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Knowledge and Attitude towards TB-HIV Co-infection Among Students of a Tertiary Institution in North-Central Nigeria

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Abstract

Tuberculosis and Human Immunodeficiency Virus (TB-HIV) co-infection poses a public health challenge to sustainable national development due to the burden of the disease. Lack of knowledge and poor attitude towards the disease especially in congregate setting, such as tertiary institutions contribute to its spread. The study examined the knowledge and attitude towards TB-HIV co-infection among students of Kwara State College of Education, Ilorin. It was a cross-sectional and non-interventional study using structured questionnaire tested for reliability (r = 0.99). Four hundred and five eligible students were interviewed using the questionnaire. Statistical Package for Social Sciences Version 17.00 was used for data entry and analysis. The findings revealed a mean score of 53.4% for knowledge about TB-HIV co-infection. The knowledge about the reciprocal interaction between TB and HIV was 40.2% while knowledge for laboratory diagnosis being difficult was 28.2%. Furthermore, the mean score for attitude was 45%. Only 30.0% of the respondents felt that prospective marital relationship should not be broken if laboratory tests are positive for TB-HIV co-infection. Significant differences were found between the level of education of the students and their knowledge of the difficulty of laboratory diagnosis of TB-HIV co-infection ($p<0.05$); and between the level of education and their attitudes towards breaking prospective marital

relationship if the partner is diagnosed with TB-HIV co-infection (P<0.05). This study recommended that health education on diseases of public health importance should be included in the curriculum for tertiary education.

Keywords: Knowledge, Attitude, TB-HIV co-infections, Reciprocal Interaction, Antiretroviral and TB medicines.

Introduction

Mycobacterium tuberculosis (TB) and Human Immunodeficiency Virus (HIV) co-infection can be referred to as a "lethal duet" due to the morbidity and mortality. The situation has been likened to a marriage between 100 years TB and 25 years HIV and their honey moon is causing harvoc (Silversides, 2006). It has also been referred to as "cursed duet" (Pennap, *et al*., 2010). The relationship is not simply a case of co-existence of both infections in the same patient; rather there is reciprocal interaction between the two infections. Both HIV and TB attack the immune system that is supposed to protect the human body. Either infection weakens the immune system such that the susceptibility to HIV or TB in the presence of the other is increased. The interaction is complex. Thus, the progression and prognosis of each infection are worsened by the other. HIV infection is the most powerful predisposing risk factor in TB infection (Pawlowski *et al., 2012*). The likelihood of reactivation, reinfection and progression of latent TB to active disease is increased. In addition, the clinical presentation of TB disease is altered (Datiko *et al.,* 2008). It is worthy to note that the risk of developing active TB is 6-10 folds greater in HIV infected individuals compared to non-infected individuals (Luber 2005; Okwor 2005). HIV positive patients with TB have a decreased chance of survival compared to HIV positive patients with matched CD4 count that do not have TB. Also, TB can accelerate the decline in CD4 count among people with HIV. TB is also the most common cause of AIDS-related deaths (Pawlowski *et al., 2012*).

Globally, TB-HIV co-infection is one of the leading causes of morbidity and mortality (Breen *et al.,* 2006). About 33 million people are HIV infected. About one-third of these are also affected by TB-HIV co-infection. It is also one of the leading causes of morbidity and mortality in sub-Saharan Africa (Idemyor, 2007). In 2011, 1.1 million (13%) of the people who developed

TB worldwide were HIV positive and 79% of those TB-HIV cases were in Africa (World Health Organization [WHO], 2012). The effectiveness of the directly observed therapy (DOT) of TB has been reduced by TB-HIV co-infection (Wang, *et al*., 2010). The complex interaction between TB and HIV infections for about 3 decades constitutes a major threat to the international community's effort to achieve the health-related United Nations Millennium Development Goals for TB and HIV infections (Gtahun *et al.,* 2010).

Generally, an HIV positive individual co-infected with TB will manifest clinical features of TB disease such as coughing, haemoptysis, fever, night sweats and weight loss. The co-existence of both diseases accentuates the difficulty of laboratory diagnosis due to the decreased sensitivity of the examination of the sputum smear for TB. Laboratory diagnosis for TB-HIV co-infection is difficult because sputum smears are negative and positive smears tend to contain fewer acid fast Bacilli (Lawn and Wood, 2011). Tuberculin tests for TB are often falsely negative. Chest x-rays are often atypical, hilar lymphadenopathy, bi-basal pneumonia and pleural effusions are seen more often while cavitation is seen less often (Eddleston and Pierini, 2002).

TB-HIV is treatable (Luetkemeyer, 2013). Both antiretroviral and TB medicines are used to treat TB-HIV co-infection. The treatment guidelines on use of antiretroviral (AVR) drugs (WHO, 2010; Federal Ministry of Health, Nigeria [FMOHN], 2010) recommended the use of combination medicines from at least two classes of ARV. This is to ensure that these medicines act either on at least two different points in the life cycle of the HIV or by two different mechanisms on one point on the HIV life cycle. Examples of ARVs include: zidovudine (ZDV), lamivivudine (3TC), abacavir (ABC) and emtricitabine (FTC) which belong to the Nucleoside Reverse Transcriptase Inhibitor (NRTI) ARV class; nevirapine (NVP) and efavirenz (EFV) which belong to the Non-Nucleoside Reverse Transcriptase Inhibitor (NNRTI) ARV class. Other ARVs are tenofovir (TDF) which belongs to the Nucleotide Reverse Transcriptase Inhibitor (N_tRTI) ARV class; and lopinavir (LPV), ritonavir (RTV), atanazavir (ATV), saquinavir (SQV), nelfinavir (NFV) and indinavir (IDV) which belong to the Protease

inhibitor (PI) ARV class. The antiretroviral therapy (ART) is life-long. The medicines for active TB include rifampicin, rifabutin, isoniazid, pyrizanamide, ethambutol and streptomycin. The pharmacotherapy for the TB is Directly Observed Treatment Short course (DOTS). Based on case definition, there are two treatment categories: category 1 (new cases) and category 2 (re-treatment cases). The treatment regimen consists of two phases: initial intensive phase of 2 months (category 1) or 3 months (category 2) and continuation phase of 4 or 6 months (category 1); or 5 months (category 2) (WHO, 2010; FMOHN, 2010). TB-HIV co-infection is curable. Once the TB has been cured it is no longer a case of TB-HIV co-infection. TB can be cured if there is strict adherence to the treatment regimen (Civil Society Perspective on TB/HIV 2006). In addition, TB-HIV co-infection preventive measures as recommended by WHO (WHO, 2012) include provision of isoniazid preventive therapy (IPT) for HIV positive people without active TB, co-trimoxazole preventive therapy (CPT), intensified case finding for TB among people living with HIV/AIDS (PLWHA) and HIV testing among all TB patients. Also, healthy life style such as regular physical exercise can prevent active TB by aiding the body to fight the TB infection, speed up the healing process and improve the patient's mood (Sessoms, 2011; Underwood, 2011 and University of Virginia Health System, 2012).

Previous studies revealed adequate accurate knowledge about HIV/AIDS: 66.6% (Sabitu *et al*, 2009) and 67.7% (Odu and Akanle, 2008) but stigmatisation towards people living with HIV/AIDS (PLWHA) in which 25.6% to 48.0% of respondents said they could not shake hands, hug, sleep on same bed, live in same house, share same office, be friends with or eat in same plate with PLWHA (Durajaiye, 2011). Also, the knowledge and attitude towards TB were 66.8% (Seyoum and Legesse 2013) and 89.4% (Mweemba *et al*, 2008) respectively. Another study conducted in Kabarole district in Western Uganda revealed fair knowledge about TB-HIV co-infection: mean Knowledge score was 48% (Wynne, 2012). The knowledge was even lower (33.4%) in another study in Nepal (Pant, 2012). However, the study in Nepal revealed a good attitude towards TB-HIV co-infection in which 78% of the community people said TB-HIV co-infected people

should not be isolated from their families while 56% of the family members of people living with tuberculosis expressed such a view (Pant, 2012). Also, about 70% of these people including family members said that the spouses of TB-HIV co-infected people should not go for second marriage while more than 90% of these people felt that TB-HIV co-infected people should not be refused from the society (Pant, 2012).

This study is designed to determine the knowledge and attitudes towards TB-HIV co-infection among students of Kwara State College of Education, Ilorin. A high level of knowledge and positive attitude towards TB-HIV co-infection would contribute to the prevention and control of the disease due to positive health and treatment seeking behaviour.

The following research questions were answered by this study:

a. What is the level of knowledge of the students about TB-HIV co-infection?
b. What is the attitude of the students towards TB-HIV co-infection?

Materials and Methods

Research design

A descriptive cross-sectional approach was adopted for the study. A total of 405 subjects (Fisher *et al*, 1998) who satisfied statistical requirements and met the inclusion criteria were used for this study. A multistage sampling technique was used to select the subjects as indicated below:

a. Simple random sampling was used to select three schools from five schools of the college. The sample was divided into 3 parts with each school contributing a part to the sample.
b. The selected schools already have departments and simple random sampling was used to select 50% of the department. The sample for each school was divided into equal parts among the selected departments in the selected school.
c. The departments had different classes: NCE I, NCE II and NCE III. The sample for the departments was divided into equal parts amongst the classes. Each class contributed equally to the sample.

Inclusion criteria

a. Students who were on full-time National Certificate in Education (NCE) academic programme.

b. Students who were in school during the period of the research.

Exclusion criteria

a. Students who were on pre-NCE or Interim Joint Matriculation Board programme.
b. Students who were on sandwich programme.
c. Students who were on programmes affiliated with other Universities

Research instrument

The research instrument used to collect data from the respondents was structured questionnaire. The questionnaire had three sections: section A had questions related to the socio-demographic characteristics of the respondents; section B contained questions related to their knowledge about TB-HIV co-infection while section C had questions related to their attitude towards TB-HIV co-infection. The validity of the research instrument was ensured with regards to content, criterion and construct. Also, the research instrument was pretested at the Kwara State College of Education, Oro using sample size representing 10% of the study's sample size. The reliability of the test instrument was ensured at the pre-test stage using the test-retest method with an interval of 2 weeks between the first and second tests. A correlation coefficient (r) value of 0.99 was obtained when both scores were subjected to Pearson's Product Moment correlation analysis indicating the suitability of the research instrument for the study.

Data analysis

The accuracy and completeness of the questionnaire were checked. The data entry and analysis were done using Statistical Package for Social Sciences (SPSS) version 17.00. Frequency distributions of quantitative variables were generated. There was also cross-tabulation of relevant variables. The results were presented in tables and charts. Significance test was determined by Chi-square at 5% significance level.

Ethical considerations

The management of the Kwara State College of Education, Ilorin granted permission for the use of the students in the research. Consent of the students was sought and obtained. Research ethics such as anonymity of respondents and confidentiality of the responses were ensured.

Results

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

CHARACTERISTICS	FREQUENCY	PERCENTAGE
AGE		
15 - 19 years	105	25.9
20 - 24 years	185	45.7
25 - 29 years	115	28.4
Total	405	
GENDER		
Female	189	46.7
Male	216	53.3
Total	405	
MARITAL STATUS		
Single	346	85.4
Married	53	13.1
Separated	2	0.5
Divorced	2	0.5
Widowed	2	0.5
Total	405	
TYPE OF MARRIAGE		
Monogamy	35	66.0
Polygamy	18	34.0
Total	53	
RELIGION		
Christianity	200	49.4
Islam	203	50.1
Traditional	2	0.5
Total	405	

The socio-demographic characteristics showed that most of the respondents were single with regard to marital status (85.4%), with age range of 15 to 29 years and a modal age class of 20 - 24 years (45.7%). Male and female genders; and Christianity and Islam were almost equally represented.

KNOWLEDGE OF RESPONDENTS ABOUT TB-HIV CO-INFECTION

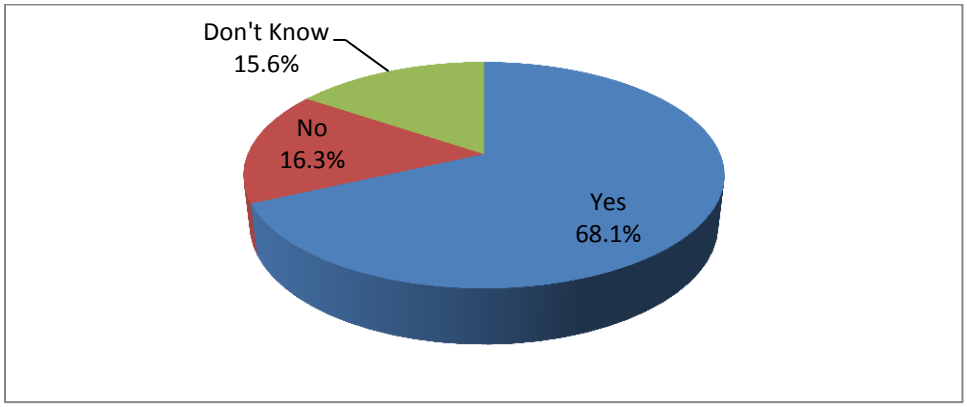

Figure 1: Knowledge of Respondents about existence of TB-HIV co-infection

From the pie chart, 68.1% of the respondents knew of cases of people who are TB-HIV co-infected.

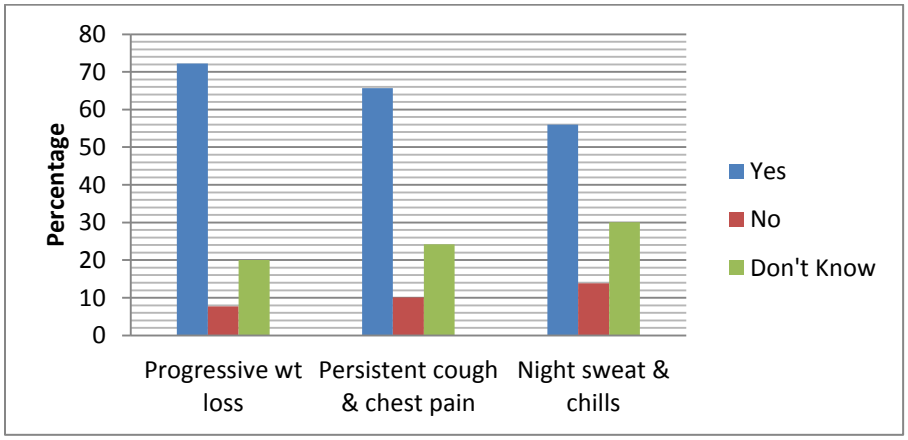

Figure 2: Knowledge of Respondents about Signs of TB-HIV co-infection.

With regard to the knowledge about signs and symptoms of TB-HIV co-infection (Figure 2), more than half of the respondents knew that progressive weight loss (72.2%); persistent cough of more than 2 weeks duration and chest pain (65.6%); and night sweats and chills (56.1%) in a HIV positive person are signs of TB-HIV co-infection. Also, majority (88.1%) of the respondents knew about the existence of the disease.

Table 2: Further Knowledge about TB-HIV Co-infection

VARIABLES	YES		NO		DON'T KNOW	
	Freq.	%	Freq.	%	Freq.	%
A. TB increases progression of HIV/AIDS	164	40.5	130	32.1	111	27.4
B. HIV increases progression of TB	175	43.2	122	30.1	107	26.4
C. Reciprocal interaction exists between HIV/AIDS and TB	163	40.2	101	24.9	141	34.8
D. Laboratory diagnosis of TB-HIV co-infection is difficult	212	52.3	114	28.2	79	19.5
E. TB-HIV co-infection is treatable	221	54.6	94	23.2	90	22.2
F. TB-HIV co-infection is curable	125	30.9	162	40.0	118	29.1
G. Millions died due to TB-HIV co-infection	357	88.1	17	4.2	31	7.7

In addition, less than half of the respondents knew that HIV/AIDS increases the progression of TB (43.2%), TB increases the progression of HIV/AIDS (40.5%), there is reciprocal interaction between HIV/AIDS and TB (40.2%), TB-HIV co-infection is curable (30.9%) and laboratory diagnosis of TB-HIV co-infection is difficult (28.2%). However, more than half (54.6%) of the respondents knew that the disease is treatable.

The mean score for respondents' knowledge about TB-HIV co-infection was 53.4%.

ATTITUDE OF RESPONDENTS TOWARDS TB-HIV CO-INFECTION

Table 3: Attitude of Respondents towards TB-HIV co-infection

VARIABLES	YES		NO		DON'T KNOW	
	Freq.	%	Freq.	%	Freq.	%
Financial and moral support should be given to a close friend diagnosed with TB-HIV co-infection.	219	54.1	113	27.9	73	18.1
Financial and moral support should be given to a fellow student diagnosed with TB-HIV co-infection.	208	51.4	132	32.6	65	16.0
Student diagnosed of TB-HIV co-infection should be sympathised with.	205	50.6	137	33.8	63	15.6
A student diagnosed of TB-HIV co-infection should be expelled from school.	150	37.1	205	50.6	50	12.4
Share room with fellow students diagnosed with TB-HIV co-infection.	162	40	192	47.4	51	12.6
Talk and play with students diagnosed with TB-HIV co-infection.	204	50.4	150	37.0	51	12.6

More than half of the respondents felt that financial and moral support should be given to a close student friend (54.1%), to a fellow student (51.4%); they can sympathise with fellow students (50.6%); talk and play with fellow students (50.4%) and it is not good to expel from school fellow students (50.6%) who are diagnosed of TB-HIV co-infection. However, only 40.0% of the respondents felt they can share room with such student.

In addition, less than half of the respondents felt that prospective marital

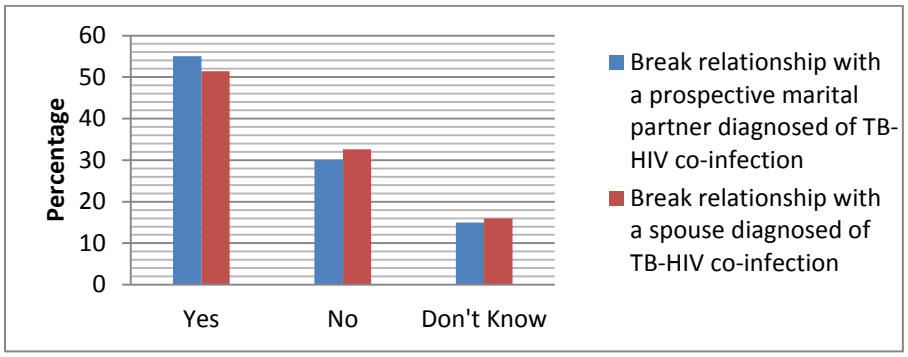

Figure 3: Attitude of Respondents towards TB-HIV Co-Infection

relationship (30.0%) and marital relationship with a spouse (32.6%) should not be broken if laboratory tests reveal he/she has TB-HIV co-infection as shown in figure 3.

The respondents' mean score for attitude toward TB-HIV was 45%.

Statistical analysis using chi-square revealed significant difference between the educational level of the students and their knowledge about the laboratory diagnosis of TB-HIV co-infection being difficult ($p < 0.05$).

Table 4: Summary of tests of significance using Chi-Square at 5% level of significance

VARIABLES	**EDUCATIONAL LEVEL**	
	Pearson's X^2	p-value
Students' knowledge of laboratory diagnosis of TB-HIV co-infection being difficult.	19.388	**0.001***
Students' knowledge of TB-HIV co-infection being curable.	2.706	0.608
Students' attitude towards breaking prospective marital relation if partner is diagnosed with TB-HIV co-infection.	12.959	**0.012***
Students' attitude towards breaking prospective marital relation if partner is diagnosed with TB-HIV co-infection.	2.600	0.627

* Significant, p value < 0.05; Degree of freedom = 4

Also, significant difference existed between the educational level of the students and their attitude towards breaking prospective marital relationship if the partner is diagnosed with TB-HIV co-infection ($p < 0.05$). However, no significant difference existed between the level of education of the students and their knowledge about TB-HIV co-infection being curable ($p > 0.05$). Also, there was no significant difference between the level of education of the students and their attitude towards breaking marital relationship with a spouse if diagnosed with TB-HIV co-infection ($p > 0.05$).

Discussion

The age range 15- 30 years as represented by the respondents is the most vulnerable. This may be due to congregate setting of tertiary schools and increased experimental sexual activity of teenagers and young adults.

The mean score for knowledge about TB-HIV co-infection (53.4%) is lower than that for HIV: 66.6% (Sabitu *et al*, 2009), 67.7% (Odu and Akanle, 2008) and 58% (Wynne, 2012). This mean score for knowledge about the co-infection is also lower than that for TB: 66.8% (Soyoum and Legesse, 2013). The higher knowledge for HIV and TB as separate diseases could be due to the publicity the individual diseases have received from the mass media, concerned national and international health organisations and health policy makers. However, the mean score for knowledge about TB-HIV co-infection in this study is higher than the findings from other studies conducted in Uganda and Nepal with mean score of 48% (Wynne, 2012) and 33.3% (Pant, 2012). The difference may be due to different study populations. The studies in Uganda and Nepal were community-based, while this study was conducted among students of a tertiary institution. The educational exposure of the students may be responsible for the higher knowledge since education is one of the factors that affect an individual's knowledge.

In this study, the respondents' general knowledge about the co-infection was good: death due to the disease (88.1%); existence of the co-infection (68.1%); disease signs and symptoms (64.6%); and the co-infection is treatable (54.6%). However, the detailed knowledge about the co-infection was low: HIV/AIDS increases the progression of TB (43.2%); TB increases the progression of HIV/AIDS (40.5%), reciprocal interaction between HIV/AIDS and TB (40.2%); TB-HIV co-infection being curable (30.9%) and laboratory diagnosis of TB-HIV co-infection being difficult (28.2%).

The low detailed knowledge about the TB-HIV co-infection could negatively impact on the health and treatment seeking behaviour of the respondents with subsequent increase in morbidity and mortality. This consequently negates any prevention and control strategies of the co-infection, attainment of MDGs goal 6 targets 1 and 3 and sustainable national development.

With regard to the attitude towards the co-infection, the mean score was 45%. This is lower than that for TB alone, 89.4% (Mweemba *et al*, 2008) and for TB-HIV co-infection, 73.4% (Pant, 2012). In this study the general attitude to TB-HIV co-infection is above average: financial and moral supports should be given to a close student friend (54.1%), to a fellow student (51.4%); sympathise with fellow students (50.6%); talk and play with fellow students (50.4%) and it is not good to expel from school fellow students (50.6%) who are diagnosed with TB-HIV co-infection. However, in areas where there are personal intimate interactions, the attitude of the respondents was less positive: only 40.0% of the respondents felt they can share room with TB-HIV co-infected students while less than two-fifth of the respondents felt that prospective marital relationship (30.0%) and marital relationship with a spouse (32.6%) should not be broken if laboratory tests reveal that the partner/spouse has TB-HIV co-infection. This is an indication of stigmatisation which could be due to the burden of the disease. This negative attitude also negatively impacts on the health and treatment seeking behaviour of the respondents with consequent increase in morbidity and mortality. Consequently, implementation of any prevention and control strategies of the co-infection may be difficult resulting in non-attainment of MDGs goal 6 targets 1 and 3 and sustainable national development. This stigma could be reduced or eliminated through adequate health information, communication and education. The results of the significant tests also indicate the need for adequate health information, communication and education. This would positively impact on the students' knowledge and attitude towards TB-HIV co-infection.

Conclusion

The general knowledge about TB-HIV co-infection is good but detailed knowledge about the disease is below average. In addition, the general attitude towards the co-infection is above average but the attitude is negative in areas that involve intimate personal interaction with TB-HIV co-infected student. This is an indication of stigmatisation against the disease which requires urgent educational intervention. This could positively impact on

health and treatment seeking behaviour and consequently, sustainable development in Africa and the world over.

Consequently:

1. Health Policy makers should give greater attention to intensive and massive awareness campaign on TB-HIV co-infection.
2. Educational messages about TB-HIV co-infections should emphasize the difficulty of laboratory diagnosis of the co-infection and TB-HIV co-infection being curable.
3. There should be inclusion of health education on diseases of public health importance in the curriculum of tertiary education.
4. Management of Kwara State College of Education should seek and engage her students in the activities of governmental and non-governmental organizations on TB-HIV co-infections.

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