

Tuberculosis Knowledge and Delayed Health Care Seeking Among New Diagnosed Tuberculosis Patients in Primary Health Facilities in an Urban District, South Africa

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Sylvia Makgopa and Sphiwe Madiba 

Department of Public Health, School of Health Care Sciences, Sefako Makgatho Health Sciences University, Pretoria, South Africa.

ABSTRACT: Patients' delay in seeking health care is a major problem in the control of tuberculosis (TB) and increases the risk of TB transmission. This study determined health-seeking practices and delays that occurred from the onset of TB symptoms until diagnosis and assessed the patients' TB-related knowledge. This was a cross-sectional study involving 391 new TB patients recruited from health facilities at an urban sub-district in South Africa from December 2016 to March 2017. Descriptive statistics and logistic regression analyses were performed using Stata 14. Over half (56.3%) of the patients delayed seeking health care for more than 30 days after the onset of their symptoms, 32% sought treatment from informal providers, and 13.3% self-medicated. Lack of suspicion of a TB diagnosis, which was prevalent in 45% of respondents, was statistically associated with delay in seeking healthcare (AOR=0.53, CI: 0.32-1.87). Overall TB knowledge was high, correct knowledge about TB transmission was 92.6%. TB knowledge was significantly associated with educational status (AOR=3.96, CI: 1.69-9.28) and seeking treatment from informal sectors (AOR=0.17, CI: 0.03-0.95). High overall TB knowledge was not statistically associated with seeking health care for TB diagnosis and treatment. We found a substantial delay between the onset of TB symptoms and seeking healthcare from a public health facility providing TB screening services. Promoting early screening and diagnosis through increasing awareness of TB is key in the elimination of TB in communities with a high TB burden

KEYWORDS: Tuberculosis, health care seeking, TB-related knowledge, South Africa, primary health, screening, access

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CORRESPONDING AUTHOR: Sphiwe Madiba, Department of Public Health, School of Health Care Sciences, Sefako Makgatho Health Sciences University, Molotlegi Street, Pretoria, Gauteng 0001, South Africa. Email: sphiwe.madiba@smu.ac.za

Introduction

The global report of the World Health Organization (WHO) indicates that tuberculosis (TB) continues to be a major public health problem worldwide. Their report further indicates that South Africa is ranked third among the 22 high-burden TB countries in the world and ranked the sixth highest country in breeding new cases of TB in the world. The scale of TB burden in South Africa is driven by a high incidence of HIV, of which more than two-thirds of TB cases reported in 2013 were co-infected with HIV. TB is largely a disease of the poor and is associated with various socio-economic and environmental factors.¹

The TB control program in South Africa is based on the network of primary health care facilities within the sub-districts that disperse TB treatment under a directly observed treatment short course (DOTS) strategy.² The DOTS strategy as recommended by WHO relies on passive case findings of TB suspects presenting themselves to the health facilities. Passive case-finding is the main approach currently applied by most national TB control programs in high TB burden countries,³ and relies on patients recognizing TB symptoms and seeking health care and screening at the healthcare facilities.⁴ Early diagnoses and treatment are key elements of successful TB control; however, a major challenge of TB control and prevention programs is a delay in seeking health care.^{5,6}

Systematic reviews on studies conducted in low middle income countries identified a wide range of factors affecting delay in the diagnosis and treatment of TB that were related to individual, socio-demographic, economic, and health system factors, as well as clinical characteristics.^{7,8} In addition, the belief that TB is always associated with HIV and stigma contribute to delayed diagnosing and treatment-seeking.^{9,10} Evidence indicates that delay in diagnosis and treatment of TB and the spread of TB is high in communities with low levels of knowledge about the mode of transmission, symptoms, cause, and preventive methods of TB.¹¹⁻¹³

Patient delay in seeking health care and early diagnosis is a major problem in the management of TB in many settings in sub-Saharan Africa.¹⁴ Despite continued efforts to increase the level of knowledge of TB transmission, treatment, and prevention in the communities, the considerable proportion of patients presenting with advanced symptoms is suggestive of TB patients delaying seeking care at health facilities in high TB burden countries.^{15,16} Although there is evidence that in South Africa delay or postponement of care-seeking is prevalent among the socio-economically disadvantaged communities.¹⁷ There are limited studies that investigate the scale of delays in seeking care at health facilities among TB suspects in South Africa, particularly from the patients' perspectives.¹⁸



This study aims to determine the health-seeking practices and delays that occurred from the onset of TB symptoms until diagnosis among confirmed TB patients accessing treatment in primary health facilities. The secondary objective was to assess the patients' TB-related knowledge and the effect it has on health seeking practices. Identifying the individual and community related factors that lead to delayed TB diagnosis and treatment is essential to evaluate the effectiveness of TB control programs to develop interventions to reduce TB transmission in communities.⁶ Furthermore, understanding the health-seeking behavior of patients with symptoms suggestive of TB is important to design national responses to improve TB services in health facilities.¹

Methods

Study design and setting

The study was a cross-sectional survey conducted between December 2016 and March 2017 among confirmed adult pulmonary TB patients. The study setting was primary health care facilities in an urban sub-district in Ekurhuleni Municipality, South Africa. The municipality is 1 of 7 in South Africa, is predominantly urban, and has an estimated population of approximately 3 286 370. The unemployment rate in Ekurhuleni is 31.8%, most people (85.4%) have flushing toilets and electricity, and 80% live in formal dwellings. The Municipality consists of 6 sub-district, and the health facilities where the study was conducted are located in the largest township situated in the North of Ekurhuleni sub-district. There are 11 primary health care (PHC) facilities and 2 tertiary hospitals in Ekurhuleni North sub-district. All the 11 PHC facilities were included in the survey since all offer TB care services such as screening and diagnosis of TB, active screening of TB contacts, dispensing TB treatment, and follow-up of TB patients using DOT support. The facilities serve an estimated population of 463 109 people, the majority of whom are from disadvantaged backgrounds.

The District Health Information data estimate that in the sub-district 1800 people are estimated to be infected with TB in a single month, although this figure may fluctuate monthly. Ekurhuleni was identified as one of the municipalities in South Africa with the highest TB burden in 2015. Since then, South Africa had committed to The Global Plan to End TB 2016 to 2020 set by the Stop TB Partnership, which involves implementing the 90-90-90 strategy for TB. Target 1 is that 90% of all TB cases should be found and given effective treatment, which might explain the higher number of TB cases.¹⁹ At the time of data collection, the estimated total population of TB patients on the TB register in PHC facilities in the sub-district was about 5000.

Sampling

To find a representative sample of TB patients within the district, the sample size was calculated using the Raosoft²⁰ online

sample size calculator. The calculation took into consideration the population size of 5000 TB patients in the district, a 5% margin of error, a 95% confidence level, and a 50% response distribution based on the assumptions that responses and response rates were unknown since there are no previously published similar studies in South Africa. The calculated sample size was 357, however, the sample size was increased to 391 patients to account for any missing data. A systematic simple random selection of patients confirmed with TB infection was performed. Typically, patients arrive very early in health facilities and wait long before being attended to. The researchers selected every fifth patient from the queue in the waiting room and asked them to participate in the study. The same procedure was followed and patients were consecutively recruited in each health facility until the intended sample size was met. The total sample size was proportionately allocated to the selected health facilities based on patients on the TB register in each facility.

Measurements

The main outcomes of interest in this study were treatment delay and overall TB knowledge regarding transmission and symptoms. The overall knowledge of the study participants about TB was assessed using 10 main questions, adapted from previously available validated questionnaires.²¹⁻²³ The questions assessed perceptions about the severity of a TB diagnosis, TB transmission and symptoms, and knowledge on the duration of TB cure. For each TB knowledge question, a score of 1 was given to a correct response, and 0 was given to an incorrect/don't know response, following which a total knowledge score was computed. The scale was then dichotomized into 2 categories using the median as the cut-off. Study participants who scored above the median were regarded as having good TB knowledge.

Diagnostic delay is defined as the duration between the onset of symptoms suggestive of TB as self-reported by study participants until the first contact with the health care service provider in public health facilities.²⁴ The time from onset of TB symptoms to TB diagnosis and initiation of TB treatment were measured in days. To dichotomize the sample into either a shorter or longer delay period we took 30 days as a cut off for patients.²⁵

Data collection

A structured pretested questionnaire in English and the local languages (Sepedi and IsiZulu) was administered by the lead author and a research assistant experienced in administering surveys. Nonetheless, the research assistant was trained on the objectives of the study. The questionnaire was adapted from previous studies^{21,26} and was pre-tested on 15 randomly selected patients from all the health facilities. After the pretest, necessary modifications of some of the questions took place to ensure clarity. Data from the pilot were excluded from the final

analysis. The questionnaire captured information on socio-demographic characteristics, knowledge on TB transmission and treatment, TB symptoms before diagnosis, health care seeking before the first visit to public health facilities and TB diagnosis, time taken before seeking healthcare in public health facilities, and reasons for the delay before a visit to the health facility. The patients were also asked questions regarding their reaction to a TB diagnosis.

Data analysis

Data were checked for completeness and consistency in semi-structured questionnaires. All statistical analyses were performed using the STATA 14.0 statistical package. Descriptive statistics was used to generate frequencies of categorical variables and to summarize data. The Pearson chi-square test was used to evaluate the statistical significance of the bivariate association of selected dependent variables with the outcome variables. An odds ratio with 95% CI was used to screen the possible associated factors. Univariate and multiple logistic regression analysis was used to examine the effect of explanatory variables (socio-demographic) on outcome variables (delayed seeking healthcare and TB Knowledge). Variables included in the multiple regression were selected based on a *P*-value of .1 at univariate analysis. *P*-values < .05 were considered as statistically significant.

Ethical considerations

Ethical approval was obtained from Sefako Makgatho Health Sciences University Research and Ethics Committee (SMUREC/H/160/2016: PG). Permission was also obtained from Ekurhuleni District Research and Ethics Department. Patients consented in a written form before the interview. To assure confidentiality, the questionnaire was completed in a private room and the information collected was recorded anonymously.

Results

Description of study participants

Table 1 presents the characteristics of the study participants. A total of 391 patients participated in the study, all of whom were diagnosed with TB and initiated on treatment. The majority (80.6%) resided in urban areas, 19.4% resided in informal settlements, 80.1% live in formal houses, and 19.1% lived in shacks. Their ages ranged from 18 to 75 years (mean age of 35 years), and the majority (41.7%) were distributed in the age group of 35 to 55 years. Over half were male (55%), single (67%), had completed the 12th Grade and tertiary education (49.6%), and were unemployed (50%) and depended on social grants. Of the 170 employed patients, 51.7% had a monthly income of between R1100-R5000 (\$76-103).

Knowledge about TB

In Table 2, the correct responses to knowledge questions are displayed. Overall, the TB knowledge mean score was 8, with a range of 0 to 9. A high proportion of patients (92.6%) scored high on knowledge of signs and symptoms and mode of transmission of TB infection. The patients responded correctly that TB is spread from 1 person to another (93%) and through contaminated air by coughing or sneezing (91%). Concerning transmission of TB through sharing utensils, the respondents scored low; over half responded incorrectly that TB is spread through sharing utensils. Concerning TB symptoms, 90% responded correctly that coughing up sputum with blood, coughing for more than 2 weeks (89%), and night sweats are clinical symptoms of TB. Other symptoms were also correctly mentioned by the patients, albeit the scores were slightly low on knowledge toward weight loss (88.5%) and prolonged fever (83.9%).

Only a small proportion ($n=16$, 4.1%) responded correctly that TB treatment duration is 6 months. The majority (339/86.7%) incorrectly mentioned that TB treatment duration is 9 months. Concerning the risks of stopping treatment before completing the course, the majority (174/44.5%) knew the risk that they would not be cured, 78 (19.9%) knew that stopping treatment early would make the disease more difficult to treat, and 68 (17.4%) knew the risk of transmission to others. It was concerning that 29 (7.5%) of the participants did not know what the risks were.

In univariate analysis variables that were significantly associated with high overall knowledge about TB included educational level (OR=3.1, CI: 1.42-6.85, $P=.004$), and previous TB diagnosis (OR=2.53, CI: 1.02-6.25, $P=.044$). Concerning action taken after onset of symptoms, those who reported seeking healthcare from other informal sources had reduced odds of having high overall knowledge about TB (OR=0.20, CI: 0.04-0.96, $P=.045$). Gender, marital status, age, and employment status were not significantly associated with overall TB knowledge.

A multivariate analysis, level of education (aOR=3.96, CI: 1.69-9.28; $P=.002$), and consulting informal sources at the onset of symptoms (aOR=0.17, CI: 0.03-0.95, $P=.044$), remained significantly associated with overall TB knowledge (Table 3).

Medication-related challenges and side effects

Table 4 presents patients' self-reported challenges in taking TB treatment. Slightly less than a quarter ($n=85$, 21.7%) had difficulties in taking TB treatment. Concerning treatment side effects, 112 (28.6%) had side effects, 29 (25.7%) had nausea, 37 (32.7%) had abdominal pains, and 46 (41.1%) mentioned tiredness.

TB-related practices

The majority 352 (90%) of patients were diagnosed with TB for the first time while only 39 (10%) had a recurrent TB

Table 1. Socio-demographic characteristics of TB patients at PHC facilities.

VARIABLES AND CATEGORIES	FREQUENCY	PERCENT
Gender		
Male	217	55
Female	174	45
Age categories		
18-35	211	54
36-55	163	41.7
56-65	14	3.6
65-75	3	0.8
Marital status		
Single	262	67
Ever married	129	33
The level of education		
No formal schooling	18	4.6
Primary education	29	7.4
Secondary education	149	38.1
Completed 12th Grade	141	36.1
Post Grade 12 qualification	54	13.8
Employment status		
Employed	181	46.5
Unemployed	198	50.9
Pensioner	10	2.6
Monthly income (n= 179)		
Less than R1000 (\$67)	22	12.3
R1100-R5000 (\$76-103)	92	51.4
R 5500-R10000 (\$379-689)	53	29.6
R10000 and above (\$689)	12	6.7
Source of income for the unemployed (n=195)		
Child grants	50	25.6
No income	134	68.7
Old age grants	11	5.6
Type of dwellings		
Formal house	314	80.1
Shacks	77	19.9
Place of residence		
Urban area	315	80.6
Informal settlements	76	19.4

infection. A significant proportion did not suspect they had TB: 289 (74%) compared to 102 (26%) who suspected a TB infection.

When asked what action they followed after experiencing initial symptoms, a significant proportion of 263 (67.3%) sought care from a health facility first. However, 128 (32%) of patients engaged in informal activities to manage the initial symptoms. For 53 (13.6%) of them, the first points of care were private medical practitioners and traditional healers (13/3.4%). A small proportion (52/13.3%) self-medicated and 10 (2.6%) did not take any action to seek help until they presented to the health facility.

Concerning access to health facilities, 3 quarters (286/73.2%) walked to their local clinics to access TB treatment, 359 (91.8%) said that it was easy to get to the local health facility, 349 (89.3%) said clinics had convenient hours of TB services, and 386 (98.7%) knew that TB treatment is freely available in health facilities (Table 5).

Health seeking practices

TB-related healthcare-seeking behaviors and practices of communities in the current study area are summarized in Table 6. The initial symptoms that a significant proportion of the patients (64.2%) sought care for was coughing sputum with blood for long, fever (11.8%), chest pain (9.5%), weight loss (11.8%), and fatigue (2.8%).

With regards to their reaction to the TB diagnosis, most of them (179/45.8%) responded that they experienced fear, 87 (22.3%) experienced depression, while a small proportion –30 (7.7%) denied the diagnosis.

The majority of patients (209/53.6%) delayed seeking health care for more than 30 days after the onset of their symptoms and the longest delay was 360 days. The median time TB patients took to initiate treatment was 30 days and the mean was 40 days, while only 181/46.4% visited health facilities within 30 days of the onset of their symptom/s. Lack of suspicion of a TB diagnosis (176/45.2%), fear of job loss (32/12.2%), and lack of money for transportation (15/6.2%) were mentioned as reasons for delaying to seek health care.

Delayed health-seeking practice was associated with age but not associated with gender, employment status, educational attainment, marital status, and high TB knowledge score.

Of the 243 patients who delayed seeking treatment, 72.4% delayed seeking treatment because they did not suspect TB infection, 8.2% feared rejection, 12.2% feared losing their job, and 6.2% lacked transportation money.

We conducted a subanalysis of the 39 (10%) patients who reported that they had a recurrent TB infection. Patients with previous TB infection were more than twice likely to have high TB-related knowledge than those diagnosed with TB for the first time (OR= 2.5, CI: 1.02-6.25, $P= .044$).

Table 2. Patient responses regarding the knowledge of TB symptoms, transmission, duration of treatment, and perceptions of the risk of not completing treatment.

PARTICIPANTS' RESPONSE TO TB KNOWLEDGE	YES	NO	DON'T KNOW
	FREQ/%	FREQ/%	FREQ/%
People can die from TB	370 (94.6%)	6 (1.5%)	15 (4.1%)
Transmission of TB			
TB spread from person to person	366 (93.3%)	20 (5.7%)	5 (1.3%)
TB spread through contaminated air	357 (91.3%)	9 (2%)	25 (6.8%)
TB spread through sharing utensils	185 (47.2%)	116 (29.6%)	90 (23.2%)
Symptoms of TB			
Weight loss	346 (88.5%)	13 (3.3%)	32(8.2%)
Prolonged fever	328 (83.9%)	14 (3.56%)	49(12.5%)
Night sweat	354 (90.1%)	8 (2.0%)	29(7.4%)
Coughing up sputum with blood	353 (90.1)	10 (2.8%)	28 (7.1%)
Coughing for more than 2 weeks	349 (89.3%)	10 (2.8%)	32 (8.2%)
Duration of treatment			
3 months	5	1.2	
6 months	16	4.1	
9 months	339	86.7	
12 months	31	8	
Perceptions of risk of stopping treatment early			
Risk that one will not be cured	174	44.5	
The disease will be transmitted to others	68	17.4	
Will make the disease difficult to treat	78	19.9	
Will result in complications	42	10.7	
I don't know	29	7.5	

Table 3. Multiple logistic regression for knowledge of TB symptoms and transmission.

	ADJUSTED OR	P VALUE	95% CONF. INTERVAL
Previous TB diagnosis	2.43	0.076	0.91-6.50
Educational attainment	3.96	0.002	1.69-9.28
Action taken			
Sought informal care	0.17	0.033	0.03-0.95
Sought care from clinic	0.53	0.371	0.11-2.43
Suspicion of TB	1.24	0.659	0.78-5.82

Factors associated with delayed health-seeking

Results from the multivariate logistic regression analysis conducted for delayed health-seeking for TB diagnosis and care are presented in Table 7. A multivariate logistic analysis,

marital status, and suspicion of TB diagnosis were statistically associated with delayed seeking. Patients who were married were less likely to delay seeking health care than those who were single (OR=0.59, CI: 0.37-0.92, $P=.023$). Patients with a

Table 4. Self-reported treatment side effects.

	FREQUENCY	PERCENT
Difficulties in taking TB medication		
Yes	85	21.7
No	306	78.3
Had treatment side effects		
Yes	112	28.6
No	279	71.4
Type of side effects		
Nausea	29	25.7
Abdominal pains	37	32.7
Tiredness	46	41.1

Table 5. Participants' health accessibility and TB related practices.

	FREQUENCY	PERCENT
Previous diagnosis with TB		
No	352	90
Yes	39	10
Had TB suspicion		
Yes	102	26.1
No	289	74.0
Action taken at the onset of symptoms		
Treated myself	52	13.30
Consulted a traditional healer	13	3.4
Sought care from the clinic	263	67.3
Sought care from a private doctor	53	13.6
Did not take any action	10	2.6
Access to health facility		
Walking to the clinic	286	73.2
Use transport	105	26.9
It is easy to get to the health facility		
Yes	359	91.8
No	32	8.2
Facility has convenient TB hours of service		
Agree	349	89.3
Disagree	42	10.8
TB treatment is freely available in health facility		
Agree	386	98.7
Disagree	5	1.3

Table 6. Reasons, duration, and delay for seeking healthcare in public health facilities.

	FREQUENCY	PERCENT
Reasons for seeking treatment		
Coughing for long and sputum with blood	251	64.2
Chest pain	37	9.5
Fever	46	11.8
Weight loss	46	11.8
Tiredness/weak	11	2.8
Reaction to TB diagnosis		
Scared	179	45.8
Depressed	87	22.3
Denied	30	7.7
Other reaction	95	24.3
Time taken before seeking medical treatment		
1-3 weeks	181	46.4
1 month	80	20.5
2 months	88	22.6
3-6 months	33	8.5
7-12 months	8	2.0
Delayed seeking health care		
No	181	46.4
Yes	209	53.6
Reasons for delaying to seek treatment (n=243)		
Did not suspect TB infection	176	73.9
Fear of rejection	20	8.2
Fear of job loss	32	12.2
Lack of transportation money	15	6.2

suspicion of TB diagnosis were also less likely to delay seeking health care than those who had no suspicion of TB diagnosis (OR=0.53, CI: 0.32-1.87, $P=.013$) High overall level of TB knowledge and other demographic variables were not statistically significant in determining the early health-seeking behavior for TB diagnosis and treatment.

Discussion

This study assessed TB knowledge and health-seeking practices of TB confirmed patients in urban PHC facilities in the Ekurhulene Metropolitan in, South Africa. The majority (73%) of the patients walked to their local clinics for TB treatment. As with previous research in South Africa, patients in this study perceived TB to be a severe disease.²³ Despite the high

Table 7. Multiple logistic regression analyses for delayed healthcare seeking for TB diagnosis and treatment.

		CRUDE OR 95% CI	P-VALUE	ADJUSTED OR 95% CI	P-VALUE
Knowledge	Ref				
	High	0.49 (0.23-1.04)	0.067	0.56 (0.25-1.25)	0.159
Marital status	Ref				
	Married	0.68 (0.44-1.04)	0.080	0.59 (0.37-0.92)	0.023
TB suspicion	Ref				
	Suspected	0.50 (0.31-0.79)	0.003	0.53 (0.32-1.87)	0.013
Previous TB diagnosis	Ref				
	Yes	0.54 (0.27-1.09)	0.088	0.61 (0.29-1.29)	0.193
Sought informal care	Ref				
	Yes	2.36 (1.11-5.00)	0.024	1.93 (0.88-4.22)	0.097
Sought care from clinic	Ref				
	Yes	1.08 (0.59-1.97)	0.789	0.80 (0.48-1.67)	0.744

prevalence of TB in South Africa in the general population and among HIV positive people,^{27,28} 3 quarters (74%) of the patients did not suspect that they had TB when they were at the onset of their symptoms which included prolonged coughing, sputum with blood, fever, weight loss, fatigue, and chest pain. Low perceived susceptibility to TB or inability to associate their symptoms with TB have been identified as barriers to early screening and diagnosis of presumptive TB patients.²⁹

Concerning knowledge, the mean knowledge score of patients in the current study was high. The majority of the patients had good knowledge regarding TB transmission and symptoms. The finding is in agreement with previous studies conducted in South Africa and other sub-Saharan countries.^{23,30-32} Of concern is that, consistent with previous research in South Africa, a substantial proportion of patients incorrectly assumed that TB can also be transmitted through the sharing of utensils.²³ We found that high overall TB knowledge was significantly associated with educational status, and action taken at the onset of their symptoms. Contrary to prior studies,^{30,33} overall high knowledge about TB was not significantly associated with gender and health-seeking practice. As far as TB treatment is concerned, a large majority of patients were not aware that TB treatment lasts for 6 months. This was despite being diagnosed with pulmonary TB. It is important to improve the education about TB in under-served communities to address the identified gaps in TB knowledge and attitudes.³⁴ Having the correct knowledge about TB symptoms and transmission is crucial for prevention, early screening, diagnosis, and early treatment-seeking behaviors for TB suspects thereby improving the management of TB.³⁰

Over half (56.3%) of patients delayed seeking care after the onset of their symptoms. Patients took a mean of 40 days and a median of 30 days to first visit a health facility after the onset of

their symptoms. A similar median time from the onset of symptoms to TB diagnosis was reported in studies conducted in other countries,^{5,25} However, a meta-analysis of studies conducted in sub-Saharan Africa (SSA) reported a median diagnosis delay higher than 2 months.⁸ Awoke et al³⁵ reported a higher median of 60 days delay in seeking healthcare. In general, the proportion of patients who delayed seeking healthcare was significantly high, given that WHO recommends diagnosis within 2 to 3 weeks of symptom initiation.³⁶ Although the majority (67.3%) of patients sought health care from health facilities for the first time, a significant proportion sought treatment from informal providers before seeking healthcare from health facilities. We concur with Getnet et al⁸ that actual delays may even be worse than reported as patients are likely to recall the date when the illness got severe but not the exact date of illness onset or the date they consulted health providers. This is evident by the fact that two-thirds (64%) of patients sought care for coughing sputum with blood for a prolonged period.

Delayed health care seeking was not affected by gender, educational status, age, and employment status, except for marital status.^{8-10,14,18,31} We further did not find a statistically significant association of overall TB knowledge and delay in seeking treatment since the overall TB knowledge was high. Lack of suspicion of a TB diagnosis which was prevalent in 45.2% of respondents was statistically significant in determining delay in seeking healthcare. Patients who reported suspension of TB diagnosis had lower odds of delaying seeking health. Failure to associate symptoms with TB was reported in other studies³¹; these patients may suspect other common respiratory syndromes that are not considered serious.⁸ Thus, some patients self-medicated and treated themselves with over-the-counter complementary and traditional medication. Self-diagnosis and

self-medication are perceived as health-seeking practices and contribute to the delay in seeking health care on suspected symptoms.^{10,37} Other studies associated self-medication with low perceived disease severity.^{33,38}

The action taken by the patients at the onset of their symptoms also led to delay in seeking healthcare for TB. In accordance with prior studies in SSA, seeking treatment from informal providers before visiting the health facilities was associated with delay in seeking healthcare.^{5,7,14,39-41} However, in the current study, a significant association was observed at the univariate logistic regression analysis. The results showed that 32% of patients sought care at health facilities after informal treatment failed. They first sought care from informal providers such as traditional practitioners, pharmacists, and private medical practitioners where TB diagnosis services are unavailable. Getnet et al⁸ suggest that if the informal health providers are engaged in TB services, they will contribute to the early identification of presumptive cases and referral to local health facilities.

We further found that some patients had felt that the symptoms were not serious enough and did not take any action and in doing so delayed early detection of the TB disease. A previous study conducted in South Africa found that the most common reason for delaying seeking care was that patients considered themselves not sick enough to seek treatment.⁴² Studies conducted in other African countries reported that patients wait for symptoms to self-resolve due to low perceived disease severity or low suspicion of TB disease.^{9,10,18,33,38} Disease severity is often the main reason for seeking healthcare for presumptive TB patients. Waiting until a cough is severe leads to a delayed diagnosis and treatment commencement.³¹ Delay in seeking care for TB diagnosis and treatment means that a considerable proportion of patients continue to transmit the disease to others.¹⁴

Previous research has demonstrated that negative attitudes toward TB are often underscored by the fear of being infected,^{23,32} which affects screening and seeking healthcare. The perception of TB as a very dangerous disease results in fear due to the relatively long time needed for its treatment.³² This might lead to presumptive TB patients denying the possibility of a TB diagnosis. In the current study, a small proportion of patients delayed seeking healthcare because they were scared that they would be rejected if they had TB, while almost half (45.8%) of the patients were terrified when they were diagnosed with TB. South Africa has a high prevalence of HIV, TB, and TB/HIV co-infection. The notion that having TB automatically translates to being HIV positive explains why some TB patients hide symptoms and delay seeking healthcare.³¹ The threat of HIV stigma, fear, and denial affect early diagnosis and treatment of TB. Thus, health education efforts should address misconceptions about TB and strengthen information to reduce the fear of TB stigma and transmission.^{23,31} Adequate knowledge and positive attitudes about TB will contribute to improved health care-seeking practice.¹

One of the limitations of this study is that the results are all based on self-reports by patients and subjected to recall bias. It is possible that patients might not recall the duration of the occurrence of TB symptoms and underestimated the time they took to access care which might influence the accuracy of the data. The study did not collect behavioral variables such as smoking and alcohol consumption and clinical data such as HIV positive status which might have influenced the health-seeking practice of the patients. One other limitation of the study is the lack of data about the content of health education and promotion information that is given to patients by health care providers. This kind of information is crucial to determine the source of misinformation about TB that is common in communities. Lastly, we did not collect data on the TB contacts of the patients. Despite these limitations, the study highlights the magnitude of delayed health-seeking practices among TB suspects in a subdistrict with a high TB burden and the role played by the informal health sector in delaying early TB screening and treatment.

Conclusion

We found a substantial delay between the onset of TB symptoms and seeking healthcare from a public health facility providing TB screening services. Over a third of the patients sought treatment from informal providers and self-medicated before being diagnosed with TB. This is even though over three-quarters walk to their local clinic. We found that the index of suspicion for TB was very low, with almost two-thirds of the patients having no suspicion that they had TB when they sought treatment for their symptoms and were subsequently diagnosed with TB. Concerning knowledge, we found high overall TB knowledge, yet having high overall TB knowledge did not translate into the early seeking of healthcare. On the contrary, the results suggest that the fear of a TB diagnosis could have played a significant role in the delay to seek care. This is evident by the high proportion of patients who were terrified of the TB diagnosis and misinformation on the duration to complete TB treatment.

Although the overall TB knowledge was high, there were gaps identified about the transmission of TB and misinformation about the duration of TB treatment. Health promotion and health education programs in PHC facilities should strengthen accurate information dissemination to promote sound TB knowledge. Engaging the general private practitioners and, to a lesser extent, the traditional health practitioners in the active TB case screening and finding will improve early diagnosis and treatment initiation. Promoting early screening and diagnosis through increasing awareness of TB is key in the elimination of TB in communities with a high TB burden.

Author Contributions

Sylvia Makgopa; Data curation; Formal analysis; Writing - original draft.

Sphiwe Madiba; Conceptualization; Supervision; Formal analysis; Validation; Review & editing.

Ethical considerations

Ethical approval was obtained from Sefako Makgatho Health Sciences University Research and Ethics Committee (SMUREC/H/160/2016: PG). Permission was also obtained from Ekurhuleni District Research and Ethics Department. Patients consented in a written form before the interview. To assure confidentiality, the questionnaire was completed in a private room and the information collected was recorded anonymously.

ORCID iD

Sphiwe Madiba  <https://orcid.org/0000-0002-3735-1248>

Availability of Data and Resources

All data used in the study are available from the lead author on request

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