Full Length Research Paper

HIV/AIDS information source use and sexual behaviour of adolescents in Ekwusigo Local Government Area of Anambra State, Nigeria

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This paper established those information sources that mostly provided the information about HIV/AIDS to 540 adolescents in Ekwusigo Local Government Area of Anambra State, Nigeria. The study showed further, how the adolescents' personal and parental characteristics explained the use of the sources as well as the relationship between source use and adolescents' sexual behaviour. The result showed that handbills, television and friends were the most frequently used sources. Use of handbills is related to decreasing total number of sexual partners, and reduction in the chances that the respondent has ever had sex, while the use of television relates to the increased chances of ever having sex, although it increased the current number of sexual partners and the decreasing use of condom during last sex. Friends relates positively to condom use during last sex and if one has ever had sex, age at first sex, last time one had sex, and current number of sexual partners. Increased investment in the use of handbills and use of friends could not only significantly reduce government's budget for HIV/AIDS awareness among youth but could also lead to increased effectiveness in achieving the impartation of the right information.

Key words: Adolescent, HIV/AIDS, information sources, sexual behaviour, rural community, South-eastern Nigeria.

INTRODUCTION

In her National Policy on HIV/AIDS, the government of the Federal Republic of Nigeria acknowledges that a comprehensive information, education and communication (IEC) system is central to the nation's efforts to prevent the spread of HIV/AIDS and mitigate its impact (NACA, 2003).

This position conforms to the World Health Organisation's (WHO, 2005) strategy regarding combating the disease, and it has led to the initiation and implementation of various information, education and communication programmes to improve the general public awareness about the disease. The expected outcome of the awareness programmes is that individuals adopt appropriate behaviors and lifestyles that could protect them from contracting the disease.

The recognized role of information in controlling behavioural diseases such as HIV/AIDS often results to communities deploying all available information sources, without any discrimination of the sources according to their use characteristics in the target communities. The objectives of this study are to: (i) establish those information sources that are mostly used by adolescents while seeking for information on HIV/AIDS in a semi-rural community in Nigeria, (ii) understand how personal and parental factors account for the use or not use of these sources, and finally, (iii) establish how these information sources relate to adolescents sexual behaviour in the community.

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In 2004 and 2006, United Nations Commission on AIDS (UNAIDS, 2004, 2006) reported that adolescents and young adults were the fastest growing population of newly infected cases of HIV globally. The present study is therefore very crucial to agencies that are responsible for HIV/AIDS control in Nigeria such as National Agency for the Control of AIDS, State Agencies for the Control of AIDS, nongovernmental, international and other organizations that are under pressure to make optimal use of scarce resources. They could invest selectively on the information sources that have greater potentials to inform audiences and result to a more focused action on the control of the disease. The study has implication that a few information sources could achieve the same level of HIV/AIDS awareness that is often expected from several sources. This opinion is partly supported by studies that show that actual use of information sources by various audiences differs from preference expressed for the sources[5], although this study made no effort to identify those few sources that could explain adolescent awareness about HIV/AIDS. Further understanding of the factors that account for the use of the sources and the relationship between the use of these sources and sexual behaviour among adolescents could contribute immensely to HIV/AIDS programming and management. Crucially, investing in the few sources that account for most of the information awareness among target audiences will save cost and maximize scarce resources.

Many studies that examine the use of information sources by adolescents abound in Nigeria, but apart from Nwagwu (2007) study which attempted the establishment of the most effective sources, many of these studies did not attempt to establish whether there existed few sources that explained most of the information source used. Most of the studies used frequency distributions to identify the most popular sources, but they did not examine the factors explaining the use of the sources or how the use of the information sources relate to the sexual behaviour of the respondents.

LITERATURE REVIEW

Information intervention on HIV/AIDS

According to Unuigbe and Ogbeide (1999), one of the major challenges of adolescent sexuality and reproductive health is lack of adequate information. Unuigbe and Ogbeide further observed that adolescent population needs to be fully exposed to sex education and that information on HIV/AIDS should be made readily available to them at home, in schools and public libraries. Iyaniwura (2004), in a study of the attitude of teachers to school based adolescent reproductive health intervenetions, highlighted the risk associated with adolescent sexuality and upheld that adolescents need appropriate information and skills to help them make informed

sexual decisions. Iyaniwura further observed that information in itself is not adequate to change the risk behavior of adolescents, but the information must be tailored to address the specific needs of the adolescents. Alongside information interventions, the implementation of measures to build self-esteem and self-efficacy, and social skills in adolescents has also been recommended by Futterman (2005).

Sources and source assessment of HIV/AIDS information to adolescents

HIV/AIDS information awareness programs make use of many different media to reach adolescents. These include: print media- books, posters, pamphlets, handbills; broadcast media- various programs on radio and TV stations; family- which includes parents, other parent-figures and siblings; friends and peers; and healthcare workers in general[5]. Others are formal and informal education activities, telephone hotlines and the internet (Ybarra et al., 2006). According to a number of researchers in different countries such as Buseh et al. (2002) in Swaziland; Nwokocha and Nwakoby (2002) in Enugu State, Nigeria; Okonta and Oseji (2006) in Delta State, Nigeria, the broadcast media seem to top the rankings in terms of their popularity as sources of HIV/AIDS and related information.

In a study of 922 high school youth in Addis Ababa, Ethiopia, Amsale et al. (2005) defined various parameters for assessing actual source use such as perceived credibility of the source, perceived appropriateness of the message, perceived accessibility of the source, perceived timeliness of the information, perceived applicability of the message and preferred source. According to the authors, the most preferred source of HIV/AIDS information for the adolescents was the radio, followed by television, with healthcare workers ranking the least. Berenson et al. (2007) have shown that the role of peers as a source of HIV/AIDS and reproductive health information to adolescents is very important and cannot be overlooked.

HIV/AIDS information intervention: The need for evaluation

With regards to adolescent sexual behavior, the desired behavioral modifications as a result of information intervention programs would include the following: delayed onset of sexual initiation, decreased frequency of sexual intercourse, reduction in number of partners, increased use of condoms at every instance of sexual activity, not offering sex for money and total abstinence from sexual intercourse until marriage. However, Kirby (1995) has cautioned that with respect to the influence of sex education and other information intervention programs on adolescent sexual behavior, expectations should be

modest as changing the behavior of people is generally difficult especially when that behavior is strongly affected by hormones, physical desire and a host of other factors.

Despite some controversies in the literature over the role of the media in adolescent sexual behaviour, there appears to be a consensus by researchers that behaviour modifications with regards to adolescent sexuality and HIV/AIDS can be achieved through well managed and comprehensive information intervention programs (Brown et al., 2002). United National Children's Fund (UNICEF, 2002) reported that the fall in the prevalence of HIV/AIDS in Uganda during 1987 to 1997 was due to the use of strong public information campaigns since the mid 1980s.

In their own study, Kirby et al. (2006) who reviewed 83 evaluations of sex and HIV programs that were based on a written curriculum and that were implemented among groups of youth in schools, clinics and other community settings in both developed and developing countries, found that that the programs had a significant delay in sexual initiation. The programmes also reduced frequency of sexual intercourse among the youths and also decreased the number of sexual partners. The review found increases in perceived risk, improvement in measured values and attitudes, improved perception of the disease, as well as increased motivation to abstain from sexual intercourse or if not possible, reduce number of sex partners.

In another systematic review of all the research published on the impact of girls' education on sexual behavior and HIV in eastern, southern and central Africa, Hargreaves and Boler (2006) found that increased levels of girls' education was associated with a delay in initiating sexual intercourse, higher levels of condom use and lower association with coercive, transactional and commercial sexual activity.

The result of a study by Magnani et al. (2005) was however different. They found that exposure to a full-coverage life skills education program had no significant effect on initiation of sexual intercourse, the programmes did not result to any significant increase in the practice of secondary abstinence and did not have any significant effect on number of sexual partners, although it had significant effects on first sexual intercourse, consistency of use of condom and use of condom at last intercourse.

All the studies reviewed examined the roles and utilization of various information sources and strategies in influencing the sexual behaviour of adolescents, but none of them examined whether there existed some few information sources that could explain adolescent choices of information sources and how the use of these sources influenced sexual behavior.

METHOD

Study area and population

This study was carried out in Ekwusigo Local Government Area (LGA) of Anambra State, in southeastern Nigeria during June to August 2007. The 2006 census put the population of Ekwusigo LGA at 89171. Based on the observation that one-third of the Nigerian population falls within the age group of 10-24 years (National Population Commission, 2006) we estimated that the LGA would have about 29724 adolescents.

Study design, sampling and data collection

The study adopted a cross sectional research design. It was established from the local government headquarter that there were 57 secondary schools in the LGA, with a total number of 12124 students, and adopted systematic sampling to select the schools and simple random sampling to select the respondents. The schools were listed in alphabetical order and the every 5th school was selected, yielding 11 schools altogether. For each of the 11 schools selected, registers of student enrolment from junior secondary to senior secondary three were obtained from the authorities, and counted a total number of 1863 adolescents was obtained. The students in this list were ordered alphabetically by their surnames, and assigned unique numbers from 001 to 1863. Then a computer-generated random number process was used to select a sample size of 30% or 569 unmarried adolescents. To ensure that the study met ethical expectation, details of the objectives, rationale and methodology of the study were verbally disclosed to the school authorities and the respondents, and to the parents/guardians of the students through a letter of consent three weeks before the survey. Students were also informed of their freedom to participate in the study or otherwise. For those that chose to participate, anonymity was ensured by requesting the students not to write their names on the questionnaire. Sixteen students did not feel comfortable with the survey or were advised by their parents or guardians not to participate, and were excluded.

Data collection and quality control

Data was collected from this sample (569) using a structured questionnaire, administered by the second author with the assistance of five trained research assistants. Buseh et al. (2002) have observed that sometimes adolescents do not understand the questions posed to them during interviews, and advocated for training or adoption of any strategy that could improve the quality of data collected. Cost of training was considered very prohibitive and an approach being used by Philliber Research Associates, New York, who is evaluating the school based Family Life and HIV/AIDS Education in Lagos State being carried out by Action Health Inc., Nigeria was chosen (http://www.philliberresearch.com/prog_tpregprev.html).

In each of the schools, selected students were simultaneously gathered in large classrooms, and the researchers explained the object of the study, and general questions were thereafter entertained from the students. After this, the research assistants read each question in the questionnaire aloud to the students to ensure that the students understood each question properly. This was expected to reduce the effects of educational level differences between junior and senior secondary school students as well as the effects of differences in the social and demographic statuses of either the students or their schools. Respondents were allowed to ask questions to clarify any of the questions read, and such questions were addressed at individual levels- the assistants moved close to the student that asked the question and provided an answer to the question privately without other students being privy of the content of the question and its answer. When it was established that the question read has been understood, the students were asked to supply their responses, and then the class moved to the next question. To ensure independence and unobtrusiveness, teachers and other administrative staff in the

schools were not involved in the data collection exercise. Also, plain sheets were provided to students to cover their questionnaire in the process of marking their responses on them. The ethical considerations implemented during the survey as well as the unobtrusive approach during data collection ensured that our respondents faced no risk for participating in the study.

Variables in the study

There are two categories of independent variables in the study- the first are the personal characteristics: gender, age and current class in school and parent the adolescent is close to. Next is the parental characteristics: father's age, mother's age, mother's level of education, father's level of education, father's occupational status and mother's occupational status. There were two groups of dependent variables. First are the use of the information sources namely television, radio, newspapers, magazines, teacher, medical personnel, storybooks, parents, posters, friends, handbills, textbooks, billboards, internet and village meeting; and then adolescent sexual behaviour namely: ever had sex, last time had sex, used condom last during sex, frequency of condom use, current number of sexual partners and total number of sexual partners. These variables were teased out from the various studies reviewed in this study.

Method of data analysis

First, data on personal and mothers' and fathers' backgrounds, sources of HIV/AIDS and the sexual behaviour were described. Next, fifteen information sources were identified and listed individually. Adopting popular grouping of these sources as electronic, print, broadcast, interpersonal etc was avoided given possible fundamental differences in their use as individual sources. For instance, fewer people might rely on teachers for reproductive health information when compared to those relying on medical personnel, but both are interpersonal sources. Principal component factor analysis was thereafter used to 'extract' few of the sources, often known as factors or components that absorbed the effects of all other sources. Usually, factor analysis would establish the contribution of each of the sources and then identify the most influential factors, thus reducing the total number of variables to a parsimonious few. These few factors or components would usually explain the most significant proportion of the total variance contributed by the 15 sources. Technically, the factor analysis helped visualize how the information sources 'loaded' on the factors, and thus obtained a general understanding of the information source use choices of the respondents. One of the major results is the explanation of the variances contributed by each of the variables often measured as 'Eigenvalues'; usually, Eigenvalues less than one signify variables that are not making very significant contributions in the total variance explained by all the variables.

Standard procedures were adopted to test the possibility of this process by using a correlation matrix to establish whether there were pairs of sources that have higher correlation coefficients than 0.6, and which could therefore be considered to belong to the same group or to be measuring the same construct, and would therefore be aggregated or removed from the analysis. Usually, the correlation matrix displays a determinant which would be more than 0.001 if the data is suitable for the analysis. Furthermore, Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's test of sphericity were used to understand whether there was sufficient number of items in the analysis and whether the resulting correlation matrix is not an identity matrix, a situation that often renders factor analysis a nullity. Generally, Kaiser-Meyer-Olkin Measure value should be greater than 0.70, while the significance value of its Chi Squared process should be less than 0.06.

The result of the correlation matrix test showed a determinant of 0.008, a value greater than the threshold of 0.001. The highest correlation of 0.436 existed only between billboards and handbills. Also, the KMO measure of sampling adequacy gave a value of 0.880, greater than the threshold 0.7, indicating that that there were sufficient items. Finally, with $X^2 = 2608.30$, df = 105 and p = 0.001, the Bartlett's test of sphericity showed that the correlation matrix was significantly different from an identity matrix. Altogether, these results supported the use of principal component analysis to reduce the variables.

The beauty of factor analysis lies in the fitting of a regression model on the factors, leading to a more meaningful explication of patterns of interrelationships among the observed variables. In this study, binary logistic regression analysis was used to establish how personal and parental variables explained adolescents' use or not use of the 'extracted' information sources. Thus, the dependent variable is binary categorical and was dummy-coded 1 if the respondent was using the source, and 0 if otherwise. For a better regression result, since similar variables guided data collection on fathers' and mothers' characteristics, it was necessary to establish whether the variables belonged to the same group or measured the same construct. A correlation matrix was also used to diagnose whether pairs of mothers' and fathers' age, educational status and occupation had correlations higher than 0.5 each which would indicate that they measured the same construct. The result showed that each pair of mother's and father's age, educational status and occupational status had correlations higher than 0.5 and were therefore combined to read parents' age, parents' educational status and parents occupational status. Students in junior secondary one through three were grouped as junior while those in senior secondary one through three were grouped as senior.

Finally, a correlation analysis was used to understand the relationship between use and non use of the extracted sources and the sexual behaviour of the adolescents. The analysis was carried out using the Statistical Package for the Social Sciences (SPSS 12).

RESULTS

Demographic background of the students and their parents

A total of 553 adolescents responded to the questionnaire; 13 were unusable because of either incompleteness of responses, and illegible or unintelligible responses. Table 1 shows that males accounted for 44% of the respondents; students in the age group of 15 to 17 were the largest in number (50.20%) and most of the students were in senior secondary 2 (38.31%). The overall mean age of the respondents was 16.6 (SD = 2.85) years; males had a mean age of 16.67 (SD = 2.774), while females had a mean age of 16.59 (SD = 2.92).

Table 1 shows further that the mean, median and modal age of the respondents' fathers were 52, 47 and 57, respectively, while the mean, median and modal age of their mothers were 47, 47 and 48. Secondary level was the highest reported educational level of the fathers (42.6%), with only 3.0% reporting not having any form of education. Although, lesser in magnitude than their male counterparts, secondary school was also the highest reported educational level of the mothers (46.9%). A little

Table 1. Demographic characteristics of the students.

Variable	Parameters	Count	Percentages (%)
Sex	Male	239	44
	Female	301	56
Age	<12	14	2.6
	12-14	80	14.8
	15-17	271	50.2
	18-20	142	26.3
	21-23	19	3.5
	>24	14	2.6
	JS1	38	7.0
	JS2	80	14.8
Current class in school	JS3	15	2.8
	SS1	158	29.3
	SS2	207	38.3
	SS3	25	4.6
	Father	128	23.7
Parent closest to	Mother	355	65.7
	Both	27	5.0
	Neither	30	5.6
	<35	5	0.9
	35-39	12	2.2
	40-44	43	8.0
Father's age	45-49	84	15.6
	50-54	121	22.4
	55-59	111	20.6
	>60	49	9.1
	I don't know	115	21.3
	<30	13	2.4
	30-34	41	7.6
	35-39	84	15.6
	40-44	106	19.6
Mother's age	45-49	120	22.2
	50-54	71	13.1
	55-59	12	2.2
	>60	8	1.5
	I don't know	85	15.7
	Uneducated	16	3.0
Father's highest level of education	Primary	127	23.5
	Secondary	230	42.6
	University/polytechnic	167	30.9
	Uneducated	13	2.4
Mother's highest level of education	Primary	116	21.5
	Secondary	253	46.9
	University/polytechnic/COE	158	29.3
	Public sector	105	19.4
Father's occupation	Private sector	125	23.1
	Self employed	287	53.1
	Unemployed	23	4.3
	Public sector	81	15.0
Mother's occupation	Private sector	132	24.4
	Self employed	302	55.9
	Unemployed	25	4.6

Table 2. Sources of HIV/AIDS information used.

S/N	Source	Frequency	Percentage (%)
1	Television	338	62.6
2	Friends	225	41.9
3	Handbills	193	35.7
4	Radio	140	25.9
5	Newspapers	135	25.0
6	Magazines	124	23.0
7	Teacher	82	20.0
8	Medical Personnel	106	19.6
9	Storybooks	85	15.7
10	Parents	78	14.4
11	Posters	78	14.4
12	Textbooks	77	14.3
13	Billboards	57	10.8
14	Internet	51	9.4
15	Village Meeting	26	5.0

more than half of the fathers (53.1%) and far more than half of the mothers (55.9%) were self-employed.

HIV/AIDS information sources use by the students

Table 2 shows the frequency distribution of the sources of HIV/AIDS information, indicating that television has the highest frequency, while village meeting has the least.

Sexual behaviour of respondents

About three of every ten respondents (29.5%, N = 540) reported ever having had sex; 34.3% of the 233 males and 25.4% of the 307 females reported ever having had sex. The mean age at sexual debut was 14.1 years; 13.97 for males and 14.22 for females, with a reported minimum age of 5 years and a maximum of 20 for males. Further, males (5.71%) were more likely to have initiated sexual intercourse before age 12 than females (2.81%), and 29.0% of all respondents have initiated sexual intercourse by age 20. The mean current number of sex partners for respondents is 2.22 (SD = 1.28); males have a somewhat higher mean number of sex partners (2.35) than females (2.09). The mean number of lifetime sex partners is 2.93 (SD = 1.54), and males have lower mean number of sex partners (1.99) than females (3.12).

There is no consistent pattern in the distribution of the responses on last time had sex. Nineteen or 12% of the 158 responded to have had sex a day before the survey, whereas 8.90% and 17.7% reported having sex the week and two weeks before the survey, respectively. During their last sexual episode, 38.62% (N = 158) of the respondents reported using condom, and more females (48.7%, N = 78) than males (28.82%, N = 80) expressed such likelihood. On frequency of use of condom during

sexual intercourse, 12% reported using condom always, 27.20% used it most of the time, 15.21% sometimes, while 12.00 and 13.30% used it rarely and never, respectively (N = 158).

Major HIV/AIDS information sources used by adolescents: A principal component analysis

The sources in Table 2 were reduced using principal component analysis of factor analysis. Table 3 shows that only three sources (factors) namely: handbills, friends and television had total Eigenvalues higher than 1 each, and altogether explained 52.87% of the whole variation attributable to the fifteen sources. The first factor was loaded on handbills, which accounted for 23.44% of the total variation, the second factor was loaded on friends which accounted for 15.76%, while the third was loaded on television, accounting for 13.67%; the other twelve sources had Eigenvalues less than 1 and altogether contributed less than 50.00% of the whole variation.

Expectedly, Tables 2 and 3 has a strong similarity. The variables that have very low use frequencies (Table 2) also have Eigenvalues less than 1 (Table 3). Hence, village meetings, textbooks, medical personnel, internet, billboards and teachers seem to play insignificant roles in informing adolescents in these communities about HIV/AIDS.

Relationship between use or non use of handbills, friends and television and personal and parental characteristics of respondents

The study examined how the two groups of the independent variables namely: personal and parental characteristics explained the adolescents' use or non-use

Table 3. Total variance explained.

Component	Initial Eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings			Extraction communalities
	Total	Percentage of variance (%)	Cumulative (%)	Total	Percentage of variance (%)	Cumulative (%)	Total	Percentage of variance (%)	Cumulative (%)	
1	5.33	35.500	35.50	5.33	35.50	35.50	3.52	23.44	23.44	0.804
2	1.54	10.26	45.76	1.54	10.26	45.76	2.36	15.76	39.21	0.655
3	1.07	7.12	52.87	1.07	7.12	52.87	2.05	13.67	52.87	0.654
4	0.98	6.51	59.38							0.622
5	0.83	5.53	64.91							0.575
6	0.75	4.99	69.90							0.556
7	0.74	4.96	74.86							0.551
8	0.61	4.09	78.95							0.544
9	0.59	3.92	82.87							0.489
10	0.53	3.55	86.42							0.483
11	0.50	3.36	89.78							0.479
12	0.47	3.11	92.89							0.457
13	0.42	2.78	95.67							0.441
14	0.39	2.60	98.28							0.394
15	0.26	1.73	100.00							0.226

of the three sources namely: handbills, televisions and friends using binary logistic regression.

Handbills

For handbills, 202 respondents reported not using the source, while 351 did. The percentage of correct prediction of all the respondents using handbills as sources of HIV/AIDS information was 62.6%. If all students who would not use handbills are correctly predicted, the odds of successful prediction would not be significantly different from 50-50, that is no better than chance (β = 0.515, SE = 0.089, Wald = 33.505, df = 1, p = 0.000, Exp (B) = 1.673). With χ^2 = 19.392, df = 18, p = 0.028, the omnibus test of the model coefficients

indicates a significant prediction when all the predictors are considered together. Overall, 64.8% of the participants were predicted correctly, although the process proved to be better at helping predict who would use handbills (96.2%) than who would not (12.4%).

Table 4 which contains variables in the equation shows that with reference to being a female, being a male is a significant but negative predictor of use of handbills just as being younger, while closeness to mother is a significant and positive predictor with reference to closeness to neither of the parents. In comparison with parents having no education at all and being unemployed, parents having tertiary education and having public service type of employment are positive and significant factors.

Expatiating on the result in Table 4, knowing that the respondent is likely not to be male and is younger in age, improves the prediction of use of handbills to seek for HIV/AIDS information by about 24 and 34%, respectively. In comparison with respondents who reported being close to none of their parents, knowing that a respondent was close to his or her mother, will 12% of the time, help us understand whether the respondents would use handbills or otherwise. With regards to parental factors, when parental level of education is known to be of tertiary type, then there is a 46% chance of correctly predicting that the respondent would use handbills when compared with parental education being none. Also, in comparison with parents who have no occupation at all, knowing that parental occupation type is public service

Table 4. Logistic regression analysis of personal and parental factors on use or not use of handbills.

Factors	β	S.E.	Wald	Significance	Exp (β)
Age of respondents	-0.023	0.037	0.450	0.025	1.235
Level of study (Ref category = junior)					
Senior	1.205	0.768	2.460	0.117	3.336
Sex of respondent (Ref category = female)					
Male	-0.086	0.190	0.206	0.034	0.917
Parents close to ((Ref category = None)					
Close to father	0.181	0.432	0.176	0.675	1.199
Close to mother	0.061	0.202	0.093	0.016	1.121
Close to both parents	0.543	0.586	0.860	0.354	1.721
Parent's age	-0.005	0.062	0.006	0.938	0.995
Parents education (Ref category = no education)					
Primary	-0.392	0.290	1.833	0.176	0.676
Secondary	-0.449	0.238	3.543	0.060	0.638
Tertiary	-0.256	0.266	0.924	0.036	1.460
Parents employment (Ref category = unemployed)					
Self employed	0.470	0.530	0.788	0.375	1.601
Private sector	0.777	0.546	2.027	0.154	2.175
Public sector	0.752	0.554	1.843	0.017	1.121

improves our knowledge by 12% that the respondents would use handbills.

Friends

Only 225 or 41.6% reported friends as sources of HIV/AIDS information, while 315 or 58.4% did not report friends for the same purpose. The success of predicting those not using friends is significant (β = -1.779, SE = 0.122, Wald = 211.166, df = 1, p = 0.000, Exp (B) = 0.169). The omnibus test of model coefficients is significant (χ^2 = 30.499, df = 12, p = 0.002), showing that the variables predicted the use of handbill successfully. Generally, 72.7% of the respondents were correctly predicted, and those who use friends were almost as much correctly predicted (37.6%) as those who were not (39.8%).

Table 5 summarizes the roles of the parameters in the process. The table shows that age of the respondents is a significant predictor of use of friends, closeness to father and closeness to mother, secondary and tertiary education is also a significant predictor and are significant predictors of friends as a source of HIV/information to the adolescents, with reference to closeness to neither parents and parents having no education, respectively. Also, self, private and public sector employment types are significant predictors, in comparison with parents having unemployed status. The odds ratios in Table 5 reveals that knowing the age of respondents increases the chances that use of handbill for HIV/AIDS information can be predicted correctly by about 9.0%. Also, predicting use of friends, correctly increases by 57 and 47% chances if it is known that the respondent is close to his or her father or close to his or her mother, respectively. With reference to those parents with no education, knowing that the parents have tertiary educational status will improve any prediction about use of friends by over 61 and 18%, respectively. Finally, knowing that parents have private and public sector employment status increases by 55 and 10%, respectively any predictions that their wards would rely on friends for HIV/AIDS information in reference to unemployed parentage.

Television

Television is a recurrent factor in HIV/AIDS education and awareness programmes, but this is not exactly the case in this study in which only 193 or 35.7% of the respondents get HIV/ADS information from televisions,

Table 5. Logistic regression analysis of personal and parental factors on use or not use of friends.

	B	S.E.	Wald	Significance	Exp (β)
Age of respondent	0.083	0.046	3.324	0.008	1.087
Sex of respondent (Ref category = female)					
Male	2.003	0.0117	2.199	0.311	2.151
Level in school (Ref category = junior)					
Senior	-0.184	0.302	0.373	0.541	0.832
Parents close to (Ref category = none)					
Close to father	1.882		3.167	0.035	1.567
Close to mother	0.903	0.52	3.022	0.012	1.466
Close to both parents	1.423	1.203	1.400	0.237	4.151
Parents age	0.044	0.061	0.518	0.472	1.045
Parents educational status (Ref category = no education)					
Primary	0.103	0.392	0.069	0.793	1.108
Secondary	0.168	0.319	0.276	0.019	1.183
Tertiary	0.487	0.379	1.646	0.020	0.615
Parents employment (Ref category = unemployed)					
Self employed	0.852	1.046	0.663	0.015	2.344
Private sector	1.785	1.053	2.873	0.001	1.558
Public sector	2.080	1.055	3.884	0.049	1.1005

while only 347 or 64.2% did not. The prediction of those who are not getting HIV/AIDS information from television successfully is significant (β = 2.009, SE = 0.202, Wald = 453.344, df = 1, p = 0.000, Exp (B) = 0.309). The model coefficients are also significant (X^2 = 29.35, df = 12, p = 0.001), and this shows that the variables predicted use of television very successful. Altogether, respondents were 62.8% of the time correctly predicted. Those who get HIV/AIDS information from television were 53.2% correctly predicted, while those who were not receiving information from television were 33.40% correctly predicted.

Table 6 shows how the variables performed in predicting the use of television. Age of the respondents, being in senior level in school and being close to mothers significantly and positively predicted use of television in reference to being junior and close to neither parents. Also, parents having tertiary education and being public sector employees positively and significantly predicted using televisions as sources of HIV/AIDS information in relation to parents being unemployed.

Probably due to the relative high value of SE in comparison with β, knowing the age of the respondents has only 0.5% likelihood of correctly predicting whether television will be used as a source of HIV/AIDS information or not. With reference to being in junior level

and close to neither parents, being in senior secondary school level and close to mother increased by 14 and 63%, respectively, the chances of rightly predicting that the respondent will use television. Furthermore, with reference to uneducated parentage, knowing that the parents of the respondents have tertiary education increases by 13%, the chances of correctly predicting that television will be a veritable information source. Finally, public sector type of employment increases the chances of correct prediction of television use by 29% in comparison with unemployed parentage.

How do the adolescent use of handbills, friends and television relate to their sexual behaviour?

In this section, how the use of handbills, friends and television – the three extracted variables, related sexual behaviour of the adolescents: age at first sexual episode, number of sexual partners, lifetime number of sexual partners, ever had sex, use of condom during last sexual encounter, frequency of use of condom and last time had sex, in the community was investigated.

Table 7 shows that there is a significant but negative relationship between use of handbills and total number of sexual partners (β = -0.018, p = 0.030), but a positive and

Table 6. Logistic regression analysis of personal and parental factors on use or not use of television.

	B	S.E.	Wald	Significance	Exp (β)
Age of respondents	0.005	0.051	0.011	0.017	1.005
Sex of respondents (Ref category = female)					
Male	0.330	0.925	0.312	0.425	2.331
Level of study of respondents (Ref category=junior)					
Senior	1.145	0.375	9.329	0.002	1.144
Parents close to (Ref category = close to none)					
Close to father	0.510	0.795	0.411	0.522	3.665
Close to mother	0.489	0.378	1.672	0.016	1.630
Close to both parents	1.365	0.900	2.302	0.129	3.915
Parents age	0.012	0.059	0.041	0.840	1.012
Parent's educational status (Ref category = none)					
Primary	0.855	0.370	5.329	0.821	2.351
Secondary	0.234	0.336	0.483	0.487	1.263
Tertiary	0.124	0.386	0.104	0.047	1.133
Parents employment status (Ref category = unemployed)					
Self employed	0.723	0.772	0.877	0.349	2.061
Private sector	0.132	0.812	0.026	0.871	1.141
Public sector	0.548	0.807	0.461	0.047	1.292

significant relationship between use of handbills and age at first intercourse (β = 0.141, p = 0.031) as well as with frequency of use of condom (β = 0.210, p = 0.027). With negligible beta in the rest of the cases, there is no significant relationship between handbills and ever had sex before (β = 0.002, p = 0.962), last time had sex (β = 0.008, p = 0.927), condom use during sex (β = 0.062, p = 0.459) and current number of sexual partners (β = 0.018, p = 0.821).

Although, with very low correlations, there is a negative but significant relationship between friends and ever had sex (β = -0.0213, p = 0.000), age at first intercourse (β = -0.193, p = 0.021), last time had sex (β = -0.132, p = 0.011) and current number of sexual partners (β = -0.026, p = 0.005), but a positive and significant relationship exists between friends and condom use during last sex (β = 0.152, p = 0.040). The relationship between friends and total number of sexual partners (β = -0.040, p = 0.332) and frequency of use of condom (β = -0.114, p = 0.220) is not significant.

Finally, use of television has a positive and significant relationship with ever had sex (β = 0.105, p = 0.017), current number of sexual partners (β = 0.028, p = 0.001), but a negative and significant relationship with condom use during last sex. The relationship between use of television and total number of sexual partners (β = -0.060, p = 0.452), age at first sexual intercourse (β =

0.065, p = 0.415), last time had sex (β = 0.023, p = 0.781) and frequency of use of condom (β = 0.043, p = 0.633) is not significant.

DISCUSSION

This study was designed to establish those major information sources that served HIV/AIDS information the most to adolescents in a semi rural community in southeastern Nigeria. The study also investigated how personal and parental characteristics of the adolescents accounted for the use of these major information sources as well as how the use of these sources related to the sexual behaviour of the adolescents.

Factor analysis reduced the 15 sources to three factors, namely handbills, friends and television. This result implies that in Ekwusigo LGA of Anambra State, Nigeria, the awareness level of the adolescents about HIV/AIDS could be significantly achieved if only handbills, friends and television were adopted as strategies. The significance of this observation is highlighted by Nwagwu[6] who argued that although it is good to adopt multiple information strategies in HIV/AIDS awareness activities, much cost could be saved if a few sources that account for much of the knowledge and awareness among a people are the strategies.

Table 7. Relationship between sexual behaviour and use of TV, handbills and friends.

	Total number of sexual partners		Ever had sex before		Age at first intercourse		Last time had sex		Condom use during last sex		Frequency of use of condom		Current number of sexual partners	
	Beta	Significance	Beta	Significance	Beta	Significance	Beta	Significance	Beta	Significance	Beta	Significance	Beta	Significance
Handbills	-0.018	0.030	0.002	0.962	0.141	0.031	0.008	0.927	-0.062	0.459	0.210	0.027	0.02	0.821
Friends	-0.040	0.332	-0.213	0.000	-.0193	0.021	-.0132	0.011	0.152	0.040	-0.114	0.220	-0.026	0.005
Television	-0.060	0.452	0.105	0.017	0.065	0.415	0.023	0.78	-0.036	0.033	0.043	0.633	0.028	0.001

In addition to the emergence of handbill as an outstanding source, the significance of television and friends in this present study somewhat corroborates many others studies. However, all the sources reviewed were carried out with self-administered questionnaire and the data were analysed mainly by frequency distributions. Our model for administering the questionnaire and the advanced analytical methods adopted in this study probably make our finding on the signifi-cance of handbills an interesting one, although Uwakwe et al. (1998) had reported similar result in a study that focused on students in universities in Nigeria.

How does one explain the emergence of handbills here as a major source of HIV/AIDS information? First, handbills are the commonest information, education and communication materials distributed by many non-governmental organizations that are working on HIV/AIDS in Nigeria; and their targets usually include students in primary and secondary schools. Handbills are relatively cheap to produce, freely distributed to users and their use is largely infrastructure-independent. This is not the case with electronic resources such as radio and television which would often require electric power to be used. Also, effective use of electronic sources would often require that the prospective user owns or has access to the infrastructures. Furthermore, a crucial component of adolescent behaviour is that they often prefer information sources that are at their command and control– sources that are surveillance-free; they could carry them around and, or keep and read them at their own convenient and private time and will. Although, many other information resources such as books, magazines and newspapers somewhat fulfill part of this expectation, they often involve some cost to own and may also be less handy than handbills. Handbills explicitly promoting inordinate sexual activities are not very commonly and openly available in schools in Nigeria, particularly in the semi rural communities where this study was carried out.

The study of Fawole et al. (1999) found television as very important sources of HIV/AIDS information. A study by Amsale et al. (2005) in Ethiopia showed that television topped the rankings in terms of their popularity as sources of HIV/AIDS and related information. But in a study in Nigeria, Nwagwu (2007) showed that television was very effective for adolescent girls more than they were for adult women who appeared to be better educated about HIV/AIDS through community associations.

Regarding how personal and parental characteristics explain use of handbill, our study shows that younger adolescents who are less likely to be males but are close to their mothers might be learning about HIV/AIDS through handbills more than they did from other sources.

The same is the case with adolescents whose parents have either secondary or tertiary type of education or whose parents are employed in a public sector organization. Further studies are required to understand why handbills appear to serve the younger adolescents better than they did the older ones as well as why closeness to mother explains use of handbills. Regarding the relationship with education of parents, we might surmise that adolescents might be seeking for further explanations from their parents or that educated parents might provide home conditions or expose their children to environments that encourage access and reading of handbills and similar literature.

For television, age of adolescents in higher classes, who are close to their mothers, and whose parents had tertiary education and public service occupation type benefited from television as a source of HIV/AIDS information. Educated parents in the public sector are most likely to afford televisions and are also most likely to allow their children, particularly older ones, watch televisions or even watch television with them. Television is an engaging multimedia facility that

uses a combination of audio, voice and images to communicate information. It combines most of the other attributes of information media–images, audio and visual, qualities which information experts have suggested as powerful in information communication.

Our result shows further that older adolescents who are close to their mothers or fathers and whose parents have secondary or tertiary education, and have either self, public sector or private sector type of employment, benefited from HIV/AIDS information passed through friends. Friends appear to be ubiquitous sources of HIV/AIDS information; adolescents of all social characteristics have access to their friends who probably have some information about HIV/AIDS. Brieger et al. (2001) in their analysis of 3585 interviews of adolescents from both baseline and follow-up studies in Nigeria and Ghana, reported that overall, friends were identified as the preferred sources of HIV/AIDS information. Also Berenson et al. (2006) reported that majority of the adolescents in their study had had discussions about sexual intercourse with their friends, while a few had discussed with their families. Furthermore, Nwagwu (2007) showed that the role of friends and relations in HIV/AIDS awareness in selected rural communities in Nigeria is very significant.

It can be observed that much of the discussions on the role of peers in HIV/AIDS education focus on the positive roles aspects. However, it is a common knowledge that peer influence could be negative sometimes, leading to adoption of negative behaviours by other adolescents. For instance, friends recruit their colleagues into cultic and other clandestine activity groups. Furthermore, much of the data collection tools used in the studies we consulted, merely asked respondents where they received information about HIV/AIDS, and then went ahead to list sources, including friends.

The study finally investigated how handbills, friends and television relate to adolescent sexual behaviour. The results showed that increasing use of handbills relates to decreasing total number of sexual partners while increasing use of handbills relates to increasing age at first intercourse as well as increasing frequency of use of condom. Our result shows no evidence of relationship between handbills and ever had sex before, last time had sex, condom use during sex and current number of sexual partners. Increasing use of friends for HIV/AIDS information relates to decreasing chances of ever had sex, reducing age at first intercourse, reducing incidence of last time had sex as well as reducing current number of sexual partners. Increasing use of friends increases condom use during last sex, while not showing any evidence of relationship with total number of sexual partners and frequency of use of condom.

Buseh (1995) has cautioned that, with respect to the influence of friends in sex education and other information intervention programs on adolescent sexual behavior, expectations should be modest as changing the behavior of people is generally difficult especially when that behavior is strongly affected by hormones, physical desire and a host of other factors. Kim and Free (2008) have evaluated peer-led interventions in adolescent sexual health education published during 1998-2005 and concluded that "despite promising results in some trials, overall findings do not provide convincing evidence that peer-led education improves sexual outcomes among adolescents". Kim and Free (2008) based their study on the famous peer-led intervention evaluations of Harden (1999) which could not also reach robust conclusions regarding the effectiveness of peer-led interventions for young people, although they made a number of recommendations for the development and evaluation of such interventions. They suggested that resource constraints, conflicting value systems and constraints on young people's autonomy (especially in schools) influence their identity and value system, and further affects the role they could play in peer education. Harden (1999) suggested that the important characteristics of peer educators are unclear and recommended that authors should describe how peer educators were recruited and selected, and that young peoples' views regarding an intervention in which they played crucial roles be fully reported.

On its own part, use of television has a tendency to increase the chances of ever having had sex and the current number of sex partners, but also relates to decreasing use of condom during last sex. Television did not show any evidence of relationship with total number of sexual partners, age at first sexual intercourse, last time had sex and frequency of use of condom. This result is very incisive, and may be interpreted in the light of increased access to Western media programmes, increased home video content, adult content and related programmes. Television programmes are not usually focused on a single event only; they contain other forms of entertainments that communicate other types of values than they do information about HIV/AIDS. These contrast with handbills which contain specific message each time. Also, television often suffers the constraint of being a one-way communication system in which the user cannot participate or contribute to any issue under discussion; the user cannot engage in a discussion with the TV nor can a telecast be repeated at the request of the viewer.

The current finding provides further information to balance the finding in a study in a community with similar social characteristics which showed that television was a very effective source in delivering HIV/AIDS information to girls in comparison with female adults. While this present study corroborates Nwagwu's (2007) study that television is a great source of information to adolescents, the current finding on the negative influence of televisions on adolescent sexual behaviour calls for improved HIV/AIDS and sexuality information content in televisions to ensure that the facility provides positive sexuality influence among adolescents.

A major consequence of the result of this study is that better HIV/AIDS awareness programmes among adolescents could be achieved in the rural communities if the emphasis could focus on handbills- materials HIV/AIDS workers in Nigeria commonly refer to as information, education and communication (IEC) materials, and friends. Further, research is required to explain the factors responsible for the pattern of use of these resources; this information is necessary to discriminate the deployment of handbills as well as increasing peer education as a strategy for HIV/AIDS information awareness strategies. Further research could be carried out to establish the proportion of television programmes that promote positive adolescent sexuality behaviour.

This study is not without limitations. For instance, the coverage of the study is too narrow to inform a national policy. This point is crucial because although there exist some forms of HIV/AIDS control awareness programmes in the local governments which could benefit from the result of this study, the major source of information that guides action on HIV/AIDS information sourcing and use rests mainly on the federal government. Moreover, Nigeria is a multi-cultural country; there is the possibility that other communities will present a different picture from that of the present result. Another limitation is the possible confounding effects in the variables used in the correlation analysis in Table 7 as well as the absence of economic variables such as parental income of the respondents.

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