Original Research Article

EFFECT OF PEER EDUCATION AND PROVISION OF ON-SITE HCT SERVICES ON THE UPTAKE OF HCT AMONG PUBLIC SECONDARY SCHOOL STUDENTS IN EBONYI STATE, SOUTH EAST NIGERIA

ABSTRACT

Background: Human Immunodeficiency virus/Acquired Immunodeficiency syndrome (HIV/AIDS) is a significant source of socioeconomic and disease burden especially among the Sub-Saharan African population. Less than 10% of these people especially the adolescents are aware of their status with an associated risk of increasing the spread of HIV. Therefore, this study was undertaken to determine the effect of peer education and the provision of onsite HIV Counselling and Testing services on uptake of HCT and the factors influencing its up-take among public secondary school students.

Methods: This was a school-based quasi-experimental study conducted from January to June 2016. A multi-stage sampling technique was used to select 932 students attending public secondary schools in Ebonyi State and an intervention comprising peer education and provision of onsite HCT services was administered in the intervention group. Data were collected using a pre-tested semi structured self-administered questionnaire and were analysed using IBM SPSS version 21. A p value of ≤ 0.05 was considered significant.

Results: At baseline, 56 (12%) in the intervention group and 61(13.1%) in the control group had ever been screened for HIV. After the 3 months intervention period, uptake of HCT increased significantly in the intervention group by 61.6% and in the control group by 1.5%; $P < 0.01$. Logistic regression revealed that being female, sexual exposure and condom use were predictors of HCT uptake.

Conclusion and recommendation: Peer health education and the provision of onsite HCT services significantly improved the uptake of HCT among secondary school students. Therefore, integrating peer health education into school health programmes and improving access to HCT services would be an effective strategy for increasing up-take of HCT among young people.

Keywords: HIV, *peer education, onsite HCT, young people*

INTRODUCTION

Sub-Saharan Africa, having only about 10% of the world's population, has as high as 60% of all people living with HIV/AIDS (PLWHAs) with less than 10% of these people being aware of their HIV status (1). The HIV epidemic in Nigeria is complex and varies widely by region. Nigeria has the second-largest number of people living with HIV with the prevalence of HIV among adolescents aged 15 to 19 years at 3.0%. In Ebonyi State and in particular, Abakaliki town a prevalence of 3.3% and 3.0% respectively has been reported (2). In spite of the HIV prevalence, studies have reported poor up-take of HCT attributed to inadequate sexual health education, assess to HCT services, unhealthy cultural practices, parents not wanting their children under 16 years to get tested and poor health care system(3,4).

HCT is the process by which individuals or couples undergo counselling to enable them to make an informed choice about being tested for HIV. This decision must be entirely the choice of the individuals and they must be assured that the process will be confidential. To increase the demand for HCT, it is important to reduce the associated stigma and discrimination and also, to use the right model of HCT that will make comprehensive HIV services accessible (3,5). The successful use of peer education as a strategy to intervene in health matters concerning the adolescents and young people have been well documented (6–9). However, even though peer education has been found to improve knowledge and sexual behaviour in adolescents, it has not been so successful in increasing uptake of HCT due to its inherent focus of improving mostly knowledge. Hence, it is not surprising that the uptake of HCT among the adolescents exposed to peer education is still very low (10–14).

Some schools and school-based health clinics offer testing on site, which has been shown to be cost-effective in areas with higher prevalence. For instance, school-based health centres across Seattle in United States provides free, on-site clinical services, for HIV and other STI counselling and testing using peer educators as HCT service providers (15). In Zambia a massive screening campaign of HIV/AIDS revealed more than 3% HIV sero-positivity rate(4). A study among health care professional students in Kilimanjaro region of Tanzania, revealed that majority of the students preferred college based HCT model of provision of HCT services and also reported that the services should be provided during youth activities and integrated into youth programs such as STIs and family planning(16). Similarly, a study in Ethiopia on HCT among adolescent observed that, majority of adolescents knew about HCT services and actually utilised them but complained about the accessibility of HCT services and further suggested that such services should be offered within the schools(17). 'I chose life' (ICL) group conducted a follow-up survey on the impact of peer education on HIV prevention and HCT uptake among students at Kenyatta University and reported that, the number of students tested for HIV had doubled with about a quarter of them being tested during an ICL HCT event (18).

This study seeks to find out if peer education and provision of on-site HCT services in a secondary school will improve the up-take of HCT among young people as well as, determine the factors influencing its uptake.

METHODOLOGY

Study Area: This study was conducted in Abakaliki, Ebonyi State within the South-East zone of the Federal Republic of Nigeria. Ebonyi State occupies a land mass of 5,935 square kilometres, with a projected population of about 2.7 million people with a growth rate of 3.2% with Abakaliki, having a population of 79,280 according to the 2006 population census(19). There are 8 accredited public and 21 private secondary schools in Abakaliki. Out of the 8 public owned schools, 2 are single sex schools while 6 are co-educational schools out of which two have peer educators club. No school in Ebonyi State owns an onsite adolescent friendly centre or offers HCT services. HCT services are provided only in two hospitals within Abakaliki; Federal Teaching Hospital Abakaliki (FETHA) and Mile 4 Hospital.

Study Design: This was a quasi-experimental study conducted in three phases; baseline survey, intervention, and post-intervention and had an intervention and control group.

Study Population/Selection criteria: The study population comprised of all senior (SS1-SS3) students attending secondary schools in Abakaliki, Ebonyi State. The inclusion criteria for sample selection was; public co-educational secondary schools with non-existent peer educators' club. Exclusion criteria was; schools that declined participation.

Sample Size Determination: To compare the proportion of students who will take-up HCT in the intervention and control group, the following formula for independent proportions was used to determine the minimum sample size required;

$$n = \frac{[Z\alpha + Z\beta]^2 [P_1 (1 - P_1) + P_2 (1 - P_2)]}{[P_1 - P_2]} \quad \ldots\ldots\ldots\ldots (20)$$

Therefore, a sample size of 466 was calculated for the intervention and control groups respectively and correcting for attrition a total of 932 study participants was chosen for this study. This was sufficient to detect a difference of estimated 5.5% between the groups with 80% power and at 5% significance level.

Sampling Technique: A multi-stage sampling technique was used, to recruit study participants. In the first stage, Abakaliki Local Government Area (LGA) was purposively selected from the 13 LGAs in Ebonyi State. In the second stage, simple random sampling by balloting was used to select two schools from the four co-educational public schools in Abakaliki without peer educators club. The two schools selected were Abakaliki High school (Intervention group) and Government Technical College Abakaliki (Control group). In the third stage, simple random sampling using the table of random numbers was used to select students from each class register proportionate to the class size until the required sample size was reached from both the intervention and control school groups (21). In the intervention school group, this selection was done after excluding the twenty-five students that were trained as peer educators. A total of 466 students from the intervention and control school groups respectively were selected after informed consents.

Intervention: The intervention comprised peer education and the provision of onsite HCT services. In intervention school group, 25 peer educators (12 boys and 13 girls) were selected from Senior Secondary Classes 1, 2 and 3. With the assistance of the head teacher, one peer educator was selected per class stream on the basis of interest, academic performance and possession of leadership qualities. A pre-training assessment was done followed by a 5-day training workshop for the peer educators. All lecture modules were adapted from Family Health International (FHI) peer education manuals (22,23). Role play, drama and games were also written and performed by the participants to demonstrate what they had learnt and to test their skills in HIV counselling, negotiating sex and refusal. A post training assessment was also done to determine the effect of the training on their knowledge of peer education, HCT and HIV/AIDS. All the training participants scored above 60% and hence, were recruited as peer educators.

Similarly, after a pre-training assessment, a 5-day supervisors' training on HCT and peer education was conducted for two health personnel (environmental health officer and a public health officer) from Ebonyi State Agency for the control of AIDS (EBOSACA) and one guidance and counselling teacher.

Following the training of the supervisors and peer educators, an onsite adolescent friendly HCT centre was established in the intervention school group were serial HIV testing was done using the Nigerian National algorithm for HIV antibody rapid test.(23,24). The HCT procedure and documentation were monitored two times a week.

Data Collection/Analysis

At baseline, data was collected using a self-administered semi-structured questionnaire adapted from National Demographic Health Survey (NDHS) and AIDS indicator survey (AIS) (12,25). Data was collected on participants' demographic and social characteristics, uptake of HCT, their preferred model for HCT and the reason for their preference was also obtained. Information was also collected on their exposure to peer education on HIV/AIDS and HCT.

After three months of the intervention, the questionnaire was re-administered to both the intervention and control school groups. In addition, counselling and testing forms, daily work summary sheet and the monthly summary sheet were used to collect data from the on-site HCT centre on students that were counselled and tested at the centre and the following variables were of interest; number of students counselled and tested for HIV per day, number of students who received peer education before testing and number of students who tested positive to the virus.

All questionnaires were reviewed by the investigator for completeness. Incomplete or wrongly filled questionnaires were not analysed. The Statistical Package for Social Sciences (SPSS) version 21 was used for data analysis (26). Frequencies, means, standard deviations and Chi-square test statistic were calculated. Variables were included into the regression model based on a cut-off of $p= 0.1$ after cross tabulation with the outcome variable and multivariable logistic regression was done to ascertain the predictors of HCT uptake. Significance for all tests was set at $p \leq 0.05$.

Ethical consideration

Ethical approval was gotten from the Clinical Ethics review board of the Federal Teaching Hospital Abakaliki. The State ministry of Health and Education also gave written approvals to conduct this study. A meeting was held with the Parents Teachers Association (PTA) to get a 'blanket' consent for their children or wards to participate in the study and a written consent letter was also obtained from parents of all the students that wished to get tested. Assent was obtained from the students.

RESULTS

Respondents in both groups were similar in their socio-demographic characteristics (p>0.05). The mean age of respondents in the control group was 16.4 ±1.6 years, and 16.3 ±1.6 years for the intervention group. The highest proportion of respondents were in the 15-17year age category in both groups. There was no statistical difference in gender and class distribution of respondents. Over 90% of respondents in both groups were from the Igbo tribe. Respondents' religion was also similar. Majority of respondents in both groups were single: 407 (87.3%) in the control group and 417 (89.5%) in the intervention group. The family type of both groups was also similar in distribution as above 50% of respondents from both groups were from polygamous family setting. Thirty-four (13.9%) of the female respondents in the intervention group and 30 (13.8%) in the control group have been pregnant before. This proportion did not differ significantly statistically (P= 0.10).

Table 1: Socio-demographic characteristic of respondents

Variables		**Intervention group (n = 466) No. (%)**	**Control group n = 466 No. (%)**	**χ^2 (p value)**
Age in years (mean ±SD)		16.3±1.6	16.4±1.6	0.46*(0.62)
Age	12- 14	58(12.4)	61(13.1)	0.48(0.78)
	15- 17	308(66.1)	298(63.9)	
	>18	100(21.5)	107(23.0)	
Gender	Male	222 (47.1)	249 (52.4)	3.13 (0.08)
	Female	244 (52.9)	217 (46.6)	
Current class	SS 1	149 (31.9)	162 (34.7)	1.20 (0.55)
	SS 2	182 (39.1)	167 (35.8)	
	SS 3	135 (29.0)	137 (29.5)	
Tribe	Igbo	448 (96.1)	448 (96.1)	0.47 (0.79)
	Hausa	10 (2.1)	12 (2.6)	
	Yoruba	8 (1.7)	6 (1.3)	
Religion	Christianity	442 (94.8)	443 (95.1)	0.03 (0.98)
	Islam	17 (3.6)	16 (3.4)	
	Traditional	7 (1.5)	7 (1.5)	
Marital status	Single	417 (89.5)	407 (87.3)	1.21 (0.75)
	Married	25 (5.4)	32 (6.9)	
	Separated	18 (3.9)	21(4.5)	
	Widowed	6 (1.3)	6 (1.3)	
Family type	Polygamous	251 (53.9)	256 (54.9)	2.23(0.89)
	Monogamous	210(45.1)	204(43.8)	
	Single parent	5 (1.1)	6 (1.3)	

*T-test statistic

At the beginning of the study there was no significant difference in the proportion of sexually exposed respondents among the intervention and control group. At 3 months post intervention, the number of sexually active respondents in the control group was higher than those in the intervention group, and the difference was statistically significant ($p<0.01$). Also, at baseline there was no significant difference between the intervention and control group in the frequency of sexual intercourse in the last 3 months and number of sexual partners, but at 3 months post intervention, a higher proportion 163 (56.4%) of respondents in the control group, compared to 82 (43.4%) in the intervention group had sex within 3 months of the study ($p<0.01$). There was statistically significant increase in the proportion of respondents that had more than one sexual partner among the control group compared to the intervention group 84 (29.3%) and 21 (11.1%) respectively, ($p<0.01$).

Condom use was assessed by assessing use at first and last coital activities in the last 3 months, and by assessing the frequency of consistent use for every coital activity. On condom use in the first and last coital activities, there was no significant difference at baseline among the two groups, but at 3 months post-intervention a significantly higher proportion of the intervention group used condom during their last intercourse; an increase from 93 (47.9%) to 106 (56.1%), compared to the control group that had a reduced proportion of condom use from 55.3% to 44.3%, ($p=0.01$).

On frequency of consistent condom use, both groups were similar at baseline. At 3 months post intervention, the frequency of consistent condom use increased among the intervention than control group. Ninety-seven (51.3%) respondents in the intervention group used condoms always compared to 72 (25.4%) in the control group, $p<0.01$. Also, the proportion of respondents that never used condoms reduced significantly in the intervention 40 (21.2%) than control group 84(29.2%). This difference was statistically significant ($p<0.01$).

Table 2: Sexual behaviour at baseline and post intervention among respondents

Variables	Baseline Intervention n= 466	Control n= 466	χ^2test (p-value)	Post Intervention Intervention n= 428	Control n= 460	χ^2 (p-value)
Ever had sexual intercourse	194(41.6)	215(46.1)	1.92(0.17)	189(44.2)	287(62.4)	29.64(<0.01)
	n=194	**n=215**		**n=189**	**n=287**	
Sexual intercourse in past 3 months						
	160(82.4)	160(74.4)	3.88(0.05)	82(43.4)	163(56.4)	8.20(<0.01)
No. of partners in the past 3 months						
None	34(17.5)	55(25.6)	4.99(0.08)	107(56.6)	124(43.2)	22.13(<0.01)
Only one	108(55.7)	99(46.0)		61(32.3)	79(27.5)	
More than one	52(26.8)	61(28.4)		21(11.1)	84(29.3)	
Used condom						
First intercourse	88(45.4)	108(50.2)	0.97(0.32)	88(46.6)	120(41.8)	1.04(0.31)
Last intercourse	93(47.9)	119(55.3)	2.24(0.13)	106(56.1)	127(44.3)	6.38(0.01)
Frequency of condom use:						
Always	44(22.7)	61(28.2)	9.12(0.03)	97(51.3)	72(25.1)	36.24(<0.01)
Sometimes	69(35.5)	54(25.0)		36(19.0)	103(36.0)	
Occasionally	38(19.6)	33(15.3)		16(8.5)	28(9.7)	
Never	43(22.2)	67(31.5)		40(21.2)	84(29.2)	

On HCT up-take, at baseline there was no significant statistical difference in willingness to screen for HIV between the study and the control groups, majority of the respondents 380 (81.5%) and 372 (79.8%) respectively were willing to screen for HIV. At 3 months post intervention, there was an increase in the proportion of respondents 352 (82.2%) that were willing to get tested for HIV in the intervention group and a decrease 325 (70.7%) in the control group, this difference was statistically significant, ($p<0.01$). There was no significant statistical difference at baseline in the proportion of respondents that had screened for HIV in both the intervention and control groups. Only 56 (12%) and 61 (13.1%) in the intervention and control group respectively had done HIV test prior to the study but at the end of the intervention period there was a significant raise of 61.6% in uptake of HIV/HCT in the intervention group (315 (73.6%)) compared to only 1.5% raise in the control group (67 (14.6%)), ($p<0.01$).

The intervention group showed a statistically significant increase in respondents that had their test done in their school adolescent friendly centre. Of the 315 (73.6%) respondents that screened for HIV during the study period, 248 (78.7%) did the screening in their School centre, $p<0.01$. Also, at 3 months post intervention there was a statistically significant increase in the proportion of respondents in the intervention group 268 (85.1%) than the control group 43 (64.2%) that had screened for HIV within 3 months of the intervention, ($p<0.01$).

Table 3: HCT up-take at baseline and post intervention among respondents

	Baseline			**Post Intervention**		
Variables	**Intervention n= 466**	**Control n= 466**	**χ^2test (p-value)**	**Intervention n= 428**	**Control n= 460**	**χ^2 (p-value)**
Willing to screen for HIV	380(81.5)	372(79.8)	0.44(0.51)	352(82.2)	325(70.7)	16.44(<0.01)
Screened for HIV	56(12.0)	61(13.1)	0.24(0.62)	315(73.6)	67(14.6)	315.2(<0.01)
Screened at school	**n=56**	**n=61**		**n=315**	**n=67**	
My school	0(0.0)	0(0.0)		248(78.7)	0(0.0)	
Time of screening:						
< 3 months	28(50.0)	38(62.3)	1.92(0.38)	268(85.1)	43(64.2)	20.75(<0.01)
3 – 1 year	12(21.4)	11(18.0)		19(6.0)	15(22.4)	
> 1 year	16(28.6)	12(19.7)		28(8.9)	9(13.4)	

Among the respondents that were willing to do HCT/HIV test, the School HCT centre was the most preferred centre among the intervention and control groups; 184(48.4%) and 183(49.2%) respectively at baseline, ($p>0.05$) and at 3 months post intervention a higher proportion in the intervention group (221 or 62.8%) than control group (183 or 56.3%) preferred the School HCT centre, though this was not statistically significant ($p>0.05$). The reasons for their preference in both the intervention and control groups were convenience 167(44%), 145(38.9%) and accessibility to the centre 140(36.8%), 156(41.9%) respectively. Same reasons were given at 3 months post intervention with a higher proportion in the intervention than control group reporting convenience as the commonest reason for their preferred model. This difference was statistically significant, ($p=0.04$). Other reasons among the intervention group were that the services were offered free of charge, and that they were encouraged by seeing their peers get tested.

Table 4: Comparison of where respondents preferred to do HCT/HIV test and reasons for their preference.

	Baseline			**Post Intervention**		
Variables	**Intervention n= 380 No. (%)**	**Control n= 372 No. (%)**	**χ^2(p-value)**	**Intervention n= 352 No. (%)**	**Control n= 325 No. (%)**	**χ^2(p-value)**
Places where respondents will prefer to do HCT/HIV test						
In my school HCT centre	184(48.4)	183(49.2)	7.78(0.10)	221(62.8)	183(56.3)	5.43(0.14)
In an hospital HCT centre	123(32.3)	157(42.2)		113(32.1)	117(36.0)	
Private lab in town	56(14.8)	25(6.7)		14(4.0)	23(7.1)	
Others	17(4.5)	7(1.9)		4(1.1)	2(0.6)	
Reasons for the preferred HCT centre						
It is convenient	167(44.0)	145(38.9)	1.91(0.17)	145(41.2)	109(33.5)	4.22(0.04)
It is very accessible	140(36.8)	156(41.9)	2.04(1.15)	130(37.0)	138(42.5)	2.16(0.14)
Stigmatisation is less	66(17.4)	65(17.6)	0.00(0.97)	73(20.7)	66(20.3)	0.02(0.89)
Others	7(1.8)	6(1.6)	0.06(0.81)	4(1.1)	12(3.7)	4.78(0.03)

On the factors influencing students to get tested for HIV; At baseline, the commonest reasons given by respondents for doing HIV/HCT were that: they were forced to do the test, they wanted to know their status and ill health. At 3 months post intervention, the commonest reason for getting tested among the intervention group was; recommendation by a peer educator 267 (84.4%), ($p<0.01$). Other reasons were noticed to have reduced significantly in the intervention group compared to the control group.

Likewise, at baseline, the reasons for not screening for HIV infection, did not show any statistical significant difference between the two groups. The commonest reasons given by respondents in the intervention and control groups include; fear of a positive HIV test result 177(43.1%), 197 (48.6%), fear of discrimination and stigmatisation 166 (40.5%), 182 (44.9%), perception of not being at risk 166 (40.5%), 141 (34.8%) respectively. At 3 months post intervention, the commonest reasons were the same as baseline except for a statistically significant reduction among the intervention group than control group in response to; unaware of where to screen 0 (0.0%), 20 (5.1%) and distance to HCT centre 0 (0.0%), 46 (11.7%) respectively, ($p<0.01$). Other reasons for not getting tested among the intervention group were fear of pin prick, sight of blood, fear of using contaminated needles and cost of HCT among the control group.

Table 5: Comparison of motivating factors and deterrents for HCT/ HIV test at baseline and post intervention

	Baseline			**Post Intervention**		
Reasons why respondents have done HIV test	**Intervention n= 56 No. (%)**	**Control n= 61 No. (%)**	**χ^2(P-value)**	**Intervention n= 315 No. (%)**	**Control n= 67 No. (%)**	**χ^2(P-value)**
I was forced	17(30.4)	13(21.3)	1.25(0.26)	5(1.6)	13(19.4)	39.06(<0.01)
Wanted to know my status	16(28.6)	17(27.9)	0.01(0.93)	105(33.3)	13(19.4)	5.02(0.03)
Ill health	16(28.6)	21(34.4)	0.46(0.49)	42(13.3)	21(31.3)	3.61(2.00)
A parent's sexual partner died of HIV or had positive result	15(26.8)	21(34.4)	0.80(0.37)	32(10.2)	20(29.9)	4.27(1.00)
Doctor's recommendation	9(16.1)	16(26.2)	1.79(0.18)	13(4.1)	15(22.4)	27.12(<0.01)
School enrolment	8(14.3)	15(24.6)	1.96(0.16)	20(6.3)	11(16.4)	2.74(1.10)
Had unprotected sexual contact	5(8.9)	12(19.7)	2.71(0.99)	24(7.6)	15(22.4)	13.14(<0.01)
Entering new sexual relationship	4(7.1)	7(11.4)	0.64(0.42)	5(1.6)	6(8.9)	30.72(<0.01)
Pregnancy (during antenatal)	3(5.4)	7(11.5)	1.39(0.24)	3(0.95)	8(11.9)	23.85(<0.01)
Peer educator's recommendation	0(0.0)	0(0.0)	-	267(84.8)	0(0.0)	188.64(<0.01)
Reasons why respondents have not done HIV test	**n= 410**	**n= 405**		**n= 113**	**n= 393**	
Fear of having a positive result	177(43.1)	197(48.6)	2.46(0.12)	73(64.6)	193(49.1)	8.45(<0.01)
Fear of a positive result, stigmatisation and discrimination	166(40.5)	182(44.9)	1.65(0.20)	63(55.8)	185(47.1)	2.64(0.10)
I am not at risk of HIV infection	166(40.5)	141(34.8)	2.79(0.09)	82(72.6)	161(41.0)	35.11(<0.01)
Distance to HCT centre	52(12.7)	48(11.9)	0.13(0.72)	0(0.0)	46(11.7)	14.55(<0.01)
Unaware of where HCT services can be obtained	27(6.6)	22(5.4)	0.48(0.48)	0(0.0)	20(5.1)	5.99(0.01)
Others	12(3.0)	10(2.5)	0.16(0.69)	10(2.5)	14(3.6)	5.43(0.02)

A multivariable logistic regression showed that in the intervention group, the odds of a female taking-up HCT was 1.7 times more than a male. Uptake of HCT also increased with increasing age group, those that were >15 years were 1.04 times more likely to take up HCT than those less than 15years, (p= 0.85). Uptake of HCT was 1.6 times more in those who had ever had sexual intercourse than those who did not and 1.5 times less in those who use condoms than those who do not, giving a significant negative association between condom use and HCT uptake (p= 0.03; C.I. 0.43, 0.97). Those that perceived themselves as not being at risk of contracting HIV were 1.2 times less likely to take up HCT than those that perceive themselves as being at risk, (p=0.81). The odds that someone willing to screen for HIV will take-up HCT was 1.4 times more likely than those that were not willing to screen for HIV, (p=0.83). Significant positive associations were found between gender and HCT uptake (p<0.01; C.I.1.28, 2.21) and between sexual exposure and uptake of HCT (p= 0.01; C.I. 0.50, 0.80). A negative association was found between condom use and HCT uptake as those that use condoms were 1.5 times less likely to take-up HCT compare to those who do not use condoms (p=0.03; C.I. 0.43,0.97)

Table 6: Multivariable logistic regression results for predictors of HCT uptake in the study group at 3 months post intervention

Independent Variables	N=428	β	p-value	AOR (95% CI)
Gender	Female (male)	0.52	<0.01*	1.70 (1.28 – 2.21)
Age	>15 years (<15 years)	0.04	0.85	1.04 (0.68 – 1.59)
Risky sexual activity	Had sexual intercourse (not had)	0.49	<0.01*	1.63 (1.25 – 2.14)
	1 partner (>1 partner)	-0.13	0.66	0.90 (0.50 – 1.54)
	Condom use (None use)	-0.44	0.03*	0.65 (0.43 – 0.97)
Risk perception	Not at risk (at risk)	-0.16	0.81	0.85 (0.22 – 3.30)
Willingness to screen for HIV	Willing to screen (not willing)	0.04	0.83	1.41 (0.74 – 1.47)

A total of 591 students received HIV counselling and testing at the school adolescent friendly centre. Two hundred and forty-eight of them were participants in the study (equivalent to 42% of all the clients seen in the centre and 53.2% of the study participants). Five hundred and ninety clients (99.8%) tested negative while one client tested positive for HIV and was referred to the Teaching Hospital ART clinic. Majority of the clients were females; 359 (60.7%) while males were 232 (39.3%). All the clients were counselled before and after testing and none of them declined testing. Other students that visited the centre to play games and interact with one another were not recorded.

Table 7: Summary data of HCT services from the Adolescent friendly centre at the end of the study

Data Elements		Male	Female	Total (%)
	Positive	0	1 (0.2%)	1(0.2)
	Negative	232 (39.2)	358 (60.7)	590 (99.8)
No. of students tested from the study participants and received peer-to-peer education				248 (41.9)
Total no. of students screened				591

IV DISCUSSION

This study showed that majority of the respondents were willing to do HCT/HIV test. While there was a further increase in the proportion of those willing to do HCT/HIV test among the intervention group at post intervention, the control group had a significantly lower percentage at the end of the study. This shows that peer education and the presence of on-site HCT services may have helped in re-emphasising the importance of HCT among the intervention group.

This study also revealed a low level of HCT uptake at baseline. Despite the high level of willingness to do HCT, only 12% in the intervention group and 13% in the control group at baseline had ever done HCT/HIV test. This shows how low the uptake of HCT is among secondary school students in Ebonyi State. This is in keeping with most literatures published on the uptake of HCT among adolescents and youths in other regions.(14,27) HCT uptake increased significantly by 61.6% within the intervention group with no significant increase in the control group. Of this increase in the intervention group, 85% had HCT within the intervention period and as much as 78.7% had it done in their school adolescent friendly centre $p<0.01$, while only 21.3% did it in other HCT centres. When asked where respondents will prefer to do HCT, majority in both groups said they would prefer to do HCT/HIV in their school HCT centre, $p>0.05$. Reasons given were that it was more convenient and very accessible. This implies that though some respondents preferred to go outside the school centre to do their HCT/HIV test, majority preferred to do it on-site in their school HCT centre. These findings are similar to a study done in a tertiary institution in Gindiri northern Nigeria, where up-take of HCT increased from 23.4% to 42.2% following health education and an on-site mobile HCT clinic.(28) This is also in line with a study done in Ethiopia by Gatta et al, among adolescents where majority of respondents suggested that HCT be offered within their school. (29) An increase in uptake was also reported by AIDS Healthcare foundation in Zambia, where on-site HCT/HIV test was done in 20 high schools and secondary schools and a massive turnout of students was recorded.(4) Likewise in a study by Mgosha et al in Tanzania revealed that majority of students preferred college based HCT model to other models.(16) A prospective study in Zimbabwe by Sherra et al, on communities with on-site mobile HCT clinic also showed a life time increase in HCT uptake from 6% to 11%.(30) This further underscores the need for HCT to be brought to the students.

Respondents in this study had various reasons for doing HIV test. At baseline respondents did the test because they were forced to, wanted to know their HIV status, ill health, knew a parent or sexual partner that died of HIV or had a positive result, had unprotected sex, doctor's recommendation and school enrolment. The difference in reasons between both groups was not statistically significant. But at 3 months post-intervention, majority of respondents in the intervention group had done HIV test because it was recommended by a peer educator (84.8%) $P<0.01$ and because they wanted to know their status (33.3%) $P=0.03$, those that did the test because they were forced to do it reduced significantly in the intervention group. All reasons given at baseline among the control group did not show any statistical difference at 3 months post- intervention. This implies that peer educators can influence behaviour change towards HCT uptake.

Among those that haven't done HCT/HIV test the major reasons given at baseline were; fear of a positive result, stigmatisation and a perception of not being at risk. Others were distance to HCT centre and unaware of were to do HCT. These reasons were similar at pre and post intervention for both the intervention and control group except for being unaware of where to obtain HCT and distance to HCT centre which reduced significantly to 0% in the intervention group. These factors were also similar to factors reported by several studies. (31,32) This is not surprising because HIV, a sexually transmitted virus is the causative agent of AIDS, the level of stigmatisation attached to this virus and disease in traditional African society is still very high and it appears that all effort at addressing this has not been very effective. This just goes to show the areas where peer education and health education should focus on to further increase HCT uptake.

Logistic regression revealed that being a female, sexual exposure and condom use were predictors of uptake of HCT. This may indicate that females are more conscious of their sexual and reproductive health than males. This is not surprising given the high level of stigmatisation and discrimination in our environment towards unwanted pregnancy, HIV and STI when they occur in females than males. Up-take also increased with

increasing age though not statistically significant. Influence by gender and age was reported in NDHS 2013; (33) where percentage of 'ever tested' increased with increasing age group and 19.2% of females aged 15-24 had ever had HIV test compare to 9.9% males in the same age group. Also, a survey reported by WHO showed that 1 in 6 women and 1 in 10 young men have been tested for HIV. [39] Studies done in Cameroun and Tanzania also showed similar gender difference.(34,35) It was also observed that those that had had sexual intercourse in the intervention group were 1.6 times more likely to take-up HCT than those that were not sexually exposed, C.I; 1.25-2.14, p=0.01. It was also observed in this study that those who used condoms were 1.5 times less likely to take-up HCT than those that did not use it, (p=0.03, C.I; 0.43-0.97). This is because they most likely believed that using condoms protects them and therefore they do not see the need to get tested. The number of sexual partners did not significantly affect uptake of HCT but those with one sexual partner were 1.1 times less likely to take-up HCT compared to those with more than one partner. On the perception of risk of having HIV; those that perceived themselves as not being at risk of contracting HIV were 1.2 times less likely to take-up HCT than those that perceive themselves to be at risk, p= 0.81. Perception of not being at risk was identified as a factor influencing up-take of HCT in a descriptive study done in Kwara State.(36)

CONCLUSIONS AND RECOMMENDATIONS

The introduction of peer education and onsite HCT services was effective in improving public secondary school students' up-take of HCT. HCT improved remarkably from 12% in the intervention group to 73% at the end of the study, p = <0.01. Major predictors of HCT uptake revealed from this study were: gender, sexual exposure and condom use. Other factors influencing uptake include: fear of a positive test result, stigmatisation and discrimination, a low risk perception and distance to HCT centre. Hence, we make the following recommendations;

Adolescent friendly centres providing free HCT services should be integrated into the secondary school environment to attract this vulnerable group to take-up HCT because they are at risk and vulnerable to be affected with HIV/AIDS. Peer educators should be trained and supervised on a regular basis to ensure they are imparting the right information to their peers as this study has shown that one of the commonest sources of information on HCT is from peer educators and friends. Lastly, the quality of teaching of family life education that is already incorporated in most secondary schools in Nigeria should be continuously monitored by the relevant agencies to ensure that correct information on HIV/AIDS is being passed across to the students, this is aimed at eliminating the misconceptions uncovered by this study.

REFERENCES

1. The Joint United Nations Programme on HIV/AIDS (UNAIDS), United Nations Children's Fund (UNICEF) WHO (WHO). Global AIDS response progress reporting 2014; construction of core indicators for monitoring the 2011 United Nations political Declaration in HIV and AIDS [Internet]. Geneva, Switzerland; 2014. Available from: http://www.unaids.org/sites/default/files/media_asset/GARPR_2014_guidelines_en_0.pdf
2. Joint United Nations Programme on HIV/AIDS (UNAIDS). Global AIDS epidemic [Internet].2013. Available from: http//www.Unaids.org/en/sub-saharanAfrica
3. FMOH. National HIV Sero-prevalence Sentinel Survey : Technical report. Nigeria Federal Ministry Of Health (FMOH), Department of Public Health National AIDS/STI Control Programme. Abuja, Nigeria; 2010. 49-90 p.
4. AIDS Healthcare Foundation (AHF). AHF Zambia tests thousands in high schools. [Internet]. 2013. Available from: www.aidshealth.org/archives/16792
5. Jimoh AAG. The scourge of AIDS in the new millenium- socio- economic implications in an emerging economy. Which way out? Hum Resour J. 2003;11(14):16–9.
6. Boswell D, Baggaly R for FHI (FHI). Voluntary counselling and testing (VCT) and young people; a summary overview. Arlington, USA; 4-19 p.
7. Family Health International (FHI), YouthNet USA for ID (USAID. HIV Counseling and testing for youths; A manual for providers. USA; 2005. 9-110 p.
8. Sloane BC, Zimmer CG. The power of peer health education. J Am Coll Heal. 1993;41(6):241–4.
9. Fernández MAL, Delchevalerie P, Van Herp M, Bray G, Greenway F, Molitch M, et al. Accuracy of MUAC in the detection of severe wasting with the new WHO growth standards. Pediatrics. American

Academy of Pediatrics; 2010;126(1):e195-201.
10. Fawole IO, Asuzu MC, Oduntan SO, Brieger WR. A school-based AIDS education programme for secondary school students in Nigeria: a review of effectiveness. Health Educ Res. 1999;14(5):675–83.
11. United Nations Children's Fund (UNICEF). Prevention of infection among adolescent and young person. Child info. monitoring;mthe situation of children and mother. [Internet]. 2012. Available from: www.childinfo.org/hiv_aids.html
12. National Population Commission. NIGERIA DEMOGRAPHIC AND HEALTH SURVEY 2013 National Population Commission Federal Republic of Nigeria. Abuja Nigeria; 2014.
13. Oyo-Ita AE, Ikpeme BM, Etokidem AJ, Offor JB, Okokon EO, Etuk SJ. Knowledge of HIV/AIDS among secondary school adolescents in calabar Nigeria. Ann Afri Med. 2005;4(1):2–3.
14. World Health Organisation (WHO)/The Joint United Nations Programme on HIV/AIDS (UNAIDS)/United Nations Children's Fund (UNICEF) (2011). Global HIV/AIDS response: epidemic update and health sector progress towards universal access, progress report. 2011.
15. Wang LY, Burstein GR, Cohen DA. An economic evaluation of a school-based sexually transmitted disease screening program. Sex Transm Dis. 2002;29(12):737–45.
16. Mgosha CP, Kweka EJ, Mahande AM, Barongo LR, Shekalaghe S, Nkya HM, et al. Evaluation of uptake and attitude to voluntary counseling and testing among health care professional students in Kilimanjaro region, Tanzania. BMC Public Health. BioMed Central; 2009;9(128):1–9.
17. Tewabe T, Destaw B, Admassu M, Abera B. Assessment of factors associated with voluntary counseling and testing uptake among students in Bahir Dar University: A case control study. Ethiop J Heal Dev. 2012;26(1):16–21.
18. I Chose Life (ICL). The impact of peer education on HIV prevention among Kenyatta University Students [Internet]. Nairobi, Kenya; 2006. Available from: www.fhi360.org/youth-sexual-reproductive-health-interventions-kenya.pdf
19. Azuogu B, Ogbonnaya L, Alo C. HIV voluntary counseling and testing practices among military personnel and civilian residents in a military cantonment in southeastern Nigeria. HIV/AIDS- reseach Palliat care. 2011;3(8):107–9.
20. Onwasigwe C. Principles & Methods of Epidemiology. 2nd Editio. Enugu: EL'Demak; 2010. 147-148, 339-340. p.
21. Araoye MO. Research methodology with statistics for health and social sciences. 2nd ed. Ilorin: Nathadex Publisher; 2004. 126-127 p.
22. Family Health International (FHI). Family Health International (FHI) training of trainers Manual. From theory to practice in peer education. 3-12 p.
23. Family Health International (FHI). Family Health International (FHI) training of trainers Manual. A sample of peer education session on HIV/AIDS. 127-132 p.
24. FMOH. Federal Republic of Nigeria National Guidelines for HIV/AIDS Voluntary counselling & Testing. Abuja, Nigeria; 2011. 220-240 p.
25. (AIS). AI survey. Basic documentation introduction to the AIS [Internet].2014. Available from: www.measurehs.com/pubs/pdf/AIS/HIV_AIDS_indicators.pdf
26. Polar Engineering and Consulting. IBM SPSS 21.0 for Window. Statistical package for social scientists incorporated, Version 21. 2003.
27. Bamidele JO, Abodunrin OL, Adebimpe WO. Sexual behavior and risk of HIV/AIDS among adolescents in public secondary schools in Osogbo, Osun State, Nigeria. Int J Adolesc Med Health. 2009;21(3):387–94.
28. Utoo PM , Ogbonna C, Zoakah AI AM. Outcome of health education on HIV/AIDS knowledge and mobile VCT uptake among students of a tertiary institution in Gindiri, north-central, Nigeria. Journal of Community Medicine & Primary Health Care,. J Community Med Prim Heal Care. 2010;22(1&2):33–40.
29. Gatta AA, Thupayagale-Tshweneagae G. Knowledge of, and attitudes towards, Voluntary HIV Counselling and Testing services amongst adolescent high school students in Addis Ababa, Ethiopia. Curationis. 2012;35(1):203–8.
30. Sherr L, Lopman B, Kakowa M, Dube S, Chawira G, Nyamukapa C, et al. Voluntary counselling and testing: uptake, impact on sexual behaviour, and HIV incidence in a rural Zimbabwean cohort. AIDS. 2007;21(7):851–60.
31. Riikka P OK. Adolescents' Knowledge and attitudes concerning HIV Infection and HIV Infected persons: how a survey and FGD are suited for researching adolescents' HIV/AIDS knowledge and attitudes. Health Education Research. Theory Pract. 1999;14(4):473–84.
32. Kwaku OA. HIV/AIDS knowledge and uptake of HIV counselling and testing among undergraduate private university students in Accra, Ghana. Reprod Heal J. 2013;10(17):103–22.
33. National Population Commission (NPC) [Nigeria] and ICF Macro. Nigeria Demographic and Health

Survey. Abuja, Nigeria; 2013.
34. Haddison EC, Nguefack-Tsagué G, Noubom M, Mbatcham W, Ndumbe PM, Mbopi-Kéou F-X. Voluntary counseling and testing for HIV among high school students in the Tiko health district, Cameroon. Pan Afr Med J. 2012;13(1):18–20.
35. Omary S. Barriers and attitudes towards HIV Voluntary Counselling and Testing (VCT) among Secondary School Pupils of Sengerema in Mwanza. Dar Es Salaam Med Students' J. Tanzania Medical Students' Association (TAMSA); 2010;8;15(1):20–3.
36. Yahaya L, Jimoh A, Balogun O. Factors Hindering Acceptance of HIV/AIDS Voluntary Counseling and Testing (VCT) among Youth in Kwara State, Nigeria. Afr J Reprod Health. Women's Health and Action Research Center; 2014;14(3):159–64.