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Patients' Satisfaction With Tuberculosis Services of Directly Observed Therapy Programs in the Gezira State of Sudan

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Background: Tuberculosis (TB) continues to be a major public health problem worldwide. In developing countries, the burden of the disease is explosive, as 95% of global TB patients reside and 98% of global TB deaths occur in these regions. Patients' satisfaction may play a major role in adherence to medications and hence improve tuberculosis cure rate.
Objectives: The current study aimed firstly to determine the level of patients' satisfaction with TB services in Gezira state, and secondly to identify it's major contributing factors.
Patients and Methods: This was a cross-sectional study by design, which included newly diagnosed TB patients in the Gezira state, located in central Sudan. The data was collected by simple random sampling from 292 patients using a pre tested questionnaire after obtaining an informed consent.
Results: The level of satisfaction with the provided TB services was 56.2%. Patients with no income were more satisfied (82.7%) with TB services than those with debts (67.1%) and savings (42.7%). Patients who attended private facilities were more satisfied with TB services (85.3%) than those who attended public health facilities. Patients were more satisfied with TB services provided by the medical assistants (70%) than that provided by general practitioners (54.4%), interns (44.7%) and chest physicians (38.3%). Tuberculosis patients who spent shorter time to receive their required service were more satisfied (63.3%) than those who spent a longer duration of time (45.4%).
Conclusions: The level of satisfaction of TB patients with the provided services was moderate. Patients having high income were more satisfied with the provided TB services than those with low income. Patients who attended private hospitals and general/chest hospitals showed high satisfaction with the provided TB services than those who attended health centers and the Tuberculosis Basic Management Units (TBMUs). Tuberculosis patients treated by a junior staff showed more satisfaction than patients treated by a senior physician.

Keywords: Patient Satisfaction; Tuberculosis; Services; Gezira; Sudan; Mycobacterium tuberculosis

1. Background

Tuberculosis (TB) continues to be a serious threat to public health worldwide. In developing countries, the burden of TB is explosive, as 95% of global TB patients reside and 98% of global TB deaths occur in these regions (1). By killing around 410000 women globally in 2012, tuberculosis creates orphans, tremendous hardship for the subjects family, puts families in poverty, and restricts the economic prosperity of families and the community as a whole (2). Tuberculosis is still a major cause of death due to multiple factors including the human immunodeficiency virus (HIV) epidemic, and spread of multi-drug resistance (3). However, tuberculosis is a curable condition (4). Treatment of tuberculosis in Sudan is accessible for all patients and is provided free of charge through public health facilities (5). The overall goal for treatment of tuberculosis is to cure the individual patient and to minimize the transmission of *Mycobacterium tuberculosis* to other people. Thus, successful treatment of tuberculosis has benefits both for the individual patient and the community in which the patient resides (6). Patients' satisfaction is how individuals perceive health care services, which is affected by the quality of care delivered by the providers. It is often based on the patient's expectations of care and the self-assessment of their experiences. Patients' satisfaction may play a major role in their behaviors; if patients are dissatisfied with the care provider or with the clinical setting, he or she may be less likely to be adherent to medications, keep appointments, identify contacts, and so forth. Research has shown that patients' satisfaction with services can be increased with effective patient-provider communication and development of a trusting relationship between the two parties (7). Satisfaction with services is especially im-

portant for patients undergoing treatment for TB because they must persist with a long and difficult therapeutic regimen. Tuberculosis treatment typically requires three to eight medications given daily or several times a week for six to eight months (8).

2. Objectives

The current study aimed to determine the level of patients' satisfaction with TB services at direct observed therapy programs in Gezira state, Sudan, and to identify its major contributing factors.

3. Patients and Methods

The study design was cross-sectional. The study population consisted of tuberculosis patients diagnosed by sputum smear for acid-fast bacilli using the Ziehl-Neelsen staining method. Newly diagnosed patients, aged 15 years and older, who were attending the health facilities at the Gezira state were enrolled in this study. This state is located in central Sudan, occupying the tract between the White and the Blue Niles, south of their convergence at Khartoum. The Gezira state has one of the highest TB rates in the country. The case detection rate at this state has been 39.7%, which was far below the target. However, this small proportion of detected cases were successfully treated (9). The sample size was 292; calculated by the National Center for Social Service (NCSS) and Power Analysis Sample Size (PASS) software using free population value. The sample was divided between the localities according to tuberculosis patient load. All the Tuberculosis Basic Management Units (TBMUs) in the selected locality were considered and two were taken by simple random allocation. The selected TBMUs were Medani, Almanagil, Almatori , Al Hasahisa, Al Kamlin, Gifar, Rofaa, Tambol and Alhosh (10). For assessing satisfaction, a validated patients' satisfaction questionnaire was adapted from Birhanu et al. 2010 (9). A pre-test was performed at the Sammeir TBMU in Khartoum state. Training of data collectors and field supervisors included orientation and filling the questionnaire. Demonstration and cross-over role playing was introduced in training. Variables measuring satisfaction with care were recorded on a 5-point Likert scale. These included: availability of services, prompt action from health care personnel, attitude of care providers, availability of free medications at these centers, distribution of tuberculosis centers in the area and waiting time. The SPSS software for windows version 20 (SPSS, Chicago, Illinois, USA) was employed to analyze the data. Comparisons between qualitative variables were made using Pearson's Chi-square and Fisher Exact tests. $P < 0.05$ was considered statistically significant. A written consent was obtained from the respondents. Ethical clearance was acquired from the ethical committee, Sudan Federal Ministry of Health. Objectives and expected outcomes of the research were explained to the participants and their right to withdraw from the study at any time was preserved. Confidentiality of data as well as respect and dignity of patients were strictly adhered to by this work.

Table 1. Relationship Between Patients' Satisfaction With Tuberculosis Services and Socio-Demographic Characteristic [a]

Factor	Satisfaction		Total	P value
	Satisfied	Not satisfied		
Age				0.457
15-35 Years	93 (58.1)	67 (41.9)	160 (56.7)	
> 35 Years	71 (53.8)	61 (46.2)	132 (43.3)	
Total	150 (56.2)	128 (43.8)	292 (100)	
Gender				0.114
Male	94 (52.5)	85 (47.5)	179 (61.3)	
Female	70 (61.9)	43 (38.1)	113 (38.7)	
Total	164 (56.2)	128 (43.8)	292 (100)	
Education				0.26
Educated	97 (60.2)	64 (39.8)	161 (55.1)	
Not educated	67 (52.3)	64 (47.7)	131 (44.9)	
Total	164 (56.2)	128 (43.8)	292 (100)	
Residence				0.058
Urban	42 (66.7)	21 (33.3)	63 (21.6)	
Rural	122 (48.9)	107 (51.1)	229 (78.4)	
Total	164 (56.2)	128 (43.8)	292 (100)	
Income				0.001
Savings	70 (42.7)	94 (57.3)	164 (56.2)	
Indebted	51 (67.1)	25 (32.9)	76 (26.0)	
No income	43 (82.7)	9 (17.3)	52 (17.8)	
Total	164 (56.2)	128 (43.8)	292 (100)	

[a] Data are presented as No. (%).

4. Results

Of the 292 patients enrolled in this study, 179 (61.3%) were males and 113 (38.7%) were female. Overall, 160 (56.7%) individuals were of young age while 132 (43.3%) were older adults. Results showed that 56.2% of TB patients were satisfied with the provided services. The younger individuals were more satisfied than the older age group (58.1% *vs.* 53.8%). Females were more satisfied than males with the provided TB care (61.9% *vs.* 52.2%). The educated patients were more satisfied than the non-educated participants (60.2% *vs.* 52.3%). Patients living in urban areas were more satisfied with the provided TB services than those residing in rural areas (66.7% *vs.* 48.9%). The study showed that patients with no income were more satisfied with TB care (82.7%) than those with savings (42.7%) and debts (67.1%) (Table 1). In seeking health care, most patients first attended health centers (45.2%), followed by hospitals (general and chest), TBMUs, private hospitals/clinics and other health facilities with the following proportions, 23.3%, 17.1%, 11.7% and 2.7%, respectively. Patients who firstly attended private facilities and general hospitals had greater satisfaction with care (85.3% and 70.5%) than those who attended health centers (44.5%) and TBMUs (34%). Satisfaction of TB care among those who attended other health facilities was (62.5%) as shown in Table 2. Table 3 shows that patients managed by the medical assistants (non-professionals who attained three years of education after secondary school to work at the primary health care level) were more satisfied with the provided TB services (70%) than those managed by general practitioners, internists and chest physicians, 54.4%, 44.7% and 38.3%, respectively. Patients who spent a short time waiting to receive TB services were more satisfied with the services (63.6%) than those who spent a longer time (45.4%), as shown in Table 4.

Table 2. Relationship Between Patients' Satisfaction with Tuberculosis Services and the First Visited Health Facility at the Gezira State, Sudan[a,b,c]

Health Facility First Visited	Satisfaction		Total
	Satisfied	Not Satisfied	
Health center	59 (44.5)	73 (55.5)	132 (45.2)
Hospital (general, chest)	47 (70.5)	21 (29.5)	68 (23.3)
TBMUs	24 (48)	26 (52)	50 (17.1)
Private hospital/clinic	29 (85.3)	5 (14.7)	34 (11.7)
Other health facilities	5 (62.5)	3 (37.5)	8 (2.7)
Total	164 (56.2)	128 (43.8)	292 (100)

[a] Abbreviation: TBMUs, Tuberculosis Basic Management Units.
[b] Pearson's Chi square value = 25.342, P = 0.001.
[c] Data are presented as No. (%).

Table 3. Relationship Between Patients' Satisfaction With Tuberculosis Services and Type of Treating Cadre in Gezira State, Sudan[a,b]

Type of Cadre	Satisfaction		Total
	Satisfied	Not Satisfied	
Chest Physician	12 (38.3)	19 (61.7)	31 (10.6)
Internist	23 (44.7)	18 (55.3)	41 (14.0)
General practioner	87 (54.4)	73 (45.6)	160 (54.8)
Medical assistants	42 (70)	18 (30)	60 (20.6)
Total	164 (56.2)	128 (43.8)	292 (100)

[a] Pearson's Chi square = 8.709, P = 0.033.
[b] Data are presented as No. (%).

Table 4. Relationship Between Patients' Satisfaction with Tuberculosis Services and Time Spent to Receive the Service, Gezira State, 2009 [a,b]

Time	Satisfaction		Total
	Satisfied	Not Satisfied	
0-30 Minutes	110 (63.6)	63 (36.4)	173 (59.2)
More than 30 minutes	54 (45.4)	65 (54.2)	119 (40.8)
Total	164 (56.2)	128 (43.8)	292 (100)

[a] Pearson's Chi square = 16.056, P = 0.001.
[b] Data are presented as No (%).

5. Discussion

Patients' satisfaction with TB care is a crucial issue in TB control and it affects utilization of services and use of anti-tuberculosis drugs (11). The results showed that 56.2% of TB patients were satisfied with the provided services. These findings are far below patients satisfaction for tuberculosis services in rural KwaZulu-Natal of South Africa, India and Ethiopia where satisfaction with TB care were 93.5%, 86.67% and 90% respectively (9, 11, 12). The younger participants were more satisfied with TB care than the older patients (58.1% *vs.* 53.8%); the relationship between age and satisfaction with TB care was not significant (P = 0.457). These findings are not in line with a study conducted in the USA where satisfaction with care was associated with increasing age (13). The current study showed that females were more satisfied with TB services than males (61.9% *vs.* 52.2%). The relationship between gender and satisfaction with TB services was not significant (P = 0.114). The educated patients were more satisfied with TB care than the non-educated (60.2% *vs.* 52.3%); the relationship between satisfaction with TB care and education was not significant (P = 0.26). Our findings are not in agreement with the findings of a study conducted in Bamako where the illiterate individuals were more satisfied with the provided TB services than the educated cases (14). In this study, the educated cases may have gained more attention from the health care providers and thus were more satisfied with the provided services than the illiterate individuals. A study on HIV/AIDS, showed a statistical relationship between education level and satisfaction (15). Urban patients were more satisfied with the provided TB services than the rural patients (66.7% *vs.* 48.9%); the relationship between satisfaction with TB services and residence was not significant (P = 0.058). The greater satisfaction of urban residents may be due to the fact that TB services provided to rural areas was poor compared to that provided to the urban areas. Patients with no income were more satisfied with TB care (82.7%) than those with debts (67.1%) and savings (42.7%); the relationship between satisfaction with TB services and income was significant (P = 0.001). This is consistent with a study conducted by Solorio MR (13). Tuberculosis services are provided free of charge, this may explain the high satisfaction of patients with no income, as they had access to treatment without payment. Patients who were diagnosed first at the private sector were more satisfied with TB services followed by the general hospitals (85.3% and 70.5%), and the relationship between satisfaction with TB services and type of clinic for first diagnosis was significant (P = 0.001). In a study conducted in Pakistan, it was found that patients were more satisfied with the services provided by the private sector where most of them sought care. In the Syrian Arab Republic, patients were satisfied and preferred treatment at the private sector and satisfaction with TB care was higher in patients first diagnosed by private practitioners (16, 17). This may be explained by the fact that TB patients preferred to be treated at the private sector as a result of stigmas. Privacy is greater at the private than the public sector (18). The study showed that TB patients were more satisfied when treated by medical assistants (70%) followed by general practitioners (54.4%) and interns (44.7%). According to our findings, patients were least satisfied when treated by a chest physician (38.3%). Patients' satisfaction reduced as the qualification of the treating cadre increased. The relationship between satisfaction with TB services and type of cadre who first diagnosed the case was significant (P = 0.033). These findings are not in line with a study conducted in India which showed no difference in satisfaction rate for different treating cadre (19). This may be explained by the fact that medical assistants are either from the same or have resided in the local communities for a long time, thus they have lived closely with the local population. On the other hand medical doctors are mostly transferred from other areas and have a turn over that do not allow them to stay long in the local communities (medical officers do not stay long specially in the states. If they stay long may build good relationships with patients). Patients' satisfaction with TB services was greater among patients who spent a short time to receive the service. The relationship between patients' satisfaction with TB services and the waiting time was significant (P = 0.001). These findings are consistent with a study conducted in India and South Ethiopia where 87% and 90% of patients were satisfied when the waiting time to receive the service was short (12, 20). This study concluded that satisfaction of TB patients with the provided services was moderate. Patients having high income are more satisfied with the provided TB services than those with low income. Patients who attended private hospitals and general/chest hospitals showed high satisfaction with the provided TB services than those who attended health centers and TBMUs. Tuberculosis patients treated by a junior staff (medical assistant and general practitioner) showed more satisfaction than patients treated by a senior physician (chest physicians and internist). Tuberculosis patients spent short waiting times to receive the service were more satisfied than those who spent a longer time. The high levels of dissatisfaction with regards to the type of health facility and type of treating cadre imply opportunities for improvement in service delivery. Further improvements are possible with regards to waiting time. Such changes could plausibly lead to increased satisfaction, increase treatment success rate and improve TB control.

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