International Journal of
Health Systems and Medical Science

ISSN: 2833-7433
Volume 2 | No 1 | January-2023

Socio-Demogratics Characteristics Associated with HIV-TB Co-Infection Among Clients Seeking Care at Dot Center in Ibadan, Oyo State, Nigeria

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Abstract: In Nigeria, co-infection with the HIV virus and tuberculosis (TB) is a highly serious public health threat. Co-infection with the other is very common among individuals who have been diagnosed as having either of the diseases. But the literature lacks thorough research examining the distributions and correlates of TB/HIV co-infections among patients visiting TB clinics in Ibadan. This study aimed to determine the socio-demographics characteristics associated with HIV-TB co-infection among clients seeking care at dot center in Ibadan, Oyo State, Nigeria. A cross-sectional study design was carried out among 500 TB/ HIV clinic participants in Ibadan, Nigeria. A straightforward irregular testing strategy was utilized to choose 8 TB clinics in Ibadan from the list of all clinics advertising THCS in Ibadan. A questionnaire survey was utilized to inspire data on TB/HIV status, chance components and information of HIV and TB from all members who agreed to be met. Graphic insights, Chi-square test and calculated relapse were utilized for information investigation at 5% level of critical. Cruel age of the patients was 33.98±13.15 a long time. The overall prevalence of TB/HIV co-infection among the participants was found to be (41.6%). Prevalence of TB/HIV co-infection were highest (11.2% and 14.8%) among participants in age group 20-29 years and 30-39 years respectively. More females (25.2%) than males (16.4%) had been infected with TB/HIV co- infection. While the prevalence was 20.6% and 16.4% among the married and the unmarried respectively. The Chi-square test's findings indicate that TB/HIV co-infection was linked to a history of TB and HIV drug defaults. Paid sex, having several partners, Relationship status and participants' jobs. Also, Multiple sex partners (OR = 6.0, 95% CI: 2.4-15.0), Extra-vaginal intercourse (OR= 0.3, 95% CI: 0.1- 0.8) and Paid sex (OR= 0.1, 95% CI: 0.5-0.7) were found to be associated with TB/HIV co-infection among the participants. The study found that the 10- to 49-year-old age group had the highest rate of co-infection. This suggests that the majority of TB/HIV co-infection affects the productive age group. Additionally, people who had more than one sex partner (OR=6.01) those whose partners are residing with them(OR=1.45) and those with formal education(OR=1.59) are more likely to have TB/HIV co-infection while those with History of anti-TB drug default(OR=0.54), History of anti-retroviral drug default(OR=0.49), those who practice Extra-vaginal intercourse(OR=0.346)

and paid sex(OR=0.19) are less likely to be TB/HIV co-infected. TB/HIV control programs that educate people on the prevalence and focus on these subgroups are likely to decrease the joint burden of TB and HIV.

Key words: TB/HIV Co-infection, socio-demographics characteristics, clients, dot center, Ibadan, Oyo State, Nigeria

Introduction

Globally, countries in sub-Saharan Africa are the worst affected by the twin epidemic of tuberculosis (TB) and human immunodeficiency virus (HIV). The prevalence of TB in the region, which hitherto was reported to be declining prior HIV epidemic, is now on the rise, with Nigeria among the countries with a high burden of TB (Hussain, Akhtar, & Nanan, 2013 & Middelkoop et al, 2017). The association between TB and HIV has been described as the cursed duet not just because of the anguish and pain it brings to the patient but because of its impact on the family, community and the population at large. TB is the 10 h leading cause of death worldwide and the leading cause of death from a single infectious agent since 2011, ahead of the human immunodeficiency virus disease (WHO, 2019). The rise in the prevalence of TB has been attributed to the HIV epidemic, among a host of other factors. TB affects mainly the poor and low socioeconomic population; unfortunately, these groups are most at risk of HIV. The result of a survey on catastrophic costs in 2018 revealed that about 60% of TB patients live below the poverty line, with 54% of them being unable to pay for treatment and had to rely on loans or selling assets to afford treatment costs despite support from government and development partners; this is worsened when there is co-infection with HIV. WHO, 2019 In 2017, an estimated 300,000 deaths were recorded globally due to TB/HIV co-infection. (TBCTA, 2019). In Nigeria, about 63,000 new cases of TB are recorded annually among people living with human immunodeficiency virus (PLHIV) (WHO, 2019) and TB mortality (including HIV-associated TB deaths) has been estimated to be about 155,000, which is the second-highest globally (Corbett et al., 2017).

HIV and TB form a lethal combination, each speeding the other's progress. (TBCTA, 2019). HIV affects the immune system and increases the likelihood of acquiring new TB infections. It also promotes both the progression of latent TB infection to active disease and relapse of the disease in those treated previously.[7] The lifetime risk of developing TB among PLHIV is 50–70% compared to 10% in HIV-negative individuals (Corbett et al., 2017). The risk of death among HIV patients with active TB ranges between 15 and 20% in 1 year compared to 7–8% among those without active TB disease (Corbett et al., 2017).

A meta-analysis conducted in Ethiopia showed the pooled prevalence of TB/HIV co-infection to be 25.6% (95% CI (20.9–30.3%)), and there was a significant association between low CD4 counts, advanced WHO stage and TB/HIV co-infection. (TBCTA, 2019) Similarly, a study in Lagos state, Southwest Nigeria, found the prevalence of TB/HIV co-infection to be 21.6%, and the odds of having TB/HIV co-infection were higher among patients above 40 years of age and cases of retreatment.[11]

In the 18 years of existence of the DOTs clinic in Federal Medical Centre Abeokuta (FMCA), there has not been a review of cases to assess the burden of TB/HIV co-infection and the associated factors despite being a major treatment site in the state. Also, the rising prevalence of TB/HIV co-infection in the region is becoming worrisome, as this serves as a tell-tale sign of treatment failures and a high mortality rate. Therefore, this study aimed to determine the socio demographic characteristic associated with TB/HIV co-infection among clients seeking care at dot center in Ibadan, Oyo State, Nigeria. The findings of this study will add to the body of knowledge on TB/HIV

co-infection and guide policymakers on the critical factors to be addressed in reducing the burden of TB/HIV.

General Objective

The general objective of this study is to determine the socio-demographics characteristics associated with HIV-TB co-infection among clients seeking care at dot center in Ibadan, Oyo State, Nigeria

Specific Objectives

The specific objectives are;

1 To determine the socio demographic characteristics of the respondents

2 To determine the pattern of prevalence of TB-HIV co-infection among the HIV and TB clinic attendees in Ibadan

3 To assess the knowledge of HIV and TB clinic attendees on HIV and TB

4 To determine the relationship between socio-demographics characteristics associated with HIV-TB co-infection

5 To determine the relationship between risk factors HIV associated with HIV-TB co-infection

HYPOTHESIS

H0- There is no relationship between the socio-demographics characteristics associated with HIV-TB co-infection among clients

H0- There is no relationship between risk factors HIV associated with HIV-TB co-infection

Materials and Methods

Study Design

A cross sectional study design was used to determine the socio-demographics characteristics associated with HIV-TB co-infection among clients seeking care at dot center in Ibadan, Oyo State, Nigeria

Study Area

The study was conducted in Ibadan, which is both the capital of Oyo State and the largest city in West Africa. Ibadan South-West is the local government area, with a population of about 291,628 and a total land area of roughly 133.500 square meters. Over the course of the Local Government Area's 10 electoral wards, there are 127 commercial healthcare institutions, 11 primary health clinics/maternity centers, and 10 state-owned healthcare facilities.

Ibadan's primary and secondary healthcare facilities act as direct observation treatment short course centers. Patients were gathered from nine DOTS facilities, including Molete's Ibadan South-West Local Government Health Care Center and Jericho's Chest Clinic.

The population of the study consists of participants at the DOTS and ART clinics in Ibadan. There are both first-time visitors and those returning after a while.

A standardized, 66-item questionnaire that was administered by an interviewer was used to gather the data.

The questionnaire is divided into seven components. The first portion asks questions about the respondent's sociodemographic profile. Information on TB risk factors, HIV risk factors, private medical history, and diagnostic test findings are among the other components.

Information on the questionnaires was entered, coded and the data was cleaned prior to analysis. Data were presenting in tables. Inferential statistics were presented and analysed using Chi-square to determine the association between independents and dependents variables at p value < 0.05.

Ethical considerations

Each subject gave their informed consent. The Oyo State Ministry of Health's ethical review committee gave its approval for this project to proceed.

Results

The analysis of 500 probable TB patients who attended TB clinics yielded the results listed below, with a mean age and standard deviation (SD) of 33.98 13.15 years. According to Table 1 below, 54 (30.8%) of the participants were between the ages of 30 and 39. There were 130 patients in the 20–29 age range (26%), 87 (17.4%) of them in the 40–49 age range, and 59 (11.8%) in the 10- to 19–year range.

34 (6. 8%) of the respondents were in the 50- to -59-year age range, 20 (4. 0%) were in the 60- to -69-year range, and 6 (1. 2%) were in the 70- to -79-year range. The age group 80 years and older had the fewest instances, only 3 (or 0.6%). There were 258 respondents who were women and 242 (48.4%) who were men. Yoruba respondents made up the majority of the sample with 373 (74.8%), followed by Igbo respondents with 76 (15.2%), and Hausa respondents with the fewest.

The majority of the respondents, 289 (57.8%), were Christian, followed by 190 (38.0%) who were Muslim and 21 (4.2%) who practiced traditional religion. Of the 500 respondents, 43 (8.6%) had no formal education, 83 (16.6%) had completed elementary school, 168 (33.6%) had completed tertiary education, and 205 (41.0%) had completed secondary education. 267 (53.4%) of the population were married, 159 (31.8%) were single, and 51 (10.2%) were cohabiting. 12 of the participants were divorced (23.2 percent). 221 respondents (44.2 percent) of the total were from monogamous families. Only 110 people (22.0%) practiced polygamy.

RESPONDENTS SOCIAL-DEMOGRAPHIC CHARACTERISTICS

VARIABLE	FREQUENCIES	PERCENTAGE (%)
AGE (YEARS)		
10 – 19	59	11.8
20 – 29	130	26.0
30 – 39	154	30.8
40 – 49	87	17.4
50 – 59	34	6.8
60 – 69	20	4.0
70 – 79	6	1.2
> 80	10	2.0
TOTAL	**500**	**100.0**
GENDER		
Male	242	48.4
Female	258	51.6
TOTAL	**500**	**100.0**
ETHNIC GROUP		
Yoruba	374	74.8
Igbo	76	15.2
Hausa	50	10.0
TOTAL	**500**	**100.0**
LEVEL OF EDUCATION		

No formal Education	43	8.6
Primary	83	16.6
Secondary	205	41.0
Tertiary	168	33.6
TOTAL	**500**	**100.0**
RELIGION		
Christianity	289	57.8
Islam	190	38.0
Traditional	21	4.2
TOTAL	**500**	**100.0**
MARITAL STATUS		
Single	159	31.8
Married	267	53.4
Cohabiting	51	10.2
Divorced/separated	11	2.2
Widowed (er)	12	2.4
TOTAL	**500**	**100.0**
CURRENT OCCUPATION		
Barber	11	2.2
Civil servant	65	13.0
Driving	22	4.4
Farming	18	3.6
Hair dressing 1	14	2.8
Student	116	23.2
Tailoring	65	13.0
Teaching	33	6.6
Trading	116	23.2
Others	40	8.0
TOTAL	**500**	**100.0**
FAMILY TYPE		
Monogamous	221	44.2
Polygamous	110	22.0
Not applicable (Single)	169	33.8
TOTAL	**500**	**100.0**
NO OF CHILDREN		
0-2	144	43.6
3-5	132	40.0
> 5	54	16.4
TOTAL	**330**	**100.0**

Out of 500 persons who visited the TB clinic, the table below demonstrates that 41.6% of respondents were co-infected with HIV and TB. The responders in the 30-39 age group were more severely/more significantly impacted by co-infection with HIV and TB. Female attendance made up 25.2% of those who had co-infection. The percentage of those with a secondary education was the greatest (19.4%). The Yoruba ethnic group reported the highest rate of co-infection (32.4 percent). The prevalence of co-infection among traders was also found, with students having the greatest rate.

PATTERN OF PREVALENCE OF HIV/TB CO-INFECTION AMONG THE RESPONDENT

VARIABLE AGE	Total N (%)	FREQUENCIES OF HIV/TB	PREVALENCE (%) HIV/TB.
Age (years)			
10 – 19	59(12.0)	31	31
20 – 29	130(26.4)	55	11.2
30 – 39	154(31.2)	73	14.8
40 – 49	87(17.6)	31	6.3
50 – 59	34(6.9)	11	2.2
60 – 69	20(4.1)	7	1.4
70 – 79	6(1.2)	0	0
> 80	10(2.0)	0	0
TOTAL	**500(100)**	**208**	**41.6**
FAMILY TYPE			
Monogamous	221(44.2)	82	16.4
Polygamous	110(22.0)	39	7.8
Not applicable (Single)	169(33.8)	87	17.4
TOTAL	**500(100)**	**208**	**41.6**
GENDER			
Male	242(48.4)	82	16.4
Female	258(51.6)	126	25.2
TOTAL	**500(100)**	**208**	**41.6**
LEVEL OF EDUCATION			
No formal education	43(8.6)	10	2.0
Primary	83(16.6)	33	6.6
Secondary	205(41.1)	92	18.4
Tertiary	168(33.1)	73	14.6
TOTAL	**500(100)**	**208**	**41.6**
ETHNICITY			
Yoruba	374(74.8)	162	32.4
Igbo	76(15.2)	34	6.8
Hausa	50(10.0)	12	2.4
TOTAL	**500(100)**	**208**	**41.6**
RELIGION			
Christianity	289(57.8)	122	24.4
Islam	190(38.0)	78	15.6
Traditional	21(4.2)	8	1.6
TOTAL	**500(100)**	**208**	**41.6**
MARITAL STATUS			
Cohabiting	51(10.2)	13	2.6
Single	159(31.8)	82	16.4
Married	267(53.4)	103	20.6
Divorced/Separated	11(2.2)	9	1.8

Widowed (er)	12(2.4)	1	0.2
TOTAL	**500(100)**	**208**	**41.6**
CURRENT OCCUPATION			
Barber	11(2.2)	0	0.0
Civil servant	65(13.0)	33	6.6
Driving	22(4.4)	4	0.8
Farming	18(3.6)	0	0.0
Hair dressing	14(2.5)	6	1.2
Student	116(23.2)	53	10.6
Tailoring	65(13.0)	31	6.2
Teaching	33(6.6)	20	4.0
Trading	116(23.2)	39	7.8
Other	40(8.0)	22	4.4
TOTAL	**500(100)**	**208**	**41.6**
NO OF CHILDREN			
0-2	144(43.6)	46	13.9
3-5	132(40.0)	49	14.8
> 5	54(16.4)	23	7.0
TOTAL	**330(100)**	**118**	38.7

The table below demonstrates that the majority of participants (86.2%) have heard of TB. 67.6% of people reported having a persistent cough as a TB symptom. It is highly significant that 7.6 percent of the participants were aware that sharing utensils does not spread TB. However, about 53% of the participants were aware that mosquitoes do not transmit (are not carriers of the TB causative organism) TB, 42.6% were aware that TB cannot be contracted through sexual activity, and approximately 93.6% were certain that TB may be contracted through coughing and sneezing. Few of the participants were aware that TB is curable.

KNOWLEDGE OF RESPONDENTS TOWARDS TB

VARIABLE (ITEM)	**FREQUENCIES OF CORRECT RESPONSE**	**PROPORTION**
Have heard of TB	431	86.2
knowledge of symptoms of TB		
Prolonged cough	338	67.6
Fever	99	19.8
Blood in sputum	290	58.0
Loss of appetite	275	55.0
Night Sweating	255	51.0
Pain in the chest	288	57.6
Tiredress/Fatigue	189	37.8
Paleness	103	20.6
Other /Weight loss	245	49.0
Knowledge of transmission of TB		
Through sharing utensils	38	7.6
Through touching TB patient	191	38.2
Through food	59	11.8

Through sexual intercourse	213	42.6
Through mosquito bite	265	53.0
Coughing /sneezing	468	93.6
Can TB be cured	48	9.6

According to the table below, 96.2% of the participants have heard of AIDS. The participants were also aware that AIDs can spread through sexual contact, 66.6% through exchanging unsterilized sharp objects, and 67.0% through contact between a mother and her unborn child. 20.2% of respondents claimed that sharing of plates, cups, and utensils was a way for it to spread.

Only 7.8% said that it can spread through mosquito. Majority of the participants knew the means of reducing HIV transmission. About 99.8% of the respondents knew that abstinence and faithfulness to a partner, 56.6% knew condom use and 58.4% knew avoiding sharing of unsterilized sharp object as means of reducing the chances of contracting AIDs (HIV)

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KNOWLEDGE OF RESPONDENTS TOWARD HIV.

VARIABLE (ITEM)	FREQUENCY OF CORRECT RESPONSE	PROPORTION
Have heard of Aids	481	96.2
Knowledge on transmission of AIDS		
By unprotected sexual intercourse	411	82.2
Through mosquito bites	39	7.8
By sharing, cups, spons & plate	101	20.2
By sharing unsterilized sharp object	333	66.6
By transfusion of unscreened blood	335	67.0
From infected mother to child	90	18.0
Knowledge on HIV prevention		
Faithful to one uninfected partner	499	99.8
By using condom during sex	283	56.6
Avoid sharing of sharp object	292	58.4

As seen in the following graph, 336 (73.2%) of all respondents have little understanding of HIV, and 438 (87.6%) have little knowledge of TB. About 57 (11.4%) and 119 (23.8%) people, respectively, showed a moderate understanding of TB and HIV. Because they are statistically significant (P 0.05), Table 5 demonstrates that the socio-demographic variables of age, gender, ethnicity, marital status, and occupation have a significant link with HIV/TB co-infection.

BIVARIATE ANALYSIS OF RELATIONSHIP BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS AND CO-INFECTION

VARIABLE AGE	Proportion of co-infection (%)	Chi-square	df	P-VALUE
Age (years)				
10 – 19	52.5			
20 – 29	42.3			
30 – 39	47.4			
40 – 49	35.6			
50 – 59	32.4			
60 – 69	35.0			
70 – 79	0.0			
> 80	0.0	14.184	7	0.048*
Gender				
Male	33.9			
Female	48.8	11.492	1	0.001*
Level of Education				
No formal education	23.3			
Primary	39.8			
Secondary	44.9			
Tertiary	43.5	7.210	3	0.065
Ethnicity				
Yoruba	43.3			
Igbo	44.7			
Hausa	24.0	7.136	2	0.028*
Religion				
Christianity	42.2			
Islam	41.1			
Traditional	38.1	0.175	2	0.916
Marital Status				
Cohabiting	25.5			
Single	51.6			
Married	38.6			
Divorced/Separated	81.8			
Widowed (er)	8.3	25.751	4	0.000*
Current occupation				
Barber	0.0			
Civil servant	50.0			
Driving	18.2			
Farming	0.0			
Hair dressing	42.9			
Others	55.0			
Student	45.7			
Tailoring	47.7			
Teaching	60.6			

Trading	33.6	41.590	10	0.000*
No of Children				
0-2	31.9			
3-5	37.1			
> 5	42.6	2.117	2	0.347

The table below illustrates the statistical associations between HIV/TB co-infection and multiple sex partners, sexual activity within the previous year, partner residency, sex partner type, paid sex, anti-retroviral treatment history, and art default history (P 0.05).

BIVARIATE ANALYSIS OF RELATIONSHIP BETWEEN RISK FACTOR OF HIV AND HIV/TB CO-INFECTION.

Variable	Prevalence of co-infection (%)	Chi-square	df	P-value
Multiple sex partners				
Yes	52.0			
No	32.8	12.181	1	0.000*
Sexual activity in last 1 year				
Yes	36.8			
No	56.7	14.754	1	0.000*
Partner residency				
Together (Yes)	35.3			
Not together (No)	51.2	9.472	1	0.002*
Sex partner type				
Husband/wife	31.7			
Live in partner	52.2			
Casual	50.6	12.720	2	0.002*
Condom use				
Yes	46.7			
No	44.1	0.027	1	0.869
Extravaginal intercourse				
Yes	36.3			
No	43.0	1.496	1	0.221
Paid sex				
Yes	78.0			
No	32.6	32.801	1	0.000*
STD				
Yes	43.4			
No	37.7	0.640	1	0.424
Use of personal barbing clipper				
Regularly				
Occasionally	35.2			
Not applicable	36.4			0.412
	41.7	1.771	2	
Sleeping away from spouse when travel				

Yes	37.4			
No	38.9	0.086	1	0.770
Chronic morbidities				
Yes	34.3			
No	43.5	1.090	1	0.296
History of anti-retroviral drug				
Yes	54.0			
No	35.7	15.120	1	0.000*
History of drug default				
Yes	52.2			
No	36.7	10.643	1	0.001*

The table below demonstrates the statistical significance of logistic regression of several sex partners against HIV/TB (OR = 6.008, 95% CI for OR: 2.402 - 15.023). Compared to those who do not, those who have several sexual partners are nearly six times more likely to have HIV/TB co-infection. Extravaginal sex was additionally discovered to be statistically significant (OR = 0.346, 95% U for OR: 0.141 - 0.850). Those that practice extravaginal intercourse are about 0.346 times more likely to have HIV/TB co-infection those that do not involve in extravaginal sex. Participants who engaged in paid sex was found to be statistically significant (OR= 0. 199, 95%cl for OR: 0. 500- 0. 794). Those who engaged in paid sex had about 0.199 times risk of having HIV/ TB co- infection than those who do not. The higher risk of co- infection was among those who had low level of education (OR= 1.587, 95%cl for OR: 1. 020- 2. 468).

MULTIVARIATE ANALYSIS OF FACTOR ASSOCIATED WITH HIV/ CO-INFECTION

Variable	**Odds ratio**	**P-value**	**95% confidence Infection**
Currently Smoking			
Yes			
No	2.422	0.185	0.655 – 8.953
History of anti-TB drug			
Yes			
No	6.097	0.264	0.256 – 145.309
History of anti-TB drug default			
Yes			
No	0.542	0.725	0.81 – 16.533
Multiple Sex Partner			
(Multiple) Yes			
(Single) No	6.008	0.000	2.402 – 15.023*
Sexual activity in last one year			
Yes			
No	0.374	0.83	0.123 – 1.139
Partner residency			
Together (Yes)			

Not together (N)	1.448	0.559	0.419 – 5.000
Sex partner type Husband/wife Casual	0.774	0.535	0.344 – 1.741
Extravaginal intercourse Yes No	0.346	0.021	0.141 – 0.850*
Paid sex Yes No	0.199	0.022	0.50 – 0.794*
History of anti-retroviral Yes No	0.370	0.460	0.026 – 5.163
History of drug default Yes No	0.494	0.597	0.036 – 6.752
Level of Education Yes No	1.587	0.041	1.020 – 2.468*

DISCUSSION

The high prevalence of TB may have been impacted by the emergence of the HIV epidemic in the studied group, according to the high incidence of HIV among TB patients. Overall, 342 persons (68.4%) tested positive for TB, indicating that the increase in infection is a matter of public health concern. HIV's introduction would have weakened people's immune systems, making TB outbreaks more likely.

The majority of participants and clinic attendees, according to this study, were between the ages of 20 and 49. Despite this, the results of the current study and Babashani & Lliyasu's 2019 study on the typical age of patients with TB/HIV co-infection are comparable. The age group 30-39 years had the majority of the TB/HIV positive patients, with the age range 20-29 years having the second-highest number. These age groups coincide with the very active age group both occupationally & sexually. Since they are more involved in human interactions chances are that they become more vulnerable to infection than any other groups. They form a very active group sexually and may have contacted TB or become more vulnerable to TB due to the presence of HIV which they may have contacted during indiscriminate sexual behaviour. This may be the reason for high prevalence of HIV with Tb patient. This implies that HIV and TB affect the most economically productive age group of the population. It can be envisioned that if nothing is done to quickly tackle this public health emergencies more effectively, it will result into great economic losses as observed by Maclead et al, 2012.

The results also show that there were more females participants than males. The majority of the female patients were infected with TB/HIV co-infection than males. These high number of clinic attendees and high prevalence of TB/HIV co-infection among female might due to the fact that females visit clinics/hospital more than males and the better health seeking behavior among females than males.

About 41%of the respondent had secondary education, 33.6% had tertiary education 16.6% had primary education and 8.6% had no formal education. A large number of the respondents belong to

Yoruba ethnic group. This result shows that Ibadan is occupied by Yoruba. The Igbo, which form the second largest group are resident in the city for commercial activities. A large number of the respondents were also Christian. This reflect that Ibadan people practice majorly Christian religion. Majority of the respondents in this study are married. Occupation distribution reveals that trading is the most practice occupation followed by tailoring and civil service work.

The results of this study have shown the prevalence of TB/HIV co-infection to be 41.6%. the prevalence shown by this (khandekar et al, 2015), 69% in Maidugari (Ajayi et al, 2019). The prevalence is higher than 19% in Maidugari (Moses et al, 2013), 12.7% in Ife (Onipede et al 2019), 6.4% found in umuahia (Nwachukwu & Peter, 2019). The variation in the prevalence of TB/HIV co-infection may be due to differences in distribution of risk factors, geographic location, awareness and nature /type of study population (Mahajon & Tandon, 2017). This study also shows that more females are infected with TB/HIV than males. The finding might due to the fact that cultural, biological & socio-economic factors contribute to women's higher vulnerability to HIV/AIDS as also observed by Pelzer et al, 2018.

This study revealed that the prevalence of HIV/TB co-infection is highest within age group 20-39 years. The finding age group 20-39 years. The finding supports the submission that TB and HIV affect the most economically productive group (FMOH, 2015).

Occupational distribution reveals that many traders tested positive to TB/HIV co-infection. This could however be because the traders are very close to the public and trading in Nigeria is usually done in unhealthy, often overcrowded environment which has earlier been reported as one of the major risk to contacting TB (Okoror et al, 2018). This is because overcrowding allows for easy pick-up of the drop lets of TB due decreasing air flow. During tracking in this environment droplets of TB could be released into the air and later picked up by healthy or HIV positive individuals since they are all very close to each other in the market place, the dusty environment of the markets also enhance the transmission of the tubercle droplets by infected individuals and healthy individuals could pick up the droplets and get infected. Traders often travel out of their area of domicile for trading purposes and more frequently and these areas could be of high infelicity and thereby increases their risk of contacting the infection and this could however account for the high risk observed for traders. The high risk also observed among students could be due to indiscriminate sexual behavior such as multiple sex partner.

The finding of this research also shows that 86.2% of the respondent have heard of TB before. This is lower than the proportion of patients in Pakistan (89.8%) know that TB can be cured (Khan et al 2006). This outcome calls for urgent public awareness and patients education. The overall result shows that better proportion 15(3.0%) of the respondents have good knowledge of HIV when compared with 5 (1.0%) of TB. About 119(23.8%) have moderate knowledge of HIV compared to 57(11.4%) of TB. Those who have poor knowledge of TB is higher 438(87.6%) compared to HIV 336(73.2%).

Majority of the respondents reported prolonged cough (67.6), Blood in sputum (54.0%). Loss of appetite (55.0%), fever (19%), Night sweating (51.0%), pain in the chest (57.6%), Tiredness/fatigue (37.8%), weight loss (49.0%), these symptoms are not specific enough to be used for screening of HIV/TB co-infection because these are commonly reported in other diseases.

The result of this study shows that TB/HIV co-infection is not associated with age. This study however consistent/agrees with the finding by Nwachuckwu and Peter in Umuahia, that age was never a risk factor of TB/HIV co-infection.

The study found that Multiple sex partner, Extraviginal intercourse, sex partner type, Paid sex and Level of education are all significant risk factors of TB/HIV co-infection after adjusting for confounders such as History of STD, Condom use at last sex, Use of personal barbing clipper, and

History of MDT/ART use. However, lee & Ho (2018) found that people who had previous history of STD are about three times more likely to have HIV than those without.

CONCLUSION

According to this study, nearly one-third of those who frequent HIV and TB clinics are also infected with TB. The study also showed that the age range of 10-49 years had a greater prevalence of co-infection. This suggests that the HIV and TB syndemic and HIV-TB co-infection disproportionately affect the productive age group. Additionally, it was discovered that HIV clinic visitors had a somewhat greater rate of co-infection with TB than did TB clinic visitors.

The majority of clinic attendees have insufficient awareness of HIV and TB, the study also revealed. Because inadequate understanding of a disease's means of transmission may be correlated with a lackluster attitude toward infection prevention, the low awareness of these diseases (HIV and TB) may increase the rate of TB co-infection among HIV positive patients. This may indicate that patient counseling and education in TB and HIV clinics needs to be improved.

In this study, condom use, Extraviginal intercourse, use of personal barbing clipper, chronic morbidity and sleeping away from spouse when travel were all not significant risk factors of HIV-TB co-infection among the clinic attendees. The study however identified multiple sex partner, sexual activity in last 1 year, sex partner type, paid sex, history of anti-retroviral drug, history of drug default, current smoking and current occupation as significant risk factors of HIV-TB co-infection among the clinic attendees. Existing Parallel TB and HIV control programs that focus on the sub-groups of patients that have these risk factors are more likely to succeed in their control efforts.

RECOMMENDATIONS

Failure to adhere to MDT/ART has been identified as a risk factor for HIV-TB co-infection. This implies that significant public health measures must be implemented to ensure drug adherence in HIV and TB clinics. It is advised that patients on DOTS be thoroughly watched as well as that an ART treatment plan be strictly observed in order to ensure medication adherence.

It is important to advise patients who are TB and HIV positive to alter their lifestyles in order to lower their risk of developing conditions including diabetes, hypertension, and cancer. Routine testing for both illnesses is advocated, as well as their integrated management, for the purpose of efficiently controlling HIV and TB in the TB and HIV clinics.

The primary goal of behavior change communication should be to prevent having many sex partners. It is clear that co-infection risk factors are different from those of TB or HIV, and as a result, their management should be completely integrated into the ongoing parallel TB and HIV control programs.

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