

Concerns about the knowledge and attitude of multidrug-resistant tuberculosis among health care workers and patients in Delta State, Nigeria

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Abstract

Background: Inadequate knowledge and wrong perception of multidrug-resistant tuberculosis (MDR-TB) by Health Care Workers (HCWs) and patients are detrimental to tuberculosis control programs.

Objective: The aim was to assess the knowledge and attitudes of HCWs and TB patients about MDR-TB in Delta State, Nigeria.

Materials and Methods: A cross-sectional study was carried out among HCWs and TB patients in Delta State, Nigeria. Data were collected using a structured interviewer-administered questionnaire and analyzed using IBM SPSS Statistics version 20.

Results: Ninety-six HCWs and 114 TB patients were studied. The HCWs (mean age 43.0 ± 10.1 years) were older than the patients (mean age 41.7 ± 16.9 years). A higher proportion (54.2%) of HCWs had tertiary education, but only 15% of the patients had above secondary education. Eight (8.3%) HCWs and majority (60.5%) of the patients had no knowledge about of MDR-TB. Only 18.4% of patients compared to 61.5% of HCWs had good knowledge of MDR-TB. Both groups demonstrated a positive attitude toward MDR-TB.

Conclusion: The knowledge of MDR-TB was poor among the TB patients studied as well as among HCWs with low educational status. MDR-TB training program for both HCWs and patients need to be re-structured to allow for greater gain in MDR-TB knowledge among both groups, which in turn may help improve compliance and treatment outcomes among patients.

Key words: Health care workers, multidrug resistant tuberculosis, Nigeria, tuberculosis patients

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Introduction

Multidrug-resistant tuberculosis (MDR-TB) is an emerging complication of tuberculosis (TB). It is either a primary resistance or an acquired resistance to the anti-TB drugs.^[1,2] The World Health Organization (WHO) has estimated a worldwide prevalence of the disease at about 500,000 (range of 450,000–650,000),^[3] and that 210,000 new cases of all forms of TB occurred in Nigeria in 2010, equivalent to 133/100,000 population.^[4] The Nigeria 2012 estimates of MDR-TB burden showed that 2.9% and 14% of new cases and retreatment TB cases

respectively were MDR-TB.^[5] The treatment of MDR-TB is rigorous, expensive and inconveniencing. Thus, many patients are afraid to cope with it and this result in the possibility of defaults, incomplete treatment and further complications.

Multidrug resistant tuberculosis has become a public health concern in Nigeria because of its demand on the health care workers (HCWs) and the health care systems in terms of facilities and operations, the risk of

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transmission of the infection, the morbidity and mortality involved and the discouraging treatment outcome. The success of treatment depends on various factors, ranging from political will of the government, health system strength and organization, procurement and supply management and factors that are modifiable by HCWs/patients and their environments. HCWs and patients' attitude towards management of the disease depends upon their knowledge and perception of the disease and the management process, which in turn, determine health seeking behaviors.

Inadequate knowledge and wrong perception about TB and MDR-TB by HCWs and patients are detrimental to TB control programs as it increases nonadherence and treatment default rate.^[6,7] On the other hand, this may be responsible for the shortage of manpower in TB referral centers. The knowledge and attitude of HCWs towards MDR-TB will determine the type and quality of information passed on to the patients during health education. Inadequate or incomplete information passed on to the patients create wrong perceptions in them or strengthen the patients' negative perceptions which are mostly inimical to appropriate health seeking behavior, thereby reducing the chances completing treatment and achieving cure.^[6-9]

Therefore, our hypothesis is that the knowledge and attitude of HCWs towards MDR-TB will influence the health care delivery systems while that of the patients will influence treatment outcomes. To the best of our knowledge, the knowledge and attitude of both HCWs and TB patients about MDR-TB in Delta State of Nigeria has not been documented in the literature. Therefore, this study was designed to assess the knowledge and attitude of HCWs and patients towards MDR-TB in Delta State, Nigeria. The data from this study will be used to suggest how MDR-TB treatment outcomes might be improved on in Delta State, Nigeria.

Materials and Methods

Study design/setting

This cross-sectional study was carried in a TB and Leprosy (TBL) Referral Hospital, located in Eku, Delta State, Nigeria from January to March 2013. The hospital serves as a referral center for TBL patients in the state. There are six wards in the hospital for in-patients; five for TB patients and one for leprosy patients on admission for ulcer care, leprosy reactions and other medical and surgical nonleprosy conditions. The HCWs in the hospital included a medical doctor (who did not participate in the study), Nurses, Laboratory Scientist/Technician, Pharmacy Technician/Assistants, Community Health Extension Workers (CHEWs) and Environmental Health Officers.

Other staffs of the TBL Control Program are TBL focal persons in the 25 Local Government Areas of the state who are responsible for the care of TB patients in other hospitals in the state. HCWs in the TBL control program were trained periodically on MDR-TB by staff of the National TBL Control Program in the Federal Ministry of Health and the German TBL Relief Association. These trainings usually take the form of workshops and seminars.

Study population

The study population comprised of all HCWs working with the State TBL Control Program (with the exception of the medical doctor) and adult TB patients aged 18 years and above who have registered with the program for at least 2 months, irrespective of their status or categorization. The minimum of 2 months registration was to ensure that they have had enough contact with HCWs with respect to health education about TB and MDR-TB.

Sample size determination and recruitment

The minimum sample size required for this study was calculated using the formula for sample size calculation in a descriptive study ($n = z^2pq/d^2$). Using a prevalence of 8% (the proportion of respondents who were knowledgeable about TB in a previous study in Nigeria),^[10] 5% precision, 95% confidence interval and adjusting for 10% nonresponse, the calculated sample size was 124. The TB patients were recruited consecutively as they come for treatment while a total population survey was done for the HCWs.

Data collection and statistical analysis

The instrument for data collection was a structured interviewer-administered questionnaire. The questionnaire was pretested in Baptist Government Hospital, Eku after which necessary corrections were made before the commencement of the study. The questionnaire contained sections on the respondents' bio-data and general information, knowledge of MDR-TB and attitudes toward MDR-TB. Six questions were used to assess the respondents' knowledge while five questions were used to assess their attitude towards MDR-TB. For knowledge, answers to the questions were graded as correct, partially correct and incorrect, and two points, one point and zero point were allocated to the answers respectively. Thus the maximum point for knowledge was 12 and the total score by respondents were converted to a percentage, which was used to categorize the respondents as follows: <25%-poor knowledge, 25–50%-fair knowledge, 51–75% good knowledge and >75%-excellent knowledge. For attitude, each correct answer was scored two points while an incorrect answer was scored zero point giving a maximum that a respondent can obtain to be 10. After converting to percentages, an attitude score of <50% constituted

negative attitude while 50% and above was taken as positive attitude.

Data were analyzed using IBM SPSS Statistics version 20 Statistical Software Program (IBM Corp, Armonk, NY, USA). Chi-square and Fishers exact tests were used to test for associations between the sociodemographic characteristics of the respondents and their knowledge of MDR-TB. The level of significance was set at $P < 0.05$ which corresponds to the 95% confidence interval.

Ethical consideration

This study was approved by the Ethics and Research Committee of the University of Benin Teaching Hospital. Informed written consent was also obtained from participants before questionnaires were administered with confidentiality was assured.

Results

Two hundred and ten respondents comprising 96 HCWs and 114 TB patients participated in the study. Table 1 shows their sociodemographic characteristics. The mean age of the patients was lower than that of the HCWs. Majority (74.0%) of the HCWs were in the age group 35–54 years. A higher proportion of the patients (79.0%) were aged between 18 and 54 years. In both HCWs and patients, females constituted of a higher proportion of the respondent, 59.4% and 57.9% respectively. More than half (54.2%) of the HCWs had tertiary education, but secondary level of education was more predominant among the patients while few of the patients (12.3%) had no formal education. Health assistants (35.4%), nurses (26.0%) and CHEWs (17.7%) constituted a higher proportion of the HCWs studied [Figure 1]. Of the HCWs studied, $< \frac{1}{2}$ (46.9%) had been trained on MDR-TB, but a little more than half (52.1%) have given health education to patients regarding MDR-TB. Less than a quarter (23.7%) of the patients have received health education on MDR-TB from HCWs.

The knowledge and attitude of the respondents about MDR-TB is shown in Table 2. The knowledge assessed in the study included knowledge of the correct meaning of MDR-TB, the names of the drugs to which MDR-TB is resistant, whether MDR-TB is a treatable condition and the duration of treatment of MDR-TB. The composite scores of the respondent showed that a higher proportion (60.5%) of the patients had no knowledge of MDR-TB. Only 18.4% of the patients had good knowledge of MDR-TB. For the HCWs, a higher proportion (61.5%) of them had good knowledge of MDR-TB while only 8.3% had no knowledge of MDR-TB. A higher proportion of both HCWs (71.9%)

and patients (67.5%) showed a positive attitude toward MDR-TB.

Tables 3 and 4 show the result of the bivariate analyses of the sociodemographic characteristics of the respondents and their knowledge of MDR-TB. For the purpose of cross-tabulation, the variables none, poor and fair knowledge were merged and re-coded as poor knowledge. Only the level of education was statistically associated with knowledge of MDR-TB among the HCWs ($P = 0.02$) but not among the patients ($P = 0.88$).

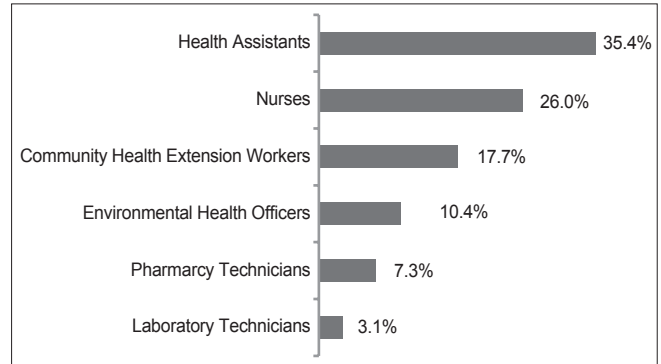


Figure 1: Category of health care workers studied

Table 1: Sociodemographic characteristics of respondents

Variables	HCWs (n=96) n (%)	Patients (n=114) n (%)
Age group (years)		
15-34	16 (16.6)	45 (39.5)
35-54	71 (74.0)	45 (39.5)
≥ 55	9 (9.4)	24 (21.0)
Mean age (years)	43.0 ± 10.1	41.7 ± 16.9
Sex		
Male	39 (40.6)	48 (42.1)
Female	57 (59.4)	66 (57.9)
Level of education		
None	0 (0.0)	14 (12.3)
Primary	20 (20.8)	32 (28.0)
Secondary	24 (25.0)	51 (44.7)
Tertiary	52 (54.2)	17 (15.0)

HCWs=Health care workers

Table 2: Knowledge and attitude about MDR-TB by HCWs and TB patients

Variable	HCWs (n=96) n (%)	Patients (n=114) n (%)
Knowledge		
None	8 (8.3)	69 (60.5)
Poor	12 (12.5)	9 (7.9)
Fair	17 (17.7)	15 (13.2)
Good	59 (61.5)	21 (18.4)
Attitude		
Positive	69 (71.9)	77 (67.5)
Negative	27 (28.1)	37 (32.5)

MDR-TB=Multidrug resistant tuberculosis; HCWs=Health care workers; TB=Tuberculosis

Table 3: Sociodemographic characteristics by HCWs' knowledge of MDR-TB

Variables	Knowledge of MDR-TB		P
	Poor n (%)	Good n (%)	
Age group (years)			
15-34	7 (43.7)	9 (56.3)	0.20
35-54	29 (40.8)	42 (50.2)	
55-74	1 (11.1)	8 (88.9)	
Sex			
Male	15 (38.5)	24 (61.5)	0.99
Female	22 (38.6)	35 (61.4)	
Level of education			
Primary	13 (65.0)	7 (35.0)	0.02*
Secondary	6 (25.0)	18 (75.0)	
Tertiary	18 (34.6)	34 (65.4)	
Training on MDR-TB			
Yes	19 (42.2)	26 (57.8)	0.49
No	18 (35.3)	33 (64.7)	

*Statistically significant. MDR-TB=Multidrug resistant tuberculosis; HCWs=Health care workers

Table 4: Sociodemographic characteristics by patient's knowledge of MDR-TB

Variables	Knowledge of MDR-TB		P
	Poor n (%)	Good n (%)	
Age group (years)			
15-34	36 (80.0)	9 (20.0)	0.17
35-54	40 (88.9)	5 (11.1)	
≥ 55	17 (70.8)	7 (29.2)	
Sex			
Male	36 (75.0)	12 (25.0)	0.12
Female	57 (86.4)	9 (13.6)	
Level of education			
None	12 (85.7)	2 (14.3)	0.88
Primary	27 (84.4)	5 (15.6)	
Secondary	41 (80.4)	10 (19.6)	
Tertiary	13 (76.5)	4 (23.5)	
Education on MDR-TB			
Yes	23 (85.2)	4 (14.8)	0.41
No	70 (80.5)	17 (19.5)	

MDR-TB=Multidrug resistant tuberculosis

Discussion

This study revealed that the level of knowledge about MDR-TB was positively associated with the educational status of the HCWs but not that of the TB patients. Participation in MDR-TB training program was not associated with greater knowledge among either the HCWs or the patients.

Nigeria is ranked 5th among the 22 high TB burden countries, which collectively bear 80% of the global burden of TB.^[11] This situation is worsened by the fact that the country is also ranked 15th among the 27 MDR-TB high-burden countries

in the world as 2.9% of all new cases and 14% of retreatment cases are MDR-TB.^[12] The knowledge of this major public health problem by both HCWs and TB patients is very vital in the control of both TB and MDR-TB.

In this study, $\frac{1}{2}$ of the HCWs admitted to have received formal training on MDR-TB, but 61.5% of them had good knowledge of MDR-TB. The educational status of the HCWs was associated with knowledge of MDR-TB. A similar result was reported by White in a survey on the knowledge, attitude and practices on TB among healthcare workers in Kingston and St. Andrew, Jamaica.^[13] This finding is important so that efforts can be made to increase the knowledge of MDR-TB in less educated HCWs. Such an intervention may be important if it is explored further because the knowledge of HCWs may determine the information passed on to the TB patients during health education sessions. This finding however, contrasted a study in southeastern Nigeria in which frontline TB HCWs had poor knowledge about TB despite the fact that the 83% of the HCWs had tertiary level of education when compared with 54.2% in our study.^[14] Inadequate or incomplete information passed on to the TB patients by HCWs would create wrong perceptions in them or strengthen the patients' own perceptions, which are often times based on cultural beliefs and misconceptions.

Many studies in Nigeria and other parts of the world have shown that patients' misconception about TB is mostly inimical to appropriate health seeking behavior, thereby reducing the chances of completing treatment and achieving cure.^[15-19] We also found that most HCWs were not engaging in the health education of their TB patients in the course of their duty. Only about half of HCWs engaged in health education within a period of 3 months (approximately, 90 days of virtually daily HCWs-patients contact) covered by the study out of which 68.0% gave between 1 and 5 times, 8.0% gave health education between 6 and 10 times and 24.0% gave health education >10 times. This is definitely inadequate for a procedure that is supposed to be carried out daily. It therefore means that the HCWs have not been utilizing the advantage of the training they had acquired, thereby denying the TB patients the benefit of health education on TB and MDR-TB, which is crucial if the WHO stop TB strategy and target that is to ensure that the prevalence of TB was halved by 2015, in line with the Millennium Development Goal (MDG) 6 is to be achieved.^[20] Another possible reason for this may be the fact the seminars and workshops used in training the HCWs seem to be ineffective in driving home the point on what they ought to know and eventually pass on to TB patients about MDR-TB. A simplified method of training that is culturally acceptable and directed at HCWs with lower level of education is advocated to improve HCWs knowledge about MDR-TB and their ability to educate TB patients.

The knowledge of patients regarding MDR-TB was generally poor in this study. This was not surprising because many studies in Africa and other parts of the world have documented that TB patients lack basic knowledge of etiology, transmission and duration of treatment of TB itself.^[17,18,21-24] However, Anochie *et al.* reported a high awareness and knowledge of TB among residents of a rural community in south-east Nigeria.^[25] In general, lack of awareness and knowledge about a disease is inimical to the control of the disease in any population. It is a common practice for patients to seek information from a wrong source like neighbors, traditional healers, churches, etc., This may worsen their condition by creating wrong perception about the disease and negative health-seeking behaviors. In the case of TB, it has been shown in many studies that poor knowledge and wrong perceptions was responsible for the delay in seeking health care in a health facility, treatment default and stigmatization of TB patients.^[6,7,18,22] All these are contributing factors to the rising prevalence of MDR-TB and this poses a major challenge to many National TB Control Programs. Odusanya and Babafemi^[15] in Lagos, Nigeria reported that the majority of TB patients do not present early to the health facilities while Kaona *et al.*^[17] in Ndola, Zambia established that 29.8% of TB patients failed to comply with TB drug taking once they started feeling better.

The attitude of HCWs and patients regarding MDR-TB was encouraging in this study, even though, few patients still expressed incorrect beliefs such as MDR-TB being the result of “evil attack.” This positive attitude by both HCWs and patients can serve as a veritable tool for improving patient’s health-seeking behavior, compliance with prescribed treatment regimen and treatment outcome.

A limitation of this study is that information on attitude regarding MDR-TB was assessed using a questionnaire therefore responses obtained are prone to information bias. A qualitative method such as focus group discussion would have been more appropriate to explore beliefs and attitudes relating to MDR-TB.

Conclusion

The knowledge of MDR-TB was poor among the TB patients studied as well as among HCWs with low educational status. This finding calls for a serious concern if Nigeria is to achieve MDG 6 by 2015. Although both HCWs and TB patients demonstrated a positive attitude toward MDR-TB, training program for both HCWs and patients need to be re-structured to allow for greater gain in MDR-TB knowledge among both groups, which in turn may help improve compliance and treatment outcomes among patients.

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