academicJournals

Vol. 7(7), pp. 241-248, July 2015
DOI: 10.5897/JPHE2015.0742
Article Number: 6E4654B53750
ISSN 2006-9723

http://www.academicjournals.org/JPHE

Journal of Public Health and Epidemiology

Full Length Research Paper

Knowledge and attitudes of adult HIV positive patients to HIV/AIDS in Yola, Nigeria

Olutayo Folashade Martins[1], Lekhraj Rampal[1]*, Lye Munn-Sann[1], Sherina Mohd Sidik[2], Norlijah Othman[3], Zubairu Iliyasu[4] and Fatai Kunle Salawu[5]

[1] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[2] Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[3] Department of Pediatrics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia.
[4] Department of Community Medicine, Aminu Kano Teaching Hospital, Kano, Kano state, Nigeria.
[5] Department of Medicine, Federal Medical Center Yola, Adamawa state, Nigeria.

Received 13 May, 2015; Accepted 28 May, 2015

Though cases of AIDS are visible in Nigeria and high awareness of human immunodeficiency virus (HIV), correct knowledge on human immunodeficiency virus (HIV) transmission and prevention has remained low with significant numbers of people living with HIV/AIDS having low attitudes towards life and the disease itself. This study determined the baseline knowledge on human immunodeficiency virus (HIV) transmission and prevention and attitudes towards HIV/AIDS of adult HIV positive patient enrolled into care at all 4 comprehensive antiretroviral therapy (ART) sites in Yola, Nigeria. Baseline reports on the knowledge and attitudes of adult HIV positive patients were obtained from a 3 arm randomized single blind clinical trial involving 386 randomly selected and allocated adult HIV patients who were enrolled into ART care at all 4 comprehensive ART sites in Yola. The intervention was 10 to 15 min clinic based Clinician Client Centred counselling and the 3 groups were; intervention group1, intervention group 2 and the control group. An interviewer administered validated and reliable structured questionnaire was used for data collection. Outcome measures were sound knowledge on HIV transmission and prevention and attitudes towards HIV/AIDS. Data was analyzed using SPSS version 22. Test of significance was at α level 0.05. Overall 237 (61.4%) had sound knowledge on HIV transmission and prevention, while 346 (89.6%) of respondents had high attitudes towards HIV/AIDS. Though majority of respondents had sound knowledge on HIV transmission and prevention as well as high attitudes towards HIV/AIDS, interventions to improve knowledge and attitudes among this group of individuals would improve positive preventive strategies.

Key words: Adult HIV patients, knowledge, attitudes, HIV/AIDS.

INTRODUCTION

HIV/AIDS is recognized as a major challenge to public health in recent times. An estimated 34.0 million people are presently known to be living with HIV/AIDS globally (UNAIDS, 2012). Variations in the distribution of this epidemic are seen among countries and regions; with Sub-Saharan Africa remaining the most severely affected

(UNAIDS, 2012). Nearly 1 in 20 adults (4.9%) are living with HIV in Sub-Saharan Africa accounting for about 69% of the global burden (UNAIDS, 2012). Nigeria has a HIV prevalence of 4.1 % (FMOH, 2010). This prevalence accounts for about 3.2 Million Nigerians out of which 2.8 million are aged 15 years and above (UNAIDS, 2013). Adamawa state with Yola as capital located in the north-eastern region has a prevalence of 3.8% (FMOH, 2010). The primary mode of transmission of HIV in Nigeria is heterosexual sex, and it accounts for 80 to 95% of HIV infections in the country (Dibua, 2009).

Cases of AIDS are very visible in Nigeria. One out of every four persons in the country has seen someone with HIV or has known someone who died of AIDS. Awareness of HIV is high (93.8%), but correct knowledge on all routes of possible transmission and methods of prevention have remained low (54 and 52.5% respectively) (NARHS, 2007).

Prevention of spread of HIV/AIDS can only be possible with sound knowledge on the various modes of transmission and spread of the disease especially among those living with the disease. Many studies have assessed the level of HIV knowledge among individual who are HIV negative or of unknown status (Asekun-Olarinmoye and Oladele, 2009; Fawole et al., 2011; Osonwa et al., 2013). However there is paucity of research that has assessed the level of sound knowledge of HIV transmission and prevention among people living with HIV/AIDS (PLWHAs) in Nigeria. This paper describes the baseline knowledge on HIV prevention and transmission and attitudes towards HIV/AIDS of adult HIV positive patients enrolled into ART care at all 4 comprehensive ART sites in Yola, north-eastern Nigeria.

MATERIALS AND METHODS

Baseline knowledge and attitudes were obtained from a 3 arm randomized single blind clinical trial involving 386 randomly selected and allocated adult HIV patients who were enrolled into Antiretroviral Therapy (ART) care; the 4 comprehensive ART sites in Yola. These comprehensive sites were the; Federal Medical Centre (FMC) Yola, State Specialist Hospital Yola (SSHY), St Francis Hospital Jambutu and Adamawa Hospital. The study took place from January to September 2014. A Clinician Client Centred training module was developed based on the Information Behaviour and Motivation (IBM) Model. Nine Clinicians involved in ART care were trained with this module to deliver a 10 to 15 min clinic based intervention (Clinician Client Centred (CCC) counselling). Intervention group 1 received 2 counselling sessions; at baseline then at 2 months. Intervention group 2 received 1 counselling session at baseline only and the control group received routine care. Follow up was at 2 months and 6 months.

Participant selection criteria and recruitment

Criteria for inclusion into this study included all persons diagnosed with HIV ≥ 18 years of age presenting to the 4 comprehensive ART clinics in Yola. Patients excluded from this study were those patients who declined consent or who were HIV positive but diagnosed with mental illnesses rendering them unfit to participate in the study.

The sample frame was the list of patients for clinic at each recruitment site. Using the list of patients for clinic at recruitment sites, a systematic random sampling technique was used with a regular interval of 5 after an initial random selection of the first client. A total of 526 HIV positive patients were assessed for their eligibility out of which 140 were excluded. Reasons for exclusion included 56 patients who did not meet inclusion criteria (50 children and 6 mentally unfit) and 60 patients who declined consent. Twenty four others excluded for other reasons included 20 patients who intended to transfer out to other ART care clinics outside Yola (the study area) and 4 pregnant women who expected to give birth during the period of the research and believed that their deliveries may affect compliance with the study protocol. Eligible patients who gave their consent were randomized and blinded (Figure 1).

Data collection

A validated and pretested questionnaire was employed as the data collection tool. Questionnaires were interviewer administered and baseline data was obtained from all 386 respondents. The questionnaire was a modified version of those used by Carey, Morrison and Johnson (HIV knowledge and prevention) in 1997 (Carey et al., 1997), Misovich, Fisher and Fisher (A measure of AIDS prevention information, motivation, behavioural skills and behaviour) in 1998 (Misovich et al., 1998) and the AIDSCAPS/WHO/CAPS Counselling an Testing Efficacy study: C and T Baseline instrument of 1995 (AIDSCAPS, 1995). It consisted of 5 sections; Section 1 on socio-demographic variables, Section 2 consisted of questions on the knowledge of HIV transmission and prevention and had a total of 17 statements and answers that had the options of ‘yes’, ‘no’ and ‘don’t know’. Section 3 consisted of 5 statements to address patient’s attitude towards HIV/AIDS. Answer options to these questions were from a 5 point Likert scale ranging from strongly agree, agree, don’t know, disagree and strongly disagree. Section 4**;** addressed sexual behaviour patterns and section 5 addressed issues of status disclosure. The questionnaire was reviewed by a panel of experts who gave a consensus that existing items in the questionnaire were valid and measured knowledge on HIV transmission and prevention, attitudes of ART patients to HIV/AIDS, sexual behaviour and status disclosure. Reliability test for knowledge gave a Cronbach’s alpha of 0.811and that of attitude gave a Cronbach’s alpha of 0.761.

Sample size

The sample size was calculated using the formula by Lemeshow et al. (1990). The largest sample size was obtained for the outcome variable of attitude towards HIV/AIDS, taking into account 10% for attrition the final sample size used was 386.

$$n = \frac{\{z_{1-\alpha/2}\sqrt{2\bar{P}(1-\bar{P})} + z_{1-\beta}\sqrt{P_1(1-P_1)+P_2(1-P_2)}\}^2}{(P_1-P_2)^2}$$

*Corresponding author. E-mail: dr_rampal@hotmail.com. Tel: +60122964308.

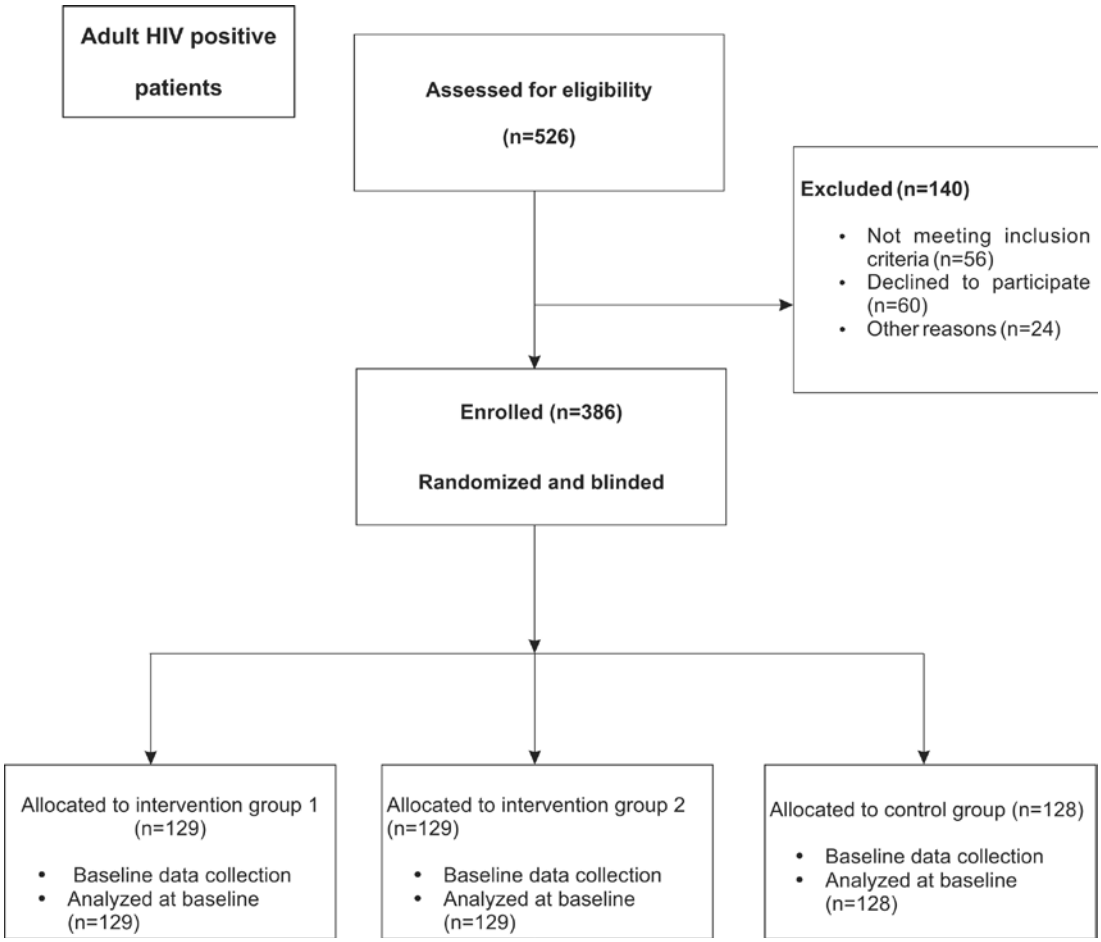

Figure 1. Flow diagram of patient participants in a randomized clinical trial conducted among HIV positive patient in the 4 comprehensive ART sites in Yola Nigeria.

Definition of terms

An adult HIV patient in this study was a person ≥ 18 years of age, reactive to HIV antibody in his or her serum.

Sound knowledge

An HIV positive client who responded correctly to 2 specific questions on HIV prevention; "that consistent condom use can reduce risk of contracting HIV" and "having sex with more than one partner can increase the risk of contracting HIV" (context adjusted from the original statement "having sex with one faithful HIV sero-negative partner can reduce a persons' chance of getting infected with HIV"). And 2 specific questions on incorrect beliefs of HIV transmission; "that HIV can spread by mosquitoes" and "that a person with HIV can look and feel healthy" (BSS, 2000). A correct response to all 4 questions was considered sound knowledge.

Not sound knowledge

An HIV positive client who did not responds correctly to 2 specific questions on HIV prevention; 'that consistent condom use can reduce risk of contracting HIV' and 'having sex with more than one partner can increase the risk of contracting HIV'. And 2 specific questions on incorrect beliefs of HIV transmission; 'that HIV can spread by mosquitoes' and 'that a person with HIV can look and feel healthy'.

High attitude

An HIV positive client that scored 16 to 25 on the attitudinal scale was considered to have a high attitude towards HIV/AIDS.

Low attitude

An HIV positive client that scored 5 to 15 on the attitudinal scale was considered to have a low attitude towards HIV/AIDS.

Ethical clearance

Ethical approval was obtained from the University Human Research Ethics Committee of the Faculty of Medicine and Health Sciences University of Putra Malaysia before conducting the study. Ethical clearance was also obtained from the Health Research Ethics Committee of Federal Medical Centre Yola Nigeria. A written and signed informed consent was obtained from each participant. This written consent was made available in English, Hausa and Fulani (Hausa and Fulani being the two major native languages in Yola).

Data analysis

Data was analyzed using SPSS version 22. A correct response to a knowledge statement earned a mark of 1 and an incorrect response 0. For the 5 point Lickert scale used, ranging from strongly disagree to strongly agree, a mark of 1 was awarded for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. All scores were added to give aggregate score. Test of significance was at α level 0.05. Primary outcome variables were sound/not sound knowledge on HIV transmission and prevention and high/low attitudes towards HIV/AIDS.

RESULTS

Socio-demographic characteristics of respondents

Of the 386 patient, 106 (27.5%) were male and 280 (72.5%) female. Most 150 (38.9%) respondents were between the ages of 30 to 39 years. The largest indigenous tribe was the Bwatiye tribe consisting in total 70 (20.5%) of respondents. Two hundred and ninety six (76.9%) were from Adamawa state in Nigeria. Majority were married 207 (53.6%). One hundred and thirty three (34.5%) had attained tertiary education while 40(10.4%) had no form of education; formal or otherwise. Civil servants (government employed) made up 102 (26.4%) of all occupations but 86 (22.3%) were neither gainfully employed nor involved in self financial generating activities. Most respondents; 207 (53.9%) had known about their HIV status for less than 36 months (< 3 years) with 377 (97.7%) already on highly active antiretroviral therapy (HAART) (Table 1).

Knowledge on HIV/AIDS and attitudes towards HIV/AIDS

Tables 2 and 3 show frequencies of respondents' responses to knowledge and attitude statements. Overall 237 (61.4%) and 149 (38.6%) of respondents had sound knowledge and not sound knowledge on HIV transmission and prevention respectively. Three hundred and forty six respondents (89.6%) had a high attitude towards HIV/AIDS while 40 (10.4%) had low attitudes towards HIV/AIDS. No statistical significant difference was seen for knowledge and attitudes among the 3 study groups (Table 4).

DISCUSSION

Sound knowledge of HIV transmission and prevention among PLWHAs

At baseline, more than half (61.4%) of the respondents had sound knowledge on HIV transmission and prevention with 149 (38.6%) not having sound knowledge. The findings of this research are higher than that seen in the country's National Reproductive Health Survey, were it was noted that correct knowledge on all routes of possible transmission and methods of prevention had remained low (54% and 52.5% respectively) (NARHS, 2007). In a Study carried out in North central Nigeria among 318 PLWHAs receiving care at a treatment clinic with similar socio-demographic characteristics as respondents in this research, a higher knowledge on possible means of transmission and prevention of HIV was seen. The study reported that overall; 77.7% of respondents had good knowledge on HIV and AIDS of which 82.1% of these respondents agreed that proper condom use could be protective against HIV/AIDS, 81.1% answered correctly that unprotected sexual intercourse between a man and a woman could result in transmission of HIV infection while 83.0% answered correctly that having sex with multiple sexual partners could increase the risk of getting infected with HIV (Olowookere et al., 2012). Proportions of good knowledge reported in this study are higher than that seen in this research; 237 (61.4%). However regarding that condoms could be protective against HIV, a higher proportion (88.1%) of a correct response to this statement was seen in this research.

In a study conducted in Maiduguri (northeast Nigeria) to assess the knowledge, attitude and perceptions of 185 people living with HIV/AIDS towards HIV/AIDS, 78% of respondents had good knowledge on the cause of HIV and 90% had good knowledge on the means by which HIV could be transmitted. Still in this study a low proportion (5 to 29%) of respondents believed that HIV/AIDS could spread via handshakes, use of public toilet seats, coughing and sneezing and also by mosquito bites (Ajayi et al., 2013). Similar levels of misconception were reported in this research with 47 (12.2%) of respondents believing that HIV could spread by coughing and sneezing while 80 (20.7%) believed that HIV could spread by mosquitoes.

An intervention study to improve condom use among HIV positive individuals in southeast Nigeria showed at baseline that 39.7% of respondents were aware of the risk of HIV spread via unprotected sex (Obi et al., 2009). This level of knowledge on condom use during sex to prevent spread of HIV is relatively lower than the findings of this research; 340 (88.1%).

A gender based study conducted among women living with HIV in Southwest Nigeria again showed good knowledge on HIV transmission. Reports in this study showed 90.2% of respondent were aware that HIV could spread through unprotected intercourse (Joda et al., 2011). Though a gender based study a comparison to this research is done as most respondents in this research were female. Still in Africa, studies have been conducted to determine HIV knowledge among HIV positive individuals. One of such study was that carried out in Gondar University in North West Ethiopia to determine knowledge, attitudes and determinants of condom use among people living with HIV/AIDS. On

Table 1. Socio-demographic characteristics of adult ART patients by groups.

Variables	Frequency, n (%)			Total	p-value
	Intervention 1	Intervention 2	Control group		
Age group (years)					
≤30	29 (22.5)	26 (20.2)	33 (25.8)	88 (22.8)	
30-39	47 (36.4)	62 (48.1)	41 (32.0)	150 (38.9)	
40-49	40 (31.0)	25 (19.4)	39 (30.5)	104 (26.9)	0.217
50-59	11 (8.5)	12 (9.3)	13 (10.2)	36 (9.3)	
≥60	2(1.6)	2 (1.6)	4 (3.1)	8(2.1)	
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)	
Mean, SD	37.47 (9.45)	37.12 (9.76)	37.07 (10.02)	37.22(9.72)	0.938
95% CI	(35.82-39.12)	(35.42-38.82)	(35.32-38.82)	(36.24-38.19)	
Gender					
Male	38(29.5)	32(24.8)	36(28.1)	106(27.5)	0.690
Female	91(70.5)	97(75.2)	92(71.9)	280(72.5)	
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)	
Occupation					
None	18(14.0)	34(26.4)	34(26.6)	86(22.3)	
Student	6(4.7)	9(7.0)	7(5.5)	22(5.7)	
Civil servant	39(30.2)	29(22.5)	34(26.6)	102(26.4)	
Business	34(26.4)	30(23.3)	27(21.1)	91(23.6)	0.284
Farming	9(7.0)	9(7.0)	8(6.3)	26(6.7)	
Applicant	2(1.6)	1(0.8)	5(3.9)	8(2.1)	
retired CS	4(3.1)	3(2.3)	0(0.0)	7(1.8)	
Others	17(13.2)	14(10.9)	13(10.2)	44(11.4)	
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)	
Marital status					
Single	25(19.4)	19(14.7)	30(23.4)	74(19.2)	
Married	66(51.2)	75(58.1)	66(51.6)	207(53.6)	
Divorced	9(7.0)	12(9.3)	7(5.5)	28(7.3)	0.591
Separated	5(3.9)	4(3.1)	2(1.6)	11(2.8)	
Widowed	24(18.6)	19(14.7)	23(18.0)	66(17.1)	
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)	

p value calculated using Chi square test (X^2) for categorized variables, One way ANOVA (*F*) used to calculated p value for age as a continuous variable, *significant at $p < 0.05$.

knowledge of use of condoms in respect to HIV prevention and transmission 86.8% of the respondents answered correctly that condoms will prevent spread of HIV/AIDS, while 84.9% also answered correctly that correct use of condoms will reduce peoples' chances of getting HIV (Kafale and Kafale 2013). Though close in proportions to the findings of this research, these reported proportions of correct responses are lower than those seen in this research.

A study conducted among PLWHAs in Mozambique showed high levels of HIV prevention knowledge with 75% of respondent acknowledging that HIV could be prevented by abstinence (Dokubo et al., 2014). In the same study 89 and 86% had the knowledge that having a single sexual partner and using condoms during sexual intercourse could prevent transmission of HIV respectively (Dokubo et al., 2014). These reported proportions are lower than that seen in this research. In this research 360 (93%) of respondents responded correctly to the fact that having sex with more than one partner could increase one's chance of being infected with HIV while 340 (88.1%) acknowledged that using a condom could lower someone's chance of getting HIV.

In a study carried out in rural Kenya to determine the level of HIV transmission knowledge between HIV positive and HIV negative individuals; knowledge of

Table 2. Knowledge on HIV transmission and prevention and of ART patients.

Variable	Yes (%)	No (%)	Don't know (%)
HIV and AIDS are same thing	51 (13.2)	270 (69.9)	65 (16.8)
There is a cure for AIDS	58 (15.0)	291 (75.4)	37 (9.6)
Coughing and sneezing spread HIV	47 (12.2)	301 (78.0)	38 (9.8)
HIV can be spread by mosquitoes	80 (20.7)	279 (72.3)	27 (7.0)
Eating healthy food can keep a person from getting HIV	45 (11.7)	327 (84.7)	14 (3.6)
Bathing or washing one's genitals after sex can keep a person from getting HIV	24 (6.2)	326 (84.5)	36 (9.3)
A pregnant woman with HIV can give the virus to her unborn child	295 (76.4)	64 (16.6)	27 (7.00)
All pregnant women infected with HIV will have babies born with AIDS	60 (15.5)	288 (74.6)	38 (9.8)
Using a condom can lower a person's chance of getting HIV	340 (88.1)	29 (7.5)	17 (4.4)
A person with HIV can look and feel healthy	374 (96.9)	9 (2.3)	3 (0.8)
There is a vaccine for HIV	60 (15.5)	263 (68.1)	63 (16.3)
A person can get HIV by donating blood	91 (23.6)	283 (73.3)	12 (3.1)
Having sex with more than one partner can increase a person's chance of being infected with HIV	360 (93.3)	19 (4.9)	7 (1.8)
A woman can get HIV if she has vaginal sex with a man who has HIV	377 (97.7)	4 (1.0)	5 (1.3)
A woman can get HIV if she has anal sex with a man who has HIV	227 (58.8)	35 (9.1)	124 (32.1)
Having a HIV test one week after having sex will tell if a person has HIV or not	58 (15.0)	270 (969.9)	58 (15.0)
Sharing a needle or razor blade with a person with HIV/AIDS can increase a person's chance of being infected with HIV	372 (96.4)	12 (3.1)	2 (0.5)

sexual transmission was high (> 80%), while knowledge on HIV prevention was lower with only 40% of HIV positive respondents correctly responding falsely to the statement “condoms makes intercourse completely safe” (Hong et at., 2012). Similar high proportions of knowledge of HIV sexual transmission were seen in this study with 377 (97.7%) of respondents correctly responding to the statement that “A woman can get HIV if she has vaginal sex with a man who has HIV” and 360 (93.3%) acknowledging correctly that having sex with more than one partner can increase a person's chance of being infected with HIV.

Attitudes towards HIV/AIDS among PLWHAs

At baseline majority 346 (89.6%) of respondents (10.4%) of respondents had low attitudes towards HIV/AIDS. A factor contributing to these high attitudes towards their disease could be that most respondents in this study had known about their HIV status for quite some time and had come to terms with it. Another factor is that majority were on antiretrovirals (ARVs) and doing well on their medications. High attitudes towards HIV/AIDS among PLWHAs were seen in the study conducted by Olowookere and his group. In his study majority of respondents had a positive attitude to their disease with 84.0% believing that a person with HIV/AIDS had hope for a better future. Also in his study 83.0% believed that having HIV was not the end of someone’s life and another 63.5% believing that it was not shameful to have HIV/AIDS (Olowookere et al 2012).

Similar high attitudes towards HIV/AIDS were seen in this research. In this research 219 (56.7%) and 54 (14.0%) strongly agreed and agreed respectively that being HIV positive was not the end of one’s life, while 149 (38.6%) and 152 (39.4%) disagreed and strongly disagreed respectively that it was shame to have HIV/AIDS. Similarly the study conducted by Ajayi et al. (2003) among PLWHAs showed a positive attitude towards HIV/AIDS with 63.0% of respondents responding affirmatively that they were living positively with their disease. But among this group of PLWHAs, 21.0% admitted that they would not mind passing on their infection to others (Ajayi et al., 2013).

Though not in exact same context; 12 (3.1%) and 35(9.1%) of respondents in this research disagreed and strongly disagreed respectively that a HIV positive person who decided to have sex should always use a condom. Lower attitudes towards their disease were seen among PLWHAs

Table 3. Attitudes of ART patients to HIV/AIDS.

Statement	Strongly agree (%)	Agree (%)	Don't know (%)	Disagree (%)	Strongly disagree (%)	Total
Being HIV positive is not the end of one's life	219(56.7)	54(14.0)	8(2.1)	48(12.4)	57 (14.8)	100 (100.0)
It is shame to have HIV/AIDS	23(6.0)	55(14.2)	7(1.8)	149(38.6)	152 (39.4)	386 (100.0)
If a HIV/AIDS positive person wants to have sex he or she should always talk about safe sex with his or her partner	205(53.1)	115(29.8)	19(4.9)	115(2.6)	37 (9.6)	386 (100.0)
A HIV positive person who decides to have sex should always use a condom	250(64.8)	79(20.5)	10(2.6)	12(3.1)	35 (9.1)	386 (100.0)
A sexual/spouse of HIV positive person should get tested to know his/her HIV status	296(76.7)	56(14.5)	2(0.5)	6(1.6)	26 (6.7)	386 (100.0)

Table 4. Knowledge (sound or not sound) and attitude (high or low) among groups.

Variables	Frequency, n=386 (%)			Total	Test	p-value
	Interventio 1	Intervention 2	Control group			
Sound knowledge						
No	47 (36.4)	56 (43.4)	46 (35.9)	149 (38.6)	X^2	0.387
Yes	82 (63.6)	73 (56.6)	82 (64.1)	237 (61.4)		
Total	129 (100.0)	129 (100.0)	128 (100.0)	386 (100.0)		
Attitude						
Low Attitude	16 (12.4)	10 (7.8)	14 (10.9)	40 (10.4)	X^2	0.456
High Attitude	113 (87.6)	119 (92.2)	114 (89.1)	346 (89.6)		
Total	129 (100.0)	129 (100.0)	128 (100.0)	386 (100.0)		

Chi square test (X^2), Significant at $p < 0.05$.

in a rural community in Southern Nigeria, where 52% of respondent admitted to feeling bad at the time of their diagnosis with 14% actually feeling like killing themselves and 12% feeling ashamed (Udiminue and Adindu, 2012). In this research similar proportions of low attitudes were seen with 23 (6%) strongly agreeing and 55 (14.2%) agreeing that it was shameful to have HIV/AIDS." Though findings of this study showed that majority of respondents had sound knowledge on HIV transmission and prevention as well as high attitudes towards HIV/AIDS, interventions to improve knowledge and attitudes among this group of individuals would help improve positive preventive strategies.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the hospital management and ART Unit staff of the FMC Yola, SSHY, St Francis Jambutu and Adamawa Hospital. Special thanks go to Dr Ali Danburam the Medical Director of FMC Yola. Also acknowledged are the members of the research team; Dr Edwin Habila, Dr Maurice Solomon, Dr Abdurrahman Mohammed, Dr Barnabas Dongonyaro, Dr Mamza Jabani, Dr Temilade Adenle, Dr Jeff Ijafu Samuel, Dr Cyril Jomusu Awhoyo, Dr Benjamin Yakubu and Dr Timothy

Williams Tizhe. Other acknowledged contributors to this research work are; Grace Oluchi Enwereuzo, Glory Haniel and Kingsley Cyprain Margson.

Conflicts of interest

Authors declare that there is no competing interest.

REFERENCES

AIDSCAP/WHO/CAPS (2005). Counseling & Testing Efficacy study: C & T Baseline Instrument. Available at: http://caps.ucsf.edu/resources/survey-instruments.

Ajayi B, Moses A, Gashau W, Omotara B (2013). Assessment of knowledge, perception and attitude of people living with HIV/AIDS towards HIV/AIDS in Maiduguri, Northeast-Nigeria. The intern. J. Infect. Dis. 12(1):1382-1390.

Asekun-Olarinmoye EO, Oladele EA (2009). Condom use among undergraduates in Osun state, Nigeria: Implications for sexually transmitted infections (STIs)/HIV prevention. Res. J. Med. Sci. 3(6):179-187.

Carey MP, Morrison- Beedy D, Johnson BT (1997). The HIV-Knowledge Questionnaire: Development and evaluation of a reliable, valid and practical self-administered questionnaire. AIDS Behav. 1(1):61-74.

Dibua U (2009). HIV/AIDS Fact sheet – Predisposing Factors the Nigeria Situation. Population Reference Bureau. Available at: http://cdn.intechopen.com/pdfs-wm/20644.pdf

Dokubo EK, Shiraishi RW, Young PW, Neal JJ, Aberle–Grasse J, Honwana N, Mbofana F (2014). Awareness of HIV status, prevention knowledge and condom use among people living with HIV in Mozambique. Plos One 9(9):e106760.

Family Health International (2000). Behavioral surveillance surveys (BSS); Guidelines for repeated behavioral surveys in populations at risk of HIV. Available at: http://www.who.int/hiv/strategic/pubbss/en/.

Fawole AO, Ogunkan DV, Adegoke GS (2011). Sexual behaviour and perception of HIV/AIDS in a Nigerian tertiary instituition; University of Ilorin, a case study. Global J. Human Soc. Sci. 11(1):65-71.

Federal Ministry of Health (FMOH) (2010). National HIV Sero-prevalence Sentinel Survey. Available at: www.nigeria-aids.org/.

Hong SY, Thompson D, Wanke C, Omosa G, Jordan MR, Tang AM, Patta S, Mwero B, Mjomba I, Mwamburi M (2012). Knowledge of HIV Transmission and Associated Factors among HIV-Positive and HIV-Negative Patients in Rural Kenya. J. AIDS Clin. Res. *3*(7):170.

Joda A, Bamkefa BO, Olugbake OA (2011). Knowledge of HIV and its transmission by women living with HIV/AIDS (WLWHA) attending HIV clinic in Lagos University Teaching Hospital (LUTH), Nigeria. J. Appl. Pharm. Sci. 1(6):197-203.

Joint United Programme on HIV/AIDS (UNAIDS) (2012). UNAIDS report on Global AIDS epidemic. Available at: http://www.unaids.org/sites/default/files/media_asset/20121120_UNAIDS_Global_Report_2012_with_annexes_en_1.pdf

Lemeshow S, Hosmer DW, Klar J, Lwanga SK, World Health Organization (1990). Adequacy of sample size in health studies. WHO.IRIS:239. Available at: http://www.who.int/iris/handle/10665/41607. Accessed 4 April 2013.

Misovich SJ, Fisher WA, Fisher JD (1998). A measure of AIDS prevention information, motivation, behavioural skills and behaviour. In: Davis, C M, Yarber, W. H., Bauser, R., Scheer, G. and Davis, S L. (Eds), Handbook of sexuality related measures. Sage Publishing. pp 328-337.

National Reproductive Health Survey (NARHS) (2007). National HIV/AIDS and Reproductive Health Survey (NARHS Plus, 2007) Available at: http://thedata.harvard.edu/dvn/dv/Nigeria/faces/study/StudyPage.xhtml. Accessed 13 December 2013.

Nigeria UNAIDS (2013). HIV and AIDS estimates Available at: http://www.unaids.org/en/regionscountries/countries/nigeria

Obi SN, Ifebunandu NA, Onah HE, Onyebuchi AK (2009). The impact of intervention on sexual practices of HIV positive individuals in Southeast Nigeria. Obstet. Gynaecol. Int. Article ID: 127480.

Olowookere SA, Fatiregun AA, Adewole IF (2012). Knowledge and attitudes regarding HIV/AIDS and antiretroviral therapy among patients at a Nigerian treatment clinic. J. Infect. Dev. Ctries 6(11):809-816.

Osonwa OK, Ogbuagu UR, Iyam MA, Osuchukwu NC, Eko JE, Achoakawa CE, Osonwa RA, Asuquo OD, Onova AA (2013). Knowledge, attitudes and risk perception among youths in Calabar, Cross Rivers state, Nigeria. IOSR-JHSS 7(1):01-08

Udiminue SD, Adindu A (2012). HIV prevelance in a rural community of Nigeria. Cont. J. Biomed. Sci. 6(1):31-40.