

Assessment of Tuberculosis Awareness and Perspectives among the Working Population Across Lagos State

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Abstract

Tuberculosis (TB) continues to be an important public health concern in Lagos, Nigeria, as it accounts for 11% of this burden in Nigeria. A cross-sectional study design was employed. Socio-demographic data (age, gender, highest level of education, local government area, and employment status) from deidentified persons who gave consent were investigated using a structured and pretested questionnaire in a Google Form. 310 participants met the inclusion criteria of working and living in Lagos State. In this study, 96.5% of the participants have heard of TB before; only 36.5% knew what TB is called in their local dialect; 75.8% know TB is caused by a microorganism; 83.2% know the signs and symptoms of TB; 91.6% of the participants know the contagiousness of TB; 91.9% admitted that importance of the knowledge of TB endemicity in Nigeria; 66% learnt about TB in school; 45.2% of the participants have ever been screened for TB; 9.7% implied they have TB associated stigma behaviour; 67.7% of participants knew at least one method of TB diagnosis; only 2.9% among the participants has been diagnosed of TB; 84.2% participants are aware that TB is curable and; only 31% of the participants have heard of TB preventive treatment (TPT). This study has been able to examine the degree of awareness and perspectives of tuberculosis in terms of the basic knowledge of TB, TB screening, TB-associated stigma, TB diagnosis, TB curability and TPT among the working population in Lagos State, this is very crucial to control TB in the country.

Keywords: Curability, Diagnosis, Prevention, Screening, Stigma, Tuberculosis.

Introduction

Tuberculosis (TB) remains one of the most infectious diseases and one of the major causes of morbidity and deaths worldwide. TB is known to cause morbidity in over 10 million persons every year and an estimated 1.30 million deaths globally with an estimated 410 000 people developing multidrug-resistant or rifampicin resistant TB (MDR/RR-TB) [36]. Nigeria has one of the highest burdens for TB, TB/HIV co-infection and multidrug resistant TB. A notable development was documented for Nigeria in 2020, 138,591 cases notified, which is 15% higher than previous years [3, 35]. Nevertheless, more than 300,000 of the estimated 440,000 new TB cases are still

missing annually. According to WHO's Global Tuberculosis Report, 2023, Nigeria has a 4.5% burden of TB globally and Lagos State accounts for 11% of this burden which was very alarming in 2022. Although, Nigeria has embraced the Directly Observed Therapy Short course (DOTS), a strategy to control TB control since 2004 and over 5,000 DOTs facilities have been adopted in treatment facilities across the country [13].

However, in 2016, the 'End TB Strategy' was adopted with the goal to reduce the incidence of TB by 85%, and mortality related to TB by 90% by the year 2030 [31; 35].

Tuberculosis is an airborne disease, and it is caused by a pathogen called *Mycobacterium tuberculosis* [11]. Tuberculosis infection

occurs when the aerosol droplets carrying the bacilli of *M. tuberculosis* are inhaled, but not everyone infected becomes sick. *M. tuberculosis* infection can be asymptomatic initially and develops into latent tuberculosis (whereby the patient gets well clinically without symptoms but remains a carrier of the tuberculosis bacilli) [8]. Research has shown that only about 5–10% of patients with *M. tuberculosis* infection will most likely develop active TB (primary TB) immediately after the incubation period, and this is identified by clinical symptoms of TB disease (cough of more than 2 weeks, fever of more than 3 weeks, unexplained weight loss and drenching night sweat) [26]. Nevertheless, the reactivation of latent TB infection can occur anytime in a carrier's life (secondary TB), once the immune system can't trigger or sustain an effectual immune response.

The important factors responsible for the immediate replication of *M. tuberculosis* bacilli and advancement to active TB are bacterial load inhaled, age, malnutrition and immune deficiencies [11]. Other major risk factors of TB are socioeconomic factors (poverty, malnutrition, wars); immunosuppression: (HIV/AIDS, chronic immunosuppressive therapy such as steroids, monoclonal antibodies against tumor necrotic factor, a poorly developed immune system in children and primary immunodeficiency disorders) and occupational (mining, construction workers, pneumoconiosis) [4].

TB patients are highly discriminated and stigmatized by their families, communities and even health workers because TB is a contagious disease that can be transmitted by sharing of the same cutlery, its association with HIV infection; the idea that TB sufferers have done something immoral like smoking, and its association with poverty [19]. Stigma is a social behavior that occurs when specific traits of a person are learned to be undesirable or determined to be undeserving. Stigmatization has negative effect on TB patients such as

reducing their self-esteem, delay in diagnosis and treatment, deliberate denial of diagnosis when done, defaulting in treatment and as a result multidrug resistance could develop, thereby increasing the transmission of TB within the society [12, 19, 21]. Also, stigma persists against people who are infected with TB because of the lack of understanding of TB prevention and control which includes prescribing TB Preventive Treatment (TPT) to non-presumptives contacts of the index TB case.

TB is curable and its regimens have changed over time. Currently, the standard of care for persons infected with drug-susceptible TB disease is a 6-month regimen of four first-line drugs: isoniazid, rifampicin, ethambutol and pyrazinamide [32]. The treatment of persons infected with drug-resistant TB requires regimens that include second-line drugs [33]. The prevention and the stop of the development of latent TB infection to active disease is very important to reduce TB incidence to the levels predicted by the End TB Strategy. And this can only be achieved by educating people living with HIV, household contacts of people with TB and other risk groups about TB prevention and control which includes prescribing TB Preventive Treatment (TPT) to non-presumptives contacts of the index TB case and immunizing children with the Bacille Calmette-Guérin (BCG) vaccine [34]. There have been a lot of new developments in epidemiological reports, new immunodiagnostic tests and molecular methods that allow rapid microbiological diagnosis and detection of variants of *M. tuberculosis* associated with drug resistance. Also, there are discovery of novel second-line antituberculosis drugs including for TB infected children, and the results of clinical trials have proven that there can be shorter duration of treatment for some TB patients [7].

TB continues to be an important public health concern in Lagos State, Nigeria, as it accounts for 11% of this burden in the country while Nigeria has a 4.5% burden of TB globally

[36]. The important factors responsible for the TB burden in Lagos include the accelerated population growth, high poverty level in the slums, HIV/AIDS epidemic and the increase in multidrug drug resistance TB [3, 30]. Lagos state is an urban center that has a lot of slums communities. The slum communities are usually exposed to TB due to the unhygienic living conditions, overcrowding tendency, high poverty levels and barriers (such as bad roads network) restricting access to health promotion, preventive and treatment services [6]. The workers who live in slums relate and interact with workers who live in a decent and conducive environment during their time at work which usually last for at least 8 hours of the day, for at least 5 working days in a week. Also, the working population are the most active population subset of the society (mostly bread winner of the family), and they work in various sectors of the labour market. As a result of this, they are the most exposed to TB and would likely infect their household with TB if they get infected at their workplace.

Hence, having basic knowledge of TB, TB screening, TB-associated stigma, TB diagnosis, TB curability and TB preventive treatment among the working population is very crucial to control TB. However, to the best of my knowledge no study has assessed the awareness and knowledge of TB among the working population across local government areas (LGAs) in Lagos State, Nigeria. This study sought to assess TB awareness and answer the question what the perspectives of TB among the working population across Lagos State are, hence, the central aim of this study was to assess tuberculosis awareness and perspectives among the working population across all local government areas in Lagos State within 5 months.

Materials and Methods

Study Design

A cross-sectional study design was employed. Socio-demographic data (age,

gender, highest level of education, local government area, and employment status) from deidentified persons who gave consent were investigated using a structured and pretested questionnaire in a Google Form.

Study Area

This study took place in Lagos State, the largest urban city in Nigeria. Lagos State is located in South-Western part of Nigeria. Lagos State lies approximately on a longitude of 20 42'E and 32 2'E respectively, and between latitude 60 22'N and 60 2'N. Lagos State is surrounded in the north and east by Ogun State of Nigeria, and in the west by the Republic of Benin. It extends for 180 kilometers along the Guinea Coast of the Bight of Benin on the Atlantic Ocean. Lagos State population was 14,862,000 as of 2021 [18]. Lagos State has twenty local government areas namely Agege, Ajeromi-Ifelodun, Alimosho, Amuwo-Odofin, Apapa, Badagry, Epe, Eti-Osa, Ibeju-Lekki, Ifako-Ijaiye, Ikeja, Ikorodu, Kosofe, Lagos Island, Lagos Mainland, Mushin, Ojo, Oshodi-Isolo, Shomolu, Surulere.

Study Population

The questionnaires were only administered to employed persons who work in Lagos, Nigeria who gave consent.

Study Duration

This study lasted for five months.

Sampling Method

This study used the non-probability method using the convenience sampling type.

Sample Size

A minimum sample size of two hundred and seventy-five (275) was calculated from the formula described by Fisher formula for sample collection [14]. A sample size that is greater than the value of 275 was used to improve the precision estimates of this study. Fisher's formula: $n = Z^2 p (1-p) / d^2$. Where n is minimum sample size; Z is the critical value; p is the

Law Enforcement	0	3	3
Manufacturing	2	50	52
Oil and Gas	0	9	9
Others	2	23	25
Self employed	0	8	8
Service	0	1	1
Transportation	0	2	2
Utility	0	2	2
Grand Total	11	299	310

In this study, 96.5% of the participants have heard of TB before; only 36.5% knew what TB is called in their local dialect; 75.8% know TB is caused by a microorganism; 83.2% know the signs and symptoms of TB; 91.6% of the

participants know the contagiousness of TB; 91.9% admitted that importance of the knowledge of TB endemicity in Nigeria; 66 % learnt about TB in school (Table 2).

Table 2. Basic Knowledge of TB among the Working Population in Lagos State n=310

Knowledge	Percentage Score for Answer
Heard of TB before	
Yes	299 (96%)
No	11 (4%)
Knowledge of TB in local dialect	
Know	113 (36%)
Don't know	164 (53%)
Not applicable	33 (11%)
TB was first learnt from:	
Workplace	1 (0.3%)
School	205 (66%)
Pre-employment health screening	1 (0.3%)
Self-learnt	1 (0.3%)
Friends and family	47 (15%)
Health care providers	20 (7%)
Media	35 (11%)
Cause of TB	
Air	30 (10%)
Cold	7 (2%)
Microorganism	235 (76%)
Smoking	2 (0.6%)
Transmitted from one person to another	1 (0.3%)
Not sure the cause	2 (0.6%)
Don't know	33 (11%)
Signs and Symptoms of TB	
Breathlessness	1 (0.3%)
Cough and loss of weight	1 (0.3%)

Cough, fever, night sweat, unexplained weight loss	258 (83.2%)
Coughing out blood only	36 (11.6%)
Losing weight drastically only	3 (1.0%)
Don't know	11 (3.6%)
Knowledge of the contagiousness of TB	
Yes	284 (91.6%)
No	9 (2.9%)
Don't know	17 (5.5%)
Importance of the knowledge of TB endemic in Nigeria	
Very important	285 (91.9%)
Somewhat important	21 (6.8%)
Not very important	2 (0.6%)
Don't know	2 (0.6%)

Also, only 45.2% of the participants have ever been screened for TB; 9.7% implied they have TB associated stigma behavior; 67.7% of

participants knew at least one method of TB diagnosis (Figure 2).

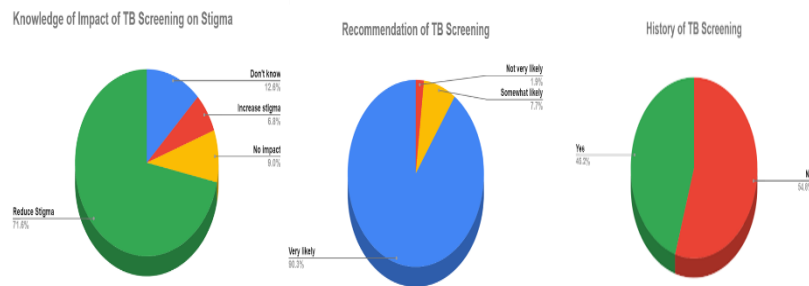


Figure 2. Knowledge of Tuberculosis Screening among the Working Population in Lagos State

Moreover, only 2.9% (9) among the participants have been diagnosed of TB, and only one person out of the nine diagnosed TB

patients didn't complete anti-TB treatment; 84.2% participants are aware that TB is curable (Figure 3).

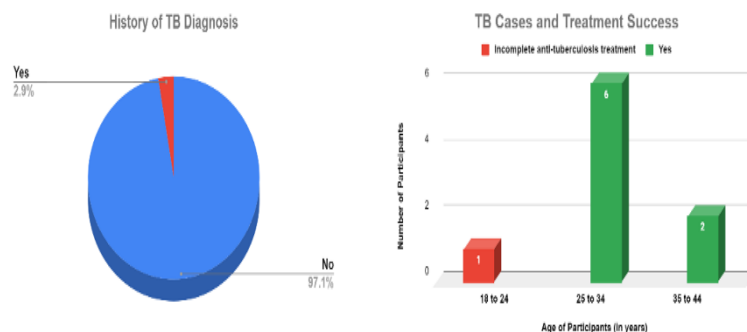


Figure 3. History of TB Diagnosis and Treatment Outcome among the Working Population in Lagos

However, only 31% of the participants have heard of TB preventive treatment and only 92%

among them are actually aware of its benefits (Table 3).

Table 3. Knowledge of TPT among the Working Population in Lagos State n=310

Knowledge of TB Preventive Treatment	Number of Participants
Heard of TB Preventive Treatment before	
Yes	96 (31%)
Awareness of the benefits of TPT	92 (96%)
Unawareness of the benefits of TPT	4 (4%)
No	214 (69%)
Awareness of the benefits of TPT	31 (14%)
Unawareness of the benefits of TPT	183 (86%)

Discussion

A total of 350 participants completed the structured questionnaire but only 310 participants met the inclusion criteria of working and living in Lagos State (Table 1, Figure 1). The responses from the 310 participants were used to determine and assess the basic knowledge of TB, TB screening, TB-associated stigma, TB diagnosis, TB curability and TB preventive treatment among the working population in Lagos State. To the best of my knowledge this is the first study to assess tuberculosis awareness and perspectives among the working population across all local government areas in Lagos State and Nigeria as a whole. TB is a known disease among the working population in Lagos State, as most of the respondents have heard about the infection (96.5%) (Table 2). This finding is similar to studies from Libya and Ethiopia that had 96.5% and 94.9% awareness of TB respectively [27, 29]. Also, my finding is also similar with studies done in Ogoja in Cross River, rural area in Lagos in Nigeria, urban area in Lagos, Enugu who had TB awareness of 97% 97.5%, 99.2% and 93% respectively [16, 21, 22]. While a study in Edo state had 86.5% TB awareness which is lower than my findings [28].

In this study, only 36.5% knew what TB is called in their local dialect and this did not correspond to the 96.5 % of the participants who have heard about TB (Table 2). This may be due to the fact that English is widely spoken in Lagos and it is the official language in

Nigeria and considering that Lagos is an urban center and the former capital of Nigeria [5]. Another factor, is there is loss of the indigenous local dialect in Nigeria [15], and this must have contributed to 52.9% of the participants who don't know what TB is called in their local dialect and likewise 10.6 % of the participants who gave responses that were not applicable. Also, a lot of Nigerians who live and work in the urban cities like Lagos have lost touch of their origin as well their local dialect, because of the embrace of the culture of the west [5]. However, from the findings in this study, it is fair to say the working class in Lagos state having good basic knowledge of TB (96.5 % of the participants have heard of TB before; 75.8% know TB is caused by a microorganism; 83.2% know the signs and symptoms of TB; 91.6% of the participants know the contagiousness of TB; 91.9% admitted that knowledge of TB endemic in Nigeria is very important) (Table 2).

The major source of knowledge of TB in this study was school (66.1 %) through formal education and this is different from a study in urban slums in Lagos by Adepoju et al., 2022 [3], where their major sources of knowledge of TB were health care workers and the radio. The finding in this study is not surprising because the study population are the working class and the least education among the participants in this study was secondary education and individuals who have access to education and social media will likely have better knowledge and better perspectives about TB (Figure 1).

Education is a very important social determinant of health because it provides valid information for healthy living. Also, being educated forecasts good knowledge and perspectives about diseases such as TB. The school setting incorporates subjects such health education that promotes health of the public. This was evident in this study as 96.5% of the participants that know about TB are all educated and this was consistent with the study of Adepoju et al., 2022 [3] as compared with participants with no formal education (Figure 1).

The findings of this study also revealed that only 45.2% of the participants have been screened (Figure 2), despite the endemicity of TB in Nigeria and Lagos contributing 11% [2] and this is higher compared to studies done in Ethiopia where only 19.4% of the study participants were ever screened for TB [17] and in Thailand where only 18.6% of participants stated that they had undergone a TB screening test [23]. Also, when considering where the participants first learnt about TB in this study, only approximately 7% first learnt about TB from health care providers and 0.3% during their pre-employment health screening (Table 2). However, despite the low screening coverage among the working population in Lagos, 90.3% of participants recommends that TB screening should be done (Figure 2) and this suggest that these participants are most likely to be more receptive to being screened for TB during their pre-employment health screening and their visit to the health care facilities if TB screening services are offered to them.

This present study reveals stigmatization is present among the working population in Lagos but is not high (9.7%) compared to a study in the year 2020 in the urban city of Lagos where 95.7% of the respondents were associated with TB stigma behavior [21], and a study in Thailand where 22.5% of community members would think less of TB patients [25]. Other studies in India (reported 73%), Tunisia (reported 54.9%) Pakistan (reported 47.9%) all

had higher prevalence of TB-associated stigmatization [10, 20, 24] compared to this study. This study reveals that 1.3% of the participants said they will start avoiding any person who is suspected to have TB or a confirmed TB case; 0.3% will reduce interaction with the presumptive (suspected) TB case or a confirmed TB case but ask them to seek medical care and 8.1% will stop sharing personal items with the presumptive TB case or a confirmed TB case. Noteworthy to mention, 89.7% of the participants said they will advise the presumptive TB case or a confirmed TB case to seek medical care and this is because they are well educated (62.3% of the participants have undergraduate education and 36.5% have postgraduate education) with least educated having a secondary school education (1.3% of the participants) and because they live an urban city like Lagos, they are most likely exposed to basic amenities, infrastructures and the media that disseminate information about public health issues (Figure 1). Also, majority of them have basic knowledge about TB (96.5%) and they are aware of the curability of TB (84.2%). The participants (26.7%) from information and communications technology industry implied they stigmatize TB presumptives and cases (Table 1), Surprisingly, 20% of the participants from the healthcare industry also suggested they will stigmatize TB presumptives and cases.

From this study, 67.7% of participants knew at least one method of TB diagnosis (Figure 2). Meanwhile, 32.3% did not have any knowledge about the method of TB diagnosis as compared to a study in Iran where 43% participants are not aware of what is the most important and accessible method for the diagnosis of pulmonary TB [9]. This could be because not all the participants are health care workers, only 24.8% of the participant work in the health care sector and only 3.9% among the participants from the healthcare sector are not aware of diagnosis of TB and these individuals will most likely be administrative staff of the healthcare

facility. The majority of the participants in this study are non-health workers (75.2%). Participants in the manufacturing had the highest percentage (17.1%) of participants who have knowledge of methods of TB diagnosis after the participants in the healthcare sector (34.8%) and 61.1% of them first learnt about TB in their schools, 11.1% from the healthcare providers, 13.9% each from their friends and media. Also, knowing fully well that screening (45.2%) is not optimal among the working population, this must have contributed to the lack of knowledge of types of TB diagnosis.

This study also reveals that only 2.9% among the participants has been diagnosed of TB, and only one person out of the nine diagnosed TB patients didn't complete anti-TB treatment (Figure 3). This might not be the reality of the working population in Lagos State because of the low screening coverage (45.2%) which is not optimal hence this must have contributed to the lack of knowledge of types of TB diagnosis and low TB cases identified, knowing that TB is endemic in Nigeria, [36].

Amazingly in this study, 84.2% participants are aware that TB is curable which is high as compared to a study by Adepoju et al., 2022 [3], in Lagos State where only about 48.4% of his study participants knew that TB is curable. Also, this study revealed 13.2% of the participants are not sure if TB is curable and 2.6% of them believes TB is not curable. Not surprisingly, the participants from the healthcare industry were the most aware of the curability of TB. Next to the health care sector was the information and communications technology industry who had 19.2% of their participants who are aware of TB curability and this as a result of their access to information on the internet. Noteworthy to mention, 8.4% of the participants who are aware of the curability of TB still implied that they will stigmatize people who are TB presumptives and TB cases,

14.3% of the participants who are not sure of the curability of TB also suggested they will stigmatize people who are TB presumptives and TB cases and 25% of the participants who believe that TB has no cure will stigmatize people who are TB presumptives and TB cases.

The awareness of TB preventive treatment is low, as only 31% of the participants of this study has heard of the TB preventive treatment and only 96% among them are aware of its benefits while 4% know nothing about its benefits (Table 3).

Conclusion

To the best of my knowledge, this is the first study on assessment of tuberculosis awareness and perspectives among the working population across Lagos State. This study has been able to provide the degree of awareness and perspectives of tuberculosis in terms of the basic knowledge of TB, TB screening, TB-associated stigma, TB diagnosis, TB curability and TB preventive treatment among the working population in Lagos State and this is very crucial to control TB in the country.

Conflict of Interest

There is no conflict of interest in this study.

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