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Quality of tuberculosis treatment services in public hospitals of Sidama Zone, Southern Ethiopia, 2016

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Tuberculosis (TB) remains a major global health problem, responsible for ill health among millions of people each year. It is the second leading cause of death from an infectious disease worldwide following human immunodeficiency virus (HIV). Tuberculosis control measures are limited by the quality of care provided at the local level. Providing a quality and timely care for patients with TB is crucial in prevention and control of the disease. This study was conducted to assess the quality of TB treatment services in public hospitals of Sidama zone, Southern Ethiopia, 2016. Cross-sectional study was undertaken from 20th May to 30th June, 2016. A total of 251 patients on TB treatment services from six public hospitals were included in the study by using consecutive sampling technique. Data was checked, coded and entered into Epidata version 3.1 and exported to SPSS version 20. Percentages mean score was used to describe overall satisfaction of patients with TB treatment services. Factors predicting patient satisfaction were identified by using multiple linear regression analysis at p-value less than 0.05. Six public hospitals and 13 TB care providers were included in the study. The index of overall structural quality mean score was 0.85 which was graded as good. A total of 48 sessions of patient-provider interaction were observed. From which 33 (68.8%) and 35 (72.9%) patients had greeted in a friendly/polite manner and had participated in decision making process, respectively. The average level of patient satisfaction score with TB treatment services was 71.6%. Educational status, ethnicity and duration of TB treatment appeared to be statistically associated with average patient satisfaction score. Most of the minimum required resources to conduct the service were available in the hospitals. Majority of the studied hospitals are structurally good. Educational status and duration of TB treatment were found to be independent predictors of patient satisfaction. Regular supervision, refreshment training, attentions to patients' dissatisfaction area were forwarded.

Key words: Quality of care, structural quality, processes of service provision, satisfaction of patient, Sidama zone.

INTRODUCTION

Tuberculosis (TB) is a chronic infectious disease caused by *Mycobacterium tuberculosis* an acid-fast bacillus. The main source of infection is untreated smear-positive pulmonary TB patient discharging the bacilli. It is mainly spread by airborne route when the infectious patient expels droplets containing the bacilli. It is also transmitted by consumption of raw milk containing *Mycobacterium bovis* (Federal Ministry of Health, 2013).

Quality health care is easily defined as doing the right thing (getting the health care services you need), at the right time (when you need it), in the right way (using the appropriate test or procedure), to achieve the best possible results (TriStar Horizon medical center, 2010).Also, Institute of Medicine (IOM) defined health care quality as safe, effective, patient-centered, timely, efficient and equitable (RIEDER, 2002).

Quality of care is a multi-faceted phenomenon. Improving health care quality requires more than the clinical competence of health care providers; it requires more than the availability of supplies and drugs (USAID/PHCR, 2003; Foot and Raleigh 2008). In a service industry, like healthcare, experience of the patient plays a crucial role in rating and assessment of quality of services. Quality in healthcare may comprise of newer technology, newer and effective medication, and higher staff to patient ratios, affordability, efficiency and effectiveness of service delivery (Tam, 2005).

Quality of TB care can be viewed from the patient, the service provider, or the facility management perspectives. When quality is seen from the perspective of a patient coming to the clinic with TB the patient expects to be greeted and treated with respect by a knowledgeable staff and the patient expects to be diagnosed and treated correctly. However, from the perspective of a service provider in that clinic, quality may mean: the provider is competent and confident to be able to provide TB services to the client treatment. And also from the perspective of the health facility management, quality may mean: the health facility is offering services and patients are being seen at the facility; the community is satisfied with the services; there are few complains about the facility from the community (TB care III, 2011).

The quality of health care is one of the agenda in most health care systems.Much of this interest in quality of care has been developed in response to recent dramatic transformations of health care systems, accompanied by new organizational structures and that may affect quality of care. It is also an issue addressed as a component of the Ethiopia Health Sector Transformation Plan (HSTP) and Ethiopia National Health Care Quality Strategy Plan. Successful tuberculosis treatment depends on more than chemotherapy and requires specific clinical and social frameworks based on an individual patient's circumstances (Mainz, 2003; The Federal Democratic Republic of Ethiopia Ministry of Health, 2015).

TB is among the most lethal infectious diseases in the world; killing one person every 3 min.TB disproportionately affects the poor, who are unlikely to have adequate nutrition and access to health care. It is also a danger to people with compromised immune systems due to human immunodeficiency virus (HIV), diabetes, or other conditions (Heidi et al., 2000).

According to global tuberculosis report, in 2014, there were an estimated 9.6 million new TB cases: 5.4 million among men, 3.2 million among women and 1.0 million among children. There were also 1.5 million TB deaths. About 26% of the incident TB cases occurred in Africa in 2010 (World Health Organization 2015).The proportion of TB cases co-infected with HIV is the highest in countries in the African region. Also, TB is a major cause of morbidity and mortality in Ethiopia. Ethiopia is among the 22 high TB burden countries and among the 27 high multidrug-resistant (MDR) TB burden countries in the world (Federal democratic republic ministry of health, April 2012).

The impact of the disease on individuals and families is often economically devastating. An average TB patient can lose up to 4 months of work and 30% of their annual income. The toll of TB on the global economy is estimated at $12 billion per year. According to World Bank analyses, countries most affected by TB lose 4 to 7% of gross domestic product due to TB-related decreases in productivity (Ending Extreme Poverty by 2030 (2015), USAID; World bank, 2002).

In recent years, many countries national health programs have expanded their focus to include not only improving access to care, but also improving the quality of care received by patients and communities. As part of quality assurance for many clinical diseases, including TB, international and national evidence-based standards and guidelines have been developed. Having explicit standards and guidelines helps ensure high-quality care, better health outcomes, and cost effective treatments (USAIDTB CARE II, 2015).

Complete and effective treatment of every patient with TB disease is essential. In many countries, the standard of care for TB disease is to use directly-observed therapy to ensure that the treatment is effective and that no drug doses are missed. Failure to cure a person with TB disease harms the patient but also exposes the patient's family, co-workers, and community to TB Ending Extreme Poverty by 2030(2015), USAID).

TB control measures are limited by the quality of care provided at the local level; care such as proper case detection and treatment of infectious cases. There was poor linkage between the TB clinic and the Infectious Disease Clinic (IDC) that provide chronic care services to HIV-positive clients. Additional patient information systems also lacked contact information for supporting proactive client follow-up, the clinic had no mechanisms

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in place for tracking clients who failed to return for routine clinical review, and limited to drug supply and occasional supportive supervision TB CARE 2014;Borgdorff and Broekmans, 2002; USAID,2012).

According to studies done in Bangladesh and Swaziland on frequencies and causes of delay of TB treatment service revealed that the complex relationship between the patient and health care workers is an important determinant of the outcome of TB treatment. Positive relationship or interaction will lead to good outcome of treatment and vice versa. The success of the interaction is affected by the knowledge of the healthcare workers on the disease and treatment protocol, their skills on patients counseling and education and their attitude towards the patients. Patients who are poorly counseled or educated on TB and its treatment may end up with poor outcomes; similarly, a negative attitude of the health care workers towards the patients will cause them to stop the treatment (TB CARE II, http://tbcare2.org/content/reducing-tb-delays-evaluating-frequency-and-causes-delays-bangladesh-and-swaziland-0).

The study done on quality of tuberculosis care and its association with patient adherence to treatment in eight Ethiopian districts revealed that the overall treatment completion rate was 74% while default and death rates were 22 and 3.8%, respectively (Mengiste, 2009). Also, study conducted on patient satisfaction on tuberculosis treatment service and adherence to treatment in public health centers and hospital of Sidama zone showed that the proportion of good adherence patients was 74% and the proportion of poor adherence patients was 26% and poor adherence due to absence of drug was 58.97%, the health facility is far away from home was 8.5%, too hard to take so many pills was 8(6.8%), fear of interaction with other medication was 5.1%, and had other appointment was 5.1% (Zekariyas et al., 2013).

Quality assessment has been considered as one element of quality assurance which looks for sources of problems in a structure, process and outcome of given service. This was the first model developed by Avedis Donabedians to evaluate health care quality. As per the Donabedian's definition of quality, the ultimate goal of quality assessment in health care program is to assess whether a program possesses the right things (input), is doing the right things (processes) and it leads to the right things (outcome) to happen (Counte, 2007). Assessing the quality of care on TB treatment can have significant importance in evaluating TB control activities and in identifying area of improvements of directly observed treatment short course (DOTs) strategies. However, there are limited published studies on the quality of TB treatment services' provision in Ethiopia, and even fewer studies do examine quality of TB treatment services in Sidama Zone. Therefore, this study has investigated the quality of TB treatment services' provision in public hospitals of the study area. It provides valuable information for those working on TB control activities, researchers and policy makers. This study can also identify major constraints in the quality of TB treatment service.

MATERIALS AND METHODS

Study design

Cross-sectional study was conducted in selected public hospitals of Sidama zone from 20th May to 30th June, 2016. The study was conducted in Sidama zone administration which is located at 275 km from the Addis Ababa. Sidama zone has an area of 10,000 km^2 of which 97.71% is land and 2.29% is covered by water. According to Sidama Zone Finance and Economic Department 2015 report, it had a total population of 4,100,000 (2,091,000 male and 2,009,000 Female). Michael (2007) Sidama zone has a population density of 451.83. It consists of 19 Woredas and 4 city administration. Regarding infrastructure, there are 133 health centers, 9 primary hospitals and 1 general hospital in the zone. Currently, all public health facilities including health posts provide TB treatment services.

Population

The source population include all public hospitals providing TB treatment services in study period, all TB patients who were currently on treatment in study period and all health providers working in TB and Leprosy (TBL) clinics during the study period. While the study population include sampled TB patients on the treatment of both intensive and continuation phase, sampled health care providers who were working in the TB clinic, and sampled hospitals that provide TB treatment services.

Inclusion and exclusion criteria

The inclusion criteria are hospitals which provided diagnostic and treatment services, TBL focal persons who had worked at the facility for at least 2 weeks and above and TB patients who are ages 18 and above and take treatment for two weeks and above. While exclusion criteria are critically ill patient who could not talk or listen to the interviewer.

Sample size

For sample size determination for observation and interview of providers, TB control activities in the six public hospitals were observed and all TBL focal persons in the respective hospitals were interviewed. While for exit interview, the total number of registered TB patients on both intensive and continuation phase in the selected public hospitals were 258. Since manageable and to get maximum sample size, all patients on the treatment in these six selected hospitals were included.

Sampling technique

Five primary hospitals providing TB treatment services were selected randomly and since there was only one general hospital in
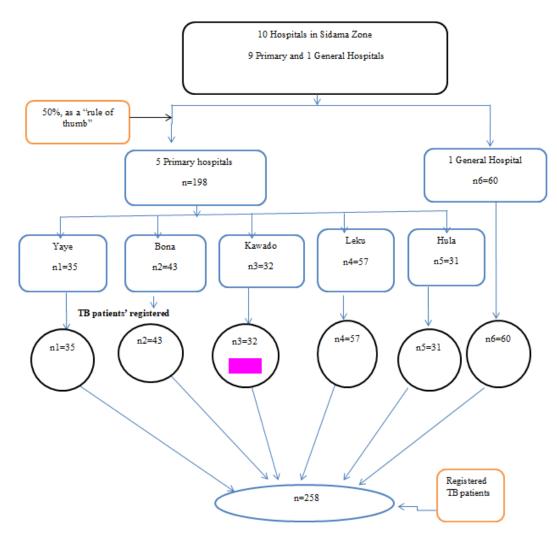
Figure 1. Diagrammatic representation of sampling procedure.

the zone and it was included in the study. The primary hospitals decided to be taken based on the rule of thumb in a sampling for quality of care study which states that if the number of units are very large (500-1000) take a 10% sample, if it is medium size (100-500), take a 20 to 30% sample and if it is very small (less than 50), take a 30 to 50% sample (Sidama zone finance and economic development department report, 2016). Hence, 50% samples from a sampling frame of 5 hospitals were taken. Exit interview was employed for those patients who fulfilled the inclusion criteria consecutively (Figure 1).

Data collection procedures

Structural assessment

Observation and inventory checklist were employed to get data for structural quality assessment of TB treatment services such as facility infrastructure, availability of different materials, laboratory supplies and staffing status. The tools were adapted from TBL manual and published literatures with some modifications (Federal

democratic republic ministry of health, April 2012; Edward and Jeremy 2006). In addition to this health workers in charge of TB clinic interview, instrument which contain any procedures/norms followed in the health facility like the AFB microscopy procedures, treatment, monitoring and follow-up of TB patients, and use of guidelines and manuals were used.

Process assessment

Semi-structured questionnaire which contains observations checklist related to provider-patient interaction and information provision.

Outcome assessment

A structured questionnaire was used for exit interview with patients after the completion of their treatment. It was adapted from published literatures (Hill et al, 2005; Elmahalli and Abdel-Aziz, 2007). The tool provides lists of alternatives to the patients. Its

content was patient's socio-demographic characteristics, inter-personal relationship between the patient and health care provider, availability of adequate resources and services, effectiveness of care (the extent to which care deliveries and its intended outcomes), and adequacy of information was included in the interview. Each study participant was asked to tell his/her level of satisfaction.

Data collection technique

Structural assessment

Data was collected by the six trained nurses using adapted national TB and leprosy control program performance monitoring checklist. While data on staff assignment, training on tuberculosis control and patterns of service delivery, and supervision were collected by self-administrated questionnaire to health care providers in the selected hospitals.

Process assessment

This was done by two trained health professionals (HO) who worked in the other hospital and were assigned to the TBL clinic. They were assigned to observe the provider-patient interaction and information provision.

Outcome assessment

The patients' satisfaction level assessment was also done by six trained nurses who speak the local language (sidaamuafoo) to conduct the exit interviews by face-to-face using structured questionnaire.

Study variables

The structural study variables are infrastructure, staffing, availability ant-TB drugs, TB manuals, reporting forms, and registration books. The process variables are information provision and patient-provider interaction. Dependent variables are patients' satisfaction with TB treatment services. Independent variables are socio demographic characteristics such as age, sex, income, ethnicity, family size, religion, occupation, educational status, cost incurred, marital status, residence, and distance.

Operational definitions

Structural quality

Structural attributes of quality will be assessed using a checklist based on five categories: facility, staffing, materials, availability of ant-Tb drugs and laboratory supplies. An average score for structural quality will be computed by assigning a score of 1 for the presence of that aspect or positive responses, a score of 0, for the absence of that aspect or negative responses of each aspect. Maximum and minimum score will be calculated for each hospital. Then, percentage score will be calculated and structural quality will be classified as: very good (90-100), good (80-89), marginal (70-79), poor (60-69) and very poor (50-59) based on published literatures (Hill et. al., 2005; Elmahalli and Abdel-Aziz, 2007).

Availabilities of drugs, materials and laboratory supplies

The amount of essential TB drugs, materials and laboratory reagents sufficient for at least a 3 months will be computed by assigning score of 2 for available and in use, score of 1 for available but not in use and 0 for not available.

Patient satisfaction level

This was measured by using a Likert's scale which contains 15 items. Each item contains score on a five-point scale ranging from (1 = strongly dissatisfied, 2 = dissatisfied, 3 = neutral, 4 = satisfied, and 5 = strongly satisfied). The magnitude of score a respondent gives to 15 items, the maximum score is 75 and the minimum is 15. The percentage of maximum scale score was computed using the following formula.

$$percentage\ mean\ score = \frac{actual\ score - potential\ minimium\ score}{potential\ maximum\ score - potential\ minimium\ score} * 100$$

This formula gave individual percentage mean score and to know the overall level of satisfaction of the study population, the average of this score was taken (Tadesse et al, 2011).

Data analysis procedures

The data was edited, coded, and entered then double data entry verification was applied using Epi data version 3.1 and exported to SPSS version 20. Using SPSS version 20, descriptive statistics (frequency tables, mean, median, and range) was used to describe the structural, process and outcome assessment of the result. A simple linear regression analysis of variables was conducted to select candidate variables at P value <0.25. Finally, multiple linear regression analysis was used to assess the relationship between patients satisfaction and the independent variables and significance of the findings was declared at p<0.05.

Data quality control

Questionnaires were translated to local language (sidaamuafoo) then back to English to ensure the consistency. To assure data quality, two supervisors and six data collectors were selected and trained for one day by principal investigator and 5% of the sample was pre-tested in non-selected hospital (Hawassa City Administration Adare hospital) before data collection. Completeness, accuracy and consistency of the collected data were checked on daily basis during data collection by supervisors and the principal investigator.

Ethical consideration

Ethical clearance was obtained from Jimma University College of Health Sciences ethical review board. Written permission was requested from Sidama Zone Administration, zonal health department and from each hospitals administration. Consent was obtained from individual interviewee subjects. At the time of data collection, data collectors read the written consent for each interviewee during interview, and a verbal consent was obtained from them. Client's privacy, confidentiality and cultural norms were respected properly.

Table 1. Availability and in use of materials (Manuals, Forms and Registers) in selected hospitals of Sidama Zone, Southern Ethiopia, July, 2016.

Manuals, forms and registers	Available and in use (%)	Available but not in use (%)	Not available (%)
Latest version of TLCP manual	3 (50)	2 (33.3)	1 (16.7)
Latest version of TLCP laboratory manual	3 (50)	1 (16.7%)	2 (33.3)
Latest version of TB unit registry	5 (83.3)	1 (16.7)	0
Latest TB referral and transfer form	3 (50%)	2 (33.3%)	1 (16.7)
Latest version of Tb sputum examination request form	4 (66.7)	2 (33.3)	0
Latest version of quarterly case finding, treatment outcome and other TB control activity report form	6 (100)	0	0
Flow chart for Diagnosis and treatment of PTB	3 (50)	3 (50)	0
Tb posters in different language	1 (16.7)	2 (33.3)	3 (50)
Weighting scale	5 (83.3)	11 (6.7)	0

RESULTS

Structural quality of TB treatment services

All the six public hospitals (Five primary and one general hospitals) included in the study and also 13 TB care providers participated in the study.

There were a total of 13 technical staff (health professionals) of TBL focal persons among these were six nurses, five health officers and remaining health workers were laboratory technicians and medical doctor.

All the hospitals had one health and laboratory professional assigned as full time workers who had basic training on TB treatment and diagnosis activities. All hospitals had at least one staff that had been trained on TB control activities of which only two had received refreshment trainings in the last 12 months.

Six TB service providers of studied hospitals were nurses and the mean service year of professionals was 4.8923 years (Range 6 months to 10 years). Eight TBL focal persons had no regular supervisor and supervisory schedule for TB control activities. Ten TBL focal persons had been supervised in the last 6 months while only three focal persons were supervised in the last 12 months.

They responded that during the last supervisory visit, supervisor(s) observed TB registry for all the TBL focal persons supervised. For two focal persons they delivered supplies, reviewed reports and discussed problems with them and for one focal person they provide current information related to TB control. Seven respondents claimed that the supervision was supportive while two respondents said that the supervision had no change. Only two focal persons who received supervisory feedback in the last 6 months where all of them had received it orally and none of them received either in written form or on supervision registry form.

The care providers had been monitoring their patients' treatment compliance by daily filling of patients' unit TB registration form immediately after the patients took their pills in all of the studied hospitals during the intensive phase of therapy. Similarly, absentees were retrieved by their contact person and health extension workers.

Availability of laboratory supplies, information, education and communication (IEC) materials and ant-TB drugs

All hospitals had and were using the latest version of quarterly case finding, treatment outcome and other TB control activity report form. Half of the studied hospitals had and were using the latest version of Tuberculosis and Leprosy Control Program (TLCP) manual, TLCP laboratory manual, referral and transfer form. Three of the studied hospitals were not available for TB posters in different language (Table 1).

The most important first line anti-TB drugs (rifampicin, isoniazid, pyrazinamide, Ethambutol and streptomycin) were available in all studied hospitals. The available anti-TB supplies are sufficient one month for existing patients. PFSA was the main source of drugs and laboratory supplies for TB control activities for all hospitals. Almost all hospitals received of these drugs and supplies were delivered to facility.

Regarding laboratory supplies and reagents all the studied hospitals had and were using binocular microscope, sputum cups, staining rack, staining reagents and boxes for keeping examined slides. The available laboratory reagents and supplies are enough for a

Table 2. Structural quality score of TB treatment services in public hospitals of Sidama Zone, July, 2016.

Hospital	Staffing	Availability of			Infrastructure	Average
		IEC materials	Anti-TB	Laboratory supplies		
Hospital 1	0.857	0.68	0.69	0.854	0.75	0.7662
Hospital 2	1	0.68	0.94	0.917	0.75	0.8574
Hospital 3	0.857	0.79	1	0.583	1	0.846
Hospital 4	0.857	0.79	0.88	0.604	1	0.8262
Hospital 5	1	0.98	0.94	0.708	1	0.9256
Hospital 6	0.857	0.79	0.88	0.729	1	0.8512
Simple average score	0.905	0.78	0.89	0.733	0.9	0.8512

*Very good (0.9-1), good (0.8-0.89), marginal (0.7-0.79), poor (0.6-0.69), very poor (0.5- 0.59).

minimum of three months.

Infrastructure

All studied facilities had separate TB treatment room and chair and table. Four studied hospitals had tape water supplies which are available for 24 h,but for the remaining two hospitals water supply was not connected with main source.

Overall structural quality

The index of overall structural quality mean score was 0.85, which was graded as good (Table 2).

Process of TB treatment services provision

Patient-provider interaction, communication between patient to care provider and health workers activities were assessed by observation.

Patient-provider interaction and information communication

Patient-provider interaction process was observed during consultation session to determine provider activities with TB treatment services for those on follow up schedule patients.

A total of 48 sessions of patient-provider interaction were observed. Eight sessions from each selected hospitals were observed during consultation session/ follow up appointment.

Thirty-three (68.8%) patients had greeted in a friendly manner, 35 (72.9%) patients had participated in decision making process. Thirty three (31.3%) patients had spoken the same language with care providers.

On other hand, the information provision to the patients explain how to take their drugs, the provider explain when to return for the next treatment, and the provider explained the need to comply with the drug treatment were 35(72.9%), 10 (79.2%), and 40 (83.3%), respectively (Table 3).

Patients' satisfaction level assessment

Socio-demographic characteristics of TB patients

Out of 258 participants intended to be included in the study, 251 (97.3%) patients had responded to the questionnaire. From the total patients, 132 (52.6%) were female. The mean age of respondents was 40±13.70263. Majority of the respondents 169 (67.3%) were married.

Concerning educational status, 88 (35.1%) of the respondents attended primary school. One hundred fifty six (62%) of the participants were protestant in religion. The mean monthly family income of respondents was 926.99 ± SD 946.02 ETB. Occupationally, 139 (55.4%) of the respondents were farmers (Table 4).

Service area related factors

The majority of respondents 160 (69.3%) does not incur cost during their visit to TB clinic. Of the 251 respondents, 204 (81.3%) had visited the facility previously. The mean distance of health facilities were 1.2709±.44532 km. One hundred eighty two (72.5%) of the respondents traveled on foot to reach hospitals are shown in Table 5.

TB patients' satisfaction level with TB treatment services

Majority of the respondents 105 (41.8%) were satisfied

Table 3. Description of provider-patient interaction and communication pattern of services provision in the selected hospitals of Sidama zone, July, 2016.

Provider-patient interaction	Yes (%)	No (%)
Provider great the patient in a friendly/polite manner	33 (68.8)	15 (31.3)
Patient participate in part of decision making process	35 (72.90)	13 (27.15)
Provider and patient speak the same language	33 (68.8)	15 (31.3)
Information provision		
The provider explain how to take the drugs	35 (72.9)	13 (27.1)
The provider explain when to return for the next treatment	38 (79.2)	10 (20.8)
The provider explain the need to comply with the drug treatment	40 (83.3)	8 (16.7)
The provider explain when follow-up sputum microscopy is done	25 (52.1)	23 (47.9)
The provider advices the patient to bring any family member/neighborhood Having sign and symptoms of Tb to the health facility	20 (41.7)	28 (58.3)
The provider ask the patient for any concerns regarding the treatment	36 (75.0)	12 (25.0)
The provider respond to the client's question	27 (56.3)	21 (43.8)

with working hours. 147 (58.6%) respondents were satisfied with waiting time. 134 (53.4%) and 119 (47.4%) of the respondents were satisfied by overall cleanliness of the waiting area and overall comfort of the waiting area, respectively.

On the other hand, study participants were strongly dissatisfied with completeness of the information given to patients about treatment and effectiveness of the services were 3 (1.2%) and 15 (6.0%), respectively shown in Table 6.

Overall patients' satisfactions with TB treatment services

The average level patient satisfaction score (the mean of percentage of maximum scale score) with TB treatment services was 71.6%. A maximum score of 86.67, a minimum of 35.00, and the range was 51.67.

Factors affecting the level of patients' satisfaction

In order to assess the association between socio-demographic characteristics and the average level patient satisfaction score with TB treatment services, simple linear regression analysis was conducted.

Variable like marital status, ethnicity, educational status, occupation and family size are eligible for multivariate analysis at p < 0.25. No significant associations were observed between sexes, age, religion, residence, and average monthly family income (Table 7).

Also, among the respondents attributes in TB control activities, three variables like incur cost for visit TB clinic, purpose of cost incur and duration of your treatment of TB treatment were associated with patients satisfaction score in bivariate analysis (p<0.25) (Table 8).

Independent predictors of patient satisfaction with TB treatment services

Multiple linear regressions with enter methods were carried out to identify predicators of the average level of patient satisfaction score with TB treatment services. Table 9 shows the regression estimates and the relative effect of each predictor variable on average level patient satisfaction score of patients on TB treatment services provision. Variables like cannot read and write, higher education completed, intensive phase of TB treatment and ethnicity of Gurage were found statistically significant in association with average level satisfaction score of patients (p<0.05).

When a unit increase cannot read and write, the respondents had an average decreased of patient satisfaction score by 1.43 units (95% CI: -4.364, -1.505). Also, a unit increase for completed their higher education of the respondents had an average decrease in the patient satisfaction score by 2.447 units (95% CI: -7.349, -2.455).

However, unit increase the intensive phase of TB treatment service had an average decrease of 3.415 unit in average level of patient satisfaction score (95%CI: -7.445, -0.615). On other hand, respondents who were Gurage ethnicity had 4.224 units in greater satisfaction score when compared with Sidama ethnicity counter

Table 4. Socio demographic characteristics of TB patients in selected hospitals of Sidama Zone, Southern Ethiopia, July, 2016.

Socio-demographic factors (N=251)	Frequency	%
Sex		
Male	119	47.40
Female	132	52.60
Age		
15-29	67	26.70
30-44	90	35.90
45+	94	37.40
Ethnicity		
Sidama	145	57.80
Amhara	39	15.50
Oromo	37	14.70
Gurage	18	7.20
Others	12	4.80
Residence of the patients		
Urban	93	37.1
Rural	158	62.9
Marital status		
Single	54	21.50
Married	169	67.30
Divorced	11	4.40
Widowed	17	6.80
Educational status		
Cannot read and write	35	13.90
Read and Write only, no formal schooling	73	29.10
Primary school	88	35.10
Secondary school	43	17.10
Higher education	12	4.80
Religion		
Muslim	27	10.80
Protestant	156	62
Orthodox	51	20.30
Catholic	17	6.80
Occupation		
Farmers	139	55.40
Government employee	5	2.00
Daily labor	18	7.20
Merchant	36	14.30
House wife	43	17.10
Student	10	4.00
Monthly income		
<500	128	51.00

Table 4. Contd.

501-1000	43	17.10
>1001	80	31.90
Family size		
1-3	68	27.10
4-7	174	69.30
7+	9	9.30

Table 5. Description of respondents attributes in TB control activities in the selected hospitals of Sidama Zone, July 2016.

Service related factors (N=251)	Frequency	Percentage
Incur cost for your visit		
No	160	63.70
Yes	91	36.30
Ever visited this clinic for TB services before		
No	47	18.70
Yes	204	81.30
Duration of your treatment		
Intensive phase	26	10.40
Continuation phase	225	89.60
Have problem with the treatment		
No	85	33.90
Yes	165	65.70
Able to get the TB clinic easily		
No	49	19.50
Yes	202	80.50
Means you normally get to the TB clinic		
Walking	182	72.50
Vehicle	48	19.10
Car	18	7.20
How long it normally takes TB clinic		
<2.5 km	183	72.90
>2.5 km	68	27.10

parts (95% CI: 1.534, 7.913).

DISCUSSION

Treatment of TB is the cornerstone of any National Tuberculosis Programme. Assessing the quality of tuberculosis treatment services is important, because it tells us how the health system is performing and leads to improved care. In this study, an effort has been made to identify information related and constraints in all components (structural, process and outcome) of TB care using Donabedian's quality assessment model in health care.

Structures/Input requirements for TB treatment services provision were assessed using national TB and leprosy

Table 6. Level of patient satisfaction with TB treatment services in selected public hospitals of Sidama Zone, Southern Ethiopia, July, 2016.

Variable (N=251)	V.D	Ds	Neutral	Sat.	V.Sat
	N (%)	N (%)	N (%)	N (%)	N (%)
Satisfied with working hours	26 (10.48)	4 (33.5)	20 (8.0)	105 (41.8)	16 (6.4)
Waiting time	4 (1.6)	33 (13.1)	23 (9.2)	147 (58.6)	43 (17.1)
Time spent with health worker	4 (1.6)	24 (9.6)	24 (9.6)	143 (57.0)	55 (21.9)
Overall cleanliness of the waiting area	5 (2.0)	26 (10.4)	32 (12.7)	134 (53.4)	53 (21.1)
Overall comfort of the waiting area	5 (2.0)	31 (12.4)	28 (11.2)	119 (47.4)	68 (27.1)
Over cleanliness of the examination room	3 (1.2)	25 (10.0)	24 (9.6)	135 (53.8)	64 (25.5)
Cleanliness of instrument or equipment used	2 (0.8)	24 (9.6)	32 (12.7)	130 (51.8)	63 (25.1)
Experienced shortage of drugs during your treatment period	1(0.4)	20 (8.0)	17 (6.8)	133 (53.0)	80 (31.9)
Availability of all the services	3 (1.2)	23 (9.2)	19 (7.6)	134 (53.4)	72 (28.7)
Respect offered by the provider	5 (2.0)	20 (8.0)	18 (7.2)	142 (56.6)	66 (26.3)
Assure privacy during examination and treatment	9 (3.6)	30 (12.0)	17 (6.8)	141 (56.2)	54 (21.5)
Provider's skill and ability in treating your problem	4 (1.6)	19 (7.6)	19 (7.6)	138 (55.0)	71 (28.3)
Completeness of the information given to you about your problem	3 (1.2)	23 (9.2)	26 (10.4)	132 (52.6)	67 (26.7)
Satisfied with the cost incur	1 (0.4)	8 (3.2)	18 (7.2)	142 (56.6)	82 (32.7)
Effectiveness of the service	15 (6.0)	27 (10.8)	16 (6.4)	125 (49.8)	68 (27.1)

*VD: Very dissatisfied, Ds: dissatisfied, Sat.: satisfied, V.Sat.: very satisfied.

control program performance monitoring checklist. The main findings from service management and staffing of TB care, all studied hospitals were staffed by full time trained focal persons. Of them, only two TB clinic care providers and laboratory professionals had received refresher trainings within the previous one year. These findings are inconsistent with study conducted in Addis Ababa where all of them had received refreshment trainings in the last 12 months (Gezahegn et al., 2014). Moreover, it was also in contrary to WHO recommendation, "all health workers should be familiar with recent information at least once in a year (World Health Organization (2015). This difference may be due to high staff turnover. To maintain quality in implementation of TB treatment services, care providers and laboratory technicians must be updated to current evidence-based information. Training is also necessary to encourage adherence to national protocols and guidelines introducing some degree of standardization in both treatment and diagnosis (Federal democratic republic ministry of health, April 2012).

There were weak supervision patterns as there was very small proportion of TBL focal persons got chance of being supervised in the 12 months and the supervision pattern was also unplanned and lack the written form of feedback, which opposes the guidelines for clinical and programmatic management of TB, leprosy and TB/HIV in Ethiopia recommendations where they recommend strong supportive supervision as part of program communication (Federal democratic republic ministry of health, April 2012).This discrepancy might be due to hospital administration not integrated supportive supervision services with other programs.

Half of the studied hospitals had and were using the latest version of TLCP manual, TLCP Laboratory Manual and TB referral, flow chart for diagnosis and treatment of PTB. This finding was not in line with studies conducted in Addis Ababa private facilities and Bahir Dar city administration public health facilities which were available in all health facilities (Gezahegn et al., 2014). The possible reason for this discrepancy might be lack of emphasis by different authorities and concerned bodies in the zone and region.

From the drug and diagnostic supplies of structural quality of TB cares, all of the studied hospitals that had first line anti-TB drugs were sufficient for one month. It was consistent with the national minimum recommendation, of "every facility should have at least one month stock level for existing patients" (The Federal Democratic Republic of Ethiopia Ministry of Health, 2015; Federal democratic republic ministry of health, April 2012). It is also not comparable with the findings of studies conducted in Jimma Zone where 90.0% of the facilities had TB drugs sufficient for at least 3 months, which may be due to frequent stock out of ant-TB drugs were common in the area (Elmahalli and Abdel-Aziz, 2007). The WHO and FMOH recommended that adequate supply of drugs and equipment's are part of programmatic activities at each level of TB control Programme (Mehret et al., 2016).

Table 7. Socio-demographic determinants of patient satisfaction score with TB treatment services at public hospitals of the Sidama Zone, Southern Ethiopia, July, 2016.

Items (N=251)	No (%)	P-value	Unstandardized β	Coefficient 95% CI for β
Sex				
Female*	132 (52.6)	0.902	-0.116	(-1.981, 1.748)
Male	119 (47.4)			
Age	-	0.893	0.005	(-0.063, 0.073)
Marital status				
Married*	169 (67.3)	-	-	-
Single	54 (21.5)	0.129	-1.778	(-4.075, .519)
Divorced	11 (4.4)	0 .726	-0.816	(-5.388, 3.757)
Widowed	17 (6.8)	0 .146	-2.768	(-6.507, .971)
Ethnicity				
Sidama*	145 (57.8)	-	-	-
Amhara	39 (15.5)	0.55	1.464	(-3.352, 6.279)
Oromo	37 (14.7)	0.108	3.968	(-.878, 8.814)
Gurage	18 (7.2)	0.021	6.435	(1.999, 11.872)
Educational status				
Primary school*	88 (35.1)			
Cannot read and write	35 (3.9)	0 .040	-2.526	(-5.446, -0.394)
Read & Write only	73 (29.1)	0.338	-1.128	(-3.441, 1.185)
Secondary school	43 (17.1)	0.041	-2.838	(-5.557, -0.119)
Higher education	12 (4.8)	0.05	-4.482	(-8.979, -0.014)
Religion				
Protestant*	156 (62)			
Muslim	27 (10.8)	0.27	-1.719	(-4.78, 1.346)
Orthodox	51 (20.3)	0.388	1.041	(-1.331, 3.413)
Residence				
Rural*	158 (62.9)			
Urban	93 (37.1)	0.731	-0.336	(-2.264, 1.591)
Monthly income				
Occupation	0.406	0.273	0	(-0.001, 0.001)
Farmer*	139 (55.4)	0.210	-3.753	(-10.478, 2.972)
Government employer	5 (2.0)	0.574	-2.364	(-6.065, 1.337)
Daily labor	18 (7.2)	0.749	-0.79	(-3.553, 1.973)
Merchant	36 (14.3)	0.396	-0.42	(-2.998, 2.159)
Housewife	43 (17.1)	-	-2.086	(-6.924, 2.751)
Student	10 (4.0)	-	-	-
Family size	-	0.106	0.575	(-.123, 1.273)
How long it normally takes TB clinic				
<2.5 km*	183 (72.9)	0.574	0.598	(-1.495, 2.692)
>2.5 km	68 (27.1)			

*Reference category (the highest frequency taken as reference categories).

Table 8. Association between the average level of patient satisfaction score with TB treatment services and description of respondents attributes in TB control activities in public hospitals of Sidama Zone, Southern Ethiopia, July, 2016.

Items (N=251)	No (%)	p-value	Unstandardized β	coefficient 95% CI for β
Incur cost for your visit				
No*	160 (63.7)	0.243	-1.147	(-3.078, 0.784)
Yes	91 (36.3)			
Ever visited this clinic for TB services before				
Yes*	204 (81.3)	0.436	0.943	(-1.440, 3.327)
No	47 (18.7)			
Purpose of incur cost				
No cost incur*	161 (64.1)	-	-	-
Transport	57 (22.7)	0.768	0 .083	(-2.604, 1.924)
Food and reception	33 (13.1)	-0.34	-2.482	(-5.289, 0.325)
Duration of your treatment				
Continuation phase*	225 (89.6)	0.008	-4.115	(-7.12, -1.104)
Intensive phase	26 (10.4)			
Have problem with the treatment				
Yes*	165 (65.7)	0.662	0.437	(-1.529, 2.403)
No	85 (33.9)			
Able to get the TB clinic easily				
Yes*	202 (80.5)	0.613	-0.603	(-2.951, 1.745)
No	49 (19.5)			
Means you normally get to the TB clinic				
Walking*	182 (72.5)	-	-	-
Vehicle	48 (19.1)	0.655	0.543	(-1.849, 2.934)
Car	18 (7.2)	0.595	-0.98	(-4.630, 0.660)
How long it normally takes TB clinic				
<2.5 km*	183 (72.9)	0.574	0.598	(-1.495, 2.692)
>2.5 km	68 (27.1)			

*Reference category (the highest frequency taken as reference categories).

About service accessibility and infrastructure, 4 studied hospitals had tape water supplies which is available for 24 h but the remaining 2 were water supplies not connected with main source which is inconsistent with National Guideline of Ethiopia (Federal democratic republic ministry of health, April 2012). All the hospitals have separate room for TB treatment.

The overall structural quality score of the current study is 0.85. Majority of the studied facilities were structurally good. This finding is better than other study conducted in Jimma zone with overall structural qualities score of 0.56 (Elmahalli. and Abdel-Aziz, 2007). This might be due to

difference of setting and time difference.

Effective interpersonal communication between health care providers and patients are one of the most important elements for improving patient satisfaction, treatment adherences and outcomes (World Health Organization, 2007). The findings of this study revealed that the provider does not only greet the patient in a friendly/polite manner was 31.3% of the sessions, patient not participate in part of decision making process was 27.15% and provider and patient not speak the same language was 31.3%. This finding is opposed by a study in Addis Ababa where all health facilities demonstrate

Table 9. Independent predictors of patient satisfaction score with TB treatment services in selected public hospitals of Sidama zone, Southern Ethiopia, July, 2016.

Variable	P-valve	Unstandardized coefficients β	Standardized coefficients β	95.0% Confidence interval β	
				Lower bound	Upper bound
Constant	0	72.774	0.021	68.295	77.253
Single	0.788	0.376	-0.107	-2.373	3.125
Widowed	0.121	-3.182	-0.066	-7.208	0.843
Cannot read and write	0.038*	-1.430	-0.094	-4.364	-0.505
Secondary school completed	0.183	-1.867	-0.070	-4.621	0.887
Higher education completed	0.026*	-2.447	-0.018	-7.349	-0.455
Daily labor	0.784	-0.533	-0.007	-4.366	3.3
Family size	0.934	-0.038	-0.010	-0.944	0.868
Cost incur to visit TB clinic	0.892	-0.162	-0.087	-2.504	2.179
Cost for food	0.241	-1.924	-0.140	-5.147	1.299
Intensive phase of TB treatment	0.018*	-3.415	0.044	-7.445	-0.615
Ethnicity Oromo	0.497	0.916	0.146	-1.735	3.568
Ethnicity Gurage	0.025*	4.224	0.021	1.534	7.913

greeting, respectful, and participating in decision making process (Gezahegn et al., 2014). This might be adequate for lack of supportive supervision and refreshment training.

Also information provision/communication between care providers show that the provider explain how to take the drugs, explain when to return for the next treatment and advices the patient to bring any family member/ neighbor having sign and symptoms of TB to the health facility was 72.9, 79.2 and 41.7%, respectively. This finding is lower than with the study conducted in public facilities of a Bahir Dar city administration where 80.5% patients were advised how to take drugs and 81.6% patients were told when the next follow-up will be (Mulatu et al., 2015). The possible reason for this might be due to lack of adequate follow-up of trained health professionals working in TB clinic.

Patient satisfaction is an important quality outcome indicator of health care in the hospital setting. This study revealed that the average level of patients satisfaction score with TB treatment services was 71.6% (M=3.8629, SD=0.29895). The average level of patients' satisfaction score was lower than a study conducted in Sidama Zone in public health facilities and Addis Ababa in private health facilities revealed that 90 and 75% of the respondents are satisfied with TB treatment service, respectively (Gezahegn et al., 2014).

The possible reason for this discrepancy might be due to lack of strong supportive supervision and care providers do not receive refreshment training.

The average level of patients' satisfaction score in this study was higher than the study conducted in public health facilities of Bahir Dar city administration where about 53.8% of respondents were fully satisfied with their

TB treatment services (Mulatu et al., 2015). This also may be due to the difference of setting.

Based on the multiple linear regression analysis result, educational status of the respondents was predictor of patient satisfaction. When unit increase cannot read and write, the respondents had an average decrease of patient satisfaction score by 1.43 units (95% CI: -4.364, -1.505). And also unit increase completed their higher education of the respondents had an average decrease of patient satisfaction score by 2.447 units (95% CI: -7.349, -2.455). This is in contrast with the study done in Sidama zone (Zekariyas et al., 2013). The possible reason might be due to time difference.

However, unit increase of the intensive phase of TB treatment service had an average decrease of 3.415 unit in average level of patient satisfaction score (95% CI: -7.445, -0.615). The one possible reason for this might be as an increase in duration of TB treatment, the patients' adherence with treatment and decrease in their sign and symptoms which might increase their satisfaction. This was supported by earlier studies that found the duration of TB treatment to be significant predictor of patients satisfaction

On other hand, respondents who were Gurage ethnicity had 4.224 units in greater satisfaction score when compared with Sidama ethnicity counter parts (95% CI: 1.534, 7.913). It was difficult to discuss here.

Social desirability bias is likely in this study as the respondents were interviewed in the wards of the hospital. Might be only satisfied patients usually visit health facility.

This study might suffer from Hawthorn effect (the Hawthorne effect is when a group of people who know they are being studied and watched perform tasks better

or improve behavior).

Conclusion

In this study, the average level of patients' satisfaction with TB treatment service was found to be low. Most of the minimum required resources to conduct the service were available in the hospitals. Almost half of the studied hospitals had and were not using IEC materials. Majority of the studied hospitals is structurally good. The major gabs identified in the majority of the hospitals were lack of refreshing training and supportive supervision. Regarding the patient-provider interaction of TB patient, care in all assessed hospitals was poor. Moreover, more than half of the patients had not given information to bring any family member/neighborhood having sign and symptoms of TB. Patient cannot read and write, completed higher education, and intensive phase of TB treatment were found to be independent predictors of patient satisfaction.

RECOMMENDATION

Based on the findings of this study, the following recommendations were forwarded: (1) to health care providers: (a) success of anti-TB therapy could be ensured through strict adherence to all the elements of TB treatment strategy, (b) great emphasis should be given for interaction and communication with patients, (c) as patients' satisfaction was not as such satisfactory, attentions should be given for those areas where greater dissatisfaction was observed like waiting time and patient respect on overall cleanliness of the waiting area and provision of complete information; (2) to all hospitals administration: regular supervision and follow up should be strengthened; to Sidama Zone Administration Health Department: (a) ongoing (refreshment) training and training on communication skills should be given for health workers, (b) procurement/distribution/supplies and IEC materials (flip charts and posters) and follow-up of their utilization should be ensured; (3) to regional health bureau: (a) Capacity strengthening supports for TB treatment sites should be continued to improve services of infrastructure, waiting areas, IEC materials and equipment, (b) mobilizing government and nongovernmental organizations to prepare refresher training; and (4) to researcher: in this study, ethnicity was the positive effect on patient satisfaction, therefore it needs further study.

Ethics approval and consent to participate

Before any attempt, ethical clearance was obtained from Jimma University College of Health Sciences ethical review board. Written permission was requested from Sidama Zone Administration, Zonal Health Department and from each hospitals administration. Consent was obtained from each individual interviewee subjects, and a verbal consent was obtained from them. Client's privacy, confidentiality and cultural norms were respected properly.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests

ABBREVIATIONS

DOTS, Directly observed treatment short course; **FMOH,** Federal Ministry of Health; **HIV/AIDS,** human immune virus/acquired immune deficiency syndrome; **IOM,** Institute of Medicine; **ISTC,** International Standards for TB Control and Care; **MDR,** TB multidrug resistant tuberculosis; **NGO,** non-governmental organization; **RHB,** Regional Health Bureau; **SNNPR,** Southern Nation, Nationality and People Regional State; **SPSS,** Statistical Package for Social Science; **TB,** tuberculosis; **TLCP,** Tuberculosis and Leprosy Control Program; **WHO,** World Health Organization; **WOHO,** Woreda Health Office; **ZHD,** Zonal Health Department.

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