Original Article

Assessment of knowledge and practice of private practitioners regarding tuberculosis control in Ethiopia

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Abstract

Introduction: Ethiopia has a growing private health sector. In recent years, the directly observed treatment short course (DOTS) strategy was initiated in selected private health facilities in the country. The objective of the present study was to assess knowledge and practice of private practitioners in tuberculosis (TB) control in Amhara Region, Ethiopia.

Methodology: An institution-based cross-sectional study was conducted among 112 private practitioners selected from all private health facilities in the region. The study was conducted between May and August 2008 and data was collected using a semi-structured questionnaire. Group differences were analyzed using the chi-square test.

Results: Fifty-nine (52.7%) of the private practitioners suspected TB in patients with three weeks' duration of cough. Only 37 (33.0%) of the private practitioners were able to precisely list the correct treatment regimens for all categories as recommended in the National Tuberculosis and Leprosy Control Program guidelines. The correct frequency of TB treatment monitoring was provided by 44 (50%) of the respondents. Overall 44 (39.3%) of the private practitioners did not have satisfactory knowledge about the directly observed treatment short course (DOTS) strategy. Those who attended DOTS training during the two years prior to the survey were more likely to have satisfactory knowledge compared to those who did not receive training (OR 4.45, 95% CI: 1.33, 14.87, $p < 0.02$).

Conclusion: A significant proportion of private practitioners did not have satisfactory knowledge and practice about DOTS. The provision of regular DOTS refresher courses improves TB management for patients in the region.

Key words: tuberculosis; private practitioners; knowledge; Ethiopia

J Infect Dev Ctries 2012; 6(1):13-19.

(Received 18 February 2011 - Accepted 01August 2011)

Introduction

According to the World Health Organization (WHO), the involvement of all health-care providers in tuberculosis (TB) control is recommended as an essential component of the Stop TB Strategy [1]. To date, evidence suggests that private providers' engagement in TB control has improved case detection [2,3]. Several studies from India have demonstrated an increase in case detection ranging from 10% to 60% in private/public mix projects [4].

TB case detection is very low throughout Ethiopia [5]. In 2008, the case detection rate (CDR) was estimated at 28% indicating that the country was far from achieving the WHO target of 70% CDR. A very low CDR of 21.5% was also registered in this study site [6], indicating an urgent need to utilize all available opportunities to increase TB case detection.

Ethiopia has a growing private health sector. Despite the increasing number of private health facilities in the country, only government health facilities have been practicing the DOTS strategy for many years. Since 2007 selected private health facilities have been involved in the private/public mix [6] initiative in the different regions of the country.

Appropriate knowledge and practice among private practitioners is crucial for early diagnosis, treatment and follow-up of TB cases. This is pivotal for a successful TB control program and prevention of drug resistance. Various factors including experience in managing TB patients, lack of awareness of national TB control guidelines, and the educational background of private practitioners affect the standard management of TB patients.

A number of studies in Ethiopia have explored the perceptions of TB among patients [7-9]. However, there is limited knowledge and practice among private practitioners about DOTS in the country. To the best of our knowledge, only one

study from Addis Ababa described private practitioners' knowledge and practice regarding DOTS [10]. As this study was performed in the capital city of Ethiopia, it may not represent the situation in different regional states of the country where the majority of the people live. The objective of the present study was thus to assess the knowledge and practice among private practitioners about the diagnosis and treatment of TB in Amhara Region, Ethiopia.

Methodology

Setting

During the study period, the study region had a total of 539 private health facilities (three hospitals, 22 higher, 119 medium, and 395 lower level clinics). Lower level clinics did not have diagnostic facilities for TB. According to the policy of the Regional Health Bureau, lower level clinics are not entitled to have smear microscopy or X-ray facilities. TB patients reporting to the lower level clinics are referred to government health centers or hospitals for more thorough examination and management. Hospitals and higher level clinics are managed by medical specialists and general medical practitioners while medium level clinics are managed by general practitioners or health officers. Lower level clinics are run by nurses and health assistants. Since 2008, thirty-five private health facilities have been involved in private/public mix-DOTS in the region [6,11]. During the study period, the region also had 17 hospitals 674, health centers and 2,750 health posts owned by the government.

Study design

An institution-based, cross-sectional study was conducted between May and August 2008. All private health facilities with TB diagnostic facilities in Amhara Region were eligible for the study. Most private health facilities had one private practitioner who owned the facility and was the responsible health worker to make the diagnosis and prescribe the appropriate treatment for TB and other illnesses. In the major towns of the region, there were one to three private practitioners involved in making the diagnosis and prescribing treatment for TB in each private health facility. From each private health facility, one participant (a medical specialist, general practitioner or health officer) was enrolled in the study. Random sampling was applied to select the participants in facilities where more than one private practitioner per private health facility was found.

Definition of variables

Medical specialists are medical doctors with an MD degree plus a specialty certificate in medicine or pediatrics.

General practitioners are general medical practitioners with a first degree in medicine. They are authorized to provide clinical services to patients presenting at hospitals and higher or mid-level clinics.

Health officers are health professionals with a first degree in public health. They have basic clinical training and are authorized to provide clinical services to patients presenting at mid-level clinics.

Data collection and analysis

A semi-structured questionnaire was used to collect data. The interviewers received adequate training and the questionnaire was pretested before data collection commenced. Five HOs collected the data. The questionnaire addressed socio-demographic characteristics and knowledge and practice about DOTS. The interviewees were medical specialists, general practitioners and health officers.

Data was analyzed using SPSS version 16 (IBM, Chicago, IL, USA). After data entry and cleaning, proportions were computed and group differences were analyzed using chi-square tests. The overall knowledge and practice concerning DOTS was assessed based on the private practitioners' response to seven specific DOTS-related questions. Correct answers were given a value of one and incorrect answers were given a value of 0. Knowledge was categorized as satisfactory or unsatisfactory based on the cumulative result and the related mean value of responses. Scores above the mean value were categorized as satisfactory knowledge and given a value of 1 while scores below the mean value were considered to represent unsatisfactory knowledge and given a value of 0. The scores were then cross-tabulated with the independent variables to look for possible associations. A p-value of < 0.05 was considered statistically significant.

Ethical approval

The study obtained ethical approval from the Regional Committee for Medical Research Ethics in Eastern Norway (REK Øst) and the Ethiopian Science and Technology Agency in Addis Ababa, Ethiopia. All study participants provided their informed consent before the start of the study.

Table 1. Socio-demographic characteristics of the study participants

Variable	n (%)
Sex	
Male	110 (98.2)
Female	2 (1.8)
Age	
25 - 34	34 (30.4)
35 - 44	54 (48.2)
> 45	24 (21.4)
Profession	
Medical specialists	18 (16.1)
GPs	50 (44.6)
HO	44 (39.3)
Medical practice	
1 - 5 years	54 (48.2)
6 - 10 years	38 (33.9)
> 10 Years	20 (17.9)

GP: general practioner HO: health officer

Results

Characteristics of study participants

Among 144 private practitioners eligible for the study, a total of 112 (77.7%) participated. The vast majority (110; 98.2%) were males. The mean age was 37.8 years. The median years of medical practice was 7.5 years (interquartile range [IQR] 3, 11) (Table 1).

Case detection

In this study, private practitioners had seen a significant number of smear-positive TB patients and suspects in their respective facilities. The median number of smear-positive cases detected per week was 1.5 (IQR 1, 2). Eighty-four (75%) of the respondents diagnosed one to three smear-positive cases per week (Table 2). In this study, 88% of the private practitioners mentioned that they would suspect TB among patients with less than three weeks' duration of cough.

Knowledge and practice about DOTS

Private practitioners' knowledge and practice about DOTS was assessed by asking different questions. All respondents knew that DOTS was the current strategy for TB control. The majority (90; 80%) mentioned case-finding and case-holding activities as important components of the DOTS strategy.

Private practitioners were asked to characterize a TB suspect. Accordingly, 59 (52.7%) replied that they would suspect TB in a patient with three weeks' duration of cough. Forty (35.7%) would screen a patient for TB if the patient complained of cough for one to two weeks' duration, and 13 (11.6%) considered a TB suspect as a patient with a cough of ≥ 4 weeks' duration. Of the participants who had seen TB suspects, 95 (84.8%) said that they had ordered smear microscopy to rule out TB. The remaining 17 (15.2%) ordered different diagnostic tests including chest X-ray (CXR), smear microscopy, whole blood count (WBC), and erythrocyte sedimentation rate (ESR).

Treatment practice and referral

Private practitioners were asked to list the treatment regimens based on the National Tuberculosis and Leprosy Control Program (NTLCP) guidelines [12] (Table 3). Accordingly, 79 (70.5%) of the respondents correctly provided the regimens in category I. Sixty-seven (59.8%) participants also accurately listed the regimens in category II, and 72 (64.3%) correctly named the regimens in category III. Overall, 37 (33.0%) were able to precisely list the correct regimens for all categories as recommended in the NTLCP guidelines (Table 4).

Concerning patient referral, 77 (69%) of the private practitioners reported that they regularly referred TB suspects and patients to government health facilities for the initiation of treatment. The main reason for referral was due to governmental policy. Despite the referral, most of the private practitioners claimed that they did not get any feedback from the receiving government health facilities.

Table 2. Number of TB suspects and smear-positive cases seen by PPs per week

Number of cases seen	n (%)
TB suspect	
1 - 10	49 (43.8)
11 - 20	39 (34.8)
> 20	24 (21.4)
Smear-positive TB cases	
0	16 (14.3)
1 - 3	84 (75.0)
> 3	12 (10.7)

Treatment monitoring

The study participants were asked about the type of diagnostic tests recommended for TB treatment follow-up. Accordingly, 88 (78.6%) of the participants correctly indicated that acid-fast bacilli (AFB) sputum microscopy was the best monitoring tool. Other diagnostic tests including CXR, white blood cell count, and erythrocyte sedimentation rate were mentioned by 24 (21.4%) of the respondents. Among those providing smear microscopy as a tool for treatment monitoring, the correct frequency of treatment monitoring was mentioned by 44 (50%) of the respondents. The other 44 (50%) indicated different schedules that were not according to the recommendations of NTLCP guidelines.

The overall knowledge of the study participants was assessed based on their responses provided to the questionnaire. The majority of respondents (68; 60.7%), had satisfactory knowledge concerning DOTS while 44 (39.3%) did not have acceptable knowledge. Study subjects that had attended DOTS training courses during the two years prior to the survey were more likely to have satisfactory knowledge compared to those who did not attend training, OR 4.45 95% CI (1.33, 14.87) (Table 5).

Recording and reporting

In this study, 78 (69.5%) of the private practitioners did not have a special TB register in their health facilities. Only 35 (31.5%) of the private practitioners reported that they had a standard TB registry book and reported quarterly to the different levels of the government health authorities.

The study participants were asked about their sources of information regarding TB control. The NTLCP manuals were cited by 83 (74%) of the respondents as a major source of information about TB control programs. Medical text books were sourced by 75 (67%) of the private practitioners and other sources of information such as handouts from TB workshops and lecture notes were used by nine (8%) of the study participants.

PPs and TB patients

Sixty-two (55%) of the study participants perceived that TB patients prefer the government health sector because of the relative accessibility and low/free cost of health care. Thirty-eight (34%) believed that TB patients prefer private health facilities due to perceived high quality of care given, followed by relatively short waiting times and flexibility in the provision of health care and other issues. Fifteen (13.3%) of the respondents were not sure of patients' preference with regard to choice of health care.

Discussion

In 1993, the Ethiopian government endorsed a policy framework acknowledging the importance of involving the private health sector to increase access to health services for the population. Since then, the private health sector has been an active partner in the provision of general public health care in urban and rural areas of the country. Until recently, however, the government has had the sole responsibility for TB control efforts. In 2007, the government took a positive step towards involving selected private health facilities in the private/public mix-DOTS initiative [11].

TB is one of the major public health diseases that has its own standard case management protocol. It is thus essential that all health providers involved in TB diagnosis and treatment are aware of this protocol to properly manage TB patients. The current study assessed the knowledge and practice of private practitioners in a rural Ethiopia. The findings showed that private practitioners' knowledge about the various categories of TB treatment regimens was low. Only 33% of the study participants correctly listed all the treatment regimens according to the NTLCP guidelines [12]. This finding is higher than that reported in another study conducted in Ethiopia in which only 9.7% of the respondents correctly mentioned the complete list of treatment regimens [10]. Nevertheless, our finding indicates that the majority of private practitioners are not familiar with the treatment regimens recommended by NTLCP. Low level of private practitioners' knowledge about TB treatment regimens was also observed in previous studies from Kenya [13], Pakistan [14] and India [15].

Table 3. NTCLP-recommended treatment regimens for TB [10,12]

Category	Treatment regimens	Treatment recomendation
I	2 months streptomycin (rifampicin, isoniazid, pyrazinamid) followed by 6 month (ethambutol, isoniazid) or- 2 months (ethambutol, rifampicin, isoniazid, pyrazinamid) followed by 6 month ethambutol, isoniazid	New smear-positive PTB patients Seriously ill smear-negative PTB cases
II	2 months streptomycin, ethambutol (rifampicin, isoniazid, pyrazinamid)/1month ethambutol (rifampicin, isoniazid, pyrazinamid)/ followed by 5s month ethambutol$_3$ (rifampicin, isoniazid)$_3$	Patients declared as treatment failure, relapse or return after default
III	2 months (rifampicin, isoniazid, pyrazinamid) followed by 6 months (ethambutol, isoniazid)	Smear-negative PTB cases and EPTB cases

Subscript numbers indicate the frequency of drug intake per week. The drugs in the parentheses are given in fixed-dose combinations.
NTCLP: National Tuberculosis and Leprosy Control Programme
MOH: Ministry of Health
PTB: pulmonary tuberculosis
EPTB: extra-pulmonary tuberculosis

Table 4. Study participants' knowledge about the different categories of anti-TB treatment regimens

Treatment categories	Treatment regimen		
	Correctly listed n (%)	Incorrectly listed n (%)	n (%)
Category I	79 (70.5)	33 (29.5)	
Category II	67 (59.8)	45 (40.2)	
Category III	72 (64.3)	40 (35.7)	
Correctly listed only one category			29 (25.9)
Correctly listed 2 categories			39 (34.8)
Correctly listed all the three categories			37 (33.0)
No category correctly listed			7 (6.2)

For monitoring treatment outcomes, 78.5% of the private practitioners relied on smear microscopy. Of these, only 50% monitored patients' treatment outcomes. This finding is higher than the study results reported from the Philippines [16] and Pakistan [17,18] in which less than 35% of the study participants were followed during treatment [16,18]. Nonetheless, the result of our study indicates that many patients on anti-TB regimens may not be followed adequately until the completion of treatment as recommended by the NTLCP guidelines. Without proper treatment follow-up, defaulters and treatment failure cases cannot be traced in a timely manner. Such patients risk developing severe complications and may transmit drug-resistant infections.

About 88% of the private practitioners mentioned that they would suspect TB among patients who reported less than three weeks' duration of cough, indicating a very high index of suspicion for TB among the respondents. This finding is higher than the study results documented in Oman 19] and Pakistan [14] where private general practitioners appear to have low suspicion of TB.

Our analysis of the respondents' overall knowledge about DOTS showed that 39% of the private practitioners did not have satisfactory knowledge. Private practitioners who attended DOTS

Table 5. Associations of socio-demographic factors and knowledge about DOTS among PPs

Variable	n (%)	Knowledge		Odds Ratio	
		Unsatisfactory	Satisfactory	(95% CI)	P-value
Age					
25-34	34 (30.4)	17	17	1	
35-44	54 (48.2)	21	23	1.6 (0.66, 3.70)	0.30
> 45	24 (21.4)	6	18	3.0 (0.95, 9.40)	0.60
Profession					
Specialists	18 (16.1)	4	14	1	
GP	50 (44.6)	22	28	0.36 (0.10, 1.2)	0.11
HO	44 (39.3)	18	26	0.41 (0.11. 1.4)	0.17
Medical practice					
≤ 5 years	54 (48.2)	25	29	1	
> 5 years	58 (51.8)	19	39	1.7 (0.82, 3.80)	1.44
Training on DOTS					
No	14 (12.5)	9	5	1	
≤ 2 years	73 (65.2)	21	52	4.45 (1.33, 14.87)	0.02
>2 years	25 (22.3)	14	11	0.41 (0.36, 5.44)	0.61

GP: general practitioner; HO: health officer

training courses prior to the survey had higher knowledge and practice compared to those without training. This result emphasizes the importance of providing regular DOTS refresher courses for private practitioners.

Maintaining a standard TB case registry and reporting all cases are essential components of the DOTS strategy which help to provide information regarding the true burden of TB and assessment of treatment outcomes. In this study, the majority of private practitioners did not maintain appropriate records of the number and type of TB cases managed. Thus the actual burden of TB in Amhara Region, Ethiopia, cannot be fully understood. A similar result was observed in a previous study conducted in Addis Ababa [10].

Private practitioners referred TB patients to the government health facilities for various reasons. However, the majority of the practitioners in this study indicated that none of the receiving government health facilities provided feedback to the referring private health facilities. The TB patient referral document has a feedback section, and receiving institutions have the responsibility to provide the referring health institution with information. Exchange of information generally provides a morale boost and feeling of belonging in the TB control program. It also helps private practitioners to identify and solve problems, and subsequently manage their program better to the benefit of TB patients. Hence it is highly important that the regional TBLCP address this issue through workshops, seminars or supervision so that feedback information is exchanged between the referring and receiving health facilities in the region. This is crucial for efficient collaborative work in TB control.

The availability of reference materials such as NTLCP guidelines, medical books and other materials are important sources of knowledge about DOTS. In this study, NTCLP manuals were found to have served as the major source of information about TB among the respondents, indicating a good circulation of the national guidelines in the region.

In conclusion, our findings indicate that private practitioners play a significant role in the diagnosis and treatment of TB in Amhara Region, Ethiopia. However, a considerable proportion of the study participants was not familiar with the different anti-TB treatment categories and not aware of the correct schedule of treatment monitoring for TB according to the NTCLP guidelines. This may indicate a poor quality of TB management among the private practitioners. It is therefore imperative that refresher training courses on DOTS are provided on a regular basis to private practitioners in the region.

Acknowledgments

The authors would like to thank the University of Oslo and the Research Council of Norway, GLOBVAC programme (grant 192468/S50), for funding this study. We are grateful to the Amhara Regional State Health Bureau in Amhara Region for facilitating the study. We also thank all private practitioners for their willingness to participate in the study.

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Conflict of interests: No conflict of interests is declared.