



DETERMINANTS OF TUBERCULOSIS PREVENTION AMONG PLWHIV/AIDS ATTENDING PEPFAR CLINIC ADEOYO TEACHING HOSPITAL, IBADAN, OYO STATE

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ABSTRACT: *The best way to reduce the rate of mortality and morbidity of the people living with HIV/AIDS(PLWHIV/AIDS) is to prevent opportunistic infections such as tuberculosis, through the use of WHO three I's: (i) isoniazid preventive therapy(IPT), (ii) infection control(IC), (iii) intensify case findings (ICF). Tuberculosis is a global concern of everyone most especially among the people living with HIV/AIDS due to their immuno suppression that make them vulnerable to an opportunistic infection. Hence, the researcher investigated the determinants of TB prevention among PLWHIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital Ibadan Oyo-State., Nigeria. A survey research design was adopted for this study while total enumeration was used to select the participants of the study. Descriptive survey research design was used. A Self –designed questionnaire was used for data collection, which was pilot tested through test-re-test and yielded a reliability coefficient (index) of 0.756. Four research questions and three hypotheses were formulated and tested. Analysis of data was done using descriptive statistics and Chi-square analysis fixed at the .05 significant levels. A total of 110 respondents participated in the study. Their age ranged from 20-63 years with a mean age of 41.5 years. The study further revealed no significant difference in the knowledge of the TB prevention and the gender of the PLWHIV/AIDS ($\chi^2 = 15.797$, $P < 0.05$). but there is a significant difference in the use of isoniazid preventive therapy among PLWHIV/AIDS ($\chi^2 = 9.298$, $P < 0.05$). The study concluded that the use of Isoniazid preventive therapy, effective infection control, early commencement of antiretroviral drug is some of the best strategies for preventing TB among PLWHIV/AIDS. Based on the outcome of this study, it was recommended that there is need to focus more on intensifying case finding, household contacts tracing and mass media campaigns to create awareness on TB prevention among the people living with HIV/AIDS.*

KEYWORDS: Determinants of Tuberculosis Prevention, People living with HIV/AIDS.

INTRODUCTION

The massive setback for the prevention and control of tuberculosis (TB) as a result of advent of HIV has been the World Health Organization (WHO) concerns throughout the whole world especially in the developing world such as Africa. Despite 90years of vaccination and 60years of chemotherapy, tuberculosis is one of the world's leading cause of death apart from Corona Virus, Lasa Fever, Ebola from an infectious agent, exceeding human immunodeficiency virus and acquired immune deficiency syndrome (HIV/AIDS) accounting for an estimate of 37% AIDS death in every year (Amare, 2016).



It has been noted that 50% of new TB cases are also HIV co-infected in Southern and Eastern Africa which are centre of HIV/TB epidemic, the multiplicity and interrelatedness of the two diseases makes it a complex in health domain. TB is preventable but it continues to pose undue risk to the lives of economically productive individual in Africa. TB accounts for 15.3% of HIV patients' deaths on the continent. Three out of Ten HIV patients aged 20-45 years are estimated to experience TB annually as a result of immuno-suppression (Kufa, Mabuto, Muchiri & Harris 2014). Within sub-Saharan Africa, Nigeria was found to be the most populous country with a population of about 182.2 million as at 2016. The middle age individual makes up over 50. 43 percent (almost half) of Nigeria's growing population (National Population Commission, 2016). As a result, all effort should be made to prevent TB among PLWHIV/AIDS by advocating on the three priority public health actions to prevent and control TB in people living with HIV/AIDS and other vulnerable patients as well as community at large.

The risk of developing TB is between 20 and 37 times greater in people living with HIV than among those who do not have HIV infection, the deteriorating effect of TB infection on the life of PLWHIV/AIDS and global health necessitate prompt use of three I's as recommended by WHO to prevent TB. There are, Isoniazid preventive therapy (IPT), infection control (IC) and intensified case finding (ICF). But it quite unfortunate that many countries including Nigeria have been slow to implement these reducing services, hence the researcher is trying to investigate the determinants of TB prevention among PLWHIV/AIDS.

Also, the 2016 political declaration on ending TB /AIDS confirmed the commitment of member state to reduce the number of TB deaths in people living with HIV/AIDS by 75% by 2020, meeting this target requires an immediate intensification of action such as promotion of the use of three I's in prevention of TB. Though, tuberculosis is no more the world's leading cause of death from an infectious agent due to emergence of other viral diseases like just like Corona Virus, Lasa Fever, Ebola, yet its impact on the wellness of people living with HIV/AIDS cannot be overlooked. Amare (2016) revealed that only about 10% of individual infected with TB progressed to active TB disease within their lifetime, the remainders of persons infected successfully contain their infection. One of the challenges of TB is that the pathogen persists in many infected individuals in a latent state for many years and can be reactivated to cause disease. The risk of progression to TB disease after infection is highest soon after initial infection and increase dramatically for persons co-infected with HIV/AIDS or other immune-compromising conditions reason been that TB spread easily through air, even in the hospital premises where people go for help has been recording a lot of people that contact TB while they are in the hospital due to structural defect of the most hospitals and overcrowding in hospital outpatient with poor ventilations (Ausman, Desalew, Atsede, Belayneh & Melaku, 2018).

It should be noted that TB, which is among the top ten causes of global mortality, has been recording more fatalities than HIV as reported by World Health Organization (2017) on WHO global Tuberculosis Summit. It remains the world's most important cause of death from an infectious agent, besides the human immunodeficiency virus (HIV) with which it is intimately linked. The risk of developing TB is between 20 and 37 times greater in people living with HIV than among those who do not have HIV infection. TB is responsible for more than a quarter of deaths in people living with HIV. Pulmonary complications have been one of the commonest causes of morbidity and mortality since the advent of Acquired Immune Deficiency Syndrome pandemic (AIDS) (Pathmanathan, Dokubo, & Bashorun,



2017). The world health organization (2017), stated that the global ratio of male to female TB infection among HIV patients was 2.80% in male and in female was 1.85%, this gender imbalance increases with age as revealed by Chan, Wong, Lea, Laung and Mak (2018).

Solomon, Amare, Tadesse, and Kebede (2015) carried out a study in Pakistan on TB infection among PLWHIV/AIDS it revealed that TB in HIV patients is higher among males than females and that it varies widely among countries, it also revealed that incidence is common in age group 21years and above. The majority of TB in HIV/AIDS patients cut across all ages. In a study carried out by Tarekegne, Jemal and Deressa (2016) in Peru of TB infection among PLWHIV/AIDS showed that TB was high in women of reproductive age compared to males in the same age range because of their frequent visit to the hospital environment. It was recorded that it is not only in resource poor countries that TB transmission occurs in hospitals in 2012 it was reported that a patient in the UK had become infected with TB and had died, as a result of receiving kidney dialysis when sitting next to another patient with infectious TB. In Africa and Eastern Europe males seems to represent the majorly adult HIV/AIDS patients with TB infection. Infact the figures are higher in Eastern Europe than African countries as revealed by Chen, Cao, ChenRen and Li (2016).

Epidemiological studies evinced that, co-infection with HIV can elevate the risk of latent TB reactivation by 20-fold and is the most potent risk factor known for the advancement of M. tuberculosis infection to active disease. The HIV virus has considerably reshaped the epidemiology of TB by widening the risk of possibility of TB infection once contracted to tubercle bacilli (re-infection) and by elevating the risk of rapid progression instantly after the infection. Human immunodeficiency virus (HIV) infection and tuberculosis (TB) not only constitute an unresolved public health challenge in Sub- Saharan Africa but also in the entire world. The World Health Organization WHO (2014) estimated that in 2013, 9 million people developed TB and 1.5 million died from the Report, 2014).

In a study conducted by Tarekegen, Jemal and Deressa (2016) in Ethiopia it was found out that TB infection among PLWHIV/AIDS occurs frequently among males than female also among patients in age group 25-34 years. In another study by Siasay, Mekonem and Ferede (2018) showed that the incidence is higher among female than male and that TB infection occurred predominantly within the age group of 25-34 years. Ogbo, Oyeleko, Olusanya and Page (2016) were of different opinion in a study carried out on TB infection among PLWHIV/AIDS that it is common among age group 50years and above this was in line with the study carried out by Liang, Shen, Sun, and Lu (2016) that revealed TB infection among PLWHIV/AIDS is common among age 60years and above in China, this was contrary to the study carried out by Okonko, Anyanwu, Osadebe and Odu (2018) in Port Harcourt Nigeria considering TB infection among people living with HIV/AIDS in relation to gender and age showed that the prevalence is higher among males (23.1%) than female (9.6%) and common among ages below 30years (21.2% than in their counterparts 30years and above (9.6%).

Mitku, Dessie, Muluneh and Workie (2016) in a study carried out in Ethiopia about TB infection among PLWHIV/AIDS shows that the incidence is higher among female 69% compared to male of 31%, also TB infection is higher among PLWHIV/AIDS who had primary education than those with high education and among those living in urban areas than those living in rural areas also among those with single marital status than those that are married this was in line with the study carried out by Jiamsakul, Lee, Nguye, Merati, and Law (2017) revealed that TB infection is high among low socio-economic status and this was



due to the increase of poverty rate in Africa countries. Also in a study carried out by Ivanous, Salmane and Viksna (2016) revealed TB infection among PLWHIV/AIDS is common among low socio-economic status due to poverty, socio overcrowding and malnutrition hence, every country should have infection control guidance which clearly needs to take into account local settings and resources, as well as the numbers of people being provided with care.

Today 50% or more of new TB cases are also HIV co-infected in Southern and Eastern Africa, which is the centre of HIV/TB epidemic. Nigeria has an estimated incidence of 300,000 cases of TB forms annually, ranking it as the 5th highest TB- burden country in the world (Nglazi, Kranzer, Holele, & Bekker, 2015). As a result, there are currently more new TB cases each year than ever before. World Health Organization (2015) has predicted that the number of patients with HIV/TB co-infection will double from 17% in 2000 to 25% in 2025. Many people with *Mycobacterium tuberculosis* and HIV have 5-10% annual risk of developing active TB. The double impact of TB and HIV co-infection is keeping large number of people trapped in poverty with these diseases that reinforce each other. An estimated of 170 million working age are lost each year as a result of TB and the health sector is burdened by the cost of drugs and treatment (Kufa, Mabuto & Harris, 2014).

It should be understood that in the South-West Part of Nigeria, in which the study centre fall, tuberculosis and HIV co-infection ranks first among the ten most common disease morbidity and mortality. It accounts for 40% of outpatient visits and 45% of inpatient admissions (Federal Ministry of Health, 2017). The increased burden of the disease has been attributed to informal settlement, stigmatization, advanced in age, high population, cigarette smoking and poverty. The magnitude of HIV and TB-co-infection is increasing despite progress made in the antiretroviral therapy and Direct observe treatments (ART/DOTs) implementation and control program.

In this background, this research is intended to study the determinants of tuberculosis prevention among people living with HIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital Ibadan, Nigeria.

Hypotheses

There is no significant difference in knowledge of male and female living with HIV/AID on TB prevention

There is no significant association between early introduction of isoniazid preventive therapy among people living with HIV/AIDS and TB prevention.

There is no significant association between early commencement of antiretroviral therapy and knowledge about TB prevention.



METHODOLOGY

Research Design: The study employed a descriptive research design to examine the determinants of TB prevention among PLWHIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital Ibadan.

Population: All patients living with HIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital Ibadan. Oyo State, Nigeria.

Inclusion criteria: All patients with HIV/AIDS attending and receiving treatment in PEPFAR clinic Adeoyo Teaching Hospital Ibadan.

Exclusion criteria: Patients with HIV/AIDS. but are not receiving treatment at PEPFAR clinic.

Sample size and Sampling Technique: Total enumeration was adopted for the selection of the people living with HIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital from Monday to Thursday for the period of four weeks due to the manageable size of the population which was 110.

Instrumentation: The instrument used for this study was a well-structured survey questionnaire. The research instrument was divided into four sections. **Section A:** This section elicited responses on demographic variables of participants such as age, gender, marital status, educational qualification, among others. **Section B:** Elicited information on respondents' knowledge of spread of tuberculosis among people living with HIV/AIDS. The items were measured on 2 continuum scale ranging from 0 to 1 (Yes = 1, and No =0). The correct answer is 1 and wrong answer is 0. Knowledge as a variable was measured as either high (mean score between 7.0 & 10.0), moderate (mean score between 4.0 & 6.0) or low (mean score between 1.0 & 3.0). **Section C:** Elicited information on the false belief and misconception of the respondents and TB prevention. The items were measured on 2 continuum scale ranging from 0 to 1 (Yes = 1, and No =0). The correct answer is 1 and wrong answer is 0. **Section D:** Elicited information about determinants of TB prevention among people living with HIV/AIDS. The items were measured on 5- point likert- scale ranging from 1 (strongly disagree) to 5 (strongly agree). Attitude score of participants below 88 was categorized as negative attitude, while attitude score of participants from 88 to 110 was categorized as positive attitude.

The instrument was subjected to a pilot testing among twenty (20) PLWHIV/AIDS attending PEPFAR clinic University College Hospital Ibadan Oyo State Nigeria while reliability test results yielded coefficient value of 0.756.

Method of Data collection: The researcher and two research assistants were involved in the administration of the instruments. The research assistants were post graduate students of University of Ibadan trained for the purpose of this study. They were given an orientation on the research and how to carry out the administration of the questionnaires. Four weeks were spent for the collection of the data using the above described instruments. The researcher and the research assistants met with the Assistant Director of Nursing Service of Adeoyo Teaching Hospital Ibadan, explaining the purpose of the research and presented the letter of permission from the ethical committee department of the ministry of health Oyo State.

Permission was granted to meet with the Head of PEPFAR clinic in a company of the secretary of chief medical director.

Heads of PEPFAR clinic were spoken with and patients were met at their clinic days, while the aim of the study as well as the need for their participation was explained to them.

First Monday of the week was used for familiarization with the head Nurse and other health care providers working in PEPFAR clinic and discussed with them the relevance of the project; while Tuesday was used to familiarize with the patients who were present at the clinic the very day with the help of the Nursing leader. The remaining days in the week and the following weeks were used for administration and collection of the questionnaire.

For easy collection of data, the instrument was translated into the local language (Yoruba) The patients who can read and write were given copies of the questionnaire to complete by themselves while the respondents who cannot read or understand English were guided by the researcher with the translated version. The researcher waited to collect questionnaire at each visit so as to ensure proper filling and complete retrieval of instruments. A period of four weeks was used in the administration of instrument and collection of data.

Method of Data Analysis: Descriptive statistics of frequency distribution, percentages, means bar and pie chart were used to analyze the data and provide answers to the research questions 1, 2, 3 and 4. Chi-square was used to test the three hypotheses one, two and three. All the hypotheses were tested at 0.5% level of significance ($p < 0.05$).

RESULTS AND DISCUSSION OF FINDINGS

Table 4.1: Demographic Data of Respondents (N=110)

Demographic Variables	Frequency	Percent (%)
Age (Years)		
less than 20	14	12.7
21-30	7	6.4
31-40	54	49.1
41-50	30	27.3
51-60	5	4.5
Gender		
Male	46	41.8
Female	64	58.2
Marital Status		
Single	18	16.4
Married	75	68.2
Divorced	7	6.4
Widowed	6	5.5
Separated	4	3.6



Educational qualification		
no education	13	11.8
Primary	37	33.6
Secondary	52	47.3
Degree	8	7.3
Family setting		
Monogamy	49	44.5
Polygamy	61	55.5
Current employment status		
Student	17	15.5
civil servant	15	13.6
self-employed	73	66.4
Unemployed/ unable to work	5	4.5

Table 4.1 depict the greatest proportion of the participants were 54(49.1%) age between 31-40years, 64(58.2%) were female and 68.2% were married. A significant number of the respondents had their educational level at secondary school 52(47.3%) while 61(55.5%) were from polygamous family and 73(66.4%) were self-employed.

Table 1: Knowledge About TB Prevention Among Gender

Knowledge of Prevention	Gender		Total	χ^2 test	p-value
	Male N(%)	Female N(%)			
Incomplete Knowledge	21(45.7)	29(45.3)	50	.001	.972
Knowledgeable	25(54.3)	35(54.7)	60		
	Mean \pm SD	Mean \pm SD	Mean \pm SD	t- test	p-value
Knowledge of Prevention	8.5 \pm .8	8.4 \pm 1.4	8.3 \pm 1.2	1.154	.251

Results showed that there was no significant difference in knowledge of male and female living with HIV/AIDS on TB prevention ($\chi^2 = .001$, $P > 0.05$, t-test = 1.154, $P > 0.05$) The mean knowledge about prevention of tuberculosis (TB) score in male (8.5 \pm .8) and in female (8.4 \pm 1.4) was approximately close to each other hence may not influence TB prevention among people living with HIV/AIDS. Same as the proportion in case of association of chi-square. (45.7vs45.3for Incomplete knowledge, 54.3 vs 54.7 for Knowledgeable, male vs female). According to Mondal et al (2014), although people often have a general idea of what TB is, gaps in knowledge on transmission, treatment and prevention leads to diagnostic and treatment delays among people living with TB. The author argues that patients with low knowledge about TB are less likely to seek healthcare and get diagnosed rather they often turn to self-medication and traditional healers which lead to delays in diagnosis and appropriate treatment.

**Table 2: Association Between Early Introduction of Isoniazid Preventive Therapy and Knowledge About TB Prevention**

Early introduction of isoniazid preventive therapy	Knowledge about TB Prevention		Total	χ^2 test	p-value
	Incomplete Knowledge N(%)	Knowledgeable N(%)			
Strongly agreed	0	7(100.0)	7	9.298	.026
Agreed	9(37.5)	15(62.5)	24		
Undecided	33(55.9)	26(44.1)	59		
Disagree	8(40.0)	12(60.0)	20		

Results showed that early introduction of isoniazid preventive therapy was significantly associated with knowledge about TB prevention ($\chi^2 = 9.298$, $P < 0.05$). Respondents who agreed strongly (100.0%) and agreed (62.5%) with early introduction of isoniazid preventive therapy had more knowledge compared to those disagreed. Implication was that the knowledge about TB prevention will influence early introduction of isoniazid preventive therapy among people living with HIV/AIDS. Implication was that early introduction of isoniazid preventive therapy among people living with HIV/AIDS will influence TB prevention. The result of the study supported Dean and Fenton (2013) who submitted concept on integrating a social determinants of health approach into public health practice: a five-year perspective of actions implemented by CDC's National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention.

Table 3: Association Between Early Commencement of Antiretroviral Therapy and Knowledge About TB Prevention

Early Commencement of Antiretroviral Therapy	Knowledge About TB PREVENTION		Total	χ^2 test	p-value
	Incomplete knowledge N(%)	Knowledgeable N(%)			
Strongly agreed	5(31.2)	11(68.8)	16	13.901	.003
Agreed	31(39.7)	47(60.3)	78		
Undecided	10(90.9)	1(9.1)	11		
Disagree	4(80.0)	1(20.0)	5		

Results showed that early commencement of antiretroviral therapy was significantly associated with knowledge about TB prevention ($\chi^2 = 13.901$, $P < 0.05$). Respondents who agreed strongly (68.8%) and agreed (60.3%) with early commencement of antiretroviral therapy had more knowledge compared to those disagreed. Implication was that the knowledge about TB prevention will influence early commencement of antiretroviral therapy among people living with HIV/AIDS. The study finding was in support of Craig, Daftary, Engel, O'Driscoll, & Ioannaki (2017) that revealed that early commencement of antiretroviral therapy treatment and subdue all forms of misconception.



CONCLUSION

The current study found that the TB prevention knowledge among PLWHIV/AIDS attending PEPFAR clinic Adeoyo Teaching Hospital, Ibadan Oyo State Nigeria was fair or moderate. The use of isoniazid preventive therapy and integration of TB case findings, however, remains low largely due to lack of awareness and low knowledge. It is therefore, important to design interventions that increase awareness of TB prevention measures; correct misconception about TB spread and its prevention, also to showcase availability of the preventive therapy in all the health facilities, more facilities that provide care for PLWHIV/AIDS needs to make TB preventive therapy available while providers need to improve the quality of services.

Given the above findings, it is therefore concluded that in order to reverse the mortality rate of PLWHIV/AIDS because of TB infection despite almost two decades international issue, urgent workable solutions are imperative. This could be achieved by giving priority to the education of the PLWHIV/AIDS on relevance of TB prevention in order to address the identified knowledge deficit about available TB preventive measures and the importance of using them. Also, countries should be advised to integrate HIV and TB service by ensuring HIV prevention and treatment programme include regular TB screening, preventive therapy and early treatment.

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