



**Research Article**

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## HIV and Sexually Transmitted Infections knowledge and practices: a survey of female secondary school students in Enugu, South East Nigeria

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### Abstract

**Background:** The discovery of HIV has re-awakened global interest in sexually transmitted infections. As a means of curbing the spread, several efforts have been made at educating people so as to positively influence their sexual practices. **Aim:** The aim of this study was to determine the knowledge and practice of female secondary school students to sexually transmitted infections in Enugu, South East Nigeria. These could not only pose as barriers to effective sexual education and impair case management but also encourage wrong and harmful practices within the community. **Methods:** This study was cross-sectional and descriptive in design using a self-administered custom designed multiple choice questionnaire with sections on general information on sexually transmitted infections, awareness and perception of such infections. Ethical clearance and informed consents were obtained. **Results:** There were 183 respondents with a mean age of  $15.9 \pm 1.3$  years, all females. There was a high level of awareness of HIV (97.8%) and STIs (94.5%). While 74.3% had correct knowledge of modes of transmission, 60.7% incorrectly identified casual contact as modes of transmission of HIV. Only 59% correctly identified all the HIV prevention methods tested, while 74.9% practiced all modes of prevention. The median aggregate score for knowledge of transmission and prevention was 72.2%, while it was 62.5% for good preventive practices. The older students were more likely to be sexually active. **Conclusion:** Female secondary school students in Enugu had a high level of awareness for sexually transmitted infections, especially for HIV. However, in-depth knowledge regarding mode of transmission and prevention was sub-optimal. There is a need to strengthen public and school based sexual health education in Nigeria.

**Keywords:** Sexually transmitted infections, Knowledge, Female students, Nigeria.

### INTRODUCTION

Early exposure to sexual activity among adolescents / young people is associated with diverse negative outcomes which includes sexually transmitted infections (STIs). Many developing African nations are characterized by high burden of infectious diseases and over the years, the battle to curb these diseases became compounded with the emergence of non-communicable diseases.

For a little over two decades now, STIs reassumed a global health concern following the discovery in 1981 of the Human Immunodeficiency Virus (HIV) which causes the Acquired Immunodeficiency Syndrome (AIDS).<sup>[1]</sup> HIV/AIDS was shortly discovered thereafter in a Nigerian girl in 1986 with Lagos (South West Nigeria) and Enugu (South East) being among the earliest cities involved.<sup>[1]</sup> About a decade ago, according to data derived from the National AIDS/STI Control programme, HIV was the fifth commonest prevalent STI with non-gonococcal genital infections (26.3%) topping the list.<sup>[2]</sup> The profile tends to vary with changes in socioeconomic, cultural, geographic and environmental factors prevalent in the population or communities.<sup>[3-5]</sup> Okonko et al, in Ibadan, South West Nigeria, reported an overall prevalence of 39% among attendees of the Association for Reproductive Family and Health (AFRH) centre with candidiasis (27%) as the commonest STI.<sup>[6]</sup> The more commonly known and early infections such as syphilis and gonorrhoea were not identified in this population.

For HIV, adult prevalence in sub-Saharan Africa as at 2013 was 4.7%.<sup>[7]</sup> As at 2015, current adult prevalence of HIV in Nigeria is put at 3.1%.<sup>[8]</sup> This apparent reduction in HIV prevalence is most likely due to control efforts that have been made at different levels by several organizations and government. Control of STIs is defined as "a public health outcome, measured as reduced incidence and prevalence,

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achieved by implementing strategies composed of multiple synergistic interventions".<sup>[9]</sup> Such gains in the control of sexually transmitted infections (as obtained in other areas of communicable disease control) can be improved by adopting unified approaches/strategies that aim for broad public health benefit while pursuing disease-specific control objectives.<sup>[9]</sup> Public health awareness campaigns driven by efforts aimed at narrowing identified knowledge and attitudinal gaps have become important tools in attempts to control STIs.

A lot of gap still exist between knowledge and sexual practices among different groups of people or populations.<sup>[10]</sup> Though knowledge of STIs appears to be generally high among many students in Nigeria,<sup>[11-13]</sup> it was recently shown to be poor among secondary school students in Ado Ekiti, South West Nigeria.<sup>[14]</sup> The gap is as a result of ambiguous information<sup>[15]</sup>, resulting in discordance between high knowledge and risky sexual behaviours which was not only demonstrated in many studies from all over Nigeria,<sup>[11-13]</sup> but also beyond Nigeria such as among medical students of a Caribbean university and high school students in Lao PDR.<sup>[16,17]</sup> If such a gap could exist among medical students, it becomes important to ask what the situation would be among secondary school students since sexual activity has been shown to commence quite as early as 13 to 15 years in many people.<sup>[10]</sup> Identification of knowledge-practice gaps among young people in secondary schools could largely provide for better health educational intervention thus curbing the spread of STIs as they are prone to several wrong practices arising from misinformation from their peers.<sup>[3]</sup>

This study therefore aimed at determining the knowledge, attitude and practices of female secondary school students about STIs in Enugu, South East Nigeria where little data is currently available for this population on this important matter of public health concern.

## METHODS

### Study sample

This study was cross-sectional and descriptive in design targeted at female senior secondary school students in Enugu, South East Nigeria. The school system in Nigeria is divided into 4 sub-groups namely - primary (6 years), junior secondary (3 years), senior secondary (3 years) and tertiary schools (4-6 years). The authors selected a junior/senior female secondary school (QCC) in Enugu metropolis. The school was selected because of its central location and the large student population (about 2000 pupils at the time of the study). This study was part of an awareness campaign on STIs in 2015. Senior secondary school students constituted about one third of the total student population.

The aim was to recruit all the final year senior secondary students attending the school morning health awareness program. A meeting was first organized with the school principal, the head teachers and later class leaders for proper sensitization of the students before the data collection. On the day of the study, the investigators obtained an informed consent from the students who were willing to participate after explaining the aims and objectives of the study. The exclusion criterion was refusal to participate.

The instrument was a custom designed multiple choice questionnaire with sections on general information about the students such as age and sex, general knowledge of common STIs, mode of spread of STI, practices of preventive measures, treatability of common STIs and sexual practices. The questionnaires were self-administered with the help of one of the investigators and retrieved the same day. All incomplete questionnaires were excluded from the analysis.

The study protocol was approved by the Ethics Committee of the University of Nigeria Teaching Hospital Enugu.

## Data analysis

Data obtained was manually sorted and coded into a personal computer. For database management and statistical analysis, the SPSS version 21 (Chicago IL, USA) was used. Results were presented in tables and figures.

## RESULTS

There were 229 questionnaires distributed of which only those from 183 students were retrieved. All respondents were females and in the same class. The mean age was  $15.9 \pm 1.3$  years.

### Knowledge of HIV and STIs

Out of all the girls, 179 (97.8%) of them had previously heard about HIV, while 5 (2.7%) of them said they had never heard about AIDS. In addition, 10 (5.5%) of the students had not heard of STIs. Their knowledge of four STIs was tested. Only 43 (23.5%) students were able to identify all four diseases as STIs. The proper identification of the other diseases as STIs is as shown in Table 1 below:

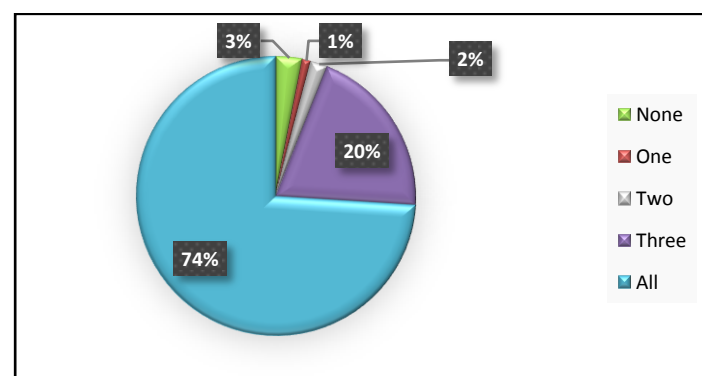
**Table 1:** Knowledge of STIs

STI	No (%)
Gonorrhoea	156 (85.2)
HIV	150 (82)
Herpes	49 (26.8)
Syphilis	150 (82)

When they were tested on knowledge of common illnesses that were not STIs, 174 (95.1%) of the students were able to correctly identify that none of the 5 diseases enquired about were sexually transmitted. Of all the students, 4 (2.2%) felt that diabetes mellitus was an STI, 2 (1.1%) thought that hypertension was an STI, while 4 (2.2%) said the same for mental illness.

### Knowledge of the transmission of HIV

There were 4 possible correct responses about the mode of transmission of HIV, and 136 (74.3%) students were able to correctly identify these, while 6 (3.3%) did not identify any correctly. This is shown in Figure 1.



**Figure 1:** Knowledge of possible modes of transmission

The least frequently identified mode of transmission was contact with infected body fluids, followed by contact with contaminated sharps. The highest mode of transmission was by sexual contact. Details of these are as shown in Table 2.

**Table 2:** Knowledge of mode of transmission of HIV

Mode of transmission of HIV	No (%) with correct knowledge
Sharps	163 (89.1)
Sexual transmission	174 (95.1)
Blood	173 (94.5)
Body fluids	151 (82.5)

In terms of identifying incorrect means of transmission, 111 (60.7%) of the students were able to identify the 4 tested components as not being methods of transmission. As many as 62 (33.9%) wrongly identified sharing of toilet facilities as a means of contracting HIV from an infected person, while 24 (13.1%) wrongly believed that sharing of eating utensils could lead to the spread of HIV (Table 3). Very few participants wrongly identified shaking hands (8 (4.4%)) and sharing a seat (6 (3.3%)) as modes of HIV transmission.

#### Knowledge of prevention of HIV and STIs

Only 13 (17.1%) of the students said that none of HIV, AIDS and STIs could be prevented. Further breakdown showed that 160 (87.4%), 125 (68.3%), and 161 (88%) participants reported that HIV, AIDS, and STIs were preventable respectively. Their knowledge of methods of prevention of HIV/AIDS and STIs were also tested. Only 5 (2.7%) did not know about any of the 5 methods of prevention that they were asked about, while 108 (59%) were able to identify all the 5 preventive methods as shown in Table 3. Table 4 shows the responses of the participants regarding identification of incorrect methods of prevention as being correct depicting their poor knowledge of methods of prevention of STIs.

**Table 3:** Knowledge of proper methods of prevention

Method	No (%)
Avoid sharing of sharp objects	173 (94.5)
Avoid unprotected intercourse	174 (95.1)
Avoid careless use of blood/blood products	172 (94)
Avoid exchange of body fluids	157 (85.8)
Having a single faithful partner	130 (71)

**Table 4:** Frequency of identifying incorrect methods as correct for prevention

Method	No (%)
Avoid sharing utensils	49 (26.8)
Avoid sharing toilets	88 (48.1)
Having 2 or more partners	23 (12.6)
Avoid shaking hands with infected persons	22 (12)
Avoid using the same chair as an infected person	20 (10.9)

#### Practice of HIV and STI prevention among the students

In terms of good preventive practices by the students, out of the 4 practices tested, 137 (74.9%) practiced all the 4 modalities, 38 (20.8%) practiced 3, 7 (3.8%) had 2 correct practices, while only 1 (0.5%) did not have any correct practice. The breakdown of the frequency of individual incorrect preventive practices by the students is as shown in Table 5.

The different aspects of knowledge of HIV transmission and prevention were equally weighted and totaled as a composite score with a minimum possible score of 0 and a maximum score of 18 (using the parameters in Tables 2 to 5). The range of scores was between 4 and

18, with 2(1.1%) having the lowest score of 4, while only 1 student had a maximum score of 18. The median (IQR) score was 13 (12-13).

**Table 5:** The frequency of incorrect HIV preventive practices by the students

Practice	No (%)
Sharing sharps	35 (19.1)
Sexual practices	6 (3.3)
Blood transfusion	3 (1.6)
Body fluids	12 (6.6)

Similarly, a composite score was calculated to determine the level of appropriate preventive practices in the students with a minimum score of 0 and a maximum of 8. The scores ranged from 1 to 8, with a median (IQR) of 5 (4 – 6), with 15 (8.2%) obtaining the maximum score.

There was a significant weak negative correlation between age and their knowledge scores ( $r = -0.15$ ,  $p = 0.04$ ) but no significant correlations between the age of the students and their practice score ( $r = 0.07$ ,  $p = 0.36$ ).

The students were asked if HIV/AIDS or STIs could be cured; 61 (33.3%) said HIV could be cured, 14 (7.7%) of them said AIDS could be cured, while 106 (57.9%) said STIs could be cured. Only 16 (8.7%) of them had undergone a HIV test, while 12 (6.6%) did not know if they had been tested before. Also, 6 (3.3%) had been tested in the past for STIs, while 11 (6.0%) did not know if they had previously been tested for STIs.

While only 6 (3.3%) had a sexual partner at the time of the interview, 4 (2.2%) of them did not have at least one sexual partner in the previous 6 months, 18 (9.8%) said they always practiced protected sex. Those who had sexual partners had a mean age of  $16.3 \pm 1.9$  years, while those who did not have had a mean age of  $15.9 \pm 1.3$  years ( $p = 0.04$ ,  $CI = -1.54$  to  $-0.57$ ).

## DISCUSSION

With the rising incidence and prevalence of STIs including HIV in Sub Saharan Africa, governments of various countries in the continent and especially Nigeria have accorded priority to awareness creation and information dissemination about HIV/STIs among the youths. This is mainly done through the mass media, public health education as well as the inclusion of the HIV/STI programs as part of school curriculum. This study, which assessed knowledge and awareness of HIV and STIs among a cohort of 183 high school female students in Enugu, Southeast Nigeria, indirectly assessed the impact of these programs on a segment of the targeted population.

The present study demonstrated high levels of awareness for both HIV and STIs as more than 90% of the students had heard about them and knew their meaning, and also only 5.5% had no knowledge of STIs. The above findings reflect the findings of similar studies done in other parts of Nigeria<sup>[14,18]</sup> and Europe,<sup>[19]</sup> suggesting that the on-going massive and intensive mass media campaigns being undertaken by both government and non-governmental agencies in Nigeria have helped to raise awareness regarding these conditions.

Regarding knowledge of STIs, only about a quarter of the students were able to identify the four diseases presented to them as being STIs, with gonorrhoea being the commonest to be so identified followed closely by HIV while Herpes was the least to be so identified. In Nigeria, it is a common sight to see unqualified persons and groups at various public spaces like motor parks, markets places, commercial transit buses and even radio stations, noisily proclaiming symptoms of gonorrhoea and claiming to have instant cures for same. Findings differed from results of studies done in Europe where awareness for

gonorrhoea varied widely from 53% to 84%.<sup>[20,21]</sup> The reverse was noted to be the case regarding herpes which emerged as the STI least identified in our study by only a quarter of the students while 56% to as much as 90% of the students correctly identified it as an STI in two different studies from Europe.<sup>[21,22]</sup>

On knowledge of appropriate preventive measures and practices for STIs and HIV, more than a quarter of the students were not aware that having a single faithful partner was an effective method of prevention<sup>[23]</sup> while only three quarters of them practiced all four preventive measures assessed. The importance of practicing the entire preventive measures correctly and consistently must be made known to these students as any shortfall in practice even on just a single occasion could result in transmission of the virus. They should equally be taught in clear terms that abstinence from sex was the best preventive measure while the sexually active ones must be informed that correct and consistent use of condoms<sup>[23,24]</sup> could reduce risk of contracting HIV and STIs, while making them understand that condoms do not guarantee 100% protection.<sup>[23]</sup>

Some of the reasons for the discordance between the responses on the definition of STIs/HIV and the different modes of transmission/prevention maybe attributed to several factors. Firstly, the dissemination of related information by unqualified individuals which earlier alluded to, secondly, sex and its related health education remains a taboo in the public space and in most families. This leaves a gap in the knowledge of these students, which may be filled by quacks and information from the internet. Finally, the content of the public health education on STI/HIV may be inadequate. In fact, the authors are not aware of any standardized curriculum that incorporates all aspects of the subject.

When knowledge of the mode of transmission of HIV was assessed, only three-quarters of the students correctly identified all the four possible modes of transmission presented to them, as being correct while 3.3% could not identify any mode of transmission of HIV. This is worrisome as it is expected that every high school student should know all the correct modes of transmission of HIV as they are typically prone to succumb to negative peer pressure, which may lead them to having unprepared and unprotected sexual exposures. Transmission of HIV through unprotected sexual intercourse was the most readily identified mode of transmission similar to findings from other parts of Nigeria, Africa and Asia.<sup>[18,25,26]</sup> Contact with infected body fluids was the least correctly identified mode of transmission, reflecting results from other parts of Nigeria<sup>[14]</sup> though this differed from results obtained from Ghana where a higher level of awareness was reported.<sup>[25]</sup> Therefore greater awareness creation should be done regarding this aspect of transmission so as to avert possible inadvertent contact with these infected body fluids, especially by uninformed care givers, who provide long term care for their infected relatives.

Incorrect modes of transmission of HIV being accepted as correct was sadly noted in this cohort of students where as much as a third of them believed that sharing of toilets with infected persons could lead to transmission of the virus while 13% and 4.4% respectively, believed that sharing of utensils and shaking hands with infected persons could transmit HIV. This trend should be reversed through more intensive enlightenments as these wrong beliefs usually form the basis for discrimination and stigmatization of people living with HIV. This also reflects findings from other parts of Nigeria<sup>[14,18]</sup> and Africa.<sup>[25]</sup> Another surprising finding from the study was the fact that a proportion of the students believed that some common chronic diseases like diabetes, hypertension and mental illness could be transmitted sexually with a similar wrong trend also reported from studies in other parts of Nigeria,<sup>[14,18]</sup> Malaysia<sup>[27]</sup> and Europe.<sup>[19]</sup>

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The composite scores showed a relatively poor general knowledge of HIV transmission and prevention in the students, with lower median scores for correct practices than knowledge. This demonstrates that a gap exists between appropriate knowledge and practice, and also that the knowledge of the students is still inadequate.

Generally, the differences in age among the students did not yield any significant correlations to their overall knowledge and preventive practices, regarding both HIV and STIs. Although older students were observed to be more likely to be sexually active than their younger counterparts, the prevalence of habitual sexual activity (3.3%) was lower compared to a study in Malaysia, which reported a prevalence of 12.6%.<sup>[27]</sup> However older age was associated with greater current sexual activity even though only 3.3% of the students were sexually active, a sharp departure from results of a Malaysian study which recorded a rate of 12.6%.<sup>[10]</sup>

Surprisingly, a third of the students believed that HIV was curable. This is similar to findings among university undergraduates in Lagos Nigeria.<sup>[28]</sup> The level of screening for HIV was low at only 8.7% while only 3.3% of the students had ever been tested for STIs. In view of this therefore, young students and adolescents should be encouraged to routinely screen for HIV and other STIs as knowledge about one's status usually led to better adherence to preventive measures and early presentation for treatment, if need be, with better outcomes.

### Limitations

The index study included only female students from a secondary school. It is possible that knowledge and practice among male students or students from a mixed school may be different hence limiting the generalizations of our findings. The questionnaires were collected during the school morning assembly, hence some of the answers might have been influenced by peers since it involved issues that dealt on a social 'taboo' such as sex.

Finally, the sample size is not likely to be representative of the general population as data was collected from an environment where many young people who are in school are likely to be exposed to trainings on HIV and STIs. Despite these limitations, the study makes available current empirical data, which shall consequently serve as valuable literature for future research in the subject.

### CONCLUSION

There was a relatively high level of awareness for sexually transmitted infections among this group of high school female students, especially for HIV infection. However, in-depth knowledge regarding mode of transmission of the STIs and their preventive measures were sub-optimal.

Concerted efforts should be made to ensure that an all-encompassing education regarding other STIs – not just HIV infection – is incorporated into the secondary school curriculum, in addition to regular mass media campaigns already being done for HIV infection.

## Authors' contributions

BEA and IO conceptualised the study; BEA collected the data while EY did the analysis. CN, EY, CO and IO prepared the script while all authors approved the final draft of the manuscript.

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## Declaration

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## Conflict of interest

The Authors declare that there are no conflicts of interest.

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