

Health information literacy of tuberculosis patients in DOT centers in Lagos state, Nigeria

Olalekan Moses Olayemi^{1*}, Ezinwanyi Madukoma², Haliso Yacob²

¹PhD Candidate, Information Resources Management Department, Babcock University, Ogun State, Nigeria

²Information Resources Management Department, Babcock University, Ogun State, Nigeria

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* Corresponding author:

Olalekan Moses Olayemi

PhD Candidate, Information
Resources Management Department,
Babcock University, Ogun State,
Nigeria

Email: Lekus2000@yahoo.com

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ABSTRACT

Introduction: Health information literacy can play a critical role in controlling and managing tuberculosis. Low knowledge of tuberculosis coupled with inadequate health information literacy may lead to poorer treatment outcome. Despite being one of the deadliest infectious diseases, there are few empirical studies on the health information literacy of tuberculosis patients in Nigeria. Therefore, this study investigated the health information literacy of tuberculosis patients in DOT Centers in Lagos State, Nigeria.

Material and Methods: The study employed a survey design. The sampling method used was a multi-stage sampling method. A total of twelve DOT Centers were selected across the three senatorial districts. A sample size of 310 Tuberculosis patients was drawn using Taro Yamane formula. A structured and validated questionnaire was used as instrument for data collection. Data were analyzed using SPSS (ver 23).

Results: The findings of the study revealed that respondents had a high level of health information literacy in their ability to identify specific health information needs, access information sources and use information. The respondents also demonstrate the ability to obtain health information more easily from printed sources than from the internet. However, their ability to understand health information easily and evaluate quality health information was low.

Conclusion: The study outcome indicates that health information literacy of the respondents can be enhanced. As a result, efforts should be made to educate tuberculosis patients on how to evaluate and comprehend health information by improving their understanding of health-related terminologies and assessing reliable health information.

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INTRODUCTION

Tuberculosis (TB) is a life-threatening disease that is rated as one of the deadliest infectious diseases globally. TB is an airborne disease; it is usually transmitted when individuals with infectious tuberculosis cough, sneezes, talk, or spit/droplets and, by so doing, expel tuberculosis bacilli into the air [1]; thus, the transmission is prevalent in congested and poorly ventilated areas. In 2017, Nigeria was said to be far worse hit by tuberculosis in Africa, after South Africa [2]. As a result of the Covid-19 pandemic, Lagos state was recently declared epicenter of tuberculosis in Nigeria. Tuberculosis is treatable and curable through taking appropriate drugs but

involves taken it daily for 6 - 9 months. However, if a patient refuses or fails to take their medication correctly, tuberculosis can become drug-resistance and require the stronger drug for a longer period [3, 4].

Drug treatment is not only the mode of controlling tuberculosis but also other factors such as adequate knowledge health or information can also play critical role in controlling and managing tuberculosis. One of the ways to involve patients in their treatment process is to provide them with accurate and vital information that will aid their understanding about their ailment. Tuberculosis patient needs critical information in order to make health decisions about

their ailment. This, however, will be largely determined by the patients' level of health information literacy. Health information literacy has been identified as one of the critical elements of the 'social infrastructure' of tuberculosis management and control. Thus, patients need knowledge and competence to explore health information resources in order to meet their information need [5, 6].

The concept of health literacy and health information literacy are sometimes used interchangeably. Both concepts are grounded in the complex concept of literacy, which itself includes multiple dimensions and characteristics [7]. Health literacy focuses on interactive communication between patients and health professionals about their health status or condition. Schardt⁸ buttressed that health literacy focus on consumers being able to understand the medical information given to them by caregivers or obtained from internet. Health information literacy, on the other hand, focus on discovery and search skills relating to health with the sole aim of improving everyday health functions [8]. According to Feinberg et al. [9] health literacy is a concept that is complex and dynamic and considers how people access, understand and use health information. Overall, the descriptions of health literacy and health information literacy relate to some extent as both concepts emphasize on the ability to recognize a health need, identify and use possible sources of information to collect relevant information; determine the accuracy of the information and its applicability to a particular situation; and analyze, understand and use the information to make good health decisions [10].

In the context of this study, health information literacy is the ability of tuberculosis patients to recognize health information needs, identify information sources, retrieve, evaluate, understand health information and use them in making good health decisions. The level of health information literacy of tuberculosis patients is one of the factors that can influence treatment outcome and health-related quality of life. As such, health information literacy refers to TB patients' ability and understanding of prevention, diagnosis, and treatment activities [11].

The exponential growth in health information sources as well as arrays of misinformation, especially on the internet has necessitated an increased need for health information literacy, which is defined as the ability to identify, evaluate and use health information appropriately. Therefore, the roles of health sciences librarian have evolved considerably in recent years. Health sciences librarians and media outlets are well-suited to contributing to the improvement of patients' health information literacy, particularly those undergoing chronic or protracted treatment. They not only provide health care professionals with access to

health information and raise awareness, but they also provide patients with health information literacy skills. These roles also include assisting families, patients, and the general public in locating credible health information so that they can use it to discuss health issues with medical professionals or seek out treatment.

Accordingly, health information literacy may be regarded as one of the major determinants of TB patients' health outcomes. Nevertheless, it has not received due attention, particularly among tuberculosis patients. Health information literacy of patients of pregnant women, heart failure patients and cancer survivors have been studied extensively [12-15] however, that of tuberculosis patients has not been adequately covered in Nigeria. Attempt have been made to study the information needs of tuberculosis patients [16], nevertheless, there is paucity of studies on TB health information literacy. It against this background that this study seeks to determine the level of health information literacy of tuberculosis patients in DOT centers in Lagos State, Nigeria.

MATERIAL AND METHODS

This study adopted survey design. The study population is comprised nine hundred and eighteen (918) TB patients receiving treatment in designated Directly Observed Treatment (DOT) Centres in Lagos State, Nigeria. Multi-stage sampling technique was used. The DOT Centers were chosen by multistage sampling as follows: six local government Areas (LGAs) were randomly selected across the three senatorial districts in the State, and two DOT Centers were selected from each of the LGAs. Thus, twelve DOT Centers were selected for the study. Sample size was determined using Taro Yamane sample size formula and the result gives 310.

Health information literacy was measured using the scale adopted from Akomolafe and Opeke [12] study measuring tool. The section consisted of 13-item health information literacy scale. The items were classified into six categories: ability to identify, access, retrieve, evaluate, understand and use health information. The response format was four-point Likert scale of Very High = 4; High = 3; Low = 2; Very Low = 1 to get the weighted mean. Validity of the instrument was confirmed by experts in the field of public health and health information management. The Cronbach's Alpha was used to test the internal consistency of the instrument and the result yield 0.72, indicating that the responses of the questionnaire were reliable.

The researcher obtained ethical approval for this study from Babcock University Health Research Ethics Committee - BUHREC 433/21. Social / administrative approval to conduct the study in the

DOT Centers was obtained from Lagos State Ministry of Health. In addition, permission was obtained from the respective DOT Centers selected. The main inclusion criteria were: registered patients with pulmonary tuberculosis who had been on treatment for more than two months, aged 18 years and above, and are mentally capable of providing consent. While the exclusion criteria are: pregnant women, extra-pulmonary tuberculosis patients, severely ill or debilitated patients and TB patients that did not give their consent. Written informed consent was obtained from the study respondents. Three hundred and ten (310) copies of the questionnaire were distributed to the tuberculosis patients, but only 298 copies were appropriately filled and validated for analysis indicating 96.1% response rate. The results were presented using descriptive analysis (tables, frequency counts, percentage distribution, mean and standard deviation).

RESULTS

Analysis of Demographic Characteristics of Respondents

The demographic information of respondents includes gender, age, marital status, highest educational qualification, occupational status. The demographic analyses are contained in Table 1.

The results of the study on gender are shown in Table 1. Out of the 298 respondents, 199 (66.8%) were males, while 99 (33.2%) were females. Majority of the patients 109 (37.5%) were in the age group of 30-41 years respondents, while the least was observed amongst those that above 66 years (2.1%). The mean age of the tuberculosis patients in the DOT centers in Lagos was 35.87 years (with standard deviation of ± 11.95 years). 152 (51.0%) of the tuberculosis patients were married, 1.0% were separated, while 1.7% were divorced. Table 1 also indicates that tuberculosis patients with secondary education 140 (47%) have the highest educational qualification, while those without formal education is the least 28 (9.4%). One hundred and forty-eight (49.7%) of the TB patients accessing treatment in DOT centers studied were self-employed.

Respondents were asked to indicate their level of health information literacy. The result of Table 1 showed that the level of health information literacy of tuberculosis patients in Lagos State, Nigeria, was high ($\bar{x}=2.63$), on a scale of 4. Further analysis shows that four indicators of health information literacy namely

ability to identify information ($\bar{x}= 2.90$), access information ($\bar{x}=2.81$), use information ($\bar{x}=2.79$) and retrieve information ($\bar{x}=2.55$) had high ratings, while ability to understand information ($\bar{x}=2.43$), and evaluate information ($\bar{x}=2.29$) indicated low ratings on the measurement scale. The reason for low score in ability to understand information resources is due to poor rating in participants' ability to understand health-related terminologies ($\bar{x}=2.35$).

Table 1: Respondents' Demographic Information

Demographic Variables		n	%
Gender	Male	199	66.8
	Female	99	33.2
	Total	298	100
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 (SD)	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
Highest educational qualification	No formal education	28	9.4
	Primary	41	13.8
	Secondary	140	47.0
	University/Tertiary	89	29.9
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	29	9.7

Furthermore, the respondents' low ratings in ability to evaluate information are due to low scores in areas such as assessing the reliability of printed sources ($\bar{x}=2.42$), judging the reliability of health information on the internet ($\bar{x}=2.29$), and inability to critically assess health issues ($\bar{x}=2.15$). The implications of this result show that respondents can easily identify their information needs, access information, use the information retrieved, while low level of health information literacy was reflected in their ability to understand and evaluate information (Table 2).

Table 2: Level of health information literacy of tuberculosis patients

	Level of health information literacy	Very High Level (4)	High Level (3)	Low Level (2)	Very Low Level (1)	Mean	Std.
	Ability to identify					2.90	0.73
1	My ability to identify needed information about my health is - -	72(24.2%)	141(47.3%)	74(24.8%)	11(3.7%)	2.92	0.80
2	My ability to know when there is need for me to seek information about my health is - -	61(20.4%)	154(51.7%)	72(24.2%)	11(3.7%)	2.89	0.76
	Ability to access					2.81	0.69
3	My ability to get health information from variety of sources is - -	55(18.5%)	143(48.0%)	90(30.2%)	10(3.3%)	2.82	0.77
4	My ability to know where to seek health information is - -	42(14.1%)	163(54.7%)	83(27.9%)	10(3.3%)	2.80	0.72
	Ability to use					2.79	0.72
5	My ability to apply health related information to my own life is - -	48(16.1%)	168(56.4%)	64(21.5%)	18(6.0%)	2.83	0.77
6	My ability to apply the understood health information for taking decisions about my health is - -	52(17.4%)	137(46.0%)	90(30.2%)	19(6.4%)	2.74	0.82
	Ability to retrieve					2.55	0.82
7	My ability to easily get health information from printed sources (magazines and books) is - -	48(16.1%)	104(34.9%)	124(41.6%)	22(7.4%)	2.60	0.84
8	My ability to easily get health information from the Internet is - -	50(16.8%)	103(34.6%)	90(30.2%)	55(18.4%)	2.50	1.00
	Ability to understand					2.43	0.83
9	My ability to easily comprehend statements is - -	30(10.1%)	140(47.0%)	81(27.2%)	47(15.7%)	2.51	0.88
10	My ability to understand health related terminologies is - -	35(11.7%)	98(32.9%)	109(33.9%)	64(21.5%)	2.35	0.95
	Ability to evaluate					2.29	0.82
11	My ability to assess the reliability of health information in printed sources (magazines and books) is - -	45(15.1%)	91(30.5%)	105(35.2%)	57(19.2%)	2.42	0.97
12	My ability to judge the reliability of health information on the internet is - -	30(10.1%)	89(29.9%)	117(39.2%)	62(20.8%)	2.29	0.91
13	My ability to critic health issues is - -	19(6.4%)	87(29.2%)	111(37.2%)	81(27.2%)	2.15	0.89

Health Information Literacy (Average Weighted Mean = 2.63)

Key: VHL = Very high level, HL = High level, LL= Low level, VLL = Very Low Level*** Decision Rule: if mean is ≤ 1.0 1.74 = Very Low, 1.75-2.49 = Low, 2.50-3.24 = High, 3.25-4.0 = Very High.

DISCUSSION

This study investigated the health information literacy of tuberculosis patients in DOT Centers in Lagos State, Nigeria. The result showed a high level of health information literacy among tuberculosis patients in DOT Centers in Lagos State, Nigeria, with an average weighted mean of 2.63 on a scale of 4 points. The study outcome demonstrated respondents' ability to identify, access, retrieve and use health information within their reach. This outcome may be attributed to the fact that most of the respondents in this study had basic educational qualification. Education is likely to play a role in their ability to identify specific health information needs, access, retrieve, evaluate, understand and use of health information. This may have subsequently increased their knowledge and health management because it allows for more flexibility in life and

encourages self-care, both of which lead to fewer physical problems and better care, and thus improved physical and psychological functioning. This result corroborates the study by Oladunjoye et al. [17] who evaluated functional health literacy among TB patients in North Central, Nigeria. Overall, functional health literacy was found to be high. This finding contradicted with other studies in different populations. The study result disagreed with the findings of Khammarnia et al. [14] done in Iran, who found that that most patients' health literacy is limited, and hence they suffered from a lack of information about their disease. In addition, the result disagreed with the study conducted by Akomolafe and Opeke [12] who discovered a low level of maternal health information literacy among pregnant women in Ekiti State, Nigeria. Similarly, findings from Jovanić et al. [18]; and Strijbos et al. [19] done in Serbia and the Netherlands respectively, revealed that a majority of their study respondents

had poor health literacy.

Another significant finding of this study is that, the respondents demonstrate the ability to obtain health information more easily from printed sources (magazines, books, leaflets etc) than from the internet as indicated based by the study scale / ratings. This implies that a considerable number of tuberculosis patients have access to and use health information from printed sources. This finding supported the result of Iorver [20] done in Nigeria, who discovered that their respondents used printed health information resources more than electronic information resources, though the resources were utilized to a low extent.

The finding of the present study also revealed that the respondents used internet, though at a lower rate when compared to printed sources. This could be attributed to lack of access or skills for navigating the internet. This finding contradicted the result of Olayemi and Abolarinwa [16] conducted in a DOT Centre in Lagos State, Nigeria. They found out that most of their respondents commonly used the internet via their mobile phone for accessing e-health information. Hence, the patients considered the internet as “very useful” and “very important” in helping them in making decisions about their ailment. Their study outcome may be attributed to the fact that the study area was Lagos metropolis; hence the TB patients attending the DOT Centres were probably well-educated with reasonable level of income and knowledge about the internet. This finding is also supported by Yusuf and Alhaji [21] done in Nigeria, who discovered that high proportion of the patients are internet users and are knowledgeable on the use of internet and how to search for information. Although the internet provides valuable health information, quality of such information is a great concern. Hence, it is an indispensable prerequisite to be skillful in evaluating the relevance and credibility of health information on the internet. Meanwhile, a higher educational level is linked to self-efficacy and a positive attitude toward internet resources.

This result is at variance with the findings of Ladd [22], who discovered that though the participants reported preferring information from their healthcare providers, they frequently sought information from the internet more than any other sources. This outcome may be influenced by their respondents' high level of education and level of internet access. Notwithstanding, the results of this study show that a significant number of tuberculosis patients get their health information from the internet. This suggests that the internet, as a new source of health information, has the potential to provide self-management information and coping mechanisms to tuberculosis patients in Nigeria. Generally, patients need variety of health information related to their health problems, however, the choice

of information sources used may be influenced by their level of education, income, occupation, and the availability of information sources.

Another major finding of this study also showed that tuberculosis patients indicated low level ability to understand and evaluate retrieved health information. This implies that the ability to easily comprehend statements, understand health-related terminologies, assess the reliability of health information sources (magazines, books, internet) and critic health issues remains a significant challenge. The inability to evaluate quality information may lead to harmful consequences, and subsequently increase patient's vulnerability. This may serve as a potential risk factors for tuberculosis patients. This demonstrates that patients with tuberculosis may not have been getting relevant and reliable health information to satisfy their health information needs, thus implying that many of the patients are likely to have an information gap. This outcome supported the finding of Oladimeji et al. [23] done in Nigeria, who found that their respondents (TB patients) could not fully assimilate the information given by the health care providers. Hence, a high proportion of poor perception of TB illness among them.

While health information resources can be very useful and empowering patients to make appropriate health decisions, they can also be confusing and overwhelming if patients lack the ability to understand and evaluate the information that is retrieved. This can be even more damning and dangerous given the prevalence of inaccurate health information, particularly on the internet. As a result, the ability to comprehend and evaluate health information can assist patients in resolving insufficient knowledge, which may manifest as a gap between what is known and unknown about their illness and treatment. In such a way, errors can be reduced minimally. Therefore, ability to identify information needs, access, retrieve health information is not only a function of use, but also of understanding and evaluating the same. Consequently, it is important to be able to access and evaluate the quality of health information because it is an important mechanism for managing and coping with any form of ailment.

CONCLUSION

It is imperative to consider health information literacy of patients with tuberculosis from a professional information perspective. This is critical because these patients spend every day of their lives, recognizing disease symptoms and attempting to respond appropriately in order alleviate the scourge. According to the findings of the study, tuberculosis patients in DOT Centers in Lagos State had a high level of health information literacy. The study respondents also demonstrated the ability to identify

specific information needs, access information sources, retrieve relevant information, and use health information. However, their ability to understand health information easily and evaluate quality health information was low. Based on findings of the study, the study recommended that healthcare providers and media outlet should direct their educational programs and efforts to enlightening TB patients through the use of vernacular, audio-visual and pictorial information in order to improve their understanding health of information. More so, health professionals and health sciences librarians should collaborate by compiling list of trustworthy TB websites on the internet and make it available in the DOT Centers via placards, notice boards or leaflets.

One limitation of the study is that health information literacy was assessed using an individual subjective rating, so respondents may have overestimated or underestimated themselves. Despite, this limitation, the study outcome draws the attention of health care professionals to the need to adequately support the health information literacy and developed effective strategies to improve TB patient's knowledge about their ailment.

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AUTHOR'S CONTRIBUTION

OM conceptualized and designed the study, performed the data collection, data analysis and drafts the manuscript. EM supervised and reviewed the study draft manuscript. HY helped in the conceptualization of the topic and made critical revisions to the work.

All authors contributed to the literature review, design, data collection and analysis, drafting the manuscript, read and approved the final manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

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No financial interests related to the material of this manuscript have been declared.

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