Predictors and Reproductive Health Implications of Knowledge of HIV/AIDS among Female Out-of-School Adolescents in Iwaya Community, Lagos State

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Abstract
Human Immunodeficiency Virus (HIV) remains a major threat to the reproductive wellbeing of millions of young people in sub-Saharan Africa. Yet, some of the intervention programmes aimed at increasing knowledge about HIV fail to reach out-of-school adolescents. This study sought answers to questions on the level of knowledge about modes of HIV transmission and misconceptions about HIV; predictors of knowledge of HIV; and the relationship between knowledge of HIV and sexual behaviour among out-of-school adolescents (ages 10 to 19), in a slum in the city of Lagos. The survey method was adopted. From a sample of 480 participants, the study found out that out-of-school adolescents are less knowledgeable about HIV, and the primary predictors of knowledge of modes of transmission and prevention of HIV are education and literacy, even when the effect of age is controlled. The study also established a relationship between knowledge of HIV and reproductive health outcomes, such as age at onset of sex, multiple sexual partnership and use of contraceptives. High knowledge of HIV increases the likelihood of use of contraceptives, although multiple sexual partnerships and early onset of sex were also found to be associated with it. Based on these findings, a mass literacy intervention programme for out-of-school adolescents is recommended.

Keywords
Out-of-school girls; Iwaya; Misconception about HIV; Education; Literacy; Young girls

Introduction

Across the globe, about 34 million people were living with Human Immunodeficiency Virus (HIV) at the end of 2011 [1]. Sub-Saharan Africa remains the worst hit region of the world, accounting for 23.5 million (almost 70%) of all the cases in the world, although the number of people newly infected with the virus has been on a steady decline [2]. It is clear that the region is over-represented in the population of those affected by the pandemic, since it accounts for only about 12% of the population of the world [3]. In Nigeria, a 3.1% HIV prevalence was recorded for adults (15-49 years) in 2010 [4]. Available statistics suggest that the majority of the people infected and affected by HIV/AIDS are young people, which reflects the fact that sub-Saharan African populations are largely young [5]. Research suggests that females are also more vulnerable than males. For instance, a higher HIV prevalence has been documented among young females than young males, with prevalence rates of 2.9 and 1.2%, respectively [6]. For the general population (youths and adults), a similar trend has been documented [4]. The vulnerability of females to HIV infection may not be unconnected to their lower levels of knowledge about HIV/AIDS. For instance, a study by Burgoyne and Drummond [7] shows that women are less knowledgeable about HIV/AIDS in sub-Saharan Africa. It is for this reason that knowledge about the means of transmitting, and/or preventing the spread of HIV/AIDS among young females is of interest in this study.

Many young unmarried people in Nigeria are sexually active, and sometimes involved in risky sexual activities, which may heighten their vulnerability to HIV infection [8,9]. A survey conducted by The Federal Ministry of Health in Nigeria reveals that about 41% of adolescent females within the age bracket of 15-19 years had experienced penetrative sexual intercourse. Among these sexually experienced female adolescents, 35% had had premarital sex in the last 12 months preceding the study. The study shows further that among sexually experienced adolescents (15-19 years), 8% had contracted STIs in the last 12 months preceding the survey [9]. Additionally, access to reproductive health services in Nigeria is poor [10], and some young people avoid visiting reproductive health centres for fear of being seen as immoral [11-13]. Protection through the use of condom at first sex is also as low as 10.5% for girls within the age bracket of 15-24 years [8].

In order to properly understand the factors for increased vulnerability, this study has reviewed earlier studies on knowledge of HIV/AIDS, beginning with studies that have documented knowledge about HIV/AIDS in Nigeria. A previous study in Nigeria has shown that only about 48% of females within the age bracket of 15-19 years are aware that people can reduce the risk of getting HIV by using condoms, every time they have sex; while 63% are aware that limiting sexual intercourse to one HIV-negative partner can help reduce the risk of acquiring HIV; 62% of adolescents agreed that the risk of contracting HIV can be reduced through abstinence from sexual intercourse; about 6 in 10 of the adolescent females agreed that a healthy-looking person can be HIV positive; and a little more than half (53%) knew that HIV cannot be transmitted by mosquito bites. About half (49.6%) of the respondents agreed that HIV cannot be transmitted by supernatural means (such as witchcraft), while 60% agreed that a person cannot contract HIV by sharing food with a person living with HIV [8].

Some studies address predictors of knowledge of HIV/AIDS, including one by Fako et al. [14], which shows that mothers’ type of job is a very significant predictor of knowledge about HIV/AIDS. The study argues that young people within the age bracket of 16 to 19 years (in comparison with younger adolescents), who were in school and having mothers, who are middle management officers or higher
professionals are the most knowledgeable about HIV/AIDS. Having a mother who is a company director/executive, professional or middle management officer was found to be the strongest predictor of having adequate knowledge about HIV/AIDS [14].

Another study by Ho and Loke [15] shows that there is a significant association between education, migration status and knowledge about HIV/AIDS. Migrants have lower knowledge about HIV/AIDS than none migrants, while people with primary education or lower levels of education had lower knowledge about HIV/AIDS. Iliyasu et al. [16] found that gender and formal education are major predictors of knowledge of HIV/AIDS, with educated males being more knowledgeable about HIV than females and people with little formal education. A study of male and female out-of-school youths in Lagos, Nigeria, also suggests that education is significantly associated with knowledge about sexually transmitted infections and HIV/AIDS [17].

Anyamene et al. [18] documented a generally high level of knowledge about HIV/AIDS and observed that residence, geo-political zone, education and wealth are predictors of knowledge about HIV/ AIDS. Urban dwellers were found to have better knowledge about HIV/AIDS than rural dwellers, just as participants from the southern zones of the country were found to have more adequate knowledge about HIV/AIDS than those from the northern parts of the country. With increase in education and wealth, knowledge of HIV/AIDS also increases.

Other studies explore the relationship between knowledge of HIV/ AIDS and sexual behaviour. Lema et al. [19] argue that in spite of the high level of knowledge of HIV/AIDS in their study, safe sex practices are low among young people. Similarly, Ebeniro [20], Ola and Olu [21] and Peltzer and Promtussananon [22] have shown through various surveys that even where the majority of the respondents are knowledgeable about the modes of transmission of HIV/AIDS, risky sexual activities such as multiple sexual partnerships, transactional sex, casual sex and non-use of condom are not uncommon among adolescents.

On the other hand, Alemu et al. [23] found out that low education is a predictor of involvement in HIV/AIDS-related risky sexual behaviour among out-of-school adolescents in Ethiopia, which was consistent with findings by Odu and Akanle [24] in South- West Nigeria, suggesting that there is a significant association between perception on HIV/AIDS and involvement in risky sexual behaviour among young people. The studies reviewed reveal a major variance on knowledge of HIV/AIDS by gender and school/educational status, with out-of-school adolescents having lower knowledge on HIV/ AIDS. This study, therefore, investigated the level and predictors of HIV/AIDS knowledge among out of school adolescents. The justification for the interest in out-of-school adolescents lies in the observation that targeting out-of-school adolescents is a major component of any HIV intervention programme, given that they are more likely to be sexually active than those enrolled in educational institutions [25,26]. In addition, intervention programmes aimed at increasing knowledge about the modes of transmission and prevention of HIV/AIDS have been put in place for in-school adolescents in Nigeria. Across the country, the National family life and HIV education has been incorporated into the curriculum [27]. While implementation may be far from what is desired, out-of-school girls are completely left out.

A corollary to this identified gap in knowledge is the unexplored relationship between knowledge of the modes of transmission and prevention of HIV/AIDS, and reproductive health outcomes among out-of-school adolescents. Such reproductive health outcome variables include timing of initiation of penetrative sexual intercourse, multiple sexual partnerships and involvement in safe sex practices, such as the use of condom. Against this backdrop, this study seeks to document knowledge about HIV/AIDS among female out-of-school adolescents in Iwaya community, in order to show the factors associated with knowledge of HIV/AIDS and discuss the potential effect of knowledge of HIV/AIDS on reproductive health outcomes within the study population.

Methods

Participants

A survey of 480 out-of-school adolescent (10 to 19 year old) girls was conducted in Iwaya community. Iwaya is one of the largest and poorest slums in Lagos metropolis [28], and is located within the South-Eastern part of Yaba, overlooking the Lagos lagoon. It covers a land area of about 80 hectares, occupied by people who are mostly squatter migrants. It shares its border to the South with Makoko community, which is another squatter settlement. The community has an estimated population of about 100,000 persons drawn from different ethnic groups in Nigeria (AHI, 2011). A small proportion of the adults in the community are employed as cleaners, gardeners and messengers in government offices in neighbouring communities. A large proportion of those in the informal sector are involved in fishing and fish selling. Another major economic activity is petty trading. On the whole, households in the community as in a typical squatter settlement in Lagos have very low incomes. The majority of the residents do not own the land on which their houses are built, and basic amenities such as water, toilet, drainage and health care facilities are in short supply. In addition, sanitation within the community is poor [29]. The living conditions of the majority of the people of the community also suggest a high level of material deprivation. Iwaya falls within Lagos metropolis, which is in the South-West zone of Nigeria.

To select the respondents, a census of all out-of-school girls aged 10-19 years was conducted. The only condition for exclusion was lack of willingness to participate in the study when the criteria of sex, age and schooling status were met. A willingness rate of 97% was recorded. The study was, however, unable to include out-of-school girls who were involved in daily activities that made them leave the community very early and return late. Informed consent was sought and obtained from all the respondents. In addition, parental approvals were sought before adolescents 18 years and below were interviewed. The Ethical review committee of Action Health Incorporated scrutinized and approved the research design and instrument for use. All interviews were conducted outside hearing distance of third parties, and only successful interviews (i.e. interviews in which reliable data were obtained on the core concerns of the study after a screening exercise) were processed for analysis using the Statistical Package for Social Sciences, Version 17.

Procedure

The cross-sectional survey design was adopted for the study. A standardized interview schedule was administered to the participants. The design gives room for face-to-face interactions between researchers.
(interviewers) and participants in the study (respondents). This study design makes it possible for the researcher to gather information on behaviour that cannot be observed. Each respondent was engaged in a one-to-one interview by trained female Field Assistants. On the average, an interview was conducted in 45 minutes. The interviews were conducted in local languages (mostly Yoruba), or Pidgin English, as considered suitable by the respondents. Key concepts and phrases in the instrument were translated into the local languages and Pidgin English during the training sessions for Field Assistants. At the end of the field exercise, the administered instruments were screened for internal consistency. Only respondents who supplied usable answers to key questions were processed for analysis.

**Measures**

A key variable in this study is knowledge of modes of transmission and prevention of HIV/AIDS. This was measured through seven questions, which test an individual’s knowledge of modes of transmission and prevention of HIV/AIDS. The questions were adopted from the 2008 NDHS questionnaire. The questions border around knowledge of the means of transmission of HIV and common misconceptions about HIV/AIDS. People knowledgeable about HIV/AIDS would have the correct answers to these questions. The questions are: (i) ‘Can people reduce their chance of contracting the AIDS virus by having just one uninfected sex partner who has no other sex partner?’ (ii) ‘Can people acquire HIV/AIDS by sharing food with someone who has HIV/AIDS?’ (iii) ‘Can people contract the AIDS virus from mosquito bites?’ (iv) ‘Can people reduce their chance of acquiring the AIDS virus by using condom every time they have sex?’ (v) ‘Can people reduce their chance of acquiring the AIDS virus by not having sexual intercourse at all?’ (vi) ‘Can people get the AIDS virus because of witchcraft or other supernatural means?’ (vii) ‘Is it possible for a “healthy-looking” person to be HIV-positive?’

Knowledge of HIV/AIDS was measured in two ways, as a continuous variable and in categorical form. To achieve this, a composite continuous measure of knowledge of HIV/AIDS was derived from these questions by assigning a point for every correct answer provided by a respondent. The total score obtainable is 7 (for those with the correct answers to all seven questions), while the lowest possible score is 0 (for those with incorrect answers to all seven questions). From this, three categories of knowledge was constructed, i.e. Very low knowledge for respondents with a total score of 0; Low knowledge for respondents with a total score of between 1 and 4; and High knowledge for respondents with scores between 5 (greater than 70%) and 7 (100%).

The independent variables in this study are education (highest educational institution ever attended), literacy, membership of youth group, ethnic origin, age and migration status. All the variables were measured in categorical form, with the exception of age, which was measured as a continuous variable. The indicators of reproductive health outcomes employed in the discussion of the implications of the findings are age at onset of sex, which was measured as a continuous variable, multiple sexual partnerships and use of condom, which were measured as categorical variables.

**Analysis**

The study employed simple frequency and percentage analysis in the description of the background characteristics of respondents, and knowledge of HIV. The study adopts One-way ANOVA and Factorial ANOVA in analyzing the mean differences in knowledge of HIV/AIDS score. Tukey’s post hoc tests were employed to show categories with significant differences in mean scores, in addition to the ANOVA. In order to analyze the effect of knowledge of HIV/AIDS on age at onset of sex, survival statistical analyses were employed. Specifically, Kaplan-Meier’s survival test was conducted, with initiation of sexual intercourse as the Status variable. The time variable in this analysis is age at onset of sex, while the factor variable is knowledge of HIV/AIDS in categorical form. Cox regression was also employed to statistically show the predictors of initiation of sexual intercourse. The Status variable in this analysis is initiation of sexual intercourse, while the Time variable is age at onset of sex. The covariates include HIV/AIDS knowledge score, which is the independent variable of interest, and confounding variables, such as age (in categories), education and marital status.

The logistic regression analysis was employed in examining the predictive power of knowledge about HIV/AIDS on other reproductive health outcomes, such as multiple sexual partnership and use of contraceptives. Tests are considered significant only in a case where the p-value is less than 0.05, or at a higher level of significance.

**Ethical considerations**

The ethical procedures of anonymity, confidentiality and informed consent were strictly adhered to in this study. All interviews were conducted outside hearing distance of third parties, and reporting was done in a manner that preserves the identity of the participants. The study design and instrument were subjected to the approval of the ethical review committee of Action Health Incorporated. The committee is made up of Sociologists, Gender researchers, and Reproductive Health researchers.

**Results**

**Background characteristics of respondents**

The participants are divided into two age groups–10 to 14 years, and 15 to 19 years. The first category accounts for 26% of the sample, while the other accounts for 74%. The mean and median ages of the participants are 16 and 17 years, respectively. About 88% of the participants had never been married, while 12% were married/living with men as married, or separated at the time of the study. A quarter of the respondents had never attended school. For more than half of the respondents, their reasons for not being in school at the time of the study are related to lack of the financial capacity to pursue formal education. Yoruba girls are in the majority in the sample, accounting for 42%. Next in size to this group are out-of-school Gun (Ogu) girls, who account for 37% of the sample. Igbo and Hausa girls represent 17 and four percents, respectively. About 76% of the respondents are Christians.

The data gathered also show that 59% of the respondents were unable to read, while 18% could read with some difficulty. Just about 23% could read fluently. Furthermore, 38% of the respondents reported membership of youth groups or associations. The mean household size for the sample is 5.73. Twenty-two percent of the respondents had lost at least one of their biological parents at the time of the study.

**Knowledge of HIV/AIDS**

A total of seven questionnaire items were used in assessing
knowledge of HIV/AIDS. The first questions is 'Can people reduce their chance of contracting the AIDS virus by having just one uninfected sex partner who has no other sex partner?' As shown in Table 1, 30% of the respondents answered this question in the affirmative, while 20% said 'No' in response. Half of the respondents had no answer to the question. Based on these, just about 30% of the respondents had the correct knowledge on this questionnaire item.

The second questionnaire item reads 'Can people contract the AIDS virus from mosquito bites?' Thirty-nine percent of the respondents answered this question correctly by saying 'No'. Sixty-one percent either had no answer or had a wrong answer to the question. Thirty-one percent had the correct answer to the question 'Can people get the AIDS virus by sharing food with a person who has AIDS?'

The study further shows that just a little more than a quarter (27%) of the respondents had the correct response to the question 'Can people reduce their chance of acquiring the AIDS virus by not having sexual intercourse at all?' Thirty-one percent of the respondents responded correctly to the question 'Can people get the AIDS virus because of witchcraft or other supernatural means?' Twelve percent of the participants responded in the affirmative to this question, while more than half (57%) had no answer to the question. Only 28% of the respondents agreed that a healthy-looking person can have the virus.

Three percent of the respondents had the correct answers to all seven questions; while 5% had correct answers to six of the questions. Eleven percent of the girls under study answered 5 of the questions correctly. A large proportion (38%) of the sample did not answer any of the questions correctly. Put differently, 38% of the respondents had 'Very low knowledge' of HIV/AIDS. Forty-four percent had “Little knowledge” about HIV/AIDS, supplying the correct answers to at least one, but not more than four of the questions adopted in measuring knowledge of HIV/AIDS. Nineteen percent of the girls had “High knowledge” of HIV/AIDS, as they were able to supply appropriate answers to at least five (more than 70%) of the questions. The question to which the majority of the participants responded correctly is "Can people acquire AIDS by sharing food with a person who has AIDS". To this question, 40% of the participant answered correctly. On the other hand, the most wide-spread misconceptions in the population are about the possibility of reducing the chances of contracting the virus through abstinence, and the possibility of a healthy-looking person having the virus. Only 27 and 28 percents, respectively, answered these questions correctly.

### Predictors of knowledge of HIV/AIDS

The average HIV/AIDS knowledge score for the sample is 2.27. The study explored the relationship between knowledge of HIV/AIDS and selected independent variables at the bi-variate level, using the one-way ANOVA statistic. As shown in Table 2, girls who had ever attended secondary schools had a significantly higher mean score for HIV/AIDS knowledge (3.38), than those who had never attended any school (1.12), and those who attended primary school (1.45). There is no significant difference in the mean scores of those who never attended school and those who stopped at the primary level. Girls who could read without difficulty, and those who could read with some difficulty, were also found to have significantly higher mean scores for HIV/AIDS knowledge than those who could not read at all. Older adolescent girls within the age bracket of 15-19 years also had significantly higher mean scores (2.72) for knowledge about HIV/AIDS than younger adolescents (0.99).

Table 2 further shows that migration status and ethnic origin are significant factors at the bivariate level. Non-migrants had significantly higher scores than migrants, while Yoruba girls in the sample had significantly higher scores than Hausa and Gun girls. Igbo girls were found to have significantly higher scores than Gun girls. The study shows that membership of association has no significant effect on HIV/AIDS knowledge scores. In order to control the effect of interactions among the independent variables, a factorial ANOVA test was conducted (Table 3). The test includes literacy, highest level of education, ethnic origin and membership of association as factors, and age in years as a covariate variable. As shown in Table 3, literacy and highest level of education remain significant factors in HIV/AIDS scores, with F statistics of 4.143 (p-value=0.016) and 7.486 (p-value=0.001). A very high mean of 3.64 is recorded for girls ages 15-19 years who had attended secondary school and could read. The results show that the combined factors of age, education and literacy are significant predictors of knowledge of HIV/AIDS.

### Knowledge of HIV/AIDS and reproductive health outcomes

Using Kaplan-Meier’s survival test, the study explored the relationship between knowledge of HIV/AIDS and the time of initiation of sexual activity. As shown in Table 4, knowledge of HIV/AIDS is a significant predictor of age at onset of sex. Adolescent girls with high knowledge of HIV/AIDS initiate sex earlier than those with little, or very low knowledge of HIV/AIDS. The Cox Regression statistic further shows that knowledge of HIV/AIDS remains a significant predictor of age at onset of sex, when the effects of confounding variables, such as highest educational institution ever attended, marital status and age, are controlled (Table 5).
study further shows that the likelihood of having ever used any form of contraceptive increases significantly with knowledge of HIV/AIDS. Knowledge of HIV/AIDS was also found to be a significant predictor of involvement in recent multiple sexual partnerships in a logistic regression model that includes age, highest level of education attended and marital status (p-value=0.042).

Discussion and Conclusion
The proportion of the studied out-of-school adolescent girls, with the correct knowledge on the possibility of reducing the chances of contracting HIV by using condom every time they have sex (30%), is less than the national average for adolescent girls within the age
It is argued here that knowledge is a form of power and the more knowledgeable young women are, the better their life chances. In other words, the desirability of knowledge about HIV is not solely anchored on its potentials to check multiple sexual partnerships or promote abstinence, which this study has shown it does not. Rather, it is desired as a form of empowerment, in addition to its potentials for improving the reproductive health of people and improving their life choices and chances. It is recommended, therefore, that the government and Non-government organizations should put in place a programme that seeks to equip all out-of-school adolescents, with literacy, which is a basic life skill. Also, attempt should be made to make sure that all girls have at least nine years of formal education. In addition, the Family Life and HIV Education programme should be extended to out-of-school youths through a specially designed programme.

**Limitations**

Although the study was designed to reach all out-of-school girls within Iwaya community, there is the likelihood that adult household heads in homes, where girls work as housemaids, denied Field Assistants access to such girls. In addition, many girls who hawk or have other daily businesses that take them out of the community all-day long could have been left out of the study. Access to girls residing in fenced houses was also limited, as there was no way to verify claims to the number of girls eligible for the study in such compounds. These make it difficult to assert that all out-of-school girls in the community took part in the study. Communicating with some of the girls was a challenge, since not all of them could communicate in English, and some also found it difficult to communicate in Yoruba, although such cases were few. In such cases where language was a barrier, members of the community who could communicate with the participants were engaged as interpreters.

**References**


Table 5: Cox Regression test for the effect of knowledge of HIV/AIDS on the likelihood of initiating sex.

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Chi square=218.475; df=5; p-value=0.000
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