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Awareness and Knowledge of Health Care Workers at Dots Facilities on the Management of Tuberculosis in Lagos, Nigeria: A Public - Private Comparison

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Authors' contributions

This work was carried out in collaboration between all authors. Author OAA conceived the study, involved with data collection, data analysis and discusssion. Author OJD wrote the methodology and was involved in the writing process. Author YAK was involved in data collection and proof reading the manuscript. Authors KOW and EOJ was involved with data collection and literature search while author OOO supervised the research. All authors read and approved the final manuscript.

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ABSTRACT

Background: The success of the directly observed treatment short course (DOTS) strategy depends on the ability of the health-care system to identify and follow-up tuberculosis (TB) suspects. This study compared the knowledge of private and public DOTS providers in Lagos State Nigeria regarding the symptoms and management of TB.

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Methods: A descriptive comparative cross sectional study was conducted between July to October 2012. Knowledge of 84 health workers (64 from public DOTS facilities and 20 from private DOTS facilities) from 34 randomly selected DOTS facilities under the Lagos State TB and leprosy control programme was assessed. Statistical package for social sciences (SPSS) version 19 was used for analysis.

Results: The mean age of the health workers at the public DOTS facilities was significantly higher (42.8±7.0 years) than those at the private DOTS facilities (37.3±5.1 years) (P = 0.002). Doctors constituted about 36% and 15% of health workers at the public and private DOTS facilities respectively. A significantly higher proportion of health workers at the private DOTS facilities (35.0%) had poor knowledge of TB management compared with those (10.9%) at the public DOTS facilities (P = 0.03). However, a higher proportion (85.9% vs 60.0%) of health workers that had fair knowledge of TB management were from the public DOTS facilities (P = 0.02) while 3.1% and 5% of health workers that had good knowledge were from the private and public DOTS facilities respectively.

Conclusion: There is an urgent need to develop effective strategies to improve the capacity of healthcare providers in both private and public DOTS facilities in Lagos State, Nigeria.

Keywords: Knowledge; health care workers; TB management; Nigeria.

1. INTRODUCTION

The involvement of all health-care providers in tuberculosis (TB) control is recommended by the World Health Organization (WHO) as an essential component of the Stop TB Strategy [1]. This collaborative intervention known as public-private mix (PPM) aims at engaging private health care providers to ensure TB patients have access to quality assured services [2]. This intervention was necessary because health care providers in the private sector have become a significant part of the health care system by providing health care services to large population in some countries including Nigeria [3,4]. As a result, they are considered to be an important source of care for the poor even where public services are widely available [5]. In some developing countries, the private providers not only out number public health care providers, they offer better geographical access and more personalized care than the public facilities. On the contrary, they frequently do not follow the directly observed treatment short course (DOTS) treatment recommendations for managing TB hence the TB patients they serve are often deprived of the benefits of standard and rational treatment [6]. It was postulated that involving the private providers in managing and notifying TB patients could increase case detection, reduce diagnostic and treatment delay and enhance patient's access to and acceptance of DOTS services. To achieve this, appropriate knowledge and practice among private practitioners is however necessary [7].

Like most countries with significant burden of TB, patients with TB symptoms in Nigeria often seek and receive care from providers which include private providers and public health care institutions outside the purview of the National Tuberculosis Programme (NTP) [6]. However, success of DOTS strategy depends not only on the ability of the health-care system to identify TB suspects but also follow-up these suspects until they are cured [8]. This has been found to be necessary for a successful TB control program and prevention of drug resistance [7].

The 2012 national prevalence survey revealed that 75% of Nigerians with TB have readily identifiable symptoms but health care providers have low index of suspicion because about 80% of TB cases remain undiagnosed and untreated [9]. Studies from Pakistan, India, Korea and Nigeria have demonstrated poor knowledge of the private practitioners regarding the diagnosis, treatment regimen of new and retreatment TB cases, duration of treatment and outcome evaluation [10-15]. Studies conducted in Nigeria either assessed the knowledge of private healthcare practitioners outside the NTP or compared them with public health care providers within the NTP [14,15]. This study compared the knowledge of private and public DOTS providers engaged in the PPM DOTS MIX in Lagos State Nigeria.

2. METHODS

2.1 Study Setting

Lagos State is the commercial nerve centre of the Nigeria with 20 Local Government Areas (LGAs) and estimated population of 21 million [16]. Health care services in Lagos State are

provided by both the public and private sector and are organized at primary, secondary and tertiary care level. There were 288 public health care facilities (3 tertiary, 35 secondary and 253 primary health care), 1981 private health care facilities (1922 private for profit and 59 private not for profit) in Lagos State at the end of 2012. From the National TB prevalence survey conducted in 2012, the prevalence of smear positive TB was 318/100,000 population [14] and Lagos state is said to accounts for 11% of the total TB cases notified in the country in 2012. The TB case detection and TB/HIV prevalence rate in Lagos in 2012 was 20.7% and 19.7% respectively.

The Lagos State TBL control programme (LSTBLCP) started in 2003 with the collaboration between the State Government and some international organizations which include; international organization like the International Union against TB and Lung Diseases (IUATLD), World Health Organization (WHO), Canadian International Development Agency (CIDA) and the United States Agency for International Development (USAID). The private sector participation in DOTS management of TB started in 2008. To be eligible, the PPs must be willing to offer TB services covered under the national TB programme free of cost to the patients in accordance with the NTBLCP guidelines and must undergo training on the NTP guidelines for TB management. The laboratory technicians were also required to undergo modular training in microscopy as per the NTBLCP guidelines. Recording and reporting materials, drugs and other consumables were given to the PPs before they commenced operation. Based on the capacity and interest of the PPs, they were assigned to any of the three schemes for collaboration. Scheme one known as “referral of patients suspected of having TB”. In this scheme, PPs refer patients or send sputum patients suspected of having TB to a NTBLCP approved treatment/microscopy center. Scheme two known as ‘Provision of Directly Observed treatment”. Private practitioners in this scheme provide DOTS to patients as per the NTBLCP guidelines. Those under scheme three can either serve as an approved microscopy center under NTBLCP (Microscopy center only) or serve both as treatment and microscopy center. There were 130 TB treatment facilities offering directly observed treatment short course (DOTS) in Lagos State at the end of 2011. There were 99 public, 31 private health care facilities (20 PFP and 11 PNFP).

2.2 Study Design

A descriptive comparative cross sectional study was conducted to compare the knowledge of public and private DOTS providers in Lagos state on the diagnosis and treatment of TB between July to October 2012. A sampling frame of 130 DOTS facilities provided by the Lagos state programme officer (99 public and 31 private DOTS facilities) was used to select, 34 DOTS facilities (23 from public and 11 private) that served as both microscopy and treatment centers and were involved in the DOTS programme for at least 2 years. All consenting health care workers who were directly involved with management of TB patients at the selected DOTS facilities were recruited into the study.

A structured pre tested questionnaires was administered on health personnel at the selected DOTS facilities after a written consent was obtained. The questionnaire administered had two sections: The first section collected socio demographic data of the health workers while the other section assessed the knowledge of the health workers on the symptoms, diagnosis, treatment and consequences of poor adherence to TB treatment.

2.3 Evaluation of Knowledge of Health Workers on TB Management

Knowledge of the health workers concerning TB was assessed using their responses to a set of 14 questions which assessed their knowledge on symptoms of TB, laboratory diagnosis of TB and follow up, treatment of TB and consequence of poor treatment adherence. Correct answer to each question was scored 1 mark while wrong answer was scored zero, giving a total of 30 marks. Using the criteria established in a study conducted in Lagos among nurses [17], health workers who obtained scores of less than 50% were classified as having “Poor” knowledge, those who obtained scores of 50% - 74.9% were classified as having “Fair” knowledge while those whose scores were 75% and above were classified as having “Good” knowledge.

2.4 Data Analysis

Data was analysed using the Statistical Package for Social Sciences (SPSS) version 19. Mean and standard deviation were calculated for numerical data while percentages were calculated for both numerical and categorical

data. Student 't' test was used to compare means and Chi square was used to compare categorical data. The confidence interval was set at 95% for all statistical tests.

2.5 Ethical Approval

The study was approved by the Health Research Ethics Committee of the Lagos State University Teaching Hospital. Written Informed consent was obtained from all respondents before recruitment into the study.

3. RESULTS

The mean age of the health workers at the public DOTS facilities (42.8±7.0 years) was significantly higher than those at the private DOTS facilities (37.3±5.1 years) (P = 0.002). Over three quarter of the health workers at the public and private DOTS facilities were females and about 60% had been trained on DOTS management of TB patients at least two years preceding the study. The doctors constituted about 36% and 15% of health workers respectively at the public and private DOTS facilities as shown in Table 1. Table 2 shows that over two thirds of health workers at the public and private DOTS facilities thought that cough, heamoptysis, night sweats, tiredness, chest pain and low grade fever were the symptoms of TB. There was no significant difference in the knowledge of health workers at the selected public and private DOTS facilities regarding the symptoms of TB. However a significantly higher proportion (93.8%) of health workers at the public DOTS facilities thought chest pain was a symptom of pulmonary tuberculosis (P = 0.03). There was no significant difference in the knowledge of the health workers at the public and private DOTS facilities studied regarding the method of TB diagnosis, number of sputum samples required for TB diagnosis, time for sputum collection and the period for the collection of the first follow sputum for AFB in new and retreatment cases (P > 0.05) as shown in Table 3. Table 4 shows that about 90% of health workers at the public and private DOTS facilities were not aware of the classification of pulmonary TB. In addition, less than half and over two thirds of the health workers at the public and private DOTS facilities studied did not know the side effects of anti-TB drugs. There was no significant difference in the knowledge of the health workers at the public and private DOTS facilities studied with regards to the number of treatment categories, number of TB drugs and their combinations for new and retreatment cases. The mean knowledge score of health workers at the public DOTS facilities was higher (17.8±3.4) than those at the private DOTS facilities (16.4±3.7) (P = 0.10). A significantly higher proportion of health workers at the private

Table 1. Socio demographic characteristics of health workers at the public and private DOTS facilities

Variable	Public (n=64) Freq (%)	Private (n = 20) Freq (%)	Test of significance	p
Age group in years				
<30	1 (1.6)	1 (5.0)	3.279^{xx}	0.002
30 – 39	25 (39.1)	13 (65.0)		
40 – 49	26 (40.6)	6 (30.0)		
≥ 50	12 (18.8)	0 (0.0)		
Mean age	42.8±7.0	37.3±5.1		
Gender				
Male	16 (25.0)	4 (20.0)	0.21^{x}	$0.7696^{\#\#}$
Female	48 (75.0)	16 (80.0)		
Had DOTS training in the last 2 years				
Yes	36 (56.2)	12 (60.0)	0.09^{x}	0.7673
No	28 (43.8)	8 (40.0)		
Profession				
Doctors	23 (35.9)	3 (15.0)	Not Valid	
Nurses	18 (28.1)	9 (45.0)		
CHO	15 (23.4)	1 (5.0)		
Others[#]	8 (12.6)	7 (35.0)		

Key ^{xx} = t test, ^{x} = Chi Square, $^{\#\#}$ = Fisher's exact, $^{\#}$ = consist of community health extension workers, Auxiliary nurses, pharmacy technician, health information officer, CHO = Community Health Officer

Table 2. Proportion of health workers at the DOTS facilities studied who had knowledge of the symptoms of pulmonary tuberculosis

Symptoms of TB	Public (n=64) Freq (%)	Private (n = 20) Freq (%)	X2	p
Cough >2-3 wks	64 (100.0)	19 (95.5)	0.38	0.2381[x]
Heamoptysis	56 (87.5)	14 (70.0)	3.36	0.0877[x]
Night sweat	63 (98.4)	18 (90.0)	3.15	0.1396[x]
Tiredness	55 (85.9)	16 (80.0)	0.41	0.4983[x]
Chest pain	60 (93.8)	15 (75.0)	5.60	**0.0320**[x]
Low grade fever	59 (92.2)	15 (75.0)	4.29	0.0530[x]
Poor appetite	55 (85.9)	16 (80.0)	0.41	0.4983[x]
Cough >2 wks as symptom thought first in TB diagnosis	59 (92.2)	17 (85.0)	0.91	0.3882[x]

NB: Correct responses reported, Key [x] = Fisher's Exact

Table 3. Proportion of health workers at the DOTS facilities studied who had knowledge of laboratory diagnosis and follow up of TB patients

Knowledge parameters	Public (n=64) Freq (%)	Private (n = 20) Freq (%)	X2	p
TB diagnosis				
Smear microscopy (correct**)**	60 (93.8)	19 (95.0)	0.01	1.000[x]
Incorrect response	4 (6.2)	1 (5.0)		
No of samples for TB diagnosis				
Two samples	18 (28.1)	8 (40.0)	1.005	0.316
Three samples	46 (71.9)	12 (60.0)		
Sputum collection				
S,M,S or S,M (correct)	51 (79.7)	13 (65.0)	1.81	0.230[x]
Incorrect response	13 (20.3)	7 (35.0)		
First sputum follow up				
Second month (correct)	61 (95.3)	17 (85.0)	2.44	0.1434[x]
Incorrect response	3 (4.7)	3 (15.0)		
First sputum follow up for retreatment cases				
Third month (correct)	45 (70.3)	14 (70.0)	0.00	0.9787
Incorrect response	19 (29.7)	6 (30.0)		

Key: S,M,S = Spot, Early Morning, Spot, S,M = Spot, Early Morning, [x] = Fisher's Exact

DOTS facilities had poor knowledge of TB management (p = 0.034) compared with those at the public DOTS facilities while a higher proportion of those with fair knowledge about TB management were from the public DOTS facilities (*P* = 0.02) as shown in Table 5.

4. DISCUSSION

This study showed that there was no significant difference in the overall knowledge of the health workers at the public and private DOTS facilities on the various aspect of TB management (*P* = 0.10). However, a significantly higher proportion of healthcare providers at private DOTS facilities (35.0%) had insufficient knowledge regarding the symptoms, laboratory diagnosis; follow up, treatment and adherence to TB treatment compared with those (10.9%) at the public DOTS facilities (*P* = 0.03). Previous studies that assessed the knowledge of health care providers at the private sector revealed their lack of sufficient knowledge in the management of TB [9-12]. Another study from India reported that private health care providers under the PPM scheme demonstrated poor knowledge resulting in poor management of patients. However there was an improvement in knowledge when compared to the knowledge before they were engaged in the PPM scheme [18].

In addition, the inadequate number of health care workers trained at both the public and private DOTS facilities may be responsible for this finding. Under the PPM scheme, private providers were expected to be trained on DOTS management of TB by the LSTBLCP before commencing operation, however only this study

showed that about 60% of the health care providers at the public and private DOTS facilities were trained by the LSTBLCP. The high turnover of health care workers especially at the private sector which has been largely attributed to poor job satisfaction [19] and the Lagos state government policy of regular redeployment of staffs within the public sector could be responsible for the high proportion of untrained health care workers at the public and

Table 4. Proportion of health workers at the DOTS facilities studied who had knowledge of TB treatment

Knowledge parameters	Public (n = 64) Freq (%)	Private (n = 20) Freq (%)	X2	p
Classification of PTB				
Smear +ve and Smear –ve	4 (6.3)	2 (10.0)	0.32	0.6248[x]
Incorrect response	60 (93.7)	18 (90.0)		
Treatment categories				
Two (correct)	52 (81.2)	19 (95.0)	2.20	0.1754[x]
Incorrect response	12 (18.8)	1 (5.0)		
No of drugs for new TB				
Four (correct)	31 (48.4)	12 (60.0)	0.82	0.3665
Incorrect response	33 (51.6)	8 (40.0)		
Drugs for new TB patient				
H,R,E,P (correct)	49 (76.6)	15 (75.0)	0.02	1.000[x]
Incorrect response	15 (23.4)	5 (25.0)		
Drugs for retreatment patient				
H,R,E,P,S	50 (78.1)	15(75.0)	0.09	0.7668[x]
Incorrect response	14 (21.9)	5 (25.0)		
Side effect of INH				
Numbness (correct)	13 (20.3)	3 (15.0)	0.28	0.7509[x]
Incorrect response	51 (79.7)	17 (85.0)		
Side effect of rifampicin				
Red Urine (correct)	27 (42.2)	5 (25.0)	1.91	0.1671
Incorrect response	37 (57.8)	15 (75.0)		
Side effect of pyrazinamide				
Joint pains (correct)	14 (21.9)	4 (20.0)	0.03	1.000[x]
Incorrect response	50 (78.1)	16 (80.0)		
Side effect of ethambutol				
Optic neuritis (correct)	25 (39.1)	4 (20.0)	2.450	0.118
Incorrect response	39 (60.9)	16 (80.0)		
Side effect of streptomycin				
Ototoxicity (correct)	30 (46.9)	2 (10.0)	8.786	**0.003**
Incorrect response	34 (53.1)	18 (90.0)		

Keys: [x] = Fisher's Exact, S –ve = Smear Negative, S +ve = Smear Positive, H = Isonizid, E = Ethambutol, P= Pyrazinamid, R = Rifampicin, S = Streptomycin

Table 5. Proportion of health workers at the DOTS facilities studied who had knowledge of the dangers of poor adherence to TB treatment

Dangers of poor treatment adherence	Public (n = 64) Freq (%)	Private (n = 20) Freq (%)	X2	p
Emergence of drug resistance	56 (87.5)	14 (70.0)	3.36	0.0877[x]
Relapse	60 (93.8)	20 (100.0)	1.31	0.5681[x]
Deteriorating health and death	53 (82.8)	14 (70.0)	1.55	0.2194[x]
Increase risk of TB Transmission	61 (95.3)	14 (70.0)	10.21	0.0048[x]
Good treatment outcome	17 (26.6)	7 (35.0)	0.532	0.466
Increase in duration of treatment	47 (73.4)	18 (90.0)	2.39	0.219[x]

Frequencies of correct responses reported for public and private DOTS facilities, Key [x] = Fisher's Exact

private DOTS facilities. It should be noted that redeployment exercise was conducted in the Lagos State civil service few weeks before collection of data. This finding shows the negative effect of redeploying trained staff to other areas of service provision without adequate replacement with other trained staff that can provide qualitative TB services. There is need for government to retain trained staff for a considerable length of time while they provide assistants that can understudy these trained staff before moving them out to other areas of need within the health system. In addition such redeployment exercise should take the training of staff on essential service provision into consideration and replace them with other trained staffs so that services will be provided without interruption.

Table 6. Knowledge of health worker at the DOTS facilities studied on TB management

Knowledge	Public (n = 64) Freq (%)	Private (n = 20) Freq (%)	p
Mean score	17.8±3.4	16.4±3.7	0.104
Poor	7 (10.9)	7 (35.0)	0.034[x]
Fair	55 (85.9)	12 (60.0)	0.022[x]
Good	2 (3.1)	1 (5.0)	0.563[x]

NB: Poor = Score less than 15, Fair = Score between 15.0 and 22.49, Good = Score above 22.49

Although the private DOTS facilities constitutes 23.8% (31 out of 130) of the total DOTS facilities in Lagos State, this proportion is small considering the size of the private health care providers in the state. Only about 1.6% (31 out of 1981) of the registered private health care providers in Lagos State is involved in DOTS management for TB at the time of conducting this study. If the state government hope to expand DOTS services and improve the quality of TB care, there is need to improve communication between public and private sectors, strengthen the regulatory system and provide adequate training for healthcare providers in the public and private sector [20]. Continuous engagement and training of the private sector in TB management will not only increase their knowledge of TB management but will ultimately lead to increase TB case detection and provision of qualitative TB services in the private sector.

5. CONCLUSION

A significant proportion of the healthcare providers at the private DOTS facilities had insufficient knowledge on DOTS management of TB. There is an urgent need to develop targeted strategies for the continuous engagement of the private sector and improve the knowledge of health care providers by continuous capacity building exercise in rder to provid qualitative TB services to the patients.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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