Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

Takele Menna Adilo*

Department of Public Health, St Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia

***Corresponding Author**: Takele Menna Adilo, Department of Public Health, St Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.

Abstract

Background: TB related stigma negatively influences lives of TB patients and their families making them vulnerable to poor quality of life. Disease-related stigma and knowledge are believed to influence patients' willingness to seek health care and adherence to treatment.

Aim: The aim of this study was to assess the determinants of TB stigma and its effects on the health seeking behavior and treatment adherences among TB patients in Addis Ababa, Ethiopia.

Methodology: A health facility based cross-sectional study was employed from March to April 2017 among randomly selected 372 TB patients attending treatment follow-up clinics at 10 public health facilities in Addis Ababa. The selection of health facilities and study subjects were done randomly.

Data were collected by 10 experienced nurses with diploma and above level of education and under the close supervisions of 2 senior health professionals and the principal investigator after pre-testing the tools and getting informed consent from each study subject. The collected data were cleaned and analyzed using computer soft-wares Epi-Info version 3.5.4 and SPSS version 20.0, respectively. Various statistical tests like descriptive statistics, Chi squared test and multiple logistic regressions were used to show the magnitude of the problem and the relation-ships of different determinants with TB stigma by controlling various confounders at the same time.

Results: The prevalence of TB stigma among the study subjects was 58.3% with 95% CI (52.8%, 62.5%). The proportions of TB patients' health care seeking delay and fear of non-adherence to already started anti-TB treatment were 61.4%; 95% CI (55.7%, 66.8%) and 61.9%; 95%CI (56.8, 67.0%), respectively.

The variables computed with TB stigma and have shown statistically significant associations (P-values < 0.05) during bi-variate analyses were further analyzed using the multivariable logistic regression model of the independent factors associated with the outcome variable. Accordingly, monthly income (AOR = 2.33; 95% CI, 1.17-4.61), smoking cigarette (AOR = 2.33; 95% CI, 1.04 - 5.21) and attitudes of other people towards TB patients (AOR = 3.28; 95% CI, 1.99 - 5.42) were found to be factors associated with TB stigma.

Conclusion: In general, more than half of the study subjects experienced TB stigma and nearly two-thirds reported that TB stigma affects individuals' health care seeking behaviors and/or delay in diagnoses and anti-TB treatment adherence. In addition, monthly income and smoking behavior of individuals, and perceived attitude of others towards TB patients are found to be determinants of TB stigma among the study participants.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

38

Thus, the health sector and its stake- holders need to strengthen health education intervention related to TB stigma at health facilities, schools and at community levels using various effective, culturally accepted and scientifically sound strategies.

Keywords: Determinants; TB Stigma; Health Seeking Behavior; Treatment Adherence; TB Patients; Ethiopia

Abbreviations

AIDS: Acquired Immune Deficiency Syndrome; AOR: Adjusted Odds Ratio; DOT: Directly Observed Treatment; HIV: Human Immune Deficiency Virus; IRB: Institutional Review Board; MDR: Multi-Drug Resistant; OR: Odds Ratio; SPHMMC: St Paul's Hospital Millennium Medical College; SPSS: Statistical Package for Social Scientists; TB: Tuberculosis

Introduction

Tuberculosis (TB) is accountable for the illnesses and deaths of millions of people in each year. Globally, 1.8 million people died from TB, including 0.4 million among people with HIV in 2015 [1].

Although the disease affects mostly adults in their most productive years, all age groups are at risk. Over 95% of cases and deaths of tuberculosis occur in developing countries. In the absence of right treatment, on average 45% of TB patients who are not infected with HIV and almost all HIV-positive people with TB will die [2].

Ethiopia ranked 7th among the high TB burden countries and 9th among the multi drug resistance tuberculosis priority countries in 2010 [3]. An estimated incidence of TB for the year 2015 in Ethiopia was 191/100,000 population [4]. In addition, as the national surveys on the burden of TB epidemic showed 31% - 41% of TB patients are HIV positive [5].

The burden of MDR-TB also remains high in the country, more importantly among previously treated TB patients [6]. While all segments of the society get TB, the poor are at greatest risk because of having more contact with other sufferers. This could be due to overcrowding at home, at work, travelling and socializing, and their weakened immune system due to poor nutrition [4]. The only effective approach to TB control is to rapidly diagnose and treat TB patients, thereby breaking the chain of infection.

A study on TB and HIV stigma as a challenge to TB treatment emphasized the significance of adherence to a complete course of tuberculosis treatment for attaining cure and minimizing the expansion of drug resistance [7]. However, once identified, sufferers experience considerable stigma and discrimination on account of their disease, leading to delays to diagnosis and treatment and, also non-adherence to the treatment that make a major impact on TB control [8].

Individuals diagnosed with TB, report fears of isolation and rejection such as losing employment, being divorced or having diminished marriage prospects, not being allowed to share meals, utensils or sleeping with family members, and general avoidance or gossip among community members [9-12]. Fear of these consequences may lead to delays in seeking care for TB symptoms and could affect adherence to treatment [9,10]. Consequently, TB stigma continues to be viewed as a barrier to TB control.

Stigma was related to covering up of symptoms, low self-esteem, decreased self-perception, treatment default, separation from support networks, and low self-care [13]. Originally stigma was described by Goffman as "an undesirable or discrediting attribute that an individual possesses, reducing the individual's status in the eyes of society" [14].

More recently, health related stigma has been defined as "a social process or related personal experience characterized by exclusion, rejection, blame, or devaluation that results from experience or reasonable anticipation of an adverse social judgment about a person or group identified with a particular health problem" [15]. This conceptualization highlights two important components of stigma: overt patients' experiences of discrimination in their community and the internalized fear and anticipation of social consequences regardless of any actual experience by the patient [16].

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

39

Patients with tuberculosis and their health-care providers also identify TB stigma as a cause of no completion of treatment [17-21]. Even after the start of therapy, concern about being identified as having TB and suffering the consequences of TB stigma may lead individuals to drop out of treatment programs.

Qualitative studies using focus groups and interviews have identified religion, socioeconomic status, level of education, and gender as possible factors associated with TB stigma [22,23], with women more often than men feeling the effects of TB stigma [9,11].

Furthermore, a study conducted in Addis Ababa showed that 69.0% of the study participants feel that TB patients are not accepted in the community and over 75% of them fear physical contact with TB patients [24]. Marriage disturbance was observed in rural and urban parts of Ethiopia [24,25].

Recently, the problem of TB stigma is becoming common among the public due to the association between TB and other related factors like HIV, poverty, low social class, knowing someone who was infected with TB or passed away because of TB [26,27]. In addition, the findings of a study also reported that AIDS stigma and a low level of education were possible predictors of higher TB stigma [27].

A research has reported that gender being female and old age people infected with TB are more stigmatized than their counterparts [28]. The qualitative studies conducted in various settings have also revealed that gender, religion, socioeconomic status, level of education were considerably associated with TB stigma [27-29].

Additionally, being female in sex and single in marital status were established to be considerable risk factors for stigma as reported from a prospective study on the stigma as an obstacle to treatment adherence among TB patients [30].

To the contrary, sex had no relationship with the degree of stigma as reported by a study from Sudan. But the degree of stigma among TB patients was importantly related with unemployment, low knowledge of TB, lower level of education, higher age and being the resident of rural areas [31].

Likewise, poverty, relationship between TB and HIV, fear of being infected, some unacceptable individual behaviors like smoking cigarette and drinking alcohol are found to be possible causes for TB stigma as shown in a study from Nepal [10].

A study on the TB Stigma that was conducted in Nigeria also showed that individual's history of smoking cigarette and drinking alcohol, education status being below secondary level, disclosure of HIV status, age, low socio-economic status and history of weight loss were significant predictors for TB stigma. But ethnicity, sex, religion, and marital status have shown no significant associations with TB stigma [32].

Nonetheless, attempts to quantify the contribution of TB stigma to diagnostic delay and treatment adherence have produced mixed results. For instance, a survey on newly diagnosed TB patients in Uganda to assess factors related to the time between the onset of TB symptoms and TB diagnosis delays reported alcohol use and subsistence farming as risk factors, but not perceived TB stigma [33]. Similarly, TB stigma was not a predictor of significant delay between the onset of symptoms and seeking health care in Zambia and Syria [34,35].

Although, a study from Cameroon found perceived TB stigma as a significant predictor of health care seeking delays of more than four weeks, the association disappeared with multivariate adjustment [36].

Reasons why TB may be stigmatizing include contagiousness [37], incorrect knowledge of its cause, transmission, or treatment [10,11,23,38], or its association with marginalized groups such as the poor, ethnic minorities, sex workers, prisoners, and those infected with HIV [10,11,23,39]. As the epidemics of TB and HIV/AIDS have converged in many areas of the world, there is growing concern that AIDS and AIDS stigma may compound existing TB stigma [40].

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

40

The impact of TB stigma on treatment compliance is also unclear. A study reported that TB stigma as a predictor of treatment adherence, among Russians with active pulmonary TB [37]. In addition, TB stigma was the most common motivation cited by HIV-infected Tanzanian patients who did not complete isoniazid preventive therapy [41]. Equally Perceived TB stigma was found to be associated with noncompliance among Pakistani patients on directly observed treatment (DOT) [42].

What's more, different studies from developing countries showed that different population groups experienced negative attitude towards TB patients and their families. A study conducted in Kenyan Community showed that TB is attributed to causes such as hard work, exposure to cold, sharing of toilet with TB patients, and hereditary [43].

Individuals with TB and their health-care providers also identify TB stigma as a cause of no completion of treatment [18,19]. Even after the start of therapy, concern about being identified as having TB and suffering the consequences of TB stigma may lead individuals to drop out of treatment programs.

In general, TB-infected men and women are a unique population whose health care seeking behavior and treatment compliance have significant social consequences in TB transmission such as risk of Multi drug resistant TB. Stigma and discrimination fuels the TB epidemic by creating a culture of secrecy, silence, ignorance, blame, shame and victimization [43,44]. Consequently, stigma and discrimination presents a serious challenge to the effectiveness of TB prevention and care activities. Although, the impact on sufferers is considerable, there is little understanding of the precise nature of the causes of TB stigma and discrimination particularly in Addis Ababa, Ethiopia that is densely populated, and with highly diversified ethnicity and culture of its residents.

Consequently, the primary aim of this study was to assess the magnitude and determinants of TB stigma, and its effects on health care seeking behavior and treatment adherence among TB patients attending public health facilities in Addis Ababa, Ethiopia.

Materials and Methods

Study design and setting

A health facility based cross sectional study was conducted at randomly selected ten health centers in Addis Ababa City Administration. Addis Ababa is located at 9 degree north latitude and 38 degree east longitude, in the range of 2200 - 2800 meters above sea-level. According to the national census report of 2007, the projected population of Addis Ababa for the year 2014 was 3, 197,000 and among those, about 52% are females [45-47].

Currently, the City is administratively divided in to ten sub-cities (Kifle-Ketemas), and one–hundred and sixteen districts/Woredas. The City has potential health service coverage of 100%. There are 11 government hospitals and 62 health centers in Addis Ababa [48,49]. In 2013/14 the expected new TB cases detection rate in Addis Ababa was about 8,000 and was among the regions with higher TB cases in the country. The national detection rate for all forms of TB was 247/100,000 [50]. The estimated prevalence of HIV/AIDS of the city was 5.2% for the year 2011, which was the highest, next to Gambella Region compared to other regions of the country and that of the national prevalence which was 1.5% [49,50].

Sample Size and Sampling methods

For this study, a health centre from each sub-city to the total of 10 health centres were randomly selected. Then in order to get a representative sample among TB patients a random sampling technique with reasonable formulas of assumptions and 15% contingency was used.

The sample size was estimated using the following single population proportion calculation formula: $n = (Z^2 \times p \times q)/d^2$. As 'n' was the sample size for the study, Z was the upper $\alpha/2$ point of standard normal distribution, where $\alpha = 0.05$, $Z\ \alpha/2 = 1.96$. As revealed in a study that was conducted in Addis Ababa previously, the reported TB stigma related fear among community was 69.0% [24]. Hence, the actual prevalence rates as indicated above considered as p = 0.69; q = 0.31.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

41

In addition, the maximum allowed difference between the maximum likelihood estimate and the unknown population parameter denoted by "d" was desired to be 0.05.

Accordingly, the calculated sample size was randomly selected 372 TB patients among TB clinic attendants of ten public health centers in Addis Ababa.

Data Collection and Quality Control

Data were collected in March and April of 2017 using pre-tested, structured and interviewer administered questionnaires. The data were collected from 372 TB patients who were 15 and above years old and also who provided written consents to participate in the study.

In order to ensure data quality, various measures were taken at different levels. Before the actual administration of the intended questionnaires, they were edited and pre-tested. Training was also given for the data collectors and supervisors by the principal investigator. The data collection procedure was carried out by 10 experienced nurses with diploma and above level of education, two supervisors, who had BSc degree and above in health sciences/co-researchers/and the Principal Investigator.

The developed standard questionnaire originally in English was translated into the local language/Amharic/and then back to English in order to check for consistency as well to make effective pre-tests and modifications as needed.

What is more, prior to the main fieldwork, the pre testing of the data collection instruments was done using TB patients from public health facilities which were not part of the main study. The health facilities that were used for pre-testing had similar characteristics to the health facilities selected for the actual study. The pre-test was helpful to identify problems and omissions as well as checking time spent in responding. Pre- testing of instruments was aimed at improving the precision, reliability, and cross-cultural validity of data. Following the pre-testing of study instruments, ambiguous or unclear questions were either rephrased or removed.

At the field level, filled questionnaires were checked first by the data collectors themselves and then by their respective supervisors on a daily basis. Then, the principal investigator cross -checked the filled and collected questionnaires randomly for their completeness and consistency daily.

Finally, at the data entry level, checking for invalid codes, missing values, inconsistency of records and duplicated entries were done carefully with due emphasis on the expected quality of data.

Ethical Considerations

High concerns for the standard of ethical issues were applied during all the activities of this study. Since TB positive populations in health facilities were the study subjects involved, due thought was given for the ethical principles of respect, beneficence, and justice during all the data collection processes.

The applications of the general principles of ethics to this study had led to the consideration of the requirements for the informed consent of the study subjects which was crucial.

Besides, all the data of this study were handled with confidentiality and anonymity. An ethical clearance was also obtained prior to this study from the institutional review board/IRB/of the St Paul's Hospital Millennium Medical College (SPHMMC). Then, official letter of co-operation was written from the SPHMMC to all the 10 TB Treatment follow-up clinics of the selected Health Centers in Addis Ababa.

All the study participants were informed about the objectives of the study adequately before asking to consent and that their participations and/or permissions were purely voluntary, and they were free to decline or withdraw at any time in the course of the study. It was also transparently clarified that the information that they provided whether orally or in writings were for the research purposes, strictly anonymous and therefore will be handled confidentially. In general, there were no personal identifications during responding to any of the questionnaire.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

42

Data Management and Statistical Analysis

All the collected data were entered into a computer with EPI Info software version 3.5.4 and analyses were done using the SPSS software program version 20.0. Different appropriate statistical methods including frequency distribution, percentages, proportions; odds ratios and adjusted odds ratio with 95% confidence intervals were calculated. Chi-square tests, bivariate and multivariate logistics regressions methods were applied to test the association between the outcome and independent variables. Assumptions behind all procedures were checked.

The variables in multivariate analyses were chosen based on existing theoretical knowledge on the variables and statistical significance found during bivariate analyses. Accordingly, the P-values less than 0.05 were considered as statistically significant.

Operational Definitions

Knowledge of TB: It was the understanding about the disease by research subjects. It was assessed by asking a few fundamental questions about cause, important symptoms, and mode of transmission, diagnosis, and treatment of TB.

Patient delay: was defined as the time between onset of TB-related symptoms and the first visit to a qualified provider (private or public health clinic or hospital).

Perception related to TB stigma: This was the patient's recognition and interpretation of his feelings or emotions based on past experiences.

Stigmatizing attitude: An attitude is an 'outlook' or 'a belief' or 'a mind-set' that has the potential to influence our actions. Respondents were expected to either agree or disagree to the related questions.

TB Stigma: In general is defined as a process within a given cultural setting that discredits/devalues an individual based on undesired attributes due to misconceptions and myths related to TB infection. It is an outcome of interest.

Results

Socio-Demographic Features of Study Participants

Of the total 372 interviewed patients who had been attending TB clinics in randomly selected public health facilities in Addis Ababa, 371 (99.7%) reacted willingly. Among these, 180 (48.5%) were females. The dominant portions of study participants (38.5%), (43.1%), (77.4%) and (48.0%) were in the age range of 25 - 35 years, Amhara by ethnicity, orthodox religion followers and illiterates or with primary level of education, respectively. With regards to marital status of the participants, 212 (57.1%), 136 (36.7%) and only 23 (6.2%) were single, married, and divorced and widowed, respectively. Of the study participants less than half, i.e., 182 (49.1%) were either public or private employees. Furthermore, the greater part of the study subjects, i.e., 207 (56.3%) reported that their monthly income during the study period was less than one thousand Ethiopian Birr (equivalent to 43 USD) or else no monthly income at all (Table 1).

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

43

Variables		Male (%)	Female (%)	Total (%)
Sex				
Male	191 (51.5%)			
Female	180 (48.5%)			
Age category				
15 - 24		55 (28.8)	57 (31.7)	112 (30.2)
25 - 35		66 (34.6)	77 (42.8)	143 (38.5)
Above 35 years		70 (36.6)	46 (25.6)	116 (31.3)
Total		191 (51.5)	180 (48.5)	371 (100.0)
Ethnicity				
Amhara		75 (39.3)	85 (47.2)	160 (43.1)
Oromo		39 (20.4)	31 (17.2)	70 (18.9)
Ghuragie		44 (23.0)	42 (23.3)	86 (23.2)
All Others		33 (17.3)	22 (12.2)	55 (14.8)
Religion				
Orthodox Christian		145 (75.9)	142 (78.9)	287 (77.4)
All Others		46 (24.1)	38 (21.1)	84 (22.6)
Education				
Illiterate and Primary level		75 (39.3)	103 (57.2)	17 8 (48.0)
Grade 9 - 12		74 (38.7)	54 (30.0)	128 (34.5)
Certificate and above		42 (22.0)	23 (12.8)	65 (17.5)
Marital Status				
Single		113 (59.2)	99 (55.0)	212 (57.1)
Married		68 (35.6)	68 (37.8)	136 (36.7)
All others /Divorced and Widowed		10 (5.2)	13 (7.2)	23 (6.2)
Occupation				
Public and Private Employees		107 (56.0)	75 (41.7)	182 (49.1)
Students and Unemployed		41 (21.5)	51 (28.3)	92 (24.8)
All others		43 (22.5)	54 (30.0)	97 (26.1)
Monthly Income				
No monthly income or less than one thousand Ethiopian Birr (Equivalent to 43.00 USD)		84 (44.4)	123 (68.7)	207 (56.3)
One thousand Eth. Birr or more		105 (55.6)	56 (31.3)	161 (43.8)

Table 1: Socio-demographic Characteristics of Study Participants by Sex, in Addis Ababa, Ethiopia; 2017; N = 372.

Clinical and TB Stigma related characteristics of study participants

As the clinical and TB Stigma related characteristics of the 371 study participants were concerned, 365 (98.9%) ever tested for HIV and from these 86 (23.5%) were found to be positive. Of them, 65 (75.6%) were on antiretroviral therapy (ART) during the study period. Moreover, 84 (22.7%), 54 (14.6) and 35 (9.4%) of the participants of the study had self-reported that they drink alcohol, smoke cigarette and chew khat during the study period, respectively. Furthermore, 227 (61.2%) reported that because of the negative attitudes of other

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

44

people towards TB patients it took them more than 2 weeks to decide for visiting health care providers although they had recognized some TB like symptoms, and 229 (61.7%) reported that they were worried to visit health facilities daily for taking anti TB medications. But the majority of the study subjects 216 (58.5%) reported that according to their perceptions, the attitude of other people towards TB patients is negative.

Finally, the prevalence of TB stigma among the study subjects was 215 (58.3%) with 95% CI (52.8%, 62.5%) (Table 2). The proportions of TB patients delay from visiting health care providing facilities earlier and for those who had already started anti TB treatment being worried to take medications daily by going to health facilities that could be the challenge to treatment adherences were 61.0%; 95% CI (56.3%, 67.1%) and 63.7%; 95%CI (59.0, 68.7%), respectively.

Variable	Male (%)	Female (%)	Total (%)
What is Your HIV Status?			
Negative	150 (79.8)	129 (72.5)	279 (76.2)
Positive	37 (19.7)	49 (27.5)	86 (23.5)
If you were tested Positive, are you currently on ART?			
No	7 (18.9)	14 (28.6)	21 (24.4)
Yes	30 (81.1)	35 (71.4)	65 (75.6)
Do you drink alcohol?			
No	131 (68.9)	155 (86.1)	286 (77.3)
Yes	59 (31.1)	25 (13.9)	84 (22.7)
Do you smoke cigarette?			
No	152 (80.0)	164 (91.1%)	316 (85.4)
Yes	38 (20.0)	16 (8.9)	54 (14.6)
Do you chew Khat ?			
No	169 (88.5)	167 (92.8)	336 (90.6)
Yes	22 (11.5	13 (7.2)	35 (9.4)
Knowledge of TB			
Knowledgeable	155 (81.2)	127 (70.6)	282 (76.0)
Not Knowledgeable	36 (18.8)	53 (29.4)	89 (24.0)
Perceived attitude of others towards TB patients			
Positive	76 (40.2)	77 (42.8)	153 (41.5)
Negative	113 (59.8)	103 (57.2)	216 (58.5)
Even though you had TB like symptoms , you delayed more than 2 weeks to visit health care facilities because of the negative attitudes of other people towards TB Patients			
Agree	122 (53.7)	105 (46.3)	227 (61.2)
Disagree	69 (47.9)	75 (52.1)	144 (38.8)
Although, you are on Anti TB treatment currently, you are worried to take the medications daily because of the negative attitudes of other people towards TB Patients?			
Agree	122 (53.3)	107 (46.7)	229 (61.7)
Disagree	69 (48.6)	73 (51.4)	142 (38.3)
Stigma Observed			
Yes	111 (58.7)	104 (57.8)	215 (58.3)
No	78 (41.3)	76 (42.2)	154 (41.7)

Table 2: *Clinical and TB Stigma related characteristics of TB Patients by sex in Addis Ababa; 2017; N = 371.*

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

45

Factors Associated with TB Stigma among TB patients in Addis Ababa

It was endeavored to determine the factors that are associated with TB stigma among patients on anti TB treatment. Accordingly, as the binary logistic regression model below in table 3 shows, the factors contributing to the TB stigma with statistically significant associations were found to be age being 35 and above (COR = 0.59; 95%CI: 0.34 - 1.0), no monthly income or monthly income was below one thousand Ethiopian Birr (equivalent to 43 USD) (COR = 1.73; 95%CI: 1.14 - 2.64), being HIV positive (COR = 1.87; 95%CI: 1.12 - 3.14), drinking alcohol (COR = 2.08; 95%CI: 1.23 - 3.53), smoking cigarette (COR = 2.56; 95%CI: 1.32 - 4.96) and perceived attitudes of others towards TB patients, (COR = 3.92; 95%CI: 2.47 - 6.20).

Variables	TB Stigma observed		Unadjusted OR (95%CI)
	Yes (%)	No (%)	
Sex of respondent			
Male	111 (58.7)	78 (41.3)	1
Female	104 (57.8)	76 (42.2)	1.04 (0.69 - 1.57)
Total	215 (58.3)	154 (41.7)	
Age category			
15 - 24	59 (52.7)	53 (47.3)	1
25 - 35	80 (56.7)	61 (43.3)	0.85 (0.52 - 1.40)
Above 35 Years old	76 (65.5)	40 (34.5)	0.59 (0.34 - 1.0)
Religion			
Orthodox Christian	164 (57.5)	121 (42.5)	1
All others	51 (60.7)	33 (39.3)	0.88 (0.53 - 1.44)
Ethnicity			
Amhara	90 (56.6)	69 (43.4)	1
Oromo	38 (55.1)	31 (44.9)	1.06 (0.60 - 1.88)
Ghuragie	54 (62.8)	32 (37.2)	0.77 (0.45 - 1.32)
All others	33 (60.0)	22 (40.0)	0.87 (0.47 - 1.62)
Education			
Illiterate and Primary	112 (62.9)	66 (37.1)	1
Secondary school or above	103 (53.9)	88 (46.1)	1.45 (0.96 - 2.20)
Marital Status			
Single	123 (58.0)	89 (42.0)	1
Married	78 (58.2)	56 (41.8)	0.99 (0.64 - 1.54)
All others/ Divorced and Widowed	14 (60.9)	9 (39.1)	0.89 (0.37 - 2.14)
Monthly income			
No or less than one thousand Eth Birr per month (Equivalent to 43.0 USD)	133 (64.3)	74 (35.7)	1
More than one thousand Eth. Birr monthly	81 (50.9)	78 (49.10)	1.73 (1.14 - 2.64)
Occupation			
Public and private employees	99 (54.7)	82 (45.3)	1

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

46

Student and un employed	57 (62.0)	35 (38.0)	0.74 (0.44 - 1.24)
All others	59 (61.5)	37 (38.5)	0.76 (0.46 - 1.25)
Are you tested for HIV?			
No	2 (50.0)	2 (50.0)	1
Yes	211 (58.3)	151 (41.7)	1.40 (0.20 - 10.03)
HIV Status?			
Negative	153 (55.2)	124 (44.8)	1
Positive	60 (69.8)	26 (30.2)	1.87 (1.12 - 3.14)
Are you on ART currently?			
No	11 (52.4)	10 (47.6)	1
Yes	48 (73.8)	17 (26.2)	2.57 (0.93 - 7.11)
Do you drink alcohol?			
No	155 (54.6)	129 (45.4)	1
Yes	60 (71.4)	24 (28.6)	2.08 (1.23 - 3.53)
Do you smoke cigarette?			
No	174 (55.2)	141 (44.8)	1
Yes	41 (75.9)	13 (24.1)	2.56 (1.32 - 4.96)
Do you chew Khat?			
No	189 (56.6)	145 (43.4)	1
Yes	26 (74.3)	9 (25.7)	2.22 (1.01 - 4.88)
TB knowledge			
knowledgeable	169 (60.4)	111 (39.6)	1
Not Knowledgeable	46 (51.7)	43 (48.3)	1.42 (0.88 - 2.30)
Perceived attitude of others towards TB pts			
Positive	36 (23.5)	117 (76.5)	1
Negative	118 (54.6)	98 (45.4)	3.91 (2.47 - 6.20)

Table 3: *Factors associated with TB Stigma among TB patients in Addis Ababa, 2017 (N = 372).*

Multivariate variable analysis of factors associated with Stigma among TB patients

The variables computed with TB stigma and have shown statistically significant associations (P-values < 0.05 during bi-variate analyses were further analyzed using the multivariable logistic regression model of the independent factors associated with the outcome variable. Accordingly, monthly income (AOR = 1.67; 95%CI, 1.04 - 2.68), smoking cigarette (AOR = 2.40; 95%CI, 1.07 - 5.39) and attitudes of other people towards TB patients (AOR = 3.32; 95%CI, 2.0 - 5.49) were found to be determinants of TB stigma. On the contrary, age, HIV status and drinking alcohol had lost their statistical significance during multivariable logistic regression analyses (Table 4).

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

47

Variable	Stigma Observed			
	Yes	No	COR; 95%CI	AOR; 95%CI
Age category				
15 - 24	59 (52.7)	53 (47.3)	1	1
25 - 35	80 (56.7)	61 (43.3)	0.89 (0.54 - 1.47)	0.83 (0.47 - 1.47)
Above 35 Years old	76 (65.5)	40 (34.5)	0.59 (0.34 - 1.0)	0.81 (0.44 - 1.47)
Monthly income				
No or less than 1000.00Eth Birr (Equivalent to 43.0USD) Monthly	133 (64.3)	74 (35.7)	1.73 (1.14 - 2.64)	1.67 (1.04 - 2.68)
More than 1000 Eth Birr	81 (50.9)	78 (49.1)	1	1
HIV Status				
Negative	124 (44.8)	153 (55.2)	1	1
Positive	60 (69.8)	26 (30.2)	1.87 (1.12 - 3.14)	1.55 (0.87 - 2.75)
Do you drink alcohol?				
No	155 (45.4)	129 (54.6)	1	1
Yes	60 (71.4)	24 (28.6)	2.33 (1.25 - 4.34)	0.86 (0.44 - 5.39)
Do you smoke cigarette?				
No	174 (55.2)	141 (44.8)	1	1
Yes	41 (75.9)	13 (24.1)	2.56 (1.32 - 4.96)	2.40 (1.07 - 5.39)
Perceived attitude of others towards TB pts				
Positive	36 (23.5)	117 (76.5)	1	
Negative	118 (54.6)	98 (45.4)	3.91 (2.47 - 6.20)	3.32 (2.0 - 5.49)

Table 4: Multivariate variable analysis of factors associated with Stigma among TB patients in Addis Ababa, Ethiopia, 2016.

Discussion

This research was carried out among patients who had been attending TB clinics in Addis Ababa. The dominant proportion of TB patients being illiterates and those with primary level of education in the sample was concurrent with the characteristics of current features of TB prevalence among adult population in Ethiopia and similar others [4,6]. In addition, more than two-thirds (68.7%) of the study subjects were in the age category from 15 - 35 years. This finding was also in agreement with the global report on tuberculosis that revealed the fact that TB epidemic affects individuals mainly in their most productive and reproductive age category of the community [2].

As the results of this study showed the prevalence of observed TB stigma among patients attending anti TB treatment in Addis Ababa was 58.3%. Although this finding was significant it was lower than the finding of a study reported previously in similar setting before about sixteen years. This could be due to the wide gap in time line and possible difference in the study population [24].

With regards to economic status of the study subjects, over fifty six percent of the study subjects reported either no monthly income or they earn less than one thousand Ethiopian birr monthly (equivalent to about 43 USD monthly). This finding agrees with various reports that showed TB mainly affects those economically more disadvantaged segments of the community [2].

The proportion of TB/HIV co-infection among the study participants was found to be 23.5%. However, this finding showed lower proportion of the synergy between HIV and TB among patients attending TB clinics of various health facilities in Addis Ababa, Ethiopia

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

48

compared with different previous national reports [5]. This difference could be explained in terms of the variations in geographical area covered during the study, the data collection methods, sample size included and the time gap whereby the study was conducted.

With regards to the perceived attitude of other community members towards TB patients, 58.5% of the study participants reported that the attitude of others towards TB patients was negative. This finding was in line with previously observed facts that reported individuals diagnosed with TB have fear of isolation and rejection to the extent of losing of employment and marriage disturbance [9-12].

What is more, as the results of this study exhibited the self-reported TB stigma associated delay from health care seeking or early diagnosis and worry to take anti-TB medications among TB patients were 61.0% and 63.7%, respectively. The findings were concurrent with the findings from previous studies that were conducted in various countries and reported the associations between TB stigma and health care seeking behavior and/or anti-TB treatment adherence [24,37,38]. Nevertheless, our findings disagree with the findings of studies from Uganda, Zambia and Syria that reported no association between TB stigma and delay in health care seeking behavior [33-35].

As the findings of this study revealed, TB patients who were aged 35 and above, HIV positive and used to drink alcohol were more likely to face TB stigma than their counter parts during binary logistic regression analyses. These findings were also concurrent with the findings of a study on TB stigma that was conducted in Nigeria [32]. Nevertheless, these variables lost their statistical significance during multivariate analyses.

Furthermore, monthly income, smoking cigarette and perceived attitude of others towards TB patients were found to have statistically significant associations with TB stigma. Accordingly, those who had no monthly income or else earn less than one thousand Ethiopian birr (less than 43 USD) per month were about two times more likely to perceive TB stigma. The finding was in line with the findings of similar studies conducted previously in Vitenam, Southern Thailand and Nigeria [22,23,32] that reported those TB patients who were poor were more likely to face stigma than their counter parts.

Besides, those TB patients who were used to smoke cigarette were about two times more likely to feel TB stigma. This finding was concurrent with the findings of similar studies conducted previously in Nepal and Nigeria that reported some unacceptable individual behaviors like smoking cigarette and drinking alcohol were observed likely causes for TB stigma [10,32].

Finally, as the findings of this study showed, TB patients who recognized negative attitudes of other people towards TB patients were about three times more likely to face TB stigma when compared to their counter parts. This finding was also in harmony with the findings of similar studies conducted in urban and rural Ethiopia before seventeen years [24,25].

Conclusion

In general, nearly two-thirds of the TB patients in Addis Ababa reported that TB stigma affects individuals' health care seeking behaviors or delay in diagnoses and anti-TB treatment adherence. In addition, as the findings of this study revealed, more than half of the study subjects experienced TB stigma. Monthly income and smoking behavior of individuals as well as perceived attitude of others towards TB patients are found to be possible factors associated with TB stigma.

Thus, the health sector and it's all stake- holders need to strengthen health education intervention related to TB stigma at health facilities, schools and other community settings using various effective, culturally accepted and scientifically sound strategies.

Finally, as this study was focused among TB patients from the capital city Addis Ababa only, country wide representative research on the TB stigma and its effects can have overriding significance in preventing and controlling the epidemic.

Competing Interest

No competing interest to be declared.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

49

Bibliography

1. World Health Organization. "Global Tuberculosis Report" (2016).

2. Tuberculosis Fact sheet Reviewed (2016).

3. Federal ministry of health. "Guideline for Program and clinical management of Drug resistant tuberculosis". First edition (2009).

4. World Health Organization. "Global Tuberculosis Report: global actions and investments fall far short of those needed to end the global TB" (2016).

5. FHAPCO/FMoH. "Single Point HIV Prevalence Estimate" (2007).

6. Setegn E., *et al.* "Multidrug resistant tuberculosis in Ethiopian settings and its association with previous history of anti-tuberculosis treatment: a systematic review and meta-analysis". *BMC Infectious Diseases* 17.1 (2017): 219.

7. Frieden TR., *et al.* "Tuberculosis". *Lancet* 362.9387 (2003): 887-899.

8. Public Health Watch. "Civil society perspectives on TB policy in Bangladesh, Brazil, Nigeria, Tanzania and Thailand". Open Society Institute: New York (2006).

9. Long NH., *et al.* "Fear and social isolation as consequences of tuberculosis in VietNam: a gender analysis". *Health Policy* 58.1 (2001): 69-81.

10. Baral SC., *et al.* "Causes of stigma and discrimination associated with tuberculosis in Nepal: a qualitative study". *BMC Public Health* 7 (2007): 211.

11. Eastwood SV and Hill PC. "A gender-focused qualitative study of barriers to accessing tuberculosis treatment in The Gambia, West Africa". *International Journal of Tuberculosis and Lung Disease* 8.1 (2004): 70-75.

12. Liefooghe R., *et al.* "Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot, Pakistan". *Social Science and Medicine* 41.12 (1995): 1685-1692.

13. Giorgianni SJ. "The health repercussions of stigma". *The Pfizer Journal* 5 (2004): 13-23.

14. Goffman E. "Stigma: Notes on the Management of Spoiled Identity". New York: Simon & Schuster (1963).

15. Weiss MG and Ramakrishna J. "Stigma interventions and research for international health". *Lancet* 367.9509 (2006): 536-538.

16. Visser MJ., *et al.* "Development of parallel scales to measure HIV-related stigma". *AIDS and Behavior* 12.5 (2008): 759-771.

17. Jackson L and Yuan L. "Family physicians managing tuberculosis. Qualitative study of overcoming barriers". *Canadian Family Physician* 43 (1997): 649-655.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

50

18. Suri A., *et al*. "Voices from the field: perspectives from community health workers on health care delivery in rural KwaZulu-Natal, South Africa". *Journal of Infectious Diseases* 196.3 (2007): S505-S511.

19. Naidoo P., *et al*. "Exploring tuberculosis patients' adherence to treatment regimens and prevention programs at a public health site". *Qualitative Health Research* 19.1 (2009): 55-70.

20. Edginton ME., *et al*. "Patients' beliefs: do they affect tuberculosis control? A study in a rural district of South Africa". *International Journal of Tuberculosis and Lung Disease* 6.12 (2002): 1075-1082.

21. Sumartojo E. "When tuberculosis treatment fails. A social behavioral account of patient adherence". *American Review of Respiratory Disease* 147.5 (1993): 1311-1320.

22. Johansson E., *et al*. "Gender and tuberculosis control: perspectives on health seeking behaviour among men and women in Vietnam". *Health Policy* 52.1 (2000): 33-51.

23. Sengupta S., *et al*. "Social impact of tuberculosis in southern Thailand: views from patients, care providers and the community". *International Journal of Tuberculosis and Lung Disease* 10.9 (2006): 1008-1012.

24. Gelaw M., *et al*. "Attitude and social consequences of Tuberculosis in Addis Ababa". *East African Medical Journal* 78.7 (2001): 382-388.

25. Getahun H. "Medical and Social consequences of Tuberculosis in Rural Ethiopia". *Ethiopian Medical Journal* 37.3 (1999): 147-153.

26. Court WA and Turner AN. "Tuberculosis and Stigmatization: Pathways and Interventions". *Public Health Reports* 125.4 (2010): 34-42.

27. Kipp A., *et al*. "Socio-demographic and AIDS-related factors associated with tuberculosis stigma in southern Thailand: a quantitative, cross-sectional study of stigma among patients with TB and healthy community members". *BMC Public Health* 11 (2011): 675.

28. Somma D., *et al*. "Gender and socio-cultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia [Special section on gender and TB]". *International Journal of Tuberculosis and Lung Disease* 12.7 (2008): 856-866.

29. Woith W M and Larson J L. "Delay in seeking treatment and adherence to tuberculosis medications in Russia: a survey of patients from two clinics". *International Journal of Nursing Studies* 45.8 (2008): 1163-1174.

30. Kipp AM., *et al*. "A prospective study of TB and AIDS stigma as barriers to TB treatment adherence using validated stigma scales". *International Journal of Tuberculosis and Lung Disease* 15.11 (2011): 1540-1545.

31. Ahmed Suleiman M M., *et al*. "Tuberculosis stigma in Gezira State, Sudan: a case-control study". The *International Journal of Tuberculosis and Lung Disease* 17.3 (2013): 388-393.

32. Abioye IA., *et al*. "Socio-demographic determinants of stigma among patients with pulmonary tuberculosis in Lagos, Nigeria". *African Health Sciences* 11.1 (2011): S100-S104.

33. Kiwuwa MS., *et al*. "Patient and health service delay in pulmonary tuberculosis patients attending a referral hospital: a cross-sectional study". *BMC Public Health* 5 (2005): 122.

34. Godfrey FP., *et al*. "Why do patients with a cough delay seeking care at Lusaka urban health centres? A health systems research approach". *International Journal of Tuberculosis and Lung Disease* 6.9 (2002): 796-805.

Determinants of TB Stigma, and its Effects on Health Care Seeking Behaviour and Treatment Adherence among TB Patients in Addis Ababa, Ethiopia: A Cross Sectional Study Design

51

35. Maamari F. "Case-finding tuberculosis patients: diagnostic and treatment delays and their determinants". *Eastern Mediterranean Health Journal* 14.3 (2008): 531-545.

36. Cambanis A., *et al.* "Duration and associated factors of patient delay during tuberculosis screening in rural Cameroon". *Tropical Medicine and International Health* 12.11 (2007): 1309-1314.

37. Long NH., *et al.* "Different tuberculosis in men and women: beliefs from focus groups in Vietnam". *Social Science and Medicine* 49.6 (1999): 815-822.

38. Dimitrova B., *et al.* "Health service providers' perceptions of barriers to tuberculosis care in Russia". *Health Policy Plan* 21.4 (2006): 265-274.

39. Nnoaham KE., *et al.* "Perceptions and experiences of tuberculosis among African patients attending a tuberculosis clinic in London". *International Journal of Tuberculosis and Lung Disease* 10.9 (2006): 1013-1017.

40. Coreil J., *et al.* "Structural forces and the production of TB-related stigma among Haitians in two contexts". *Social Science and Medicine* 71.8 (2010): 1409-1417.

41. Munseri PJ., *et al.* "Completion of isoniazid preventive therapy among HIV-infected patients in Tanzania". *International Journal of Tuberculosis and Lung Disease* 12.9 (2008): 1037-1041.

42. Meulemans H., *et al.* "The limits to patient compliance with directly observed therapy for tuberculosis: a socio-medical study in Pakistan". International Journal of Health Planning and Management 1.37 (2002): 249-267.

43. Devid J W. "Linking HIV and TB underlying issues to consider when Scaling up integration of HIV& TB services in Cambodia". Report prepared for international HIV/AIDS Alliance, Phnom Penh (2001): 1-8.

44. ICN, Nurses Fighting AIDS Stigma Crying for all. International Counsel of Nursing Geneva, Switzerland, ICN, Intentional Nursing Day (2001): 3-13.

45. FHAPCO, World Bank. HIV/AIDS in Ethiopia: an epidemiological synthesis (2008).

46. Central Statistical Agency. 2007 Ethiopian census, first draft (2009).

47. Federal Democratic Republic of Ethiopia. "Report on progress towards implementation of the UN Declaration of Commitment on HIV/AIDS". Federal HIV/AIDS Prevention and Control Office (2010).

48. The World Fact-book, "Ethiopia" (2011).

49. Ethiopian Public Health Institute HIV related estimates and projections for Ethiopia (2012).

50. Health and Health Related Indicators 2006 E.C (2013/2014) Version 1, (2014).

Volume 12 Issue 1 September 2017