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## Health Satisfaction among Pulmonary Tuberculosis Patients on Directly Observed Therapy in a Nigerian Tertiary Hospital

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### Abstract:

**Introduction:** Tuberculosis (TB) remains a major public health concern despite the decline in its mortality rate globally. Although, the introduction of directly observed treatment strategy (DOTS) short course with its five components in Nigeria in 2003, aimed at decreasing TB-related morbidity, preventing TB death, and decreasing TB transmission has recorded significant success.

**Objective:** To evaluate the health satisfaction and socio-demographic profiles of pulmonary tuberculosis patients on directly observed therapy.

**Methods:** A cross sectional study was conducted in the tuberculosis clinic of University of Ilorin Teaching Hospital, Ilorin, Kwara state. Data were collected from 154 patients through systematic random sampling using an interviewer administered questionnaires. Statistical package for social sciences version 20 was used for the analysis.

**Results:** Majority of the respondents (60.1%) were less than 38 year old with a mean age of 39±13years. There was male (61%) preponderance with female to male sex ratio 1:1.5. Most

respondents had formal education (79.9%) and 51.3% were married. About half of the respondents (45.5%) were in occupational class IV and none in class 1. New cases were 73.4% while others had some treatment previously. Sixty four of the respondents (41.6%) remained, sputum positive after two months of treatment. However, most of the respondents (88.3%), had certain levels of health satisfaction.

*Conclusion:* This study showed that tuberculosis is a disease of poverty affecting young productive adults in this area. And the cases of primary resistant among patients in this area may be on the increase. Nevertheless, the DOT treatment modality gives high level of health satisfaction among the patients.

*Key Words:* Health Satisfaction, Pulmonary Tuberculosis, Directly Observed Therapy, Nigeria.

## INTRODUCTION

Tuberculosis (TB) remains a major public health problem in the world. It affects one third of the world's population<sup>[1]</sup>. According to World Health Organization (WHO) estimations in 2012, approximately 8.6 million people are infected and 1.3 million died from TB<sup>[2]</sup>. The disease disproportionately affects people in poor-resource settings, particularly in Africa and Asia.

This poses significant challenges to developing economies as it primarily affects people during their most productive years. Although the largest number of new TB cases in 2012 occurred in the South-East Asia Region, however, the estimated incidence rate in sub-Saharan Africa had approximately one quarter of world's cases, and the highest rates of cases and deaths relative to population (255 cases per 100 000 population) more than double the global average<sup>[2]</sup>. An estimated 75% of 1.3 million deaths from TB in 2012 occurred in Africa and South-East Asia Regions<sup>[2]</sup>.

Although, tuberculosis is no longer among the 10 leading causes of death, it is still among the top 15 and second only to human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) among infectious diseases.<sup>[3]</sup> Nigeria is one of the 22 highest-burden countries that account for about 80% of all TB cases globally.<sup>[4]</sup>

Tuberculosis is a curable disease but failure of patients to adhere to therapy makes it a major public health concern<sup>[5]</sup>. Standard anti-TB treatment requires prolonged therapy (at least 6-8 months) with multiple potentially toxic drugs that can lead to adverse reactions in a significant number of patients<sup>[6]</sup> hence may act as obstacles to completion of therapy. Patient compliance is

cardinal to successful treatment and prevention of drug resistant strains. Satisfied patients are more likely to comply with medical treatment, and cooperate with the health care providers<sup>[7,8,9]</sup>. Patient satisfaction is an important factor in treatment adherence, patient utilization of health facility/services and a crucial health systems outcome index<sup>[8,9]</sup>.

Several advisory panels have recommended directly observed therapy (DOT) as a means to ensure patient adherence through the administration of all doses of medication by trained healthcare providers<sup>[10,11]</sup>. DOT has been shown to increase treatment completion rates, decrease relapses, and possibly reduce the overall incidence of TB<sup>[12,13]</sup>. DOT seeks to improve the adherence of people to tuberculosis treatment through health workers, family members, or community members directly observing them taking their anti-TB drugs. The advantages of DOT are that people can be closely monitored and that there is a social process with peer pressure that may improve adherence. The Directly observed treatment short course (DOTS) is an internationally recommended strategy for controlling TB developed, in 1995 by WHO and was adopted by Nigeria in 2003<sup>[2,3]</sup>. Since 1995, over 56 million people have been successfully treated and an estimated 22 million lives saved through use of DOTS and the Stop TB Strategy worldwide<sup>[2]</sup>.

This study aimed at determining the health satisfaction of TB patients on DOT and the socio-demographic factors that might be associated with health satisfaction.

## MATERIALS AND METHODS

A cross sectional study was carried out in the TB clinic of the Department of Family Medicine,

University of Ilorin Teaching Hospital Ilorin. Ilorin is the capital of Kwara state, North Central Nigeria. The Clinic serves as a referral centre for primary and comprehensive health care centres within and around Kwara state. Enrolment into the Clinic is based on positive sputum smear results and/or radiographic features suggestive of TB, in patients who present with clinical signs and symptoms suggestive of tuberculosis. The hospital record showed that two hundred and fifty seven (257) patients received treatment in the clinic in the previous year.

The sample size was determined by using fisher's statistical formula for estimating minimum sample size in health studies.<sup>[14]</sup> An approximated sample size of 154 was used for the study.

One hundred and fifty four patients that satisfied the inclusion criteria were selected using systematic random sampling technique.

All adult PTB patients, attending the TB clinic of the Department of Family Medicine at University of Ilorin Teaching Hospital, who have had at least two months of anti-tuberculosis drugs and gave their consent to participate in the study, were included. Excluded were patients with other chronic medical illnesses e.g. HIV, Hypertension, Diabetes, Chronic Obstructive Pulmonary Diseases (COPD). Also excluded were patients with diagnosed major psychiatric illnesses and patients with extra pulmonary Tuberculosis.

### **Instruments of the study**

**Socio-demographic characteristics:** This section included the respondents' age, sex, religious affiliation, level of education, marital status, occupation and ethnicity. The respondents were grouped into different occupational classes using Oyediji's socioeconomic classification model<sup>[15]</sup> this is a local instrument for social status

stratification base on individuals' occupations and educational achievements.

The health satisfaction was evaluated using the health satisfaction section of World Health Organization Quality of life (WHOQOL-BREF) instrument. This questionnaire has good psychometric properties<sup>[16]</sup> and has been validated and used in previous studies in Nigeria<sup>[17,18]</sup> The Yoruba version of this instrument which has been validated and adjudged suitable and relevant for studies in Nigeria<sup>[18,19]</sup> was used in this study. Categorization was done depending on whether the respondent's score in each domain was < (less than) the mean – 1 standard deviation which was graded 'poor', a score of mean  $\pm$  1 SD, 'fair' and a score of > mean + 1 SD, 'good'.

Ethical clearance to undertake the study was obtained from the Ethical Review Committee of the University of Ilorin Teaching Hospital. and the subjects were adequately informed about the nature of the study before obtaining their consent. The pretesting revealed that interviewer-administration of the questionnaire would be the best option considering the varying educational status of the study population. In such situation the interviewer read out the questionnaire to non-literate respondents.

### **Data analysis**

Statistical package for social science [SPSS version 20.0.] and Excel 2007 software were used for the statistical analysis. Cross tabulation, frequency statistics and chi-square test were used to evaluate the relationships between variables. A statistical significant level of less than 0.05 values was set.

## RESULTS

Table 1: Socio-demographic characteristics of respondents

VARIABLES (N=154)	FREQUENCY	Percent (%)
<b>AGE</b>		
18-27	47	30.5
28-37	47	30.5
38-47	27	17.5
48-57	16	10.5
≥ 58	17	11.0
<b>SEX</b>		
Male	94	61.0
Female	60	39.0
<b>RELIGION</b>		
Christianity	48	31.2
Islam	106	68.8
<b>EDUCATION</b>		
No formal Education	31	20.1
Primary	40	26.0
Secondary	38	24.7
Tertiary	45	29.2
<b>MARITAL STATUS</b>		
Single	58	37.7
Married	79	51.3
Separated	4	2.6
Divorced	9	5.8
Widow/Widower	4	2.6
<b>ETHNICITY</b>		
Hausa	8	5.2
Yoruba	130	84.4
Igbo	4	2.6
Others	12	7.8

N= Total number of respondents

%= percentage of respondents

Table 1 shows the sociodemographic characteristics of the respondents. A total of 154 respondents were recruited for the study. Most of the respondents (70.1%) were below the age of 38 years and the mean age was  $36 \pm 13$  years. Majority of the respondents (61%) were male and 68.8% were Muslims. Most respondents had formal education, tertiary (29.2%), secondary

(24.7%) and primary (26.0%) while the rest have no formal education. The largest ethnic group among the respondents was the Yoruba (84.4%) while Hausa (5.2%), Igbo (2.6%) and the other minority ethnic groups constitute (7.8%). Most of the respondents (51.3%) were married, 37.7% were singles and 5.8% divorced while the widowed and separated respondents each made up 2.6% of the study population.

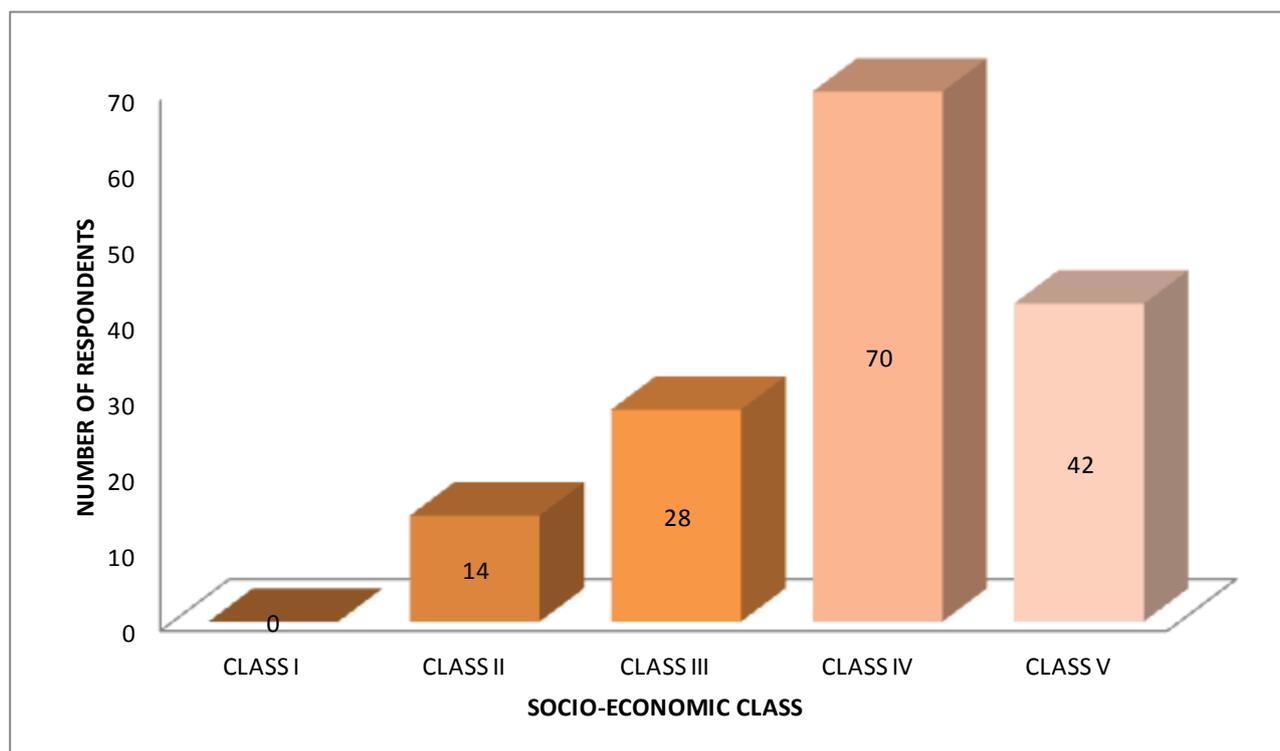


Figure 1 depicts the respondents' occupational classes.

There is no respondent in the uppermost class (class I). Most of the respondents (45.5%) were in class IV while 27.2% were in class V, 18.2% in class III and 9.1% were in class II.

Table 2: Sputum smear results of the respondents

VARIABLES	BASELINE	CURRENT
(N=154)	n <sub>1</sub> (%)	n <sub>2</sub> (%)
Positive	139 (90.3)	64 (41.6)
Negative	15 (9.7)	90 (58.4)

N= Total number of respondents

n<sub>1</sub>= Number of respondents with baseline sputum smear

n<sub>2</sub> = Number of respondents with current sputum smear

(%) = Percentage of respondents in bracket row

Table 2 shows the sputum smear results of the respondents. Most of the baseline smear results (90.3%) were positive while sixty four (41.6%) of the patients still remain positive after at least two (2) months of anti-TB drugs.

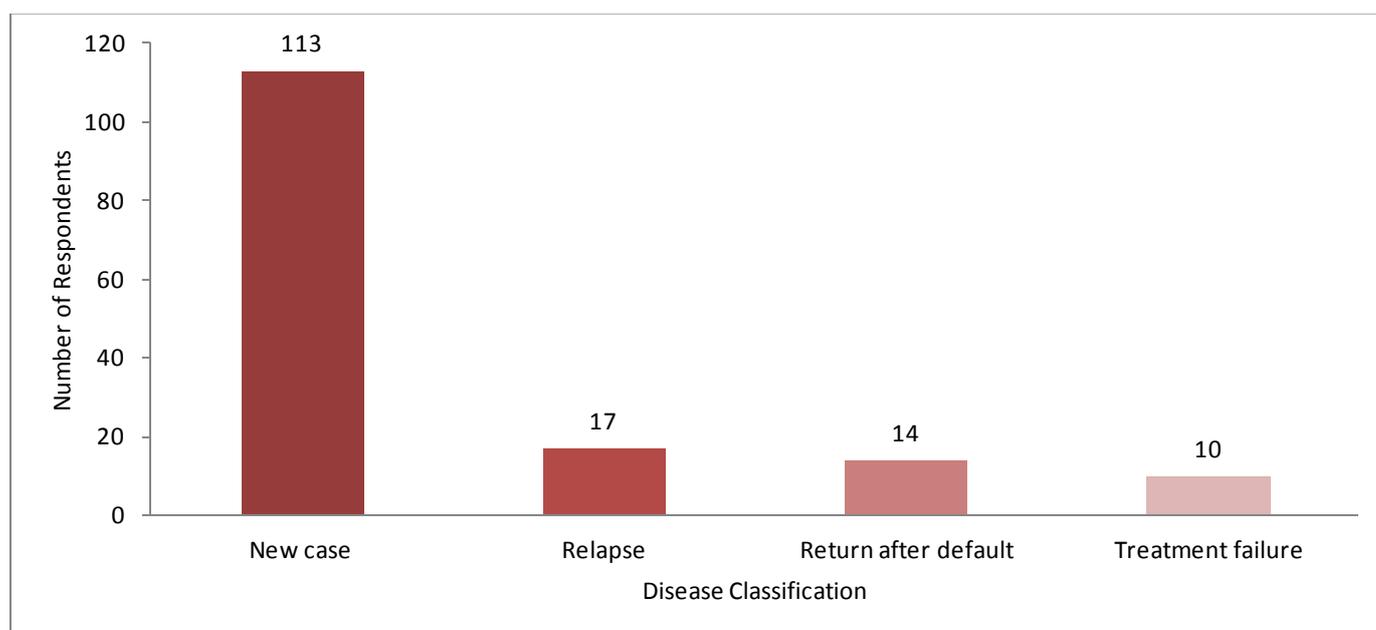


Figure 2 depicts the different classification of the respondents' disease condition. Most of the patients were New cases (73.4%) while only 26.6% of the patients had previous encounter with anti-TB drugs; relapse (11.0%), return after default (9.1%) and treatment failure (6.5%).

Table 3: Association between health satisfaction and respondents sociodemographic characteristics

VARIABLES (N=154)	HEALTH SATISFACTION			X <sup>2</sup>	P
	GOOD	FAIR	POOR		
	n (%)	n (%)	n (%)		
<b>AGE</b>				<b>7.090</b>	<b>0.527</b>
18- 27	19(40.4)	25(53.2)	3(6.4)		
28 – 37	16(34.0)	23(49.0)	8(17.0)		
38 – 47	9(33.2)	14(51.9)	4(14.9)		
48 – 57	2(25.0)	8(50.0)	4(25.0)		
≥ 58	4(23.5)	10(58.9)	3(17.6)		
<b>SEX</b>				<b>1.088</b>	<b>0.580</b>
Male	33(35.1)	48(51.1)	13(13.8)		
Female	23(38.3)	32(53.4)	5(8.3)		
<b>MARITAL STAUS</b>				<b>7.885</b>	<b>0.445</b>
Single	21(36.2)	29(50.0)	8(13.8)		
Married	31(39.2)	41(51.9)	7(8.9)		
Separated	1(25.0)	2(50.0)	1(25.0)		

Divorced	1(11.1)	5(55.6)	3(33.3)		
Widowed	1(25.0)	3(50.0)	1(25.0)		
<b>OCCUPATION</b>				<b>9.168</b>	<b>0.164</b>
Class I	--	--	--		
Class II	9(64.3)	3(21.4)	2(14.3)		
Class III	13(46.4)	11(39.3)	4(14.3)		
Class IV	20(28.6)	21(58.6)	9(12.8)		
Class V	14(33.3)	23(54.8)	9(12.9)		
<b>EDUCATION</b>				<b>6.376</b>	<b>0.382</b>
No formal education	7(22.6)	20(64.5)	4(12.9)		
Primary	16(40.0)	21(52.5)	3(7.5)		
Secondary	13(34.2)	18(47.4)	7(18.4)		
Tertiary	20(44.4)	21(46.7)	4(8.9)		

N= Total number of respondents

n = Number of respondents in row

(%) = Percentage of respondents in row bracket

$X^2$  = Chi-Square

P = Level of significance

Table 3 shows the association between health satisfaction and socio-demographic characteristics of the respondents. The grade of good health satisfaction decreases with advance age of the respondents and male gender. None of the associations were statistically significant ( $p > 0.05$ ). Female gender has more respondents (38.3%) with good grade and lesser respondents (8.3%) with poor grades of health satisfaction. Majority of the respondents from different educational levels and various marital statuses in

this study had fair grades. However, respondents with tertiary education had the largest proportion of good grade (44.4%) while married (39.2%) have more respondents with good grades compare with single (36.2%), separated (25%), widows (25%) and divorce (11.1%). Most of the respondents in class II (64.3%) and class III (46.4%) had good grades while majority in class IV (58.6%) and class V (54.8%) had fair grades. None of the associations were statistically significant ( $p > 0.05$ ).

Table 4: Distribution of health satisfaction among the respondents

Health satisfaction	Frequency	Percentage
Good	56	36.4
Fair	80	51.9
Poor	18	11.7

Table 4, shows the distribution of the respondents health satisfaction. There were few patients (11.7%) who were dissatisfied with their health (poor health satisfaction)

## DISCUSSION

The sociodemographic profiles of one hundred and fifty four respondents in this study showed that majority of the respondents (60.1%) were less than thirty eight year old. The age range was 19-67 years with a mean age of  $39 \pm 13$  years. This is similar to  $35.1 \pm 14.4$  years found in a previous study on adult TB patients in this Centre<sup>[20]</sup> and the reported majority (70%) of patients belonging to 20-39 years age group in a similar study in India.<sup>[21]</sup> It also conforms to the assertion that TB is common among the adolescents and the young adults in developing countries while it is commoner among elderly and immunosuppressed patients in developed countries.<sup>[3]</sup>

Most of the respondents were Muslims and they were also from the Yoruba ethnic group similar to the findings in previous studies done in this centre.<sup>[18,20]</sup> This is not surprising, because majority of inhabitants of Ilorin are Yoruba of Islamic faith. There is also male (61%) preponderance in this study with female to male sex ratio 1:1.5. This is similar to the findings in the earlier studies with (56.7%)<sup>[20]</sup> and (66%)<sup>[18]</sup> of male respondents respectively. This may be as a result of adventurous nature of the male gender which may easily predispose them to tuberculosis being an infectious air borne disease. Furthermore, the risk factors that predispose to TB like overcrowding, smoking and alcoholism are also commoner among the male gender in this study area. In the present study area, polygamy is a common practice among the predominantly Yoruba Muslim inhabitants. Here, the husbands are usually, solely responsible for the upkeep of their wives and children. Consequently, tuberculosis could have significant impact on socio-economic activities in this environment in view of the limited financial resources.

Most of the respondents (79.9%) had formal education with majority (29.2%) having tertiary education. Even though the TB clinic of the Department of Family medicine is a primary care setting, it is situated within a tertiary healthcare institution where most literate people prefer to seek healthcare services. They believe it offers the best manpower and facilities especially for chronic illnesses while most of the people without formal education would rather seek alternative therapy for their chronic illnesses. Most of the respondents (90.9%) were in the three

lowest occupational classes. Majority (45.5%) was in class IV and there were no respondent in occupational class I. This supports the declaration that tuberculosis is one of the three primary diseases of poverty along with AIDS and malaria<sup>[3]</sup>. This also confirmed that tuberculosis is no respecter of educational status but standard of living and immune status, this quite instructive for a country like Nigeria with teeming unemployed educated young men and women with no welfare package or social security.

Most of the participants were married (51.3%) of the total respondents. This has an implication for the treatment and control of tuberculosis in developing countries,<sup>[3]</sup> considering the vulnerability of the patients' spouses and children. A patient suffering from active TB expels about 40,000 infectious aerosol droplets per sneeze or cough and without proper treatment can infect about 10-15 persons per year.<sup>[22]</sup>

One hundred and thirteen (73.4%) of the respondents had newly diagnosed tuberculosis while forty one (26.6%) were old TB cases who have had treatment previously; relapse, return after default and treatment failure cases. There were about ninety percent of the respondents with positive baseline sputum smear results, but after at least 2 months of anti-tuberculosis drugs only about fifty eight percent of the total respondents had sputum smear conversion. This highlights the importance of anti-TB drugs in elimination of the bacteria as evidenced by the sputum smear conversion. Nevertheless, the high percentage of respondents with persistent sputum smear positivity (about 42%) after at least 2 months of treatments probably reflects the assertion that the sub-Saharan Africans have high incidence of primary drug-resistant cases and possibly the highest rates of transmitted MDR tuberculosis in the world.<sup>[2]</sup> However, it is difficult to confirm the diagnosis of MDR and XDR tuberculosis in this centre because of lack of facilities for drug-sensitive test.

Majority of the respondents (51.9%) of the patients were fairly satisfied with their health under the DOT treatment modality while fifty six (36.4%) were highly satisfied. Most of the patients (88.3%) indicate health satisfaction similar to ninety percent found in an Ethiopian study<sup>[23]</sup> and above eighty percent reported in New York<sup>[24]</sup>.

This may account for the success recorded on MDG as regard to tuberculosis in Nigeria as well as the decline in prevalent and mortality rate of the disease globally<sup>[3]</sup>. Female gender, younger subject, married status and higher social class are factors favourable to better health satisfaction. These might be indications of the economic and social burden on the male gender in this area and the fact that younger people have better physical strength and reserve than older ones hence ability to cope with the disease burden. Family support and better socioeconomic dividends for married patients and those in higher social classes may account for their better health satisfaction.

### CONCLUSION

Tuberculosis is an important public health challenges especially for a poor-resource country like Nigeria where most of the populace are within the vulnerable age-group. There is the need for economic empowerment in addition to food and social security in developing countries to break the evil cycle of poverty and tuberculosis. Despite the encouraging impact of directly observed therapy, there is need for public enlighten to curb the rising scourge of resistant strains which treatment involve more drugs, longer duration and probably worse adverse drug reactions. Directly observed therapy short course strategy with its five components should be adopted for other rampaging infectious diseases because of its high health satisfaction index among patients which may be due to its ability to enhance better drug adherence and promote robust patient-doctor (health workers) relationship.

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