

Original Research Article

Knowledge, Preventive Practices and Occurrence of Sexually Transmitted Infections among Female Undergraduate Students in North-Central Region of Nigeria

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Abstract: Background: Sexually Transmitted Infections (STIs) pose a significant global public health challenge as they are a major cause of acute illnesses, infertility, disabilities and death among men and women, particularly among adolescents and young adults than any other age group. **Objectives:** This study assess the knowledge, preventive practices, and occurrence of sexually transmitted infections (STIs) among female undergraduate students. **Methods:** A descriptive cross-sectional study design was conducted among 415 respondents using the convenient sampling technique. Relevant data were collected using a semi structured questionnaire that covers aspects of the research objectives and all questionnaires were retrieved and analysed using descriptive and inferential at a p-value < 0.05 level of significance. **Result:** This study revealed that more than half (56.4%) of the respondents were between 21-25 years of age and the mean \pm S.D was 23.32 ± 4.285 . Majority (84.6%) have a good knowledge, 9.2% have a fair knowledge and 6.3% have a poor knowledge; more than half (57%) of the participants demonstrated a good level of preventive practices. 12.8% of the respondents had ever contracted a sexually transmitted infection with gonorrhoea being the most prevalent accounting for 67.9% of all cases. It was also deduced that the level of knowledge of respondents on STIs had no significant influence on their preventive practices with a p-value of 0.407. However, level of knowledge had a significant influence on occurrence of STIs among respondents with p-value of 0.017.

Keywords: Knowledge, Preventive Practices, Occurrence, Female Undergraduates, University, Sexually Transmitted Infections (STIs).

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INTRODUCTION

Sexually transmitted infection (STIs) are global concerns as they are a major cause of acute illnesses, infertility, disabilities and death among men and women (Oharume, 2020), with over 1 million new people being infected every day and over 350 million new cases reported annually, particularly among adolescents and young adults than any other age group according to a global survey (Mutaru *et al.*, 2021, WHO, 2024). 1 out of 2 people will acquire a STI by the time they are 25 years old (WHO, 2024). Individuals between the ages of 15-24 reported the highest rates of sexually transmitted infections (Yuh *et al.*, 2020).

Sexually transmitted infections (STIs) are a group of illnesses transmitted from one individual to another through sexual contact (Mutaru *et al.*, 2021, WHO, 2024). STIs such as syphilis, gonorrhoea and chlamydia are curable, while STIs like the human

papilloma virus (HPV), hepatitis B, human immune virus (HIV) and herpes simplex are uncurable, although treatable. (Nzopotam *et al.*, 2022).

STIs are a burden on people in the developing and developed countries with Sub-Saharan Africa contributing to over 70% of the universal burden (Nigussie & Yosef, 2020). In developing countries such as Nigeria, risky sexual behaviors, limited preventive practices and poor knowledge about sexually transmitted infections put adolescents and young adults at great risk of contracting STIs, and most female university students are grouped under the adolescent and young adult age category, leaving them at greater risk (Mokgatle *et al.*, 2021). These risky sexual behaviors include having unprotected sexual vaginal, oral and anal intercourse, multiple sexual partners, and poor use of contraceptive measures (Chan, 2021). Lack of knowledge about STIs may lead to delay in treatment among female university students, which may lead to a series of complications in

the long run, such as pelvic inflammatory diseases, infertility, abortion, stillbirths and perinatal and neonatal morbidity (Mutaru *et al.*, 2021). Furthermore, there is increasing concern regarding the high prevalence of STIs among female students and the apparent gaps in their knowledge and preventive practices. This gap hinders the development of effective strategies to mitigate the spread of STIs (Otu *et al.*, 2021). Addressing STIs among female undergraduate students is crucial as they can significantly impact their physical health, as well as their psychosocial well-being (Scheinfeld, 2023).

Preventive practices such consistent and correct condom use, and reducing the number of sexual partners, are critical in managing and reducing the occurrence of STIs (Cegolon *et al.*, 2022). However, the extent at which these practices are adopted by female students in Nigerian University remains unclear. Identifying the knowledge gaps, preventive practices adopted by female undergraduate students is essential for developing targeted interventions that can effectively reduce the spread of STIs among this group. Therefore, this study aims to assess knowledge, occurrence of, and preventive practices against sexually transmitted diseases among female undergraduate students in North-Central Region of Nigeria, to address gaps and contribute to STI research.

Research Hypothesis

Hypothesis 1: There is no significant relationship between the level of knowledge about sexually transmitted infections (STIs) and preventive practices against STIs among female undergraduate students.

Hypothesis 2: There is no significant relationship between the socioeconomic background and the level of knowledge of STIs among female undergraduate students.

Hypothesis 3: There is no significant relationship between the level of knowledge of STIs and the occurrence of STIs among female undergraduate students.

RESEARCH METHODOLOGY

Study Design and Setting

A cross-sectional descriptive study was conducted to determine female students' knowledge, preventive practices against sexually transmitted infections, as well as the occurrence of sexually transmitted infections in North-Central Region of Nigeria. The study was conducted in one of the few Federal Universities in Nigeria whose establishment is aimed to implement one of the educational directives of the Third National Development Plan, which was aimed at providing more opportunities for Nigerians aspiring to acquire university education and to generate high-level manpower which is vital for the rapidly expanding economy. It is located in Ilorin South local government area, Kwara State, North Central Geopolitical Zone, Nigeria. It has several faculties, including the Faculty of Agriculture, Education, Life sciences, Physical sciences,

Arts, Basic medical sciences, Basic clinical sciences, Clinical sciences, Communication and Information sciences.

Study Population

The total population of undergraduates at University of Ilorin is estimated to be 48,000, while the number of female students is estimated to be 19,500.

The sample size for this study was calculated using the Andrew Fisher's formula (Andrew and John

1998)
$$n = \frac{z^2 pq}{d^2}$$
 where 'n' is required sample size; 'Z' is the standard normal deviation corresponding to the 95% coefficient interval (equivalent to 1.96); 'P' is the prevalence of the attribute being studied and was estimated at 0.5; 'q' is 1 - p and 'd' is the margin of error or the desired level of precision which was set at 5% (0.05). We calculated the minimum required sample size to be 377 using the formula and to account for potential loss of questionnaires, and non-responses of filled questionnaires, an additional 10% of the sample size was added as a precaution. Therefore, a final sample size of 415 respondents was used for the study the convenient sampling technique was used to select the female undergraduate students who were willing to participate.

Instrument for Data Collection

The instrument for data collection was a semi-structure questionnaire developed by the researcher based on extensive literature review to suit the purpose of the study. The questionnaire comprises of variables on socio-demographic data from the respondents, knowledge of sexually transmitted infections, preventive practices against sexually transmitted infections, and occurrence of STIs among female undergraduate students of the University of Ilorin. A combination of Multiple-choice, Yes and No, and Likert-scale questions were used in the questionnaire. The face and content validity of the instrument was done by experts in the field of adolescent health, sexual and reproductive health research and statistics. The reliability of the instrument was determined using test-retest method which involved the administration of the 42 copies of questionnaire (10% of the sample size) to undergraduate students from a different university with similar characteristics at two weeks interval. The reliability of the instrument was measured using Cronbach's Alpha and a Cronbach Alpha coefficient of 0.86 was obtained which confirmed the reliability of the instrument. The questionnaires were designed in English language and were distributed by the researchers. The questionnaires were designed in English and data were collected via an Internet-based link (Google Forms). The invitation link was primarily distributed via student groups on social media platforms namely WhatsApp, Facebook and Twitter. The link was shared by the researchers, as well as willing participants who forwarded it to other potential participants from the universities. On the first page of the questionnaire,

participants were informed that their participation was purely on a voluntary basis and their consent was taken prior to the administration of the questionnaires. There was no possibility of placing any undue pressure on the respondents as the survey had to be completed via an online link. All responses were kept confidential. A total of 419 responses was gotten. The duration of data collection was six weeks.

Statistical Analysis

All survey responses were imputed into the computer using IBM SPSS version 25 (Armonk, NY), for data analysis and results were presented using descriptive statistics in form of frequency table, percentages and charts and inferential statistics in form of chi square was used to test the generated hypotheses at 0.05 level of significance.

Ethical Considerations

The respondents were given adequate information about the study. Confidentiality was ensured by not disclosing the respondents' identity. Anonymity was emphasized by not asking for the respondents' name on the questionnaires. They were informed of their right to withdraw from the survey at any time. There was no possibility of placing any undue pressure on the respondents as the survey had to be completed via an online link. They were informed of their right to withdraw from the survey at any time without any threats or penalties whatsoever. All related ethical issues were addressed during the conduct of this study. Ethical clearance was obtained from the University of Ilorin, Faculty of Clinical Sciences Ethical Review Committee with reference number UIL/CHS/FERC/006.

RESULTS

Table 1: Socio-demographic characteristics of the respondents (n=415)

Variable	Frequency	Percentage (%)
Age		
16-20	103	24.8
21-25	234	56.4
26-30	42	10.1
31-35	30	7.2
36-40	6	1.4
<i>Mean ± S.D= 23.32 ± 4.285</i>		
Religion		
Christianity	174	41.9
Islam	237	57.1
Traditional	4	1.0
Ethnicity		
Igbo	20	4.8
Hausa	15	3.6
Yoruba	336	81.0
Others	44	10.6
Marital status		
Single	367	88.4
Married	42	10.1
Cohabiting	6	1.4
Course of study		
Health related	222	53.5
Non-health related	193	46.5
Year of study		
1st year	19	4.6
2nd year	75	18.1
3rd year	73	17.6
4th year	130	31.3
5th year	94	22.7
6th year	24	5.8
Have sexual partner		
Yes	170	41.0
No	245	59.0
Number of sexual partners		
None	245	59.0
1	136	32.8
2-4	19	4.6
5 and above	14	3.6

Table 1 shows that more than half (56.4%) of the respondents were between 21-25years of age and the mean ± S.D was 23.32 ± 4.285; more than half (57.1%) were Muslims while majority (81%) were Yoruba and majority (88.4%) were single. More than half (53.5%)

were studying health related courses and about one-third (31.3%) were in their third year. More than half (59%) of the respondents do not have sexual partners, 32.8% had only one, 4.6% had 2-4 while 3.6% had 5 and above.

Table 2: Knowledge on STIs among female undergraduate students (n=415)

Variable	Yes Freq (%)	No Freq (%)
Have you ever received any information regarding STIs?	372(89.6%)	43(10.4%)
Chlamydia is a type of STI	337 (81.2%)	78 (18.8%)
Cholera is a type of STI	29 (7.0%)	386 (93.0%)
Gonorrhea is a type of STI	371 (89.4%)	44 (10.6%)
Tuberculosis is a type of STI	384(92.5%)	31 (7.5%)
STIs affect only women	17 (4.1%)	398 (95.9%)
STIs can be transmitted through blood transfusion	244 (58.8%)	171 (41.2%)
STIs can be transmitted through clothe-sharing	66 (15.9%)	349 (84.1%)
Poor personal hygiene contributes to the spread of STIs	288(69.4%)	127(30.6%)
All STIs can be cured	137 (33.0%)	278 (71.8%)
STIs are as a result of witchcraft	19 (4.6%)	396 (95.4%)
Mosquitoes can cause STIs	33 (8.0%)	382 (63.4%)
Drinking unclean water causes STIs	38 (9.2%)	377 (90.8%)
Burning pain on urination is a symptom of STIs.	385 (92.8%)	30 (7.2%)
Pain during intercourse is a symptom of STIs.	371 (89.4%)	44 (10.6%)
Genital itching is a symptom of STIs.	379 (91.3%)	36 (8.7%)
Foul vaginal discharge is a symptom of STIs	387 (93.3%)	28 (6.7%)
Contraceptive pills prevent STIs	77 (18.6%)	338 (81.4%)
Condoms provide protection against STIs	369 (88.9%)	46 (11.1%)
There are effective vaccines against some STIs	331 (79.8%)	84 (20.2%)

Table 2 shows that majority (89.6%) had received information regarding STIs while the identified STIs by respondents included Chlamydia (81.2%), gonorrhoea (89.4%), tuberculosis (92.5%) and cholera (7%). Majority (95.9%) disagreed that STIs affect only women and that STIs can be transmitted through clothe-sharing (84.1%) while more than half (58.8%) affirmed that STIs can be transmitted through blood transfusion and 69.4% affirmed that poor personal hygiene contributes to the spread of STIs. Only one-third (33%) affirmed that all STIs can be cured; majority (95.4%)

disagreed that STIs are as a result of witchcraft while (63.4%) disagreed that mosquitoes can cause STIs and (90.8%) disagreed that drinking unclean water causes STIs. Symptoms of STIs as affirmed by respondents included burning pain on urination (92.8%), pain during intercourse (89.4%), genital itching (91.3%) and foul vaginal discharge (93.3%). Majority (88.9%) affirmed that condoms provide protection against STIs, (79.8%) agreed that there are effective vaccines against some STIs while majority (81.4%) disagreed that contraceptive pills prevent STIs.

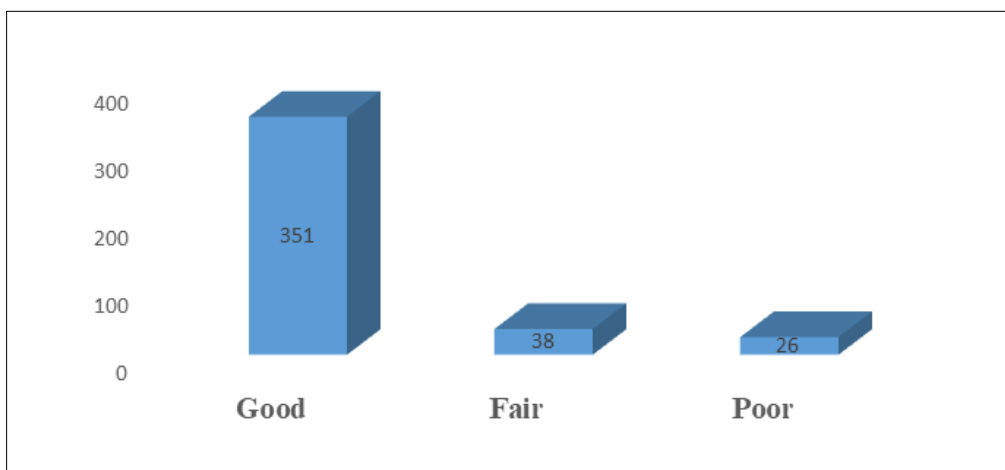


Figure 1: Level of knowledge of respondents on STIs

Figure 1 shows the summary of level of knowledge of respondents on sexually transmitted infections with the majority 351 (84.6%) having good

knowledge, 38(9.2%) have a fair knowledge and 26(6.3%) have a poor knowledge.

Table 3: Preventive practices adopted by respondents to reduce the transmission of STIs

Variable	Always Freq (%)	Sometimes Freq (%)	Never Freq (%)
Do you insist on the use condoms during sexual intercourse?	152 (36.6%)	184 (44.3%)	79(19.0%)
Have you ever considered taking vaccines against certain STIs	56 (13.5%)	233 (56.1%)	126 (30.4%)
Do you have sex intercourse with commercial sex workers?	14 (3.4%)	29 (7.0%)	372 (89.6%)
Do you wash your genitals before sex?	150 (36.1%)	179 (43.1%)	86 (20.7%)
Do you wash your genitals after sex?	313 (75.4%)	38 (9.2%)	64 (15.4%)
Do you abstain from sex?	125 (30.1%)	204 (49.2%)	86 (20.7%)
Do you use antibiotics after sex?	36 (8.7%)	119 (28.7%)	260 (62.7%)
How often do you go for STI tests?	45 (10.8%)	154 (37.1%)	216 (52.0%)

Table 3 shows that less than half (44.3%) of respondents sometimes insist on the use of condoms during sexual intercourse, (36.6%) always insisted while (19%) never insisted. More than half (56.1%) had sometimes considered taking vaccines against certain STIs while 30.4% had never and 13.5% had always considered taking vaccines. Majority (89.6%) never have sexual intercourse with commercial sex workers, 7% sometimes had while 3.4% had always. Less than half (43.1%) sometimes wash their genitals, (36.1%) always wash their genitals before sex, 20.7% never wash their

genitals before sex; majority (75.4%) wash their genitals after sex while 15.4% never wash their genitals and 9.2% sometimes wash their genitals after sex. Less than half (49.2%) sometimes abstain from sex as a means of preventing STIs, 30.1% always abstain from sex while 20.7% never abstain from sex; 62.7% never use antibiotics after sex while 28.7% sometimes use and 8.7% always use antibiotics after sex. More than half (52%) of the respondents had never gone for STI test, 37.1% sometimes go for test and 10.8% always go for STI tests.

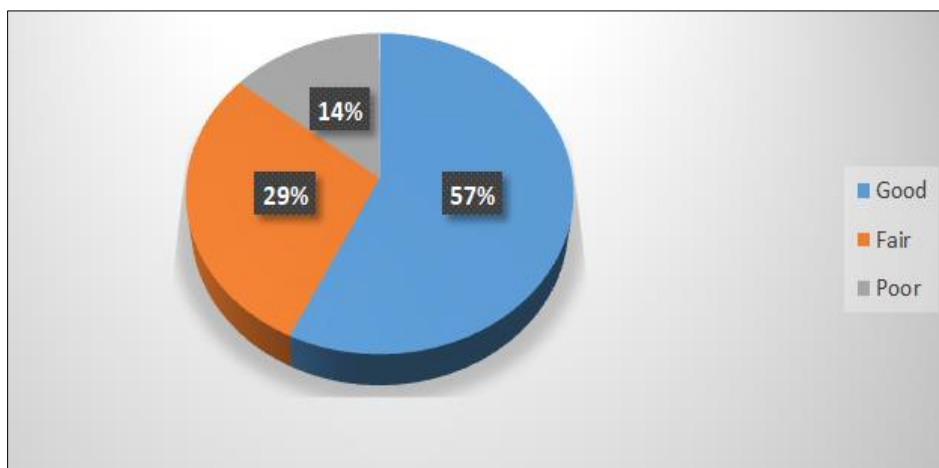


Figure 2: Level of preventive practice of STIs

Figure 2 shows that the level of preventive practices of STIs among respondents were good (57%), fair (29%) and poor (14%).

Table 4 : Occurrence of STIs among respondents

Variable	Frequency(n=415)	Percentage (%)
Ever contracted an STI?		
Yes	53	12.8
No	342	82.4
I don't know	20	4.8
If yes, how many times?	(n = 53)	
Once	33	62.2
Twice	16	30.2
Four times	2	3.8
More than four times	2	3.8

When did you contract it?	(n = 53)	
2010-2014	4	7.5
2015-2019	8	15.1
2020-2024	41	77.4

Table 4 shows that only 53 (12.8%) of the respondents had ever contracted a sexually transmitted infection; out of which 33(62.2%) contracted an STI once, 16(30.2%) contracted it twice while 2(3.8%) and another 2 (3.8%) contracted an STI four times and more

than four times respectively. Majority (77.4%) contracted an STI within 2020-2024 while 15.1% contracted it within 2015-2019 and 7.5% contracted it between 2010 and 2014 (Table 4).

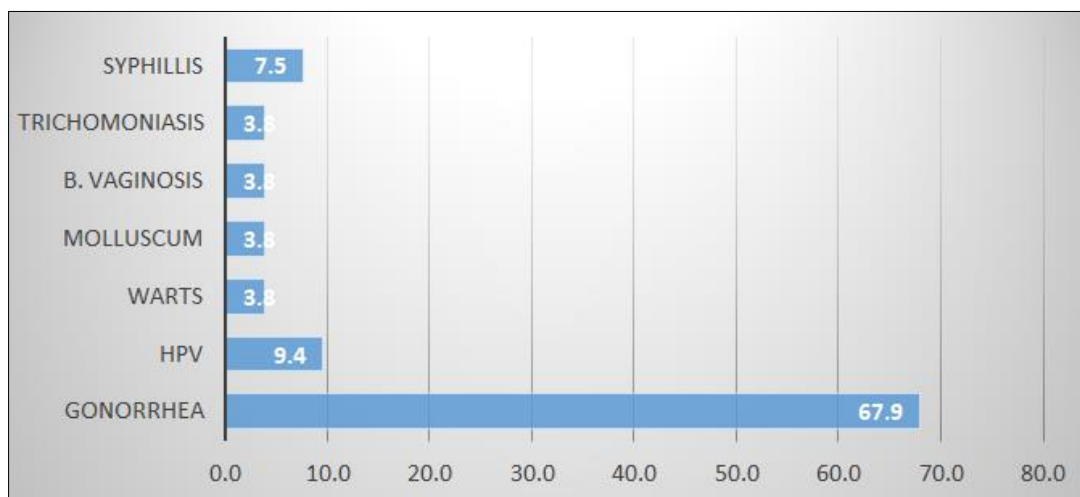


Figure 3: STIs contracted by respondents

The study shows that the respondents had contracted the following STIs; gonorrhoea (67.9%), Human papilloma virus (9.4%), syphilis (7.5%),

trichomoniasis (3.8%), Molluscum contagiosum (3.8%), genital warts (3.8%) and bacterial vaginosis (3.8%).

Table 5: Statistical illustration of the association between level of knowledge and preventive practices against STIs

Level of Knowledge	Level of Preventive Practice			Total	Statistics
	Fair	Poor	Good		
Good	99	52	200	351	$X^2 = 3.994^a$ P-value = 0.407
Fair	10	5	23	38	
Poor	11	1	14	26	
Total	120	58	237	415	

Findings from Table 5 shows that there is no statistically significant association between the level of knowledge on STIs and the preventive practices among

respondents with p-value of 0.407 since the p-value > 0.05 significance value, null hypothesis was accepted.

Table 6: Statistical illustration of the association between level of knowledge and occurrence of STIs

Level of Knowledge	Occurrence of STIs			Total	Statistics
	Not sure	No	Yes		
Good	13	290	48	351	$X^2 = 7.381^a$ P-value = 0.017
Fair	4	31	3	38	
Poor	3	21	2	26	
Total	20	342	53	415	

Findings from Table 6 shows that there is statistically significant association between the level of knowledge on STIs and its occurrence among respondents with p-value of 0.017 since the p-value < 0.05 significance value, null hypothesis was rejected.

DISCUSSION OF FINDINGS

The study revealed that majority (89.6%) had received information regarding STIs. This is in corroboration with a study conducted at the University of Ibadan, Nigeria, about sexually transmitted infections (STIs) and associated risk perceptions among

undergraduate students by Omeneki *et al.*, (2023) which revealed that 98.2% of participants reported receiving education on STIs. Regarding types of STIs, a knowledge gap existed as some of respondents identified tuberculosis (92.5%) and cholera (7%) as types of STIs. This study showed the respondents' good knowledge on the causes, risk factors, mode of transmission and symptoms of STIs. The overall knowledge of STIs among respondents was good. This is in line with previous studies conducted in Nigeria (Omeneki *et al.*, 2023), Indonesia (Winarto *et al.*, 2023), and Ghana (Koray *et al.*, 2022). Where majority of their respondents had good knowledge. However, this study contradicts another study conducted in Italy by Cegolon *et al.*, (2022) among university freshmen, where their overall knowledge of STIs was low.

Preventive Practices of Respondents towards STIs

It was deduced from the study that 44.3% of respondents sometimes insist on the use of condoms during sexual intercourse while 36.6% always insisted. This is in contrast with findings from a study conducted among students at a public higher education institution in Rio de Janeiro where there was a concerning observation regarding the low rate of continuous condom use, both with stable and casual partners, despite the majority reporting negotiation of condom use (Laércio *et al.*, 2022). More than half (56.1%) had sometimes considered taking vaccines against certain STIs while less than half (49.2%) sometimes abstain from sex as a means of preventing STIs. More than half (52%) of the respondents had never gone for STI test. This is in line with findings from a study conducted by Mulic *et al.*, (2023) where only a fraction of students underwent STD testing. Nevertheless, more than half (57%) of the respondents had a good level of preventive practices. This contradicts similar study conducted by Ramos *et al.*, (2020) where the STI prevention practices among respondents were inadequate.

Occurrence of STIs

Findings from the study revealed that only 12.8% of the respondents had ever contracted a sexually transmitted infection; and the most reported STIs contracted were gonorrhoea, Human papilloma virus and syphilis. This is in congruent with a previous studies where N.gonorrhoea (gonorrhoea), followed by *Treponema pallidum* (syphilis) were reported as the most common STIs (Tamrat *et al.*, 2020; Nzopotam, *et al.*, 2022). This study is in contrast with findings from a study conducted in Uppsala, Sweden, by Smeds, *et al.*, (2024) where *Chlamydia trachomatis* was the most common STI pathogen, followed by Herpes simplex virus and *Mycoplasma genitalium*.

Implication of Study

Sexually transmitted infections (STIs) remain a pressing health challenge among young women, particularly female undergraduate students being vulnerable (Johnson & Jackson, 2021). Therefore, it is

the role of health care professional especially nurses to provide effective education, screening, testing, treatment and advocacy for patients with STIs. Furthermore, nurses play a key role in promoting knowledge, prevention and early detection of STIs among adolescents and young adults. This can help to reduce the incidence of STIs, improve health outcomes and empower young women to make informed decisions about their sexual health.

CONCLUSION

STIs are global concerns as they are a major cause of acute illnesses, infertility, disabilities and death, particularly among adolescents and young adults than any other age group. This study was carried out to assess the knowledge, preventive practices, and occurrence of sexually transmitted infections (STIs) among female undergraduate students. Findings from this study revealed that more than half (56.4%) of the respondents were between 21-25 years of age and the mean \pm S.D was 23.32 ± 4.285 . Majority (84.6%) have a good knowledge, 9.2% have a fair knowledge and 6.3% have a poor knowledge; more than half (57%) of the participants practiced a good level of preventive practices. 12.8% of the respondents had ever contracted a sexually transmitted infection, with gonorrhoea being the most prevalent accounting for 67.9% of all cases. It was also deduced that level of knowledge of respondents had no significant influence on level of preventive practices among respondents with p-value of 0.407. However, the level of knowledge had a significant influence on occurrence of STIs among respondents with p-value of 0.017.

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