		
Distance from Health Facility (Access)	Poor	56 (59.6%)	12 (27.3%)	0.001	4.7 (2, 13)
	Good	38 (40.4%)	32 (72.7%)		
Respondents' Knowledge About TB	Poor	73 (77.7%)	37 (84.1%)	<0.001	11.5 (4.8, 28)
	Good	21 (22.3%)	7 (15.9%)		
Using Reminder aid	No	44 (46.8%)	20 (45.5%)	>0.05	0.8 (0.3, 1.8)
	Yes	50 (53.2%)	24 (54.5%)		
Total		94 (100%)	44(100%)		

Status of treatment, follow up and adherence among TB patients

Among interviewed respondents, 68.1% (94/138) replied that they had missed their daily medication at least once during their entire follow up to date and among them 6.4% (6/94) have missed their medications for 2 or more days. Among reasons mentioned by respondents, forgetting, getting back to home to fetch food or money, far distance, unavailability of health workers were the major factors making patients to miss, interrupt or default from treatment. Due to this reason majority of them 63.8 % had poor adherence status (Table 3).

Factors related with poor treatment adherence

Among respondents, 61 (44%) participants listed different factors related to individual patient, health system and social conditions, which affect adherence to their treatment and follow-ups. Among personal factors raised by respondents, the major is forgetting which account for 21.3% (13/61) followed by getting seriously ill and shortage of money for transport and other expenses, each accounting for 9.8% (6/61). Factors like topographic and climatic conditions like distance from health facility, rainy season and river overflow were also other barriers for which about 25% (15/61) patients have complained while un-availability of concerned health worker or closure of health institution particularly health posts were factors raised in relation to the health system. However, majority (68%) respondents witnessed that their relation with health workers is good, and 31% said excellent while 3.7% said relation is fair and the rest had said nothing. Among factors notified by respondents, knowledge of respondents about TB is the major determinant for adherence on TB treatment having statistical significance and association [$p < 0.001$; OR=11.5; 95%CI (WHO, 2005; Daniel and Datiko, 2007)]. This indicates that patients who

have no or poor knowledge of TB due to not getting enough information from care providers on the disease, treatment condition and problems of interruption will have about 12 times risk of interrupting their treatment compared to those with good knowledge.

On the other hand, access to health facility has also relation to non-adherence to TB treatment. Although TB treatment is said to be decentralized to health posts, still several patients interrupt their treatment due to far distance health facility especially when their illness becomes more severe and when they lack to pay for transport which also is statistically significant [$p = 0.01$; OR=4.7, 95%CI (Waisbord, 2004; www.euro.who.int/features/2005/feature.tb)].

DISCUSSION

In this study adherence status of TB patients on follow-up in JUSH was assessed and as major reasons poor adherence have also been noted. Respondents' knowledge probed based on having knowhow on disease source, transmission method, manifestations, treatment as well as preventive measures. About eighty five percent (118/138) participants have heard about TB and regarding knowledge of symptoms and signs of TB, 51 (37%) respondents tried at least two symptoms of TB saying cough lasting for 2 or more weeks, spitting up blood, chest pain and loss of weight.

This is similar to the finding of research done in Lusaka, Zambia. Knowledge about TB disease, its treatment or prevention has shown positive association with treatment compliance indicating that patients that lack knowledge about TB will have more 10 times risk of interrupting treatment [$p < 0.001$; OR=11.5; 95%CI (WHO, 2005; Daniel and Datiko, 2007)] which also coincides with the Zambian study (Kaona et al, 2004).

The rate of interruption of at least one daily dose anti-TB medication very high where 68.1% (94/138) replied

that they had missed their daily medication at least once during their entire follow up to date, from whom 6.4% (6/94) have bad adherence missing their medications for 3 or more days. Forgetting, frequently getting back to home when treatment is outside their catchment, for changing clothing, fetching food or money, far distance, unavailability of health workers and closure of health facilities were among reasons mentioned making patients to miss, interrupt or default from treatment (Adane et al, 2013). From personal factors patients raised, that replying forget-fulness account for 21.3% (13/61), getting seriously ill and shortage of money for transport and other expenses each account for 9.8% (6/61) (Widjanarko et al, 2009). Geographic and climatic conditions like access to treatment facility, rainy season and filling of rivers were also other barriers complained by about 25% (15/61) patients while absenteeism of concerned health worker or closure of health posts were factors raised in relation to health system. Knowledge of respondents about TB is the major determinant for adherence on TB treatment having statistical significance and association [$p < 0.001$; OR=11.5; 95%CI (WHO, 2005; Daniel and Datiko, 2007)]. This indicates that patients who have no or poor knowledge of TB due to not getting enough information from care providers on the disease, treatment condition and problems of interruption will have about 12 times risk of interrupting their treatment compared to those with good knowledge. Poor access or long distance to health facility is the other reason described for non-adherence. Currently the national guideline recommend TB treatment to be decentralized down to health posts, however, still several patients interrupt their treatment due to travel to long distance especially when becoming seriously illness and when they lack money for transport, the finding is similar to that done in Ethiopia, showing statistically significance [$p = 0.01$; OR=4.7, 95%CI (Waisbord, 2004; www.euro.who.int/features/2005/feature_tub)].

Conclusion

1. From findings of this study, majority participant have information about TB and in relation to source of infection, symptoms and signs of TB, modes of TB and treatment duration.
2. The rate of treatment interruption is high where about more than half of (68.1%) of respondents replied missing one or more of their daily dose and bad adherence was

also seen among few cases who missed their medications for 3 or more days.

3. Forgetting, poor access, absenteeism of health workers and closure of health facilities, geographical and climate were reasons mentioned making patients to poor adherence.

4. Poor access and poor knowledge of respondents are the main reasons due to which respondents interrupt their treatment in JUSH having statistical significance and association with non-adherence.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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