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Original Article

Assessment of Health-Related Quality of Life of Tuberculosis Patients in Lagos State, Nigeria

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Abstract

Background and aims: Tuberculosis (TB) is a major public health disease threat in the world, particularly in Nigeria. The burden of TB infection could have a far-reaching effect on the psychological, physical, and social well-being of patients and consequently deterioration in their health-related quality of life (HRQOL). Accordingly, this study examined the HRQOL of TB patients in directly observed therapy (DOT) centers in Lagos State, Nigeria.

Methods: The survey design was used for the study, and a total of twelve public DOT Centers were chosen as the study sites. A sample size of 310 was obtained using the Taro Yamane formula. A structured and validated questionnaire was applied to collect data. The World Health Organization Quality of Life Assessment-BREF tool was employed to assess HRQOL. Statistical analysis was conducted using SPSS software, version 23.

Results: Based on the results, the overall status of the HRQOL of the studied TB patients was moderate (average weighted mean = 2.48) on a 4-point scale. The finding of the study also highlighted the significant effect of TB on several domains of HRQOL. The psychological domain had the highest HRQOL score ($\bar{x} = 2.60 \pm 0.64$), while the environmental domain represented the lowest HRQOL score ($\bar{x} = 2.31 \pm 0.63$).

Conclusion: Overall, the HRQOL of TB patients was at a moderate level. The disease had no negative impact on the HRQOL of TB patients across all domains. This finding calls upon strategies to ensure a healthy lifestyle and a conducive living physical environment.

Keywords: Directly observed therapy, Hospital, HRQOL, Primary health care, Pulmonary

Introduction

Tuberculosis (TB) remains one of the world's most serious public health diseases. Nigeria is currently ranked first in Africa and among the top ten countries in terms of TB incidence and burden.[1] Lagos State has been dubbed the epicentre of TB in Nigeria.[2] The rising incidence of TB in Lagos State can be largely attributed to high population density on a small landmass, overcrowded residential areas, rapid urbanization, air pollution, and congested roads, all of which often favor transmission. Patients with TB suffer not only from the disease's symptoms but also from its burden, which includes emotional or psychological dysfunction, functional limitations, financial issues during diagnosis and treatment, adverse effects from anti-tubercular drug intake, comorbid illness/co-infection, and socioeconomic factors.[3,4]

TB can be risky and fatal and have a severe impact on patients as it decreases their physical, mental, and economic strength. It often leaves a negative impact on TB patients. These problems have a significant impact on the patient's well-being and weaken the resistant system of the body.[5] The overall effect can lead to a decline in health-related quality of life (HRQOL) across multiple health domains, including physical, social, psychological, and environmental health.[4] As a result, HRQOL for a person with TB is a growing concern, especially considering the prevalence and the tendency of the disease to develop into multi-drug resistance. Therefore, despite TB diagnosis and treatment, the focus has now shifted toward the HRQOL of TB patients since it is now critical for considering the overall impact of TB on health and patients' perceived perception of their well-being.

The previous study has shown that the HRQOL of TB patients in South East Nigeria is low.[6] However, only a few studies have attempted to find out HRQOL of TB patients in Lagos State, Nigeria, despite consistently being responsible for about 11% of the cases of TB registered in the country annually. [7,8] Assessing HRQOL is important, especially in chronic diseases such as TB because it can provide health-care providers with more information about their health status, its associated characteristics, and how to manage the infection. Therefore, this present study evaluated the HRQOL of TB patients in Lagos State, Nigeria, as well as the hypothetical influence of socio-economic factors on their HRQOL.

Materials and Methods

Study Design

This study applied a survey design. The study population comprised 918 registered TB patients who were receiving treatment at the time of the study at the Directly Observed Treatment Centres in three senatorial districts (West, East, and Central) in Lagos State, Nigeria. The multistage sampling technique was employed to select participants for the study. In the first stage, all three Senatorial Districts in Lagos State were chosen for inclusion in this study. In the second stage, a simple random technique by balloting was used to select two local government areas in each of the Senatorial Districts (Lagos East, Lagos Central, and Lagos West). In the third stage, purposive sampling was used to choose two directly observed therapy (DOT) Centres with the highest load/burden of TB patients in each of the selected local government areas. This was accomplished because many of the DOT Centers had small numbers of TB patient visits. Hence, a total of twelve DOT Centers were chosen for the study. In the fourth stage, stratified proportionate sampling was applied to select TB patients from each of the intended centers according to their respective representation in the population. A sample size of 310 was obtained using Taro Yamane formula.

Inclusion and Exclusion Criteria

The main inclusion criteria were registered patients with pulmonary TB, who had been on treatment for more than two months, aged 18 years and above, and were mentally capable of providing consent. On the other hand, the exclusion criteria included pregnant women, extra-pulmonary TB patients, severely ill or debilitated patients, and TB patients who did not give their consent. Social/administrative approval to conduct the study in DOT Centers was obtained from the Lagos State Ministry of Health. In addition, permission was obtained from the respective DOT Centers chosen as the study sites. Written informed consent was directly obtained from the study participants.

Data Collection Tools

The World Health Organization HRQOL (WHOQOL) BREF questionnaire was used to assess the HRQOL. This questionnaire has good psychometric scores, having been validated and applied in previous related studies in Nigeria.[6] Content validity and face validity were quantitatively evaluated to determine the validity of the questionnaire. In this study, Cronbach's alpha coefficient was applied to examine the internal consistency of the WHOQOL-BREF scale (24 items), which was 0.91, and for physical, psychological, social, and environmental domains, the corresponding values were 0.79, 0.89, 0.70, and 0.81, respectively. Each question and domain were rated on a Likert-type scale (1-4), and higher scores indicated a better HRQOL. The questionnaire was administered to the respondents of the study at the designated DOT Centers in order of appearance during their clinic visit, and according to their convenient accessibility as long as they were ready to participate in the study.

Statistical Analysis

The collected data were entered, cleaned, and analyzed using the SPSS, version 23. Descriptive statistics such as percentages, mean, and standard deviation were employed to analyze the data, and the hypothesis (Socioeconomic factors such as age, education, occupation, and income) was tested using simple linear regression.

Results

Overall, 310 copies of the questionnaire were distributed among TB patients, but only 298 copies were appropriately filled and validated for analysis, indicating a 96.1% response rate.

The socio-demographic characteristics of the study population are provided in Table 1. Of the 298 TB patients in the study, 199 (66.8%) were males, while 99 (33.2%) were females. Most study participants (n = 109, 37.5%) were in the age group of 30-41 years with a mean age of 35.87 ± 11.95 years. In terms of educational attainment, most participants (n = 140, 47%) had a secondary education, and only 29.9% attended university/tertiary institutions. The majority of the patients (49.7%) of TB patients were self-employed, while 0.7% of them were unemployed. The study participants' income level per month revealed that 129 (43.3%) of the TB patients earned less than ₦30 000, while 11 (3.7%) of them earned between ₦ 60 000 and ₦ 89 999.

Table 2 presents the results of the HRQOL of TB patients in DOT Centres in Lagos State, Nigeria. With an average weighted mean of ($\bar{x}$ = 2.48) on a 4-point scale, the result demonstrated that the overall status of the HRQOL of the studied TB patients was moderate. Further details from the analysis revealed that the psychological ($\bar{x}$ = 2.60) and physical ($\bar{x}$ = 2.55) domains indicated high ratings among TB patients, while the social ($\bar{x}$ = 2.46) and environmental ($\bar{x}$ = 2.31) domains represented moderate levels. This result implies that TB patients were least impaired in the psychological and physical domains, but significantly impaired in the social and environmental domains in the DOT Centres in Lagos State.

Of the four dimensions of HRQOL, psychological ($\bar{x}$ = 2.60) and physical ($\bar{x}$ = 2.55) domains had the highest scores, respectively. This HRQOL domain score could be attributed to the fact that TB patients in the DOT Centres in Lagos State indicated high measurement scores in the areas such as having a feeling that their life is meaningful ($\bar{x}$ = 2.73), performing daily activities ($\bar{x}$ = 2.68), being able to concentrate well ($\bar{x}$ = 2.66), having personal relationships ($\bar{x}$ = 2.66), having self-satisfaction ($\bar{x}$ = 2.65), and being able to enjoy life ($\bar{x}$ = 2.65). The result related to the HRQOL of TB patients regarding the environmental ($\bar{x}$ = 2.31) and social ($\bar{x}$ = 2.46) domains had the lowest scores, respectively. Contribution to these least score

Table 1. Respondents' Demographic Information

Demographic Variables	No.	Percent
Gender		
Male	199	66.8
Female	99	33.2
Total	298	100.0%
Age		
18-29 years	102	35.1
30-41 years	109	37.5
42-53 years	53	18.2
54-65 years	21	7.2
>66 years	6	2.1
Mean age in years (standard deviation)	35.87 (±11.95)	
Marital status		
Single	125	41.9
Married	152	51.0
Divorced	05	1.7
Widow/widower	13	4.4
Separated	03	1.0
Total	298	100.0%
Highest educational qualification		
No formal education	28	9.4
Primary	41	13.8
Secondary	140	47.0
University/tertiary	89	29.9
Total	298	100.0%
Occupation status		
Self-employed	148	49.7
Civil servant	19	6.4
Private organization worker	51	17.1
Retired	09	3.0
Student	40	13.4
Unemployed	2	0.7
Others (Pastor, clergy, Corper, drivers, and housewives)	29	9.7
Total	298	100.0%
Personal income per month		
<₦30000	129	43.3
₦ 30001 - ₦ 59999	70	23.5
₦ 60000 – ₦ 89999	25	8.4
More than ₦ 90000	11	3.7
No income	63	21.1
Total	298	100.0%

domains in HRQOL demonstrated low measurement scores in areas such as security ($\bar{x}$=2.43), access information ($\bar{x}$=2.40), physical environment ($\bar{x}$=2.37), living conditions ($\bar{x}$=2.31), sexual activity ($\bar{x}$=2.25), an opportunity for leisure activities ($\bar{x}$=2.17), transportation ($\bar{x}$=2.13), and income ($\bar{x}$=2.13). This result implies that TB further affects the environmental domain of the patients compared to all other health domains.

Table 2. Health-related Quality of Life of Tuberculosis Patients

S/No.	Health-Related Quality of Life	Mean ± SD
	Psychological domain	**2.60 ± 0.64**
1	I feel my life is meaningful.	2.73 ± 0.84
2	I can concentrate well.	2.66 ± 0.76
3	I am satisfied with myself.	2.65 ± 0.80
4	I enjoy life.	2.65 ± 0.83
5	I do not always have negative feelings such as blue mood, despair, anxiety, and depression.	2.48 ± 0.80
6	I accept my bodily appearance.	2.46 ± 0.88
	Physical domain	**2.55 ± 0.61**
7	I am satisfied with my ability to perform my daily living activities.	2.68 ± 0.86
8	I am able to get around well.	2.61 ± 0.81
9	I am satisfied with my sleep pattern.	2.59 ± 0.81
10	I have enough energy for everyday life.	2.54 ± 0.84
11	I am satisfied with my capacity for work.	2.51 ± 0.81
12	Physical pain does not prevent me from doing what I want to do.	2.46 ± 0.90
13	I do not always need medical treatment to function in my daily life.	2.43 ± 0.87
	Social relationship domain	**2.46 ± 0.68**
14	I am satisfied with my personal relationships.	2.66 ± 0.80
15	I am satisfied with the support I get from my friends.	2.48 ± 0.87
16	I am satisfied with my sex life.	2.25 ± 0.89
	Environmental domain	**2.31 ± 0.63**
17	I am satisfied with my access to health services.	2.54 ± 0.80
18	I feel very safe in my daily life.	2.43 ± 0.72
19	I have access to information needed for my day-to-day life.	2.40 ± 0.85
20	I feel my physical environment is healthy.	2.37 ± 0.79
21	I am satisfied with the conditions of my living place.	2.31 ± 0.85
22	I have opportunity for leisure activities.	2.17 ± 0.84
23	I am satisfied with my means of transport.	2.13 ± 0.97
24	I have enough money to meet my needs.	2.13 ± 0.79
	Health-related quality of life (Average weighted mean = 2.48)	

Note. * Decision Rule: If mean is ≤1.0 1.74 = Low, 1.75-2.49 = Moderate, 2.50-3.24 = High, and 3.25-4.0 = Very high.

Hypothesis testing: Socio-economic factors (Age, education, occupation, and income) will not significantly influence the HRQOL of TB patients in Lagos State, Nigeria.

Based on the results (Table 3) socio-economic factors had a significant influence on the HRQOL of TB patients in Lagos State, Nigeria (t (295) = 7.749, P < 0.05), indicating that socio-economic factors could predict the HRQOL of TB patients in Lagos State, Nigeria, and the null hypothesis was rejected accordingly.

Discussion

The findings of this study showed that the overall HRQOL of TB patients in the investigated DOT Centres was at a moderate level ($\bar{x}$=2.48), even though several studies have demonstrated that TB has a significant and all-

Table 3. Simple Linear Regression Analysis of Socio-economic Factors and Health-related Quality of Life of Tuberculosis Patients

Predictors	B	Beta (β)	T	*P*	R^2	Adj. R^2	F	ANOVA (Sig.)
(Constant)	1.187		7.003	0.000	0.169	0.166	60.054	0.000
Social-economic factors	0.475	0.411	7.749	0.000				

Dependent variable: Health-related quality of life.
Predictor: (Constant), socio-economic factors.
DF (F-statistic) = 1,296; DF (T-statistic) = 295
Note. ANOVA: Analysis of variance.

encompassing negative impact on patients' HRQOL. This finding may be attributed to the free availability of TB drugs and effective therapeutic strategies accessible to patients in the DOT Centers. This finding is consistent with that of a previous study performed in Singapore.[9] The result also matches that of Agboola and Ikonne[10] conducted on different study populations in Nigeria. However, this finding sharply contradicts the outcome of previous studies in Cameroon, Indonesia, and Iran.[11-13] The respondents' overall moderate level HRQOL in this present study can also be related to their high psychological score status since they can still engage in everyday activities, along with having some social support from their surroundings and some financial resources. The impact of a low minimum wage or low income on HRQOL is supported by the findings of Fang et al,[14] representing that TB patients with annual incomes well below the country's average had the highest frequency of missing medication doses due to opportunity and transportation costs during treatment despite free provision for TB patients.

Another major finding of this study was that psychological ($\bar{x} = 2.60$) and physical domains ($\bar{x} = 2.55$) had the highest mean score on a 4-point scale. This indicated that these domains of the HRQOL of TB patients in Lagos State, Nigeria were least impaired when compared with other domains. This suggests that most TB patients have little or no impairment in psychological functioning areas (e.g., self-esteem, ability to concentrate, and self-satisfaction) and physical functioning (implying good activities of daily living, being able to get around well, having sufficient sleep and rest, as well as enough energy and capacity for work). This outcome may be attributed to the fact that a majority of the study respondents had the basic educational qualification, which may have given them the skills to cope, live a healthier life, have healthy behavior and problem-solving ability, and manage psychological distress.

However, this finding is inconsistent with that of an earlier study by Sartika et al[15] conducted in Ciamis, Indonesia; they found that the physical domain was the most affected domain among the TB patients. Similarly, Rahmalia et al[16] reported that TB patients' physical health was more impaired when compared with psychological and social health, and they attributed this issue to symptoms and limitations on physical issues. This result also contradicts the finding of Muhammed et al,[17] implying that TB patients' QOL was poor in both physical and mental domains. Furthermore, this outcome does not match the findings of the study performed by Kanu[18] in Nigeria, revealing that HIV/TB co-infected patients had lower QOL in terms of both physical and psychological domains. Notwithstanding, this outcome may be due to the comorbidities of the infection among the respondents of their study.

Moreover, the finding revealed that social ($\bar{x} = 2.46$) and environmental ($\bar{x} = 2.31$) domains were at a moderate level on a 4-point scale. This is reflected in the social domain areas (e.g., social support and sexual activity) and the environmental domain (e.g., insecurity of life, access to information, physical and home environments, opportunities for leisure, transportation, and financial resources) of TB patients, which were more affected or impaired. This outcome corroborates the finding of Osahon and Okolo,[6] indicating that TB patients in South East, Nigeria, scored the highest on the social relationship domain, Thus the social domain was not much impaired. This is in line with the finding of Malik et al,[19] confirming that the social functioning of several TB patients was marginally impaired. In the same vein, Jovanić et al[20] reported that social functioning was among the least impaired in another different study population. However, the result of the present study contradicts the findings of Dhuria et al,[21] representing that social domain QOL was negatively affected. Accordingly, sufficient support (social relationship) is an important component of treatment for TB patients since patients with adequate support are more likely to have good care, encouragement to adhere to their treatment regimen, and reasonable resources to pay transportation and other treatment expenses. Therefore, making it possible for them to adhere to their drugs and complete treatment.

In all the dimensions of HRQOL in the present study, the findings of the study showed that the lowest recorded scores were related to the environmental and social domains, respectively. The environmental domain included not highly good financial resources, transportation, opportunities for leisure, conditions of the living environment, opportunities for acquiring new information, and transportation, and the social domain indicated inadequate social support and sexual activity. This finding is also consistent with that of Iti et al[22]; they found that the most affected domains were environmental and social relationship domains, suggesting the need for an improvement in the physical environment, as well as a reduction in stigmatization and discrimination often shown toward TB patients. This outcome may be attributed to the frequent isolation of TB patients

from the community and general family life due to the infectious nature of the disease, which can also contribute to depression and feelings of insecurity in daily living among TB patients. This is in conformity with the finding of Hutahaean,[23] demonstrating that there is a meaningful and high relationship between social support and QOL of TB patients.

Conversely, Shalabey et al[24] in Saudi Arabia revealed that social and environmental domains had the lowest score rating, respectively. This outcome also contradicts the findings of Sabri and Nagi,[25] indicating that social and psychological domains had the maximum effect, respectively. The treatment of TB in DOT Centers has often typically concentrated on the usage of some anti-tubercular drugs in the patient's body to eliminate the bacteria, but the outcome of the present study suggests the need to sufficiently take into account the negative effect of the disease on environmental and social domains. Meanwhile, differences in the findings between this study and the previous one could be due to variations in the environment studied and the pathology of TB infection. The finding of the hypothesis demonstrated that socio-economic factors had a significant influence on the HRQOL of TB patients in Lagos State, which is in line with the findings conducted in Pakistan and Germany,[26,27] implying that the socioeconomic status of patients is a key determinant of HRQOL.

Limitations of the Study

One limitation of this study was that the assessment of HRQOL is a subjective measure; hence, some of the respondents may have overestimated or underestimated their HRQOL scores. Thus, the findings of this study should be interpreted with caution. Nevertheless, the strengths of this study lie in the use of the validated instrument (WHOQOL-BREF) scale, which has been widely used in different countries to assess the HRQOL of TB patients.

Conclusion

The rationale of this study was to measure the HRQOL scores of patients with active TB in Lagos State, Nigeria. The results revealed that the HRQOL of the study participants was overall moderate. Environmental and social domains were the most affected, while psychological and physical domains were the least affected areas. As a result, for following up on treatment and care interventions in these patients, it is critical to pay attention to and monitor the HRQOL of TB patients in areas such as access to information, physical environment, leisure opportunities, transportation, and financial resources.

Author Contributions

Conceptualization: Olalekan Moses Olayemi.
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Conflict of Interest Disclosures

The authors declare that there is no conflict of interests.

Ethical Approval

Ethical clearance was obtained from the Babcock University Health Research Ethics Committee - BUHREC 433/21.

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