Patients' Delay in Seeking Health Care for Tuberculosis Diagnosis in East Gojjam Zone, Northwest Ethiopia

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Abstract. Patients' delay in seeking diagnosis is a major problem in the management of tuberculosis (TB). Relative to the burden of TB, there is lack of data on the magnitude of delays in seeking care and why patients fail to seek early care at health facilities in Ethiopia. A facility-based cross-sectional study was conducted from April to July 2013 in East Gojjam Zone, Amhara, Ethiopia, to assess patients' delays and associated factors in TB patients. Using simple random sampling, 605 (327 male and 278 female) participants were recruited. Of the total, 323 (53.4%) TB patients were delayed in seeking health care (median = 45 days; mean = 78.5 days). The following independent variables were associated with patient delays: age $\geq$ 45 years (adjusted odds ratio [AOR] = 8.74, 95% confidence interval [CI] = 4.71–16.23, $P < 0.001$); working as a farmer (AOR = 4.18, 95% CI = 1.44–12.11, $P = 0.009$); prior visit to holy water sites, traditional healers, and/or private drug shops (AOR = 69.11, 95% CI = 13.91–343.29, $P < 0.001$; AOR = 14.74, 95% CI = 1.43–152.31, $P = 0.024$; AOR = 2.10, 95% CI = 1.22–3.59, $P = 0.007$, respectively); poor knowledge about TB (AOR = 2.79, 95% CI = 1.74–4.92, $P = 0.006$), and extrapulmonary TB (AOR = 14.69, 95% CI = 8.21–26.26, $P < 0.001$). Generally, patients' delay in seeking care at health facilities was high (53.4%). Most of TB patients getting treatment from holy water (95.3%; 101/106) and traditional healers (84.6%; 11/13) were delayed. Therefore, for early seeking in modern health care, a combination of interventions is required to encourage TB patients.

BACKGROUND

Tuberculosis (TB) is a chronic bacterial disease, which is a major challenge to public health globally, especially in developing countries.¹ Delays in seeking health care and treatment aggravates the situation, which greatly affects individuals and national economies by incurring avoidable costs and increasing the risk of transmission, greater clinical severity, and mortality.^{2,3}

Patient delay can be related to many factors that provoke or hamper health-seeking behavior. According to previous studies, though there are differences from site to site, some of the factors associated with patient delay include patients' knowledge about TB; a long distance to health services; self-treatment at home following existing norms or advice from relatives; patients' beliefs that symptoms are for doing something against God; hope that symptoms will resolve without treatment; lack of readiness or a decision to visit health-care providers; poor satisfaction with care; being busy with work; fear of gossip or stigma, including perceived links between TB and other causes of discrimination; shortage of money, especially for transportation; and poor knowledge, such as the belief that TB is always associated with human immunodeficiency virus/acquired immunodeficiency syndrome.^{4–12}

In Ethiopia, TB is a leading cause of morbidity, hospital admission, and death.¹³ The country is also among the few in the world where TB control remains far behind the World Health Organization (WHO) target.¹⁴ Cognizant of the huge burden of TB in the country, the government of Ethiopia has incorporated TB control as one of the priority health

program packages. However, TB still remains a major public health problem in Ethiopia,¹⁵ and this could be partly due to patients' delay in seeking care. According to previous studies, delays have become alarmingly prolonged, even up to 2–8 months.^{10–12} Studies conducted in Tigray and Gondar showed 53% and 76.6% patients' delay in a diagnosis of pulmonary TB, respectively.^{10,11} However, in Ethiopia, to alleviate the severity of the disease and to design more appropriate interventions, more data are required from different parts of the nation. Hence, the aim of the present study was to assess the magnitude of patients' delay for first health-care visit and associated factors in East Gojjam Zone, Ethiopia.

MATERIALS AND METHODS

Study area. The study was conducted in 19 TB diagnostic health services in East Gojjam Zone. East Gojjam Zone has a total population of 2,397,876 according to the 2007 population census. A total of 6,258 TB patients were enrolled in diagnostic TB centers (1,792 were from the 19 clinics) according to the annual report of East Gojjam Zone Health Department, 2012.

Study design and period. A cross-sectional study was conducted from April 8 to July 7, 2013.

Study population. All newly diagnosed TB patients (pulmonary TB [PTB] or extrapulmonary TB [EPTB]) whose age was greater than or equal to 15 years, and who visited the selected health facilities were included. Diagnosis was confirmed based on acid fast bacilli microscopy, X-ray or histopathologic examinations.

Sample size and sampling technique. Using a single proportion formula [$n = (Z\alpha/2)^2 \times p(1 - p)/d^2$], design effect = 2, and considering a 10% contingency, the calculated sample size was 605. Multistage sampling scheme was applied to include the 605 study participants. East Gojjam Zone has 18 administrative districts and a total of 72 TB diagnostic

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centers. First, 50% of the 18 administrative districts were randomly selected. Second, from each of the selected nine districts, half of the TB diagnostic centers were randomly selected. Then, from each of the selected health facilities a representative sample was obtained proportional to the population size of the districts.

The following sample size were included from each of the selected TB diagnostic centers: Debre Markos Referral Hospital (200), Awja Health Center (25), Sedie Health Center (25), Gengerta Health Center (15), Mertu LeMariam Health Center (25), Dibo Health Center (20), Ginde Woin Health Center (25), Gemborie Health Center (20), Bichna Health Center (30), Yetmen Health Center (20), Yejubie Health Center (25), Kork Health Center (20), Kuy Health Center (25), Debre Eysus Health Center (20), Fendika Health Center (15), Yebokla Health Center (20), Amanuael Health Center (25), Shelel Health Center (20), and Debre Markos Health Center (30). Finally, in each of the selected health facilities all newly diagnosed TB patients were included conveniently till the calculated sample size met.

Exclusion criteria. Patients under the age of 15 or who were critically ill and unable to respond were excluded.

Data collection procedures. After written informed consent was obtained from the participants, data were collected from the newly diagnosed TB patients at the exit by trained nurses or health officers using a structured face-to-face interviewer-administered questionnaire. The questionnaire contained data on the sociodemographic characteristics, predisposing factors (such as patient's knowledge and attitude about TB), and enabling factors such as accessibility, affordability, and others. To ensure respondents ability to understand the questions, the structured questionnaire was pretested before the actual data collection, and amendments were made accordingly. Completeness and consistency of data were checked at the end of each interview before patients had left the room, and the collection procedure was closely supervised by the principal investigator. Finally, data cleaning and coding was performed for appropriate analyses.

Data analysis. Data were entered into Epi Data 3.1. (Epi-data Association, Odense, Denmark) Analyses were carried out after the data were transferred into Statistical Package for Social Science (SPSS, Chicago, IL) version 16. Descriptive statistics were computed for the study variables. Bivariate and multivariate analyses were carried out to study the association of variables. In bivariate analysis, crude odds ratios were reported and variables with a *P* value of < 0.05 were entered into multivariate analysis to control for the effect of confounders; in the multivariate analyses, a *P* value < 0.05 was considered statistically significant, and the adjusted odds ratio (AOR) and 95% confidence intervals (Cis) were reported.

Ethical considerations. Ethical approval was obtained from Debre Markos University, College of Medicine and Health Sciences, Research Ethical Review Committee. Official letters were also obtained from administrators of the East Gojjam Zone Health Department and respective health facilities. A written consent form was signed by each study participant.

Operational definitions.

Patients' delay: It is the time interval between onsets of symptoms of TB and first seeking care at conventional TB control health facility. Taking a base from previous studies,^{16,17} and considering the infrastructure and health service expansion, a patient is said to be delayed if he or

she visits a health facility after 30 days or more after his or her onset of TB symptoms.

Good knowledge: Study participants who correctly answer for greater than or equal to 80% of the knowledge-assessing questions were considered with a good knowledge.

Fair knowledge: Those study participants who correctly answer 60–80% of the knowledge-assessing questions.

Poor knowledge: Those study participants who correctly answer less than 60% of the knowledge-assessing questions.

RESULTS

Study participants. In the present study, 605 respondents (327 male and 278 female) were included with an overall response rate of 100%. The mean age of respondents was 35.42 (± 13.08 standard deviation). Of the total, 423 (69.9%), 328 (54.2%), and 234 (38.7%) of participants were rural dwellers, farmers, and illiterate, respectively (Table 1).

Patients' delay. Of the total, 323 (53.4%) study participants were delayed in seeking TB diagnostic health services, in which those participants did not visit a health-care facility within 30 days after the onset of clinical illness. The mean and median times to seeking care were 78.5 and 45 days, respectively (interquartile range = 3–425 days). The delay was higher in patients with EPTB than PTB (81.8%, 193/236 versus 35.2%, 130/369). The mean and median times in patients with PTB were 45.1 and 30 days, respectively.

Factors associated with patient delay. From the sociodemographic factors, age and occupation showed statistically significant associations with delay in a multivariate

TABLE 1

Sociodemographic characteristics of tuberculosis patients (*N* = 605) in East Gojjam Zone, northwest Ethiopia, April–July 2013

Variable	Number	Frequency (%)
Sex		
Male	327	54.0
Female	278	46.0
Age (years)		
15–29	240	39.7
30–44	192	31.7
≥ 45	173	28.6
Marital status		
Married	388	64.1
Single	180	29.8
Divorced or widowed	37	6.1
Place of residence		
Rural	423	69.9
Urban	182	30.1
Educational status		
Cannot read and write	234	38.7
Grade 1–6	207	34.2
Grade 7–12	129	21.3
College and above	35	5.8
Occupation		
Government employee	43	7.1
Private employee	34	5.6
Merchant	30	5.0
Farmer	328	54.2
Student	73	12.1
Daily laborer	97	16.0
Monthly household income		
≤ 695 Ethiopian birr/35 U.S. dollars	406	67.1
> 695 Ethiopian birr/35 U.S. dollars	199	32.9

TABLE 2

Association of sociodemographic characteristics of TB patients ($N = 605$) with delay in seeking health-care facility in East Gojjam Zone, northwest Ethiopia, April–July 2013

Variable	Total	Patient delay		COR (95% CI)	<i>P</i> value	AOR (95% CI)	<i>P</i> value
		Yes	No				
Sex							
Male	327	156 (47.7)	171 (52.3)	1			
Female	278	167 (60.1)	111 (39.9)	1.65 (1.19–2.28)	0.002	1.44 (0.97–2.15)	0.073
Age (years)							
15–29	240	83 (34.6)	157 (65.4)	1			
30–44	192	86 (44.8)	106 (55.2)	1.54 (1.04–2.27)	0.030	1.27 (0.80–2.02)	0.311
≥ 45	173	154 (89.0)	19 (11.0)	15.33 (8.88–26.46)	< 0.001	8.74 (4.71–16.23)	< 0.001
Marital status							
Married	388	233 (60.1)	155 (39.9)	1			
Single	180	67 (37.2)	113 (62.8)	0.39 (0.27–0.57)	< 0.001	1.56 (0.90–2.70)	0.114
Divorced or widowed	37	23 (62.2)	14 (37.8)	1.09 (0.55–2.19)	0.802	1.37 (0.55–3.40)	0.504
Residence							
Rural	423	267 (63.1)	156 (36.9)	3.85 (2.66–5.58)	< 0.001	1.83 (0.96–3.48)	0.068
Urban	182	56 (30.8)	126 (69.2)	1			
Educational status							
Cannot read and write	234	151 (64.5)	83 (35.5)	6.14 (2.67–14.13)	< 0.001	1.04 (0.33–3.24)	0.952
Grade 1–6	207	118 (57.0)	89 (43.0)	4.48 (1.94–10.32)	< 0.001	1.60 (0.56–4.63)	0.383
Grade 7–12	129	46 (35.7)	83 (64.3)	1.87 (0.79–4.45)	0.157	1.46 (0.53–4.07)	0.465
College and above	35	8 (22.9)	27 (77.1)	1			
Occupation							
Government employee	43	11 (25.6)	32 (74.4)	1			
Private employee	34	8 (23.5)	26 (76.5)	0.89 (0.31–2.55)	0.836	1.32 (0.42–4.17)	0.632
Merchant	30	18 (60.0)	12 (40.0)	4.36 (1.60–11.88)	0.004	4.51 (1.41–14.44)	0.011
Farmer	328	238 (72.6)	90 (27.4)	7.69 (3.72–15.91)	< 0.001	4.18 (1.44–12.11)	0.009
Student	73	21 (28.8)	52 (71.2)	1.18 (0.50–2.75)	0.711	0.90 (0.28–2.87)	0.858
Daily laborer	97	27 (27.8)	70 (72.2)	1.12 (0.50–2.54)	0.782	0.96 (0.34–2.69)	0.939
Monthly household income							
≤ 695 Ethiopian birr/35 U.S. dollars	406	219 (53.9)	187 (46.1)	1.07 (0.76–1.50)	0.697		
> 695 Ethiopian birr/35 U.S. dollars	199	104 (52.3)	95 (47.7)	1			

AOR = adjusted odds ratio; CI = confidence interval; COR = crude odds ratio; TB = tuberculosis.

analysis: TB patients whose age was greater than or equal to 45 years were about nine times more likely to be delayed in coming to health-care facilities compared with the 15–29 years age group (AOR = 8.74, 95% CI = 4.71–16.23, $P < 0.001$); farmers were about four times more likely to be delayed compared with government employees (AOR = 4.18, 95% CI = 1.44–12.11, $P = 0.009$). Other sociodemographic factors such as sex, marital status, place of residence, educational status, and income of the patients did not show a statistically significant association with delay ($P > 0.05$) (Table 2). With regard to patients' knowledge about TB, for patients' delay there was statistically significant difference between those who had poor knowledge about TB compared with those who had good knowledge (AOR = 2.79, 95% CI = 1.74–4.92, $P = 0.006$); patients who had never heard about TB were more likely to be delayed (AOR = 2.83, 95% CI = 1.02–3.87, $P = 0.006$); patients who said TB is caused by cold weather were more likely to be delayed compared with those who said a tiny organism is the causative agent (AOR = 5.95, 95% CI = 1.28–27.75, $P = 0.023$); and patients who lacked knowledge about the free treatment services for TB were more delayed (AOR = 1.62, 95% CI = 0.96–2.79, $P = 0.035$) (Table 3). With regard to patients' attitudes towards TB, patients who hold traditional beliefs tended to have delayed seeking in health-care facility compared with those who opposed this, but it was not statistically significant. Similarly, patients who did not want to disclose their diseases

were more likely delayed, but it was not statistically significant (Table 4).

DISCUSSION

The present study confirms the presence of a substantial patients' delay in seeking a health-care facility among the TB patients in the study area, which can be challenging in the management of TB.

In the present study 53.4% of TB patients were delayed to seek modern health facility which might be partly due to lack of awareness and traditional medicinal practices. In Ethiopia, it is not uncommon to visit alternative traditional treatment sources such as holy water sites and traditional healers, our finding also support this. The finding of the present study, 53.4% patients' delay, is consistent with previous data from Tigray region, Ethiopia (53%),¹⁰ but higher compared with the finding from Amhara region, Ethiopia (48%),¹⁶ and lower compared with the findings from Gondar, Ethiopia (76.6%),¹¹ Somali region, Ethiopia (87%),⁸ Kibwezi, Kenya (65.4%),¹⁸ Ibadan, Nigeria (61.8%),⁹ and rural Nigeria (69%).⁷ In patients with PTB, the median delay was 30 days, which means a considerable proportion of patients could be able to transmit the disease to others. This finding is consistent with previous findings from South Sudan (28 days),¹⁹ and reports by the WHO in the east Mediterranean: Iraq (31 days), Syria (31 days), but lower from the finding in Somali region (60 days).¹⁹ However, it is higher compared with the findings from Pakistan (9 days), Egypt (12 days), Iran

TABLE 3

Association of patients' knowledge about TB with delays in seeking health-care facility in East Gojjam Zone, northwest Ethiopia, April–July 2013

Variable	Total	Patient delay		COR (95%)	P value	AOR (95%)	P value
		Yes	No				
Ever heard about TB? (N = 605)							
Yes	553	285 (51.5)	268 (48.5)	1			
No	52	38 (73.1)	14 (26.9)	2.55 (1.35–4.82)	0.004	2.03 (1.02–3.87)	0.006
Cause of TB (N = 553, excluding those who had not heard of TB)							
Tiny organism	440	195 (44.3)	245 (55.7)	1			
Evil/sprit	6	3 (50.0)	3 (50.0)	0.84 (0.14–5.06)	0.847	0.94 (0.16–5.71)	0.949
Cold weather	13	11 (84.6)	2 (15.4)	6.91 (1.51–31.54)	0.013	5.95 (1.28–27.75)	0.023
I do not know	94	76 (80.9)	18 (19.1)	5.31 (3.07–9.17)	< 0.001	4.73 (2.67–8.38)	< 0.001
Transmission route of TB (N = 553)							
Coughing/sneezing	513	252 (49.1)	261 (50.9)	1			
Shaking hands	8	7 (87.5)	1 (12.5)	7.25 (0.89–59.53)	0.065	8.31 (1.00–69.17)	0.050
Eating together	20	15 (75.0)	5 (25.0)	3.11 (1.11–8.68)	0.030	3.31 (1.15–9.51)	0.026
I do not know	11	10 (90.9)	1 (9.1)	10.36 (1.32–81.50)	0.026	6.29 (0.74–53.32)	0.092
Knowledge of perceived signs and symptoms of TB (N = 553)							
Yes	505	253 (50.1)	252 (49.9)	1			
No	48	32 (66.7)	16 (33.3)	1.99 (1.07–3.72)	0.031	1.08 (0.53–2.22)	0.834
Ever heard about free treatment services for TB? (N = 553)							
Yes	508	251 (49.4)	257 (50.6)	1			
No	45	34 (75.6)	11 (24.4)	3.17 (1.57–6.38)	0.001	1.62 (0.96–2.79)	0.035
Patients' knowledge about prevention of TB (N = 553)							
Yes	539	275 (51.0)	264 (49.0)	1			
No	14	10 (71.4)	4 (28.6)	2.40 (0.74–7.75)	0.143		
Overall level of knowledge about TB (N = 553)							
Good	387	98 (25.3)	289 (74.7)	1			
Fair	107	35 (32.7)	72 (67.3)	1.56 (1.07–3.52)	0.071	1.14 (0.78–2.13)	0.082
Poor	111	98 (88.3)	23 (20.7)	3.34 (2.14–5.91)	0.002	2.79 (1.74–4.92)	0.006

AOR = adjusted odds ratio; CI = confidence interval; COR = crude odds ratio; TB = tuberculosis.

(24 days),^{20,21} South Africa (14 days),⁶ and other different findings from Ethiopia.^{11,21,22} The possible explanations for the differences could be due to differences in awareness, accessibility to health facilities,^{10,11} cultural factors, and the like, which could be different from site to site even within the same country. In the present study patients aged ≥ 45 years were more delayed compared with those aged 15–29 years. Younger people may have better information, while older people may have less awareness and traditional cultural beliefs.^{23,24} With regard to occupation, farmers and merchants were more delayed compared with government employees; this could be related to lack of awareness, accessibility, and difference in beliefs. Patients with EPTB

were more delayed compared with PTB; this could be due to the nature of EPTB, which has unspecified signs and symptoms. Use of other informal treatment sources had a significant association with patient delay; more than half of the respondents 334 (55.2%) had sought care from at least one informal provider. First point of contact at a holy water site was found to be a risk factor for prolonged patient delay; patients who had visited holy water sites were almost 30 times more likely to be delayed compared with those who came directly to health-care facilities. This could be due to patients believing that holy water is an effective alternative therapy and remedy for different types of disease. Factors such as sex, educational status, place of residence, marital

TABLE 4

Association of patients' attitudes toward TB with the delay in seeking a health-care facility in East Gojjam Zone, northwest Ethiopia, April–July 2013 (N = 553)

Variable	Total	Patient delay		COR (95% CI)	P value	AOR (95% CI)	P value
		Yes	No				
Traditional medicine is better than modern medicine to cure TB							
Agree	23	14 (60.9)	9 (39.1)	1.66 (0.48–5.74)	0.422		
Disagree	530	271 (51.1)	259 (48.9)	1			
Modern medicines are not sure to cure TB							
Agree	131	89 (67.9)	42 (32.1)	5.85 (1.3–26.37)	0.022	3.51 (0.74–16.66)	0.114
Disagree	422	196 (46.4)	226 (53.6)	1			
Since TB is frightening for people, going to traditional medicine is better than modern medicine							
Agree	28	20 (71.4)	8 (28.6)	4.56 (1.3–16.06)	0.018	3.3 (0.9–12.08)	0.072
Disagree	525	265 (50.5)	260 (49.5)	1			
It is shameful to have TB							
Agree	44	33 (75.0)	11 (25.0)	2.35 (1.14–4.85)	0.021	1.28 (0.54–3.04)	0.581
Disagree	509	252 (49.5)	257 (50.5)	1			
It is never to disclose for others if you have TB							
Agree	59	41 (69.5)	18 (30.5)	2.54 (1.33–4.84)	0.005	1.98 (0.93–4.22)	0.076
Disagree	494	244 (49.4)	250 (50.6)	1			

AOR = adjusted odds ratio; CI = confidence interval; COR = crude odds ratio; TB = tuberculosis.

status, income, distance of home from health facility, transportation, and other medical services cost had no significant association with patient delay.

In general, in the present study the magnitude of patients' delay to seek health-care facility was found to be significantly high, which might be due to low awareness of TB and other related factors. More than half, 55.2%, of TB patients delayed seeking a health-care facility while getting treatment from other informal sources. Interventions such as health promotion and education, integration of informal treatment sources into national TB control program, active case finding, health insurance, and extending of health services are recommended to reduce the possibility of patients' delay for TB diagnosis.

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