HEALTH EDUCATION IMPACT ON STIGMA AND DISCRIMINATION AGAINST PEOPLE LIVING WITH HUMMAN IMMUNODEFICIENT VIRUS INFECTION AMONG ADOLESCENTS IN SOUTH WESTERN NIGERIA- A COMMUNITY BASED EXPERIMENTAL STUDY

ABSTRACT

Introduction: Young people in Nigeria constitute an important group due to their vulnerability and sexual inexperience. Even though there is a high level of awareness about HIV among young people in Nigeria, there are still relatively high levels of misconceptions and stigma. This study was therefore carried out to investigate effect of health education on stigma and discrimination of PLWHAs among adolescents in Ogun State, Nigeria.

Methodology: This was a quasi-experimental community-based study. The study was carried out in three (3) phases . A multistage random sampling technique was used in choosing the required samples for this study. Two Local Governments which was selected in the State formed the experimental and control groups. A semi-structured pretested interviewer-administered questionnaire was used for data collection. Data analysis was done using SPSS statistical software version 19.

Results: A total of 215 participants were recruited into the study. 31.2% were males, 52.6% were adolescents aged 10-14 years and 47.4% were aged 15-19 years, while 67.3% were Christians. Over half of respondents at baseline will encourage family member with HIV to openly disclose status. Generally there were significant improvements in attitude in the intervention group. In particular, there were very large improvements for willingness to share meals with PLWHA from 51.2% to 82.9% ($p<0.001$), willingness to buy food from food seller (21.3% to 75.4%, $p < 0.001$), and willingness to share meals with HIV positive classmate (from 53.4% to 80.3%, $p <0.001$). There were no significant improvements for keeping the status of an HIV infected person secret ($p = 0.085$), that female teacher with HIV be allowed to continue teaching ($p =0.124$) and that respondent will stop being friends with close friend with HIV ($p = 0.999$).

There was also a significant reduction in stigma scores for both the intervention ($t = 4.92$, $p < 0.001$) and control groups at 4 months post intervention ($t = 4.33$, $p < 0.001$). There was only a significant difference for family type, where the mean stigma scores were higher among respondents from polygamous homes and those with widowed parents compared to those from monogamous homes ($F = 3.22$, $p = 0.008$).

Conclusion: The study shows that adolescents from dysfunctional families such as polygamous homes and widowed parents had a significantly higher scores. Establishment of Youth Friendly Clinics in the communities that would focus more on adolescents from dysfunctional homes thereby meeting their peculiar health needs.

INTRODUCTION

Young people in Nigeria constitute an important group due to their vulnerability and sexual inexperience. Even though there is a high level of awareness about HIV among young people in Nigeria, there are still relatively high levels of misconceptions and stigma.[4; 5] In a nationwide survey, only about a third of respondents had comprehensive knowledge about HIV while less than a quarter had accepting attitudes towards people living with HIV AIDS.[4] Improvement of knowledge about HIV transmission and prevention and correction of stigma and discriminatory attitudes will help in the fight against HIV among young persons in Nigeria.[4; 5]

Stigma and discrimination are two major problems often faced by people living with HIV and AIDS in many developing countries, including Nigeria.[4; 5] Stigma and discrimination shown to persons living with and affected by HIV and AIDS can worsen the spread and the impact of the HIV and AIDS epidemic. A major contributor to this stigma and discrimination is the criminalisation of high risk groups like commercial sex workers, drug addicts/abusers and men

who have sex with men (MSMs) in our society which thus drives them underground and further increasing their vulnerability to HIV infection.[4; 5] As a result of fear of discrimination and stigma, many individuals are afraid of seeking HIV testing to know their HIV status while persons living with HIV and AIDS (PLWHAs) may be less inclined to declare and openly acknowledge their HIV sero-status. This can lead to continued under-reporting of the epidemic, increased transmission, and limited access to treatment, care and support programmes. On the other hand, stigma and discrimination violate the human rights and dignity of people living with HIV and AIDS and those affected by the epidemic.[4; 5]

HIV/AIDS-related stigma and discrimination remains a major hindrance to knowing one's HIV status as well as accessing care if positive,[4; 5; 14] and remains one of the key drivers of the HIV epidemic in Nigeria which also include low personal risk perception (which is very common amongst adolescents) and multiple concurrent sexual partnerships.[4; 14] This notwithstanding, there are few studies that quantifies the burden of effect of stigma and discrimination on access to care of HIV in Nigeria. Hence there is need for intervention studies on the adolescents that would focus on their development of accepting attitudes to people living with HIV/AIDS (PLWHAs). There is generally an increased awareness about HIV/AIDS among adolescents in Nigeria as evidenced by findings from recent national surveys,[4; 5]

Programmes aimed at reducing stigma and discrimination against people living with HIV or people at risk of HIV infection should address the actionable causes of stigma and discrimination and empower people living with and vulnerable to HIV.[63] Research has shown that the actionable causes are: (a) ignorance about the harm of stigma, (b) continuing irrational fears of infection, and (c) moral judgement.[63; 64] In a cross-sectional study to assess the attitude of antenatal attendees to people living with HIV/AIDS (PLWHAs) in Uyo, south-south Nigeria,[65] it was found that there was a statistically significant association between good knowledge of HIV/AIDS and a positive attitude to PLWHAs and a high educational status with a positive attitude to PLWHAs.[65] The study thus concluded that specific information and counselling interventions aimed at dispelling misconceptions about HIV/AIDS should be reinforced.[65]

Programmes to address these causes can involve a variety of approaches. Community interaction and focus group discussions involving people living with HIV and members of populations vulnerable to HIV infection;[63; 64] as reinforced in a study that concluded that education

intervention was associated with increased accepting attitudes to people living with HIV/AIDS (PLWHAs).[48] Use of media, including advertising campaigns, entertainment designed to educate as well as to amuse ("edutainment"), and integration of non-stigmatizing messages into TV and radio shows;[63] this was reinforced by a Nigerian-based study to assess the relationship between media saturation, communication exposure and HIV stigma in Nigeria and found that accepting attitudes towards people living with HIV were more prevalent among men than among women.[66] Exposure to HIV-related communication on the media was associated with increased knowledge about HIV, which is in turn a strong predictor of accepting attitudes.[66] Communication exposure also had a significant and positive association with accepting attitudes towards people living with HIV.[66] In contrast, community media saturation was not strongly linked with accepting attitudes for either sex.[66] The findings strongly suggest that media-based HIV programs constitute an effective strategy to combat HIV/AIDS-related stigma and should therefore be intensified in Nigeria.[61]

Engagement with religious and community leaders, and celebrities;[58] Inclusion of non-discrimination as part of institutional and workplace policies in employment and educational settings;[58; 59] Measurement of HIV-related stigma through the *People Living with HIV Stigma Index*,[62] including in health care settings and communities; and Peer mobilization and support developed for and by people living with HIV aimed at promoting health, well-being and human right[63; 64]. This study was therefore carried out to investigate the effect of health education oo stigma and discrimination among adolescents in Ogun state Nigeria.

Study Area

The State is populated mainly by the Yoruba ethnic group with several sub-groups mainly The Sub-groups are mainly the Egba, Yewa, Awori, Egun, Ijebu, Remo, Ikale and Ilaje, Anago, Ketu and Ohori. There are also other non-Yoruba ethic groups that settled in the State owing largely to its proximity to Lagos (the economic capital of Nigeria) and the presence of several industries. The occupations of the inhabitants are majorly farmers, civil servants, factory workers and self-employed businesses (e.g. traders, commercial transporters including motorcycle riders).

Each Local Government has at least a secondary healthcare facility as well as several primary health care facilities spread throughout the political wards in the LGA. There are three (3) tertiary health facilities in Ogun State: Olabisi Onabanjo University Teaching Hospital, Sagamu; Federal Medical Centre, Abeokuta and National Neuropsychiatric Hospital, Aro (Abeokuta). HIV Counselling and Testing (HCT) services are rendered in most of these health facilities as well as other reproductive health services. Ogun State presently has a total of ninety-five (95) HCT centres.[16]

3.2 Study design

The study was a quasi-experimental community-based study to determine the effect of health education on HIV/AIDS risk behaviours and stigmatisation practices among adolescents in the selected Local Governments in the State. Two Local Governments (Ado-Odo/Ota & Ifo), randomly selected from two of the senatorial zones in the State formed the experimental and control groups.

The study was carried out in three (3) phases – Pre-intervention, Intervention and Post-Intervention phases. Phase one (pre- intervention) involved cross-sectional comparative descriptive study, while phase two involved comprehensive health education intervention in the experimental/intervention group only. Phase three (post-intervention) involved comparative study between the experimental and control group immediate post-intervention as well as four (4) months post-intervention;

Pre-Intervention activities

1. Constituting research team: the lead investigator was assisted by trained assistants which included a coordinator of a local community-based organisation (CBO) involved in HIV/AIDS youth programmes; a trained peer educator; a secondary school teacher trained in family life and HIV education (FLHE); two (2) volunteer persons living positively with HIV (PLPs); a health worker in each of the selected Local Government Areas involved with HIV/AIDS programme.

2. House enumeration in the selected political wards for the study (was conducted in conjunction with town-planning officials of the LGA) as part of the process of selection of participants for the study. These were done between 2nd and 4th weeks in Dec. 2014.
3. Informed consent of the parents/guardians of the adolescents to allow them fully participate at all stages of the study were obtained.
4. Informed consent of the participants themselves were obtained (which emphasised their voluntary participation and permission to withdraw further participation from the study at any time if they so desired).
5. There was pre-testing of 20 questionnaires before the main study was conducted using some adolescents resident in Ipokia LGA which was different from the two Local Governments already selected for the main study. Amendments were made to the research instrument to minimise ambiguity and improve clarity. This was also to ensure validity and reliability of the research instrument.
6. There was a baseline survey to determine the knowledge of the adolescents in the two groups (i.e. control and intervention) about modes of transmission and prevention of HIV as well as their perception of risk of contracting the virus and their level of stigma towards persons living with HIV; this represented the pre-training assessment for the intervention group and the initial assessment for the control group.

Intervention

Training sessions were for two days and were in four (4) modular units which were: (1) knowledge about HIV/AIDS and other STIs; (2) Personal Risk Perception; (3) HIV Status, Stigma and Discrimination and (4) Care and Support and Rights of People Living with HIV/AIDS (PLWHAs). The first two modules i.e. (1) and (2) above constituted the training for Day 1; while the latter two modules i.e. (3) and (4) above constituted the training for the second day. The baseline survey for the control group (in Ifo LGA) was held on Sat. 10th Jan. 2015 at llepa community hall at 3 – 5pm.

Post-Intervention Activities

- These were conducted in two phases: immediate post-intervention and four (4) months post-intervention.

- The post-intervention evaluation was carried out using same questionnaire that had been used during the pre-intervention evaluation to determine immediate gain (immediate post-intervention) and the residual gain (four months post-intervention) in HIV/AIDS-related Knowledge Attitude and Practice (KAP) after the initial assessment in the intervention and control groups respectively.
- Evaluation of the effects of the training was done using calculated scores for the various variables during analysis.
- There was Focus Group Discussions (FGD) conducted in all the political wards used for the study. This was done soon after the immediate post-intervention activities were concluded (refer section 3.7 for details).

Sample size determination

The minimum sample size (n) was determined by the statistical formula for comparing proportions between two groups thus:

- $\boldsymbol{n = D(Z\alpha_{/2} + Z_{\beta})^2}$ **x** $\boldsymbol{\{P_1(1 - P_1) + P_2(1 - P_2)\} / (P_1 - P_2)^2}$ [210]

Where,

$\boldsymbol{Z\alpha_{/2}}$ = Critical value of the standard normal deviate corresponding to level of significance (α) of 5% = 1.96.

- $\boldsymbol{Z_{\beta}}$ = Critical value of the standard normal deviate corresponding to type II error (β) of 10% (Power = 90%) = 1.28.
- **D** = Design effect for the sampling design used = 1.5
- $\boldsymbol{P_1}$ = Proportion of adolescents (15-19) with perception of "No risk at all" regarding contracting HIV (NARHS Plus 2007) in the control group = 63.8% or 0.638.
- P1 – P2 = difference in risk perception between the experimental and control groups to be detected = 20%
- $\boldsymbol{P_2}$ = Proportion of adolescents (15-19) with perception of "No risk at all" regarding contracting HIV in the experimental group = 63.8 – 20% = 43.8% or 0.438.
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- Hence,

- $n = 1.5\ (1.96 + 1.28)^2 \times \{0.638(1 - 0.638) + 0.438(1 - 0.438)\} / (0.638 - 0.438)^2$.
- $n = 1.5\ (3.24)^2 \times \{0.638(0.362) + 0.438(0.582)\} / (0.2)^2$.
- $n = 1.5 \times 10.4976 \times \{0.230956 + 0.243276\} / 0.04$.
- $n = 1.5 \times 10.4976 \times 0.474232 / 0.04$.
- $n = 7.46744676/0.04$
- $n = 154.29 \equiv \mathbf{155}$.

Hence, to cater for attrition rate of 10%, the minimum sample size is 155/1-10% = 172 for each group (i.e. intervention and control); Further adjustment for 10% non-response gives a minimum of 172/0.9 = 192. However in this study 250 participants were recruited in each group.

3.4 Subject Selection and Sampling Methods

A multistage random sampling technique was used in choosing the required samples for this study. **Stage I (Senatorial zone selection):** Ogun West and Ogun Central senatorial zones were selected from 3 senetorial zones of the state by balloting

Stage II (LGA selection): From each of the two (2) selected senatorial zones, one LGA was selected by simple random sampling technique by balloting Hence Ado-Odo/Ota Local Government was selected to be the intervention (experimental) group whilst Ifo LGA the control.

Stage III (Ward selection): From the list of political wards in each of the selected LGAs, two (2) wards with contiguous borders were selected by simple random sampling technique Hence for the experimental LGA (Ado-Odo/Ota), of the sixteen (16) wards, Iju ward was first selected; A similar procedure was deployed in the control LGA (Ifo) in which of the eleven (11) wards, Olose ward was selected by balloting

Stage IV (Houses selection): At the level of the selected Wards, house enumeration was carried out by the research team and some officials from the town-planning unit of the Local Governments. From the combined total number of houses counted in the experimental and control Wards clusters (i.e. the two (2) wards selected in each LGA), a systematic random sampling technique (using a sample interval) was deployed to choose 250 houses in each of the experimental and control wards respectively. This sample interval was determined by dividing

the total number of houses enumerated in both the experimental (4,016) and the control (2,857) wards by the sample size in the experimental and control wards respectively i.e. 250 {hence 4,016/250 and 2,857/250 for the experimental and control wards respectively}. Hence the sample interval was 17 and 12 for the experimental and control wards respectively. The first house was determined by using the table of random numbers to pick a house from the house enumeration list.

Stage V (selection of individual adolescent participant): Only one adolescent (age 10-19yrs) was studied per house and this was randomly selected by a simple random sampling technique carried out by balloting. When there was no adolescent in a selected house, then the next house to it was considered but subsequent house selection was made without prejudice to predetermined sampling interval.

Exclusion Criteria: Only adolescents whose parents/guardians were permanent residents and who had been residing with them (parents/guardian) in the area for at least 6 months prior to the time of study were included in the study.

Consent was obtained to participate in the study from both the parents/guardian of the adolescents as well as the adolescents themselves. Others were excluded from the study.

Research Instrument and Data collection

A semi-structured interviewer-administered questionnaire (adapted from the National HIV/AIDS and Reproductive Health Survey (NARHS Plus) 2007)[4] was used for data collection (Appendix 1). This was pre-tested before the main study was conducted using some adolescents resident in Ipokia Local Government, Ogun State. Amendments were made to some aspects of the instrument that were found ambiguous or lacked clarity.

The sections of the questionnaire included: Section A consisting of socio-demographic characteristics. Section B which consists of questions on knowledge of the adolescents about modes of transmission and prevention of HIV; and Section C which consists of questions to assess their level of stigma and discrimination towards persons living with HIV.

Data management and analysis

The questionnaires were checked for proper completion upon collection from participants. The data were entered into SPSS statistical software version 19. The data were cleaned for errors and data edited. Composite variables (aggregate scores) for knowledge and stigmatising attitudes were computed from items on the questionnaire. For knowledge about HIV, responses from 29 items were combined. These items included knowledge and misconceptions about HIV transmission, HIV prevention, and treatment for HIV positive individuals. A correct response was given a score of 1 and an incorrect one scored 0. Thus the 'yes' responses for the questions on correct modes of transmission and prevention were scored 1 while this was reversed for the misconceptions. The total obtainable knowledge score was 29.

Concerning stigma and discrimination, stigmatizing attitudes got a score of 1 while accepting attitudes were scored 0. There were 16 items related to attitudes to family members, non-family members, classmates and teacher with HIV, thus the total obtainable stigma score was 16. Data were summarized using means and standard deviation for normally distributed quantitative data and median and range for skewed data. Qualitative data was summarized using frequencies and proportions.Baseline comparisons in the distributions of categorical socio-demographic variables and HIV knowledge, testing and stigma were tested using the Chi square test. The mean scores (knowledge and stigma scores) were compared between baseline and immediate post intervention for the intervention group and between baseline and 4 months post intervention for the two groups using the Paired t test.

In order to determine the association between stigma and socio-demographic characteristics, mean stigma scores were compared across levels of socio-demographic characteristics. For variables with two categories, independent samples t test was used to compare the groups while One-way ANOVA was used to compare variables with more than two categories. Multiple linear regression of stigma scores was also done on selected variables. The association between risky sexual behaviour and socio-demographic characteristics was tested using Chi square tests. Level of significance for all tests was 5%.

RESULT

Section 4.1: Socio-demographic characteristics

Table 1 shows the distribution of socio-demographic characteristics between the intervention and control groups. The socio-demographic characteristics shows that 31.2% were males, 52.6% were adolescents aged 10-14 years and 47.4% were aged 15-19 years, while 67.3% were Christians. The two groups were similar concerning gender (X^2 = 2.31, p = 0.128), age (X^2 = 2.69, p = 0.101), parents' marital status (X^2 = 0.12, p = 0.729), family type (X^2 = 5.57, p = 0.062), mother's children (X^2 = 2.39, p = 0.303), father's children (X^2 = 1.50, p=0.473), father's education (X^2 = 2.88, p = 0.237), mother's education (X^2 = 4.75, p = 0.093) and religion (X^2 = 1.16, p = 0.282).

Comparison of change in responses to knowledge items at 4 months between intervention and controls

Knowledge about HIV was compared at baseline and 4 months post intervention for the intervention and control groups and the results are shown in Tables 12 to 14. Generally there were more significant improvements in knowledge at 4 months for the intervention compared to control groups. For example the knowledge about HIV transmission improved more for the intervention while misconceptions reduced among the intervention group compared to controls (Table 12). In the intervention group, the proportion of respondents that thought an individual could contract HIV by sharing eating utensils significantly reduced from 24.4% to 11.1% (p =0.001). Similarly a lower proportion post intervention (4.9%) compared to baseline (12%) thought witchcraft was a mode of HIV transmission (p = 0.024).

Comparison of change in stigma and discrimination at 4 months between intervention and controls

In Table 18, the changes in stigmatizing attitudes at 4 months are shown for the intervention and control groups. Compared to controls, the intervention group had significant improvements for those items related to attitudes to family member with HIV. For most other items there were no clear differences between the intervention and control groups.

Among the intervention group, the proportion of respondents willing to care for HIV positive relative significantly increased from 88.8% to 97.6% (p = 0.001). Also the proportion willing to

share meals with PLWHA increased from 52% to 69.7% (p = 0.002). There were similar large improvements for willingness to sit beside PLWHA (p < 0.001), and to buy food from food seller with HIV (p < 0.001) among the intervention group.

However,, the changes in stigma scores are shown in Table 19 for the intervention and control groups. Stigma scores significantly reduced immediate post intervention for the experimental group (t = 9.53, p <0.001). There was also a significant reduction in stigma scores for both the intervention (t = 4.92, p <0.001) and control groups at 4 months post intervention (t = 4.33, p < 0.001). The reduction in stigma scores were computed and compared between the intervention and control groups. There was no significant difference in the reduction in stigma scores between the intervention and control groups (p = 0.952) (Table 20).

Association between stigma and socio-demographic characteristics (bivariate and multivariate analysis)

The differences in stigma scores across levels of categorical variables are shown in Table 22. There was only a significant difference for family type, where the mean stigma scores were higher among respondents from polygamous homes and those with widowed parents compared to those from monogamous homes (F = 3.22, p = 0.008). Post hoc tests for pairwise comparisons only found significant differences between widowed parents and monogamous homes. Stigma scores at baseline were also correlated with knowledge scores. There was a weak negative but significant correlation between knowledge and stigma (r = -0.27, p<0.001) (result not shown in table).

The variables significant at 20% on t tests and F tests (gender, family type and father's education) were entered into a multiple linear regression. The regression coefficients and 95% confidence intervals are shown in Table 23. Respondents from polygamous homes or widowed parents had significantly higher mean stigma scores (p = 0.049) compared to those from monogamous homes. Gender and father's education were not significant.

Table 1: Comparison of socio-demographic characteristics of adolescents

Variable	Intervention (n=215)	Control (n=215)	Chi square	P value
Gender				
Male	67(31.2)	82(38.1)	2.31	0.128
Female	148(68.8)	133(61.9)		
Age (years)				
10-14	113(52.6)	96(42.4)	2.69	0.101
15-19	102(47.4)	119(55.3)		
Parents' marital status				
Currently married	175(81.8)	173(80.5)	0.12	0.729
Others	39(18.2)	42(19.5)		
Family type				
Monogamous	161(75.2)	143(66.8)	5.57	0.062
Polygamous	48(22.4)	58(27.1)		
Widowed parent	5(2.3)	13(6.1)		
Mother's children				
1-3	70(32.6)	68(31.8)	2.39	0.303
4-5	119(55.3)	109(50.9)		
6+	26(12.1)	37(17.3)		
Father's children				
1-3	63(29.6)	53(25.1)	1.50	0.473
4-5	91(42.7)	90(42.7)		
6+	59(27.7)	68(32.2)		
Father's education				
Primary and below	33(15.5)	38(17.8)	2.88	0.237
Secondary	71(33.3)	84(39.3)		
Tertiary	109(51.2)	92(43.0)		
Mother's education				

Primary and below	49(22.9)	54(25.1)	4.75	0.093
Secondary	75(35.0)	92(42.8)		
Tertiary	90(42.1)	69(32.1)		
Religion				
Islam	70(32.7)	81(37.7)	1.16	0.282
Christianity	144(67.3)	134(62.3)		

*Some variables have totals less than 215 due to missing values

Table 12: Comparison of knowledge and misconceptions about HIV transmission at baseline and 4 months post intervention for the intervention and control groups

Variable	**Intervention**			**Control**		
Correct modes	**Baseline**	**4 months post***	**P value**	**Baseline**	**4 months post***	**P value**
Sexual intercourse						
Yes	183(100)	179(97.8)	0.989	186(96.9)	186(96.9)	0.999
No	0	4(2.2)		6(3.1)	6(3.1)	
Blood transfusion						
Yes	179(97.8)	177(96.7)	0.754	184(95.8)	182(94.8)	0.815
No	4(2.2)	6(3.3)		8(4.2)	10(5.2)	
Mother to unborn						
child	147(81.2)	142(78.5)	0.597	153(79.7)	138(71.9)	0.091
Yes	34(18.8)	39(21.5)		39(20.3)	54(28.1)	
No						

Oral sex						
Yes	116(64.1)	131(72.4)	0.159	155(80.7)	135(70.3)	0.024
No	65(35.9)	50(27.6)		37(19.3)	57(29.7)	
Sharing sharp objects like razor						
Yes	173(95.6)	175(96.7)	0.791	187(97.4)	182(95.3)	0.424
No	8(4.4)	6(3.3)		5(2.6)	10(4.7)	
Sharing needles						
Yes	172(95.0)	180(99.4)	0.021	188(97.9)	186(96.9)	0.754
No	9(5.0)	1(0.6)		4(2.1)	6(3.1)	
Anal sex						
Yes	151(85.3)	150(84.7)	0.999	154(80.2)	164(85.4)	0.237
No	26(14.7)	27(15.3)		38(19.8)	28(14.6)	
Misconceptions						
Sharing toilets						
Yes	44(24.0)	30(16.4)	0.087	77(40.1)	49(25.5)	0.003
No	139(76.0)	153(83.6)		115(59.9)	143(74.5)	
Sharing eating utensils						
Yes	44(24.4)	20(11.1)	0.001	102(53.1)	29(15.1)	<0.001
No	136(75.6)	160(88.9)		90(46.9)	163(84.9)	
Mosquito bites						
Yes	90(49.2)	40(21.9)	<0.001	109(56.8)	96(50.0)	0.218
No	93(50.8)	143(78.1)		83(43.2)	96(50.0)	
Witchcraft						
Yes	22(12.0)	9(4.9)	0.024	7(3.6)	20(10.4)	0.015
No	161(88.0)	174(95.1)		185(96.4)	172(89.6)	
Kissing						
Yes	58(31.7)	68(37.2)	0.302	90(46.9)	54(28.1)	<0.001
No	125(68.3)	115(62.8)		102(53.1)	138(71.9)	
Hugging						
Yes	18(9.8)	8(4.4)	0.076	26(13.5)	11(5.7)	0.017

No	165(90.2)	175(95.6)		166(86.5)	181(94.3)	

*At 4 months post intervention there were 183 participants in the intervention group and 192 in the control group that remained in the study

**For the question on anal sex, 177 respondents answered

4.4.3

Table 18: Comparison of responses to stigma and discrimination items at baseline and 4 months post intervention among the intervention and control groups

	Intervention			**Control**		
Variable	**Baseline**	**4 months post**	**P value**	**Baseline**	**4 months post**	**P value**
Desirable attitudes						
Willing to care for family member with HIV Yes No	150(88.8) 19(11.2)	165(97.6) 4(2.4)	0.001	174(91.6) 16(8.4)	181(95.3) 9(4.7)	0.210
Willing to share meals with PLWHA Yes No	91(52.0) 84(48.0)	122(69.7) 53(30.3)	0.002	52(27.8) 135(72.2)	62(33.2) 125(66.8)	0.343
Willing to sit beside PLWHA Yes No	110(65.5) 58(34.5)	142(84.5) 26(15.5)	<0.001	82(43.2) 108(56.8)	124(65.3) 66(34.7)	<0.001
Willing to buy food from food seller with HIV Yes No	39(23.1) 130(76.9)	75(44.4) 94(55.6)	<0.001	19(10.6) 161(89.4)	23(12.8) 157(87.2)	0.627
Agree that HIV positive						

female teacher be allowed to teach Yes No	126(69.6) 55(30.4)	147(81.2) 34(18.8)	0.015	89(47.1) 100(52.9)	149(78.8) 40(21.2)	<0.001
Willing to sit with HIV positive classmate Yes No	120(67.4) 58(32.6)	147(82.6) 31(17.4)	0.001	90(47.1) 101(52.9)	122(63.9) 69(36.1)	0.003
Willing to share writing materials with HIV positive classmate Yes No	117(66.1) 60(33.9)	129(72.9) 48(27.1)	0.188	80(42.6) 108(57.4)	104(55.3) 84(44.7)	0.021
Willing to play with HIV positive classmate Yes No	135(78.5) 37(21.5)	146(84.9) 26(15.1)	0.152	85(44.5) 106(55.5)	125(65.4) 66(34.6)	<0.001
Willing to share meals with HIV positive classmate Yes No	92(53.8) 78(46.2)	122(71.3) 49(28.7)	0.001	45(23.6) 146(76.4)	79(41.4) 112(58.6)	0.001
Willing to share toilet with HIV positive classmate Yes No	113(66.1) 58(33.9)	124(72.5) 47(27.5)	0.222	44(23.0) 147(77.0)	78(40.8) 113(59.2)	0.001
Willing to help a support group of HIV positive people Yes No	147(81.2) 34(18.8)	156(86.2) 25(13.8)	0.253	144(75.4) 47(24.6)	168(88.0) 23(12.0)	0.002
Willing to participate in a						

support group meeting Yes No	112(61.9) 69(38.1)	150(82.9) 31(17.1)	<0.001	72(37.9) 118(62.1)	109(57.4) 81(42.6)	0.001
Willing to remind HIV positive friend/family member to take drugs Yes No	171(94.5) 10(5.5)	177(97.8) 4(2.2)	0.180	178(92.7) 14(7.3)	178(92.7) 14(7.3)	0.999
Undesirable attitudes						
Will stop being friends if found out close friend has HIV Yes No	36(19.7) 147(80.3)	21(11.5) 162(88.5)	0.036	73(39.5) 112(60.5)	26(14.1) 159(85.9)	<0.001

Table 19: Change in stigma score over follow up period for the intervention and control groups

INTERVENTION GROUP				
Baseline Mean (SD)	**Immediate post Mean (SD)**	**N**	**Paired t test**	**P value**
6.1(3.7)	2.8(2.4)	173	9.53	<0.001
Baseline Mean (SD)	**4 months post**		**Paired t test**	**P value**
5.8(3.5)	3.7(3.2)	141	4.92	<0.001
CONTROL GROUP				

Baseline Mean (SD)	**4 months post**		**Paired t test**	**P value**
8.4(3.8)	6.6(3.7)	165	4.33	<0.001

Table 20: Comparison of change in stigma scores at four (4) months between the experimental and controls groups

Group	**N***	**Mean reduction in stigma score (SD)**	**Median reduction in stigma score (range)**	**Mann Whitney U**	**P value**
Intervention	141	2.2(4.8)	2(23)	11586	0.952
Control	165	1.8(5.4)	2(24)		

*The totals are lower than the respective totals available post intervention due to missing data

Section 4.5:

Table 22: Comparison of stigma scores across categories of socio-demographic variables for all participants (intervention and controls combined) at baseline

Variable	**Mean stigma score**	**SD**	**N**	**Independent samples t**	**P value**

				OR F test**	
Gender					
Male	6.74	4.17	135	1.57	0.118
Female	7.40	3.84	255		
Age (years)					
10-14	7.10	3.83	185	0.33	0.744
15-19	7.23	4.07	205		
Parents' marital status					
Currently married	7.13	4.00	312	0.52	0.605
Others	7.39	3.84	77		
Family type					
Monogamous	6.93	4.02	274	3.22	0.041*
Polygamous/Widowed parent	8.85	3.76	114		
Mother's children					
1-3	7.39	3.89	127	0.27	0.761
4-5	7.05	4.06	204		
6+	7.16	3.87	58		
Father's children					
1-3	7.01	3.92	107	0.18	0.832
4-5	7.16	4.08	161		
6+	7.33	3.88	118		
Father's education					
Secondary and below	7.49	4.10	208	1.64	0.173
Tertiary	6.79	3.92	179		
Mother's education					
Primary and below	7.25	3.99	100	0.07	0.934
Secondary	7.08	4.00	146		
Tertiary	7.21	3.95	143		

*Post hoc tests showed significant differences between participants from monogamous homes and those with widowed parents (p =0.017)

**Independent samples t test was used to compare mean stigma scores of dichotomous variables while the F test was used to compare the means of variables with more than two categories (multichotomous variables).

Table 23: Multiple linear regression of stigma scores at baseline on variables

Variable	**Regression coefficient**	**95% CI for regression coefficient**	**P value**
Gender Female Male	0.52	-0.21 to 1.27	0.161
Family type Polygamous/Widowed parent Monogamous	0.83	0.01 to 1.67	0.049
Father's education Secondary and below Tertiary	0.71	-1.46 to 0.04	0.065

DISCUSSION

The outcome of the intervention showed a significant improvement in HIV knowledge at 4 months post-intervention compared to baseline among the intervention group compared to the control group. In addition, the improvements in knowledge at immediate post intervention appeared to be sustained at 4 months post intervention. Notably, there were significant reductions in the level of all misconceptions about HIV transmission though not the same for misconceptions about HIV prevention. Previous intervention studies among adolescents have shown significant improvements in HIV knowledge.[29,33,39,47,49,50] About a tenth of the study

participants felt that HIV could be spread through witchcraft and hugging, similar to 11% and 8% reported by the 2012 national survey.[5] Kissing was however reported by about 40% in this study lower than 54% reported in the Osun State study[32] higher than 21% reported in the 2012 survey[5] and slightly over a quarter reported by the 2013 survey.[212]

Misconceptions about modes of HIV transmission certainly have a role to play in accepting attitudes towards those with the disease, thus efforts at reducing misconceptions are necessary in reducing stigma. In this study the intervention educated the students and tried to correct the misconceptions. Less than 80% knew about oral sex and anal sex as modes of HIV transmission. Though these modes of transmission become risky when there is no protection, campaign messages need to emphasize the high HIV risk associated with these sexual behaviours. The stigma associated with oral and anal sex especially in the traditional African society suggests that innovative approaches to discussion of oral and anal sex are needed. Compared to the modes of HIV transmission, the knowledge about HIV prevention was lower. In fact only avoidance of sharp objects was known by over 80% of the respondents.

Regarding accepting attitudes towards people living with HIV (PLHIV) vis-a-vis stigma and discrimination, the respondents in this study had fair levels of accepting attitudes, as the mean scores were 6 in the intervention and 8 among controls at baseline out of a total stigma score of 16. While there were very positive attitudes concerning caring for family member with HIV and reminding HIV positive friend to take drugs, the responses to most other items on attitude were less positive. In fact less than a quarter of respondents indicated willingness to buy food from HIV positive food seller. Generally less than two thirds would share meals with or sit beside HIV positive non-family member, share materials or writing materials with classmate. These results indicate that more campaigns are needed to correct these stigmatizing behaviours among adolescents. The 2012 survey reported 43% was willing to share meals with HIV infected person, and that compares with about 40% found in this study.[5] In addition, about 38% of 15-19 year olds in the 2012 survey,[5] and 44% from the 2013 national survey[212] was willing to buy food from infected shopkeeper, higher figures than about 16% found in this study.

Another related finding is the high proportion (about 70%) that would keep the status of a family member with HIV secret. This proportion is even higher than the 60% and 65% respectively from the 2012 survey[5] and 2013 survey.[212] Keeping the HIV status of a family member secret

portends negative consequences for the HIV positive individual as early access to treatment and other benefits of HIV care are missed once HIV status is kept secret. A related finding is that less than two thirds will encourage family member to openly acknowledge HIV status. Interventions such as the one in this study, especially with new and innovative methodologies are urgently needed to correct several stigmatizing and discriminatory attitudes found among the adolescents in this study. It appears that the relatively high level of knowledge does not translate to accepting attitudes towards persons with HIV.

The study also revealed significant associations between stigma, family type and HIV knowledge. The lowest stigma scores were found among adolescents from monogamous homes compared to those from other homes. This finding could be an indication that those from monogamous homes are more tolerant, as they reside in homes with smaller families, with fewer siblings and perhaps better bonded with family members. Thus they may be more likely to care for family members and other people needing help. The inverse association between HIV knowledge and stigmatizing attitudes to PLWHA found in this study has been reported by previous studies among antenatal attendees in South-south region of Nigeria[65] and among adults in Ghana.[214] It is apparent that lower levels of misconceptions about HIV transmission and prevention would translate to more tolerant behaviour towards PLWHA. The implication of this association is that efforts at improving HIV knowledge must be intensified, as stigma levels are also likely to reduce.

The association between stigma and father's education was not significant but lower stigma scores were found among those whose fathers had tertiary education. The educational level of the parent is likely to positively influence the child's level of information about social and health issues generally and this could reduce their levels of stigma. Studies have also shown significantly lower levels of stigma among those with higher education.[65, 214] Concerning gender differences in stigma, males had lower stigma scores than females, however the difference was not statistically significant. Previous studies in Nigeria have reported higher accepting attitudes among males.[64, 215]

The intervention instituted appeared beneficial among the intervention group especially when the responses immediate post-intervention are compared to baseline. The mean stigma score reduced from 6 at baseline to 2.8 immediate post, but rose to 3.7 at 4 months post intervention. Looking at some of the individual stigma items, the proportions willing to sit beside person with HIV, to

buy food from HIV infected shopkeeper, to share writing materials, or share meals with classmate reduced between immediate post intervention and 4 months post. This indicate that some of the stigmatizing attitudes are ingrained in the minds of the adolescents and will require regular exposure to interventions to correct some of the stigmatizing attitudes. A previous systematic review has noted that the stigma reduction interventions usually work on a small scale and their impacts are short term.[216, 217,71,72,218, 47, 49] One way to ensure regular exposure to education about HIV is the inclusion of HIV AIDS as compulsory subjects to be taken by all students for those in school, while regular community interventions should also focus on those adolescents out of school.

The intervention in this study didn't seem to markedly reduce stigma and more innovative interventions need to be tried in future studies. Some studies have highlighted the importance of community factors on accepting attitudes towards PLWHA.[64, 219, 220] This suggests that interventions targeting whole communities as well as individuals such as adolescents could be more successful in reducing stigma. Such large-scale interventions need to be tried by HIV AIDS programmes and governmental organizations.

CONCLUSION

This study is one of the few interventions focusing on HIV stigma among adolescents. Stigma has an important role to play in the transmission of HIV and in the utilization of health care services such as HIV testing.[224] This study is unique because it is one of the very few studies in Nigeria with a main focus on the effect of an intervention on stigma. Several Nigerian studies have investigated the effect of different interventions on HIV AIDS knowledge[47], sexual behaviour,[28, 31, 36] and knowledge of Reproductive Health issues such as premarital sex, pregnancy prevention, abortion and STIs.[30, 31, 36]

Innovative interventions and campaigns at the community level focusing on reducing stigmatization are needed that will consider the peculiar socio-cultural factors in the design of such interventions as dynamics of change in the community may be more important in shaping attitudes and behaviour rather than individual factors. Stigma reduction interventions need to focus more on adolescents from polygamous homes and those with poor HIV knowledge as this study has shown higher stigmatizing attitudes among them.

Establishment of Youth Friendly Clinics in the communities that would focus more on meeting the peculiar health needs of adolescents especially against the backdrop that in this study, it was a general consensus of the respondents that these facilities though very beneficial to them, were none existent in their communities. Government at all levels should ensure stricter enforcement and compliance with the various laws related to protecting people living with HIV/AIDS (PLWHAs) against stigma and discrimination as this can serve as a disincentive to those (persons, groups or corporate establishments) in the habit of meting out such treatment to these individuals. Government at all levels should begin to responsibly take ownership of all HIV/AIDS related programmes in their domain and channel resources at their disposal towards meeting the peculiar HIV/AIDS related health needs of their community members not least the adolescents

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