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Tuberculosis Control Mechanisms and Contact Tracing: Knowledge and Practice among TB Patients at Dots Centers in Southeast Nigeria

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Abstract

Background: The public health burden of tuberculosis in Africa is further compounded by the high HIV prevalence in the continent. The goal of the National TB program is to reduce significantly the burden of TB by 2015 in line with the Millennium Development Goals (MDGs) and pulmonary tuberculosis (PTB) partnership targets which among others is to detect at least 70% of the estimated infectious (smear-positive) cases and to achieve a cure rate of at least 85% of the detected smear-positive cases. Low case detection rate and poor knowledge of the disease have been a bane in achieving a successful TB.

Methods: The study design is descriptive cross sectional. A multistage sampling method was used in sample selection of the patients from two treatment centers in the southeast zone of Nigeria. The survey instrument is a semi-structured questionnaire.

Results: Three hundred and forty-eight questionnaires were analyzed. The mean age for the respondents was 32.6 ± 10.7 years. One hundred and thirty-one (37.6%) knew that TB is caused by germ bacteria while 33 (9.5%) and 57 (16.4%) additionally believed it could be caused by evil spirit and food poisoning respectively. Two hundred and thirty six (67.8%) of the respondents have not heard about contact tracing. One hundred and twelve, (32.2%) knew that contact tracing involve bringing for screening all household members in contact with the TB patients including children less than six years of age. Only about 23.6% of the respondents brought contacts for screening prior to the study.

Conclusion: Knowledge of the patients accessing tuberculosis services at the treatment centers in southeast Nigeria about the disease, contact tracing and practice is poor. Intensive health education is urgently needed.

Keywords: Tuberculosis patients; Contact tracing; Tuberculosis control; Directly observed treatment short course (DOTS)

Introduction

Tuberculosis is a chronic bacteria air borne disease that primarily affects the lung and characterized by cough, chest pain, night fever, loss of weight and haemoptysis. It is one of the most important communicable diseases in the majority of the developing countries [1-3]. The World Health Organization estimates that about a third of the world's population is infected with mycobacterium tuberculosis and that about 16-20 million are suffering from the disease. Globally, 9.2 million new cases and 1.7 million deaths from TB occurred in 2006, out of which 0.7 million cases (7.6%) and 0.2 million deaths (11.8%) were in HIV positive people [4]. The African region has an annual incidence of about 376/100,000 for all cases, 158/100,000 smear positive cases and 49% case detection rate of new smear positive cases compared to 46/100,000 for all cases, 20/100,000 smear positive cases and 60% case detection rate for the Americans and 53/100,000 for all cases, 25/100,000 for smear positive cases and 51% case detection rate for the European region respectively [4]. Even at the start of the new millennium, tuberculosis remains the most important infectious disease in the world despite long decade of efforts dedicated to bringing the problems under control. This dire situation prompted the World Health Organization (WHO) in 1993 to declare TB a global emergency [5].

In Nigeria, just as in many other African countries, tuberculosis is a major public health problem. The TB burden is further compounded by the high HIV prevalence of 4.1% in the country [6]. Tuberculosis was declared a national emergency in Nigeria in June 2006 after which an emergency plan for the control of the disease was developed. Currently, Nigeria is ranked 5th among the 22 high TB burden countries in the World and has second highest burden in Africa [7]. The WHO report on Global Tuberculosis Control 2008, revealed that Nigeria in 2006 had incidence for all cases 311/100,000, incidence for smear positive 137/100,000, prevalence for all TB cases 616/100,000 while case detection rate was put at 20% [4,7].

The TB scourge and burden is worsened by the scourge and rapid increase of HIV infection in many parts of the World especially countries in the sub-Sahara Africa and South East Asian. Tuberculosis is the leading cause of death among people infected with HIV and is documented as one of the commonest opportunistic infections in personal living with HIV and AIDs, particularly in African and Asian sub-regions [1,7]. In the absence of HIV infection, the lifetime risk of developing TB is 5-10%, whereas the risk among the HIV/AIDs is 50% or more [8,9]. Thus while TB is the leading killer in HIV infected individuals, HIV on the other hand has emerged as the strongest known factor allowing latent remotely acquired TB infection to progress to overall clinical tuberculosis [10].

Apart from HIV infection, several other factors account for the risk of developing tuberculosis disease. Children under the age of 5 years and elderly subjects older than 65 to 70 years are more vulnerable to TB,

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partly because immunity is slightly reduced at these ages [11]. World over, TB affects men more than it does women (60-75%) attributable to differences in social habits and a slight genetic predisposition on the part of women as suggested by many studies [11]. Individuals with a chronic illness like neoplasm, diabetes mellitus, heavy smokers and those in extreme poverty continue to be the main allies of TB because of the weakened immune system and greater contact with other sufferers due to overcrowding and poor nutrition as is the case with poverty [11].

There has been a lot of speculations and beliefs about TB disease closely tied to history and culture, though drastically reduce in the western world but still prevalent in the African and Asia sub regions. This was attributed to the initial poor knowledge of the disease through the course of history and lack of understanding which has not helped contemporary efforts to combat the illness. Such lack of understanding probably explains why human kind has been unable to defend itself against this terrible illness for the most of history, leaving the people with only option being ill and ultimately death [11]. Dr. Draus in a study entitled Tuberculosis: misunderstanding and stigma explained that TB, previously known as consumption has always carried with it a stigma, a negative social perception transmitted through preconceived notions or ideas concerning ethnic origins, lifestyles and many other factors [12].

In a study done in Ethiopia, how to persuade the patient to adhere to treatment, ignorance as to the cause and harmful effects of TB on the individual and the community were identified as the most difficult task for tuberculosis control [13]. Lack of knowledge and poor understanding of the causes, signs and symptoms, transmission mechanisms and harmful effects of TB may not only delay initiation of treatment at both patient and hospital level, but may also cause poor adherence to treatment on the part of the patient and thus capable of truncating the control effort or measures as the case may be.

Tuberculosis is curable, provided patients are detected early and treated promptly as prescribed in the National Tuberculosis and Leprosy Control Program Guideline (NTBLCP). The goal of the National TB program is to reduce significantly the burden of TB by 2015 in line with the Millennium Development Goals (MDGs) and pulmonary tuberculosis (PTB) partnership targets. The targets among others include to detect at least 70% of the estimated infectious (smear-positive) cases and to achieve a cure rate of at least 85% of the detected smear-positive cases [14]. These targets have not been achieved as reported by WHO report on global tuberculosis control [15]. Although, there has been remarkable increase in the smear positive case detection rate (CDR) from 15% in 2002 to 27% in 2005 [16]; it is still low compared to the global target of 70% [17].

This low detection rate has been a bane in achieving a successful TB control in Nigeria. It is known that detection of tuberculosis in the population is one of the preventive measures, which is essential to the control of the disease [18]. Delay in the diagnosis of tuberculosis may worsen the disease, increase the risk of death and enhance tuberculosis transmission in the community [18]. According to NTBLCP guideline, whenever a diagnosis of a TB suspect as a smear positive is made, the patient should bring all adult contacts who are coughing for 3 weeks or more and all children of the household below 6 years of age including children born while on treatment to the health facility for TB screening [14]. Effective contact tracing and screening remain essential to prevent secondary cases and are especially important for child contacts, given their greater susceptibility to disseminated disease and the difficulty in diagnosis in this age group [13]. In fact, it has been stated that about half of the close contacts of an infectious patient will become infected and an untreated smear positive case may infect an average of 10-20 individuals in two years [19]. Contact tracing is very necessary to establish the primary source of the TB disease and to detect all those who are secondary infected for proper diagnosis and prompt treatment [18].

It is therefore paramount that tuberculosis patients are educated and encouraged during their first visit and subsequent course of treatment to bring along their friends and family contacts for screening if the TB control efforts were to be successful. This is more so considering that most patients diagnosed and treated in the health facilities as TB cases were self referred or were secondarily referred from another unit within the same facility. More emphasis should therefore be placed on contact tracing of close relatives, friends or persons connected with the TB patients. Contact tracing is very necessary to establish the primary source of the TB disease and to detect all those who are secondarily infected for proper diagnosis and prompt treatment [18].

As TB is transmitted from patients with lung disease to sensitive individuals by inhalation of infectious particles, a search for infected subjects among relatives of patients with infectious tuberculosis is the best method of preventing later development of the disease in populations, where the prevalence of tuberculosis is low. It is against this background of the importance of contact tracing and good knowledge of the factors associated with tuberculosis disease in the success of the control efforts, especially as regards to early presentation, treatment and reduction in the transmission that this study was undertaken. The outcome of this study would send a signal to the health care providers about the effectiveness and efficiency of their health education component of the tuberculosis control measures at their centers. It is our firm believes that ascertaining the knowledge of the tuberculosis patients about the disease control mechanisms and practice of contact tracing would be a step in the right direction for planning future tuberculosis disease control intervention in the southeast zone of Nigeria and the nation at large.

Materials and Methods

The study areas were Enugu and Ebonyi States, two of the five states that make up the South-eastern zone of Nigeria. The other three states are Anambra, Imo and Abia. Enugu State has 17 L.G.As and is bounded by Ebonyi, Abia and Imo States in the North and Anambra in the West. It has a population of 3,140,471 people by 2006 census. Government-owned health facilities in Enugu State include 377 primary health centers, 55 secondary health facilities and 4 tertiary health facilities, while private facilities including primary and secondary are 257 and 235 respectively. The study site in Enugu State, the University of Nigeria Teaching Hospital Chest Unit, is the biggest TB center out of the 56 TB units in the state. The unit registers an average of 20 new smear positive patients each month and annual turn over of 250-300 new patients. The TB unit is run three times weekly, Mondays, Wednesday and Friday. Ebonyi State is made up of 13 LGA's with headquarters at Abakaliki and has a population estimate of 2,852,832 from the 2006 census. The major occupation of the people is farming. There are 284 health facilities and 15 TB centers and 20 microscopic centers in Ebonyi State.

The study site in Ebonyi State, Mile 4 TB center is the largest TB center in the State. The unit registers an average of 45 new smear positive patients each month. The mile 4 TB Units runs five days weekly clinics, Monday to Friday.

The study design is descriptive cross sectional. The study population was all the patients receiving treatment for pulmonary tuberculosis in

the two study centers. A calculated sample size of three hundred and forty-four was used for the study. This was increased to 380 to take care of non-response rate. One hundred and ninety patients were selected from each of the study units.

A multistage sampling method was applied in this study. The first stage was the selection of Enugu and Ebonyi states from the five states in the southeast using simple random sampling technique. In each of the selected states, the list of TB units was compiled using the Directly Observed Treatment Short Course TB units Directory (DOTS Directory). The Units were stratified according to services offered and the centers that offer both laboratory and treatments were enlisted. From the enlisted TB centers in each of the states, a center which sub-serves the greatest number of patients was selected. In this case, UNTH Chest Unit Enugu and Mile 4 Abakaliki were purposively selected.

At the level of patient selection, each of the centers was visited during their clinic days, Monday, Wednesday and Friday for UNTH and Monday through Friday for Mile 4 TB Units. Each day after registration of patients for treatments, fifteen and nine patients respectively were randomly selected from UNTH and Mile 4 TB units using the clinic TB register. The choice of the number of patients as calculated per day was dependent on the number of clinic days and on the five weeks time frame for data collection. However, the remaining 10 patients for each of the TB units were selected on the 5th week of the data collection. The data collection was carried out concurrently in the two TB centers.

A semi-structured questionnaire was used. The questionnaire was interviewer administered to the less literate, but self-administered to the literate respondents. The questionnaire was pre-tested in a TB unit that was not selected for the study. Three trained research assistance administered the questionnaire in each of the TB center. Information elicited included the socio-demographic characteristics, knowledge about tuberculosis including the causes, signs and symptoms, risk factors of pulmonary tuberculosis, transmission and control mechanisms and contact characteristics. Ethical approval was obtained from the Ethics Committee of the University of Nigeria Teaching Hospital, Enugu. Individual informed oral consent was obtained prior to the interview.

Data entry and analysis was done using Statistical Package for Social Sciences (SPSS) soft ware version 11 and Epi-info version 3.3.2. Categorical variables were compared where necessary using Chi-square test at $p<0.05$ level of significance and 95 percent confidence interval. A correct response to any question scored one, whereas incorrect, no answers or not sure responses scored zero. A 50% knowledge and above was considered good while below 50% was considered poor for the purpose of this study.

Results

Three hundred and eighty questionnaires were administered. Three hundred and forty-eight were completely and consistently filled while 32 were incomplete giving a non response rate of 8.42%. The mean age for the respondents was 32.6 ± 10.7 years.

Females, 178 (51.1%) were slightly higher in number than males, 170 (48.9%). Most of the respondents were artisans, 135 (38.8%) and the majority, 146 (42%) had secondary school as the highest educational level. One hundred and thirty-one (37.6%) knew that TB is caused by bacteria while 33 (9.5%) and 57 (16.4%) additionally believed it could be caused by evil spirit and food poisoning respectively. Mode of transmission of TB was said to be airborne by 132 (37.9%) of the patients, through contact by 192 (55.2%) and consumption of infected cow milk by 97 (27.9%) of the patients. Overcrowding, poor housing, smoking, alcohol, malnutrition and poverty were identified as risk factors to TB disease by between 33%-52% of the patients in each case. Tuberculosis infection control methods known by the patients in decreasing order were cough etiquette, 233 (67.0%), early diagnosis and treatment, 213 (61.2%), nutritional improvements, 205 (58.9%), BCG immunization 200, (57.5%) and natural ventilation by 199 (57.2%).

Two hundred and thirty six (67.8%) of the respondents have not heard about contact tracing. One hundred and twelve (32.2%) knew that contact tracing involve bringing for screening all household members in contact with the TB patients including children less than six years of age. Majority of the contacts, brought for screening by the patients were between the ages of zero to nineteen years which was 87.79%. Children less than ten years, 33 (57.9%) were mostly affected. The most prevailing symptoms among the contacts were weight loss: 8 (14.0%), cough: 7 (12.3%) and fever: 7 (12.3%). Eighteen (31.6%) of the contacts brought were tuberculin positive, 5(8.8%) were sputum AFB positive and 7 (12.3%) were chest X-ray positive. Among the 57 contacts brought for screening, 8 (14.0%) were diagnosed with TB disease (Tables 1-9).

Age group	Frequency N=348	Percent
<20	47	13.5
20-29	110	31.6
30-39	78	22.4
40-49	49	14.1
≥ 50	64	18.4

Table 1: Age distribution of the respondents.

Socio-demographic characteristics	Frequency N=348	Percent
Gender:		
Male	170	48.9
Female	178	51.1
Occupation:		
Student	71	20.4
Trader	59	17.0
Farmer	45	12.9
Civil Servant	38	10.9
Artisan	135	38.8
Marital Status:		
Ever married	170	48.9
Never married	178	51.1
Education:		
No formal education	47	13.5
Primary	66	19.0
Secondary	146	42.0
Tertiary	89	25.5

Table 2: Socio-demographic characteristics of the respondents.

Cause of TB	Frequency N=348(%)	X^2	P
Bacteria:			
Yes	131(37.6)	155.72	0.000
No	32(9.2)		
Don't know	185(53.2)		
Evil Spirit:			
Yes	33(9.5)	164.410	0.000
No	192(55.2)		
Don't know	123(35.3)		
Food Poisoning:			
Yes	57(16.4)	96.54	0.0000
No	179(51.4)		
Don't know	112(32.2)		

Table 3: Respondents knowledge of the cause of tuberculosis (TB).

Mode of transmission	Frequency N=348(%)	X^2	P
TB is an airborne diseases			
Yes	132(37.9)	104.38	0.000
No	46(13.2)		
Don't know	170(48.9)		
Transmitted from Patients to contacts:			
Yes	192(55.2)	187.45	0.000
No	24(6.9)		
Don't know	132(37.9)		
Transmitted via consumption of infected cow milk.			
Yes	97(27.9)	55.94	0.000
No	82(23.6)		
Don't know	169(48.5)		
TB is a waterborne disease:			
Yes	84(24.1)	40.14	0.0000
No	160(46.0)		
Don't know	104(29.9)		
Transmitted via food:			
Yes	61(17.6)	124.63	
No	93(26.7)		
Don't know	194(55.7)		

Table 4: Respondents knowledge of the mode of transmission of tuberculosis (TB).

Risk factors	Frequency N=348(%)	X^2	P
Crowded conditions:			
Yes	148(42.5)	150.23	0.000
No	29(8.3)		
Don't know	171(49.2)		
Poor Housing:			
Yes	148(42.5)	142.99	0.000
No	31(8.9)		
Don't know	169(48.6)		
Smoking:			
Yes	184(52.9)	142.06	0.0000
No	37(10.6)		
Don't know	127(36.5)		
Alcohol:			
Yes	164(47.1)	99.41	0.000
No	46(13.2)		
Don't know	138(39.7)		
Malnutrition:			
Yes	122(35.0)	84.72	0.000
No	56(16.1)		
Don't know	170(48.9)		
Poverty:			
Yes	116(33.3)	45.62	0.000
No	74(21.3)		
Don't know	158(45.4)		
Age:			
Yes	66(18.9)	138.52	0.000
No	82(23.6)		
Don't know	200(57.5)		

Table 5: Responds' Knowledge of the Risk Factors of Tuberculosis.

Discussion

World-wide, TB affects men more often than it does women (60-70%), a higher prevalence attributable to differences in social habits, including exposure to environmental hazards; although an increasing number of studies are suggesting a slight genetic predisposition on the part of women [11,12]. In this study however, there was marginally more female preponderance than the males. The observed near similarity in the frequency of exposure of both sexes to tuberculosis may have a lot to do with the recent positive developments in women empowerment, equal rights, equal opportunities and greater involvement in the mainstreams of life including exposure to occupational hazards. Most of the patients in this study were artisans which may explain their greater exposure to the risk factors of TB disease.

The knowledge of the aetiologic agent and route of transmission of tuberculosis disease was poor as less than half of the respondents correctly identified bacteria (germ) as the cause and airborne as the main transmission route. Respondents additionally expressed one form of belief or the other about the causes of tuberculosis including evil spirit, food poisoning and water borne infections. This lack of knowledge and understanding may have a very serious diagnostic, treatment and adherence and control implications among the patients including the possibility of seeking for traditional and alternative medical care. The knowledge of the risk factors of developing TB disease was also

Ways of controlling TB Transmission	Frequency N=348(%)	X^2	P
TB Patients to close mouth when coughing			
Yes	233(67.0)	326.35	0.000
No	9(2.6)		
Don't know	106(30.4)		
Early diagnosis and treatment			
Yes	213(61.2)	227.04	0.000
No	26(7.5)		
Don't know	109(31.3)		
Increasing natural ventilation	199(57.2)		
Yes	22(6.3)	204.91	0.000
No	127(36.5)		
Don't know			
General Improvement in nutrition	205(58.9)		
Yes	19(5.5)	224.92	0.000
No	124(35.6)		
Don't know			
Immunization with BCG	200(57.5)		
Yes	19(5.4)	215.09	0.000
No	129(37.1)		
Don't know			

Table 6: Respondents' knowledge of ways of controlling tuberculosis transmission.

Awareness/knowledge	Frequency N=348(%)	X^2	P
Have heard about contact tracing			
Yes	112 (32.2)	88.37	0.000
No	236(67.8)		
Meaning of Contact tracing: screen all household members			
Yes	112(32.2)	248.69	0.000
No	20(5.7)		
Don't know	216(62.1)		
Screen only household members coughing:			
Yes	216(62.1)	199.78	0.000
No	81(23.3)		
Don't know	51(14.6)		
Screen only household members coughing out			
Yes			
No	238(68.4)	292.42	0.000
Don't know	67(19.3)		
	43(12.3)		

Table 7: Awareness and knowledge of contact tracing among TB patients.

Variable	Frequency N=57	Percent
Age (Year):		
<10	33	57.8
10-19	17	29.9
20-29	5	8.8
40 and above	2	3.5
Gender:		
Male	39	68.4
Female	18	31.6
Occupation:		
Student	48	84.2
Others	9	15.8
Education:		
NFE	4	7.0
Primary	36	63.2
Secondary	12	21.0
Tertiary	5	8.8
Living with Patients:		
Yes	53	93.0
No	4	7.0
Relationship with patients:		
Children	48	84.2
Others	9	15.8

Table 8: Socio-demographic features of contacts brought for screening by the TB patients.

Clinical features	Frequency N=57	Percent
Age (Year):		
Cough	7	12.3
Fever	7	12.3
Night sweats	3	5.3
Weight loss	8	14.0
Hemoptysis	1	1.8
Laboratory Findings:		
Tuberculin test		
Positive	18	31.6
Negative	39	68.4
Sputum AFB		
Positive	5	8.8
Negative	52	91.2
Chest X-Ray Report		
Positive	7	12.3
Negative	50	87.7
Contacts diagnosed as		
TB Patients	8	14.0
Contacts not TB case	49	86.0

Chi-square of contacts diagnosed as TB Case
X^2=58.98; df=1; p=0.000

Table 9: Clinical features of contacts brought for screening by TB patients.

poor except for the possibility of contracting the disease from positive contacts as stated by 55% of the responding patients. Knowledge of others risk factors such as overcrowded conditions, poor housing, alcohol, malnutrition and poverty were poor. This poor knowledge would probably aid transmission of tuberculosis in the south-eastern zone of Nigeria and may speak to improper health education which may have contributed to the high level of ignorance of the disease among these patients. However, the observed poor knowledge is not very peculiar to this study as many other researchers both local and international have reported similar poor knowledge of the aetiology and risk factors associated with TB disease among the sufferers [20-25]. In a two separate survey studies done in Nwanza, Tanzania and Omdurman, Sudan assessing the knowledge of TB patients about TB disease, the researchers reported that only 30% (out of 296 TB patients) and 36.2% (out of 1000 TB patients) respectively had satisfactory knowledge about TB disease [6,25]. Similarly Zhang and Zhu in their study on the knowledge and practice among TB patients and DOT providers about pulmonary TB reported incomplete or incorrect knowledge and understanding of TB disease [26]. Comparable result to the findings in our study was also reported by Khan et al. among Pakistani TB patients who considered food (47.6%) as source of TB infection and emotional trauma (57%) as a causative agent [27]. All these findings suggest that there is still serious gap in health education and TB information given to patients accessing services in the TB centers. Could it mean that TB service providers are not consistently giving health education to these patients which is part of their care and management or that the patients are still wallowing in the long aged and deep rooted cultural beliefs about TB disease? This is a question that is yawning for an answer from researchers on TB disease.

A positive observation was however made on the knowledge of the TB patients on the ways of controlling TB disease. Regarding the benefits of cough etiquette, early diagnosis and prompt treatment, increasing natural ventilation, improved nutrition and immunization with BCG on controlling tuberculosis, over 50% of the TB patients knew and agreed that these procedures and processes are of immense benefits and useful in controlling tuberculosis transmission. Similar positive observations on the knowledge of TB control mechanisms as found in this study were also reported by researchers in Tanzania, Cameroon and Nepal [21,24,28]. Both Cameroon and Nepalese studies reported that about 50% of TB patients had good knowledge about ways of controlling TB transmission. This good level of knowledge on a positive note should encourage tuberculosis patients to bring their contacts for screening, take their children for BCG immunization and promote the use of the other control measures that could help reduce the transmission of tuberculosis in their localities. However, the findings about contact tracing practice in this study is in contrast to the expected good health seeking behavior, which based on the respondent's good knowledge of the benefits and usefulness of the enlisted tuberculosis control measures.

The awareness of contact tracing among TB patients in this study was quite low. Less than one-third of the TB patients studied had heard about contact tracing. The poor awareness of contact tracing among the TB patients may have contributed to the poor knowledge of the meaning of contact tracing reported among these patients. Less than one-third of the responding patients also knew that all the household members of sputum positive TB patients should be brought for screening. These findings would not augur well for the control effort toward TB transmission considering the fact that contact tracing is very necessary in establishing the primary source of the TB disease and detecting all those who are secondarily infected for proper diagnosis and prompt treatment [18]. The negative impact of this poor awareness and knowledge about contact tracing would be more appreciated when we recognize that a single infectious person who remained undetected can infect between ten and fifteen persons every year, making a vicious cycle of failing control efforts [29]. Each of these ten to fifteen persons will subsequently infect another ten to fifteen persons each year. Lack of awareness of contact tracing was partially implicated in the treatment delays reported in surveys in Sub-Sahara Africa [24,30,31]. Such treatment delay and also delay in diagnosis was reportedly common in Nigeria and Tanzania surveys. The study in Lagos, Nigeria reported that majority of patients who delayed going to hospital also had a low level of knowledge about TB disease [29]. The treatment delays would

invariable lead to increase in the transmission of cases and would worsen clinical outcomes in the community [32,33].

About a quarter of the contacts brought for screening by TB patients in this study were diagnosed as TB cases. This number is epidemiologically significant considering the fact that one undetected case will in one year infect ten to fifteen other persons [29]. This finding becomes more significant as greater than 50% of the positive contacts brought for screening were children less than ten years and lives with their parents and guardians. Similar observations were made in a study on tuberculosis contact tracing done among children in Brazil [34]; although slightly higher in percentage than that reported in another study done in New Delhi, India [35]. This finding underscores the need to bring all children less than 6years of the household of positive TB patients for TB screening as recommended in the National Tuberculosis and Leprosy Control Programme of the Federal Republic of Nigeria [14].

In conclusion, TB patients accessing services in the TB centers in the Southeastern part Nigeria have low knowledge about TB disease and poor contact tracing practice. This finding is capable of truncating all the efforts geared toward TB control with resultant increase in the transmission of the disease. This is also worrisome considering the high prevalence of HIV/AIDs in Nigeria as tuberculosis is the single most important prevailing opportunistic infection and greatest cause of mortality in persons dually infected with TB/HIV/AIDS disease. This calls for urgent and intensified health education campaign about TB disease and control mechanisms among the TB patients in this region to enhance their knowledge about the disease and importance of contact tracing in the control of tuberculosis.

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