Awareness and knowledge of Sexually Transmitted Infection (STI) among Nursing students in a tertiary institution in Anambra state

Abstract

Background

Sexually transmitted infections (STIs) are an umbrella term for a range of contagious diseases typically spread through intimate contact.More than one million cases of STIs occur every day across the globe, the majority of which remain symptomless. Sexually transmitted infections (STIs) are a major global health problem, with more than 340 million new cases occurring every year worldwide.

Method: This study determined levels of awareness and knowledge of Sexually Transmitted Infection (STI) among Nursing students in a tertiary institution in Anambra stateusingdescriptive cross-sectional study design. A simple random technique was used to select 209 undergraduates in a tertiary institution in Anambra state.

Results: The study revealed that202 (96.7%) are aware of sexually transmitted infections and majority of the respondents got STI information through their friends (95.7%) and Television station(91.9%).Very high percentage of the respondents 198 (94.7%),206 (98.6%), 193(92.3%) and 194 (93%)respondents know that STI affects both men and women, HIV/AIDs, Gonorrhea and Syphilis are STI respectively. However, a lower percentages of respondents 137 (65.6%),135 (65.6%) ,131 (62.7%),135 (65.6%)127 (60.8%), and 106 (50.7%) know that genital warts, Human papilloma Virus, Genital Herpes, Chlamydia and Trichomoniasis to be STIs respectively. Vaginal discharge and painful sextual intercourse were the most well-known signs and symptoms.

There is a need to increase sensitization of young people on sexually transmitted diseases and their complications to improve the knowledge of all prevalent sexually transmitted diseases.

Keywords: Sexually transmitted diseases; Nursing students, knowledge, Awareness, Anambra state.

Background to Study

Sexually transmitted infections (STIs) are an umbrella term for a range of contagious diseases typically spread through intimate contact. And it also includes any sort of physical contact with another person, including mother-to-child transmission from pregnancy and childbirth, blood product and tissue transfer (Petry *et al.,* 2019). STIs are caused by more than 30 pathogens, including bacteria, viruses, protozoa, and fungi. STIs can be recognized as curable and incurable. The common curable STIs are Gonorrhea, Syphilis, Chancroid, Chlamydia, Trichomoniasis and lymphogranuloma Donovan's (Rashida *et al.,* 2023). STIs are interrelated, meaning that getting one can heighten the chances of catching other infections, including HIV (Karamouzian*et al.,* 2017).

According to the World Health Organization, more than one million cases of STIs occur every day across the globe, the majority of which remain symptomless (Habu *et al.,* 2018). Sexually transmitted infections (STIs) are a major global health problem, with more than 340 million new cases occurring every year worldwide. In 2016, 376 million new infections were reported that included the following four STIs: trichomoniasis (156 million), Chlamydia (127.2 million), gonorrhea (86.9 million), and syphilis (6.3 million). In addition, >500 million subjects have been reported to have a genital infection by herpes simplex virus (HSV), and >290 million women with human papillomavirus (HPV) infection are estimated annually (Chrysa *et al.,* 2021). Young people are mostly at risk from STIs, although they represent only 25% of the sexually active population. According to the latest data, young people aged 15–24 years represent almost 50% of all newly acquired STIs worldwide (Slobodan, *et al.,* 2021). In the United State, there are estimated 15.3 million new cases of sexually

transmitted infections each year and 3 million of which occur in people between the ages of 13-19 and one out of four sexually active teenagers reported a sexually transmitted infection every year. Nearly two third (2/3) of all sexually transmitted infections occur in people younger than 25 years of age (Habu *et al.,* 2018).

In Africa, the high prevalence of HIV is connected to a high percentage of STIs that are untreated or inadequately treated. Africa currently accounts for 20–35% of the global burden of curable and non-curable STIs (Nzoputam*et al.,* 2022). Based on the study findings from southern Ethiopia, only 36% of school students had good awareness about the prevention of STIs. More than half (52.2%) of students had multiple sexual partners, where 11% had sexual intercourse with commercial sex workers. Similarly, in the study findings from Gondar and Bahir Dar city, 39% and 65.2% of school students had good awareness about the prevention of STIs, respectively (Yilkal&Mulusew, 2020). Treatments for HIV and other STIs are not readily available in sub-Saharan Africa and other resource-limited areas, where the prevalence of HIV and other STIs is high. In the absence of treatment and laboratory infrastructure to monitor treatment efficacy, increasing awareness of STIs and STIs screening are crucial components of STIs prevention programs (Meghana *et al.*, 2022).

In Nigeria, a recent study found that there is a high prevalence of STDs among students (Nzoputam et al 2022). More than half of the respondents (54.2%) had poor knowledge of symptoms of sexually transmitted infections. Only 13.9% were aware that sexually transmitted infections could be asymptomatic. The self-reported prevalence of symptomatic sexually transmitted infections was 36.5% (Adekemi et al, 2013).

Another study in Nigeria concluded that there was a gap in knowledge and preventive practices of STIs among young unmarried people (Oluwole et al 2020).

Untreated or poorly managed STIs could cause many complications including long term unfavorable clinical sequel to the individuals. Syphilis can increase the risk of acquiring HIV three-fold or more in all humans. Gonorrhea as well as Chlamydia trachomatis infection causes epididymitis resulting in infertility among males. In females, pelvic inflammatory disease, dyspareunia, infertility and chronic pelvic pain, which could upsurge the risk of ectopic pregnancies, abortions, stillbirths, perinatal and neonatal morbidities (Tshewang, Kinzang, & Ripa, 2023).

However, knowledge of other STIs is limited, this may be due to the widespread publicity accorded to HIV, neglecting other STIs which may predispose them to HIV (El-Duah, Harris & Appiah-Brempong, 2021). The assessment of STIs awareness among young adults is essential to develop effective strategies for STI protective measures. Increasing STIs awareness, as the most effective protective approach, could reduce the rate of people with STIs (Amirkhanzadeh& Cong, 2019). One of the most effective protective methods against STIs is the consistent and correct use of condoms during sexual activity. Another important protective measure against STIs is early detection and treatment. Screening for STIs among sexually active individuals is necessary and treating the infections before they cause long term health complications. There are several STI protection measures and they include: Abstinence, being faithful to a faithful partner, using condoms consistently and correctly, avoiding excessive use of alcohol or drugs, vaccination, early diagnosis and treatment (Nwabueze *et al.,* 2014).

More worrisome is the declining age of first sexual intercourse all over the world including Nigeria (Yaya and Bishwajit, 2018).Early exposure to sexual intercourse may likely lead to multiple sexual partners with its consequence of STIs(Rashida *et al.,* 2023). The increased incidence of these infections and their scourge posed a greater challenge on the healthcare system as they contribute to increase in the morbidity and mortality rate among youth, and exert a high physical and emotional toll on the afflicted individual as well as an economic burden on the individual, family, community and the health care system in general. (Habu *et al.,* 2018) Studies indicate that young university students, aged 18 to 29 years, are more vulnerable to STIs, considering the feeling of autonomy, rejection to follow rules, the beginning of sexual life, the variability of partners and the university scenario itself, which favors the appearance and consolidation of certain behaviors, especially those related to alcohol and drug consumption (Freitas, Eloi & Felix, 2022).

There is paucity of evidence on the level of knowledge of STI among young people in our context in spite of the gap in the knowledge found in previous study in Nigeria. This study tries to provide evidence on the level of knowledge of STIs including the protection methods among students of a tertiary institution in Anambra state.

Materials and Method

The study adopted a descriptive cross-sectional study design. A simple random technique was used to select 209 undergraduates in a tertiary institution in Anambra state.

Data was collected using a validated self-structured questionnaire with four (4) sections. Section A consist of 6 items and was based on the socio-demographic data of the respondents, section B consists of 6 items which was used to assess the student awareness of sexually transmitted infections, section C consists of 2 items and was used to divulge information on the students awareness on the health consequences of sexually transmitted infection, section D consists of 6 items and was used to ascertain the student awareness on the protection methods used against sexually transmitted infection. The questionnaires were administered through the use of online Google form. Data collected was analyzed using SPSS version 25.0. for Descriptive statistical techniques which include percentages, frequencies and presented in tables. Ethical approval was obtained from the Research ethics committee of the faculty of Health sciences and Technology, Nnamdi Azikiwe university,Nnewi campus, Nnewi. Verbal consent was also obtained from the students before the questionnaire google forms were sent out.We maintained confidentiality of all information provided and anonymity of the respondents were maintained.

.

Results

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Questions	Options	Frequency	Percentage (%)
Age	15-19 years	16	7.6
	20-24 years	149	71.3
	25-29 years	27	13
	30 years and above	17	8.1
Sex	Male	39	18.7
	Female	170	81.3
Religion	Christian	190	91
	Muslim	13	6.2
	Traditionalist	6	2.8
Ethnic group	Igbo	172	82.3
	Yoruba	24	11.5
	Hausa	13	6.2
Educational level	200	27	13
	300	50	24
	400	65	31
	500	67	32
Marital status	Single	165	79
	Married	42	20
	Divorced	2	1

Result from Table 1 above showed the socio-demographic characteristics of the respondents Out of the 209 respondents involved in this study, 15 (7.6%) of them were between the ages of 15-19, while 149 (71.3%) were between 20-24 years, 27 (13%) were between 25-29 years, 17 (8.1%) were between 30 years and above. Majority of the respondents 170 (81.3%) were female while 39 (18.7%) were males.

From the table also, the majority of the respondents 190 (91%) were Christian, while 13 (6.2%) were Muslim and 6 (2.8%) were traditionalist.

The table also showed the ethnic group of the respondents. Majority of the respondents 172 (82.3%) were Igbos, while 24 (11.5%) were Yorubas, and 13 (6.2%) were Hausas.

Also the table showed that majority of the respondents 67 (32%) were in 500 level, while 65 (31%) were in 400 level, 50 (24%) were in 300 level and 27 (13%) were in 200 level.

The table showed that the majority of the respondents 165 (79%) were single, while 42 (20%) were married and 2 (1%) were divorced.

Table 2 :Awareness of Sexually transmitted infections

Variable	Options	Frequency	Percentage (%)
Ever heard of STI	Yes	202	96.7
	No	7	3.3
Source of information	TV/radio	192	91.9
	Newspaper	97	46.4
	Public talks/seminar	173	82.8
	Billboard/posters	133	63.6
	Hospital/ health workers	137	65.6
	Teachers	185	88.5
	Friends	200	95.7
	Parents	117	56
	I read it on my own	129	61.7

Table 2 above showed the awareness of Nursing students on sexually transmitted infections. Majority of the respondents 202 (96.7%) are aware of sexually transmitted infections, while 7 (3.3%) are not aware of sexually transmitted infections (STIs).

The table also revealed that majority of the respondents had their source of information from Friends 200 (95.7%), while 192 (91.9%) had their source of information through TV/radio, while 185 (88.5%) had their source of information from their Teachers, 173 (82.8%) through public talks seminars, while 137 (65.6%) through hospital/ health workers, 133 (63.6%) through Billboard/posters, while 129 (61.7%) read it on their own, while 117 (56%) through their Parents, and 97 (46.4%) through the Newspaper

Table 3: Knowledge of Sexually Transmitted Infection

Variable	Options	Frequency	Percentage (%)
STI affects both sexes	Yes	198	94.7
	No	11	5.3
STI known you know	HIV/AIDS	206	98.6
	Sickle cell anaemia	15	7.2
	Gonorrhea	193	92.3
	Syphilis	194	93
	Typhoid	7	3.3
	Trichomoniasis	106	50.7
	Genital warts	137	65.6
	Pneumonia	8	3.8
	Human papilloma virus	135	64.6
	Chlamydia	127	60.8
	Malaria	2	1
	Genital herpes	131	62.7
	Diarrhea	4	2
Causes of STI	Bacteria	177	84.7
	Virus	201	96.2
	Bad hygiene	27	13
	Drinking unclean water	3	1.4
	Fungi	157	75
	Having sex during menses	41	19.6
	Protozoa	112	53.6
	Witchcraft	14	6.7
	Mosquito	7	3.3
How to contact STI	Needle and syringes	173	82.8
	Blood and blood products	195	93.3
	Sharing the same plate with an infection person	24	11.5
	Unprotected sexual intercourse	206	98.6
	Mother to child	186	89
	Sharing the same toilet with an infected person	35	16.7
	Exposure to cough of an infected person	42	20.1
	Kissing	67	32.1

Majority of the respondents 198 (94.7%) agreed that sexually transmitted infections affect both men and women, while 11 (5.3%) are of the opinion that sexually transmitted infections does not affect both men and women. The table also showed that majority of the respondents 206 (98.6%) are aware of the type of STIs to be HIV/AIDs, while 193(92.3%) are aware that gonorrhea is a type of STIs, while 194 (93%) opined syphilis, 137 (65.6%) choose genital warts, 135 (65.6%) choose human papilloma virus, while 131 (62.7%) choose Genital herpes, 127 (60.8%) state that Chlamydia is a type of STIs, while 106 (50.7%) choose Trichomoniasis, 15 (7.2%) choose Sickle cell anaemia, 8 (3.8%) choose Pneumonia, while 7 (3.3%) choose Typhoid, while 4 (2%) state that Diarrhea is a type of STIs, and 2 (1%) choose Malaria as a type of STIs.

From the results obtained, the majority of the respondents indicated that the cause of STIs is Virus 201 (96.2%), Bacteria 177 (84.7%), Fungi 157 (75%) and Protozoa 121 (53.6%). Others are of the opinion that the cause of STIs include bad hygiene 27 (13%), having sex during menses 41 (19.6%), witchcraft 14 (6.7%), Mosquito 7 (3.3%) and drinking unclean water 3 (1.4%).

Also from the table, majority of the respondents indicated that STIs can be contracted through unprotected sexual intercourse 206 (98.6%), while 195 (93.3%) believed that it can be contracted through blood and blood products, 173 (82.8%) believed that it can be contacted through needle and syringes, while 186 (89%) stated that it can be contracted through Mother to child, while others stated that through kissing 67 (32.1%), Exposure to cough of an infected person 42 (20.1%), sharing the same toilet with an infection person 35 (16.7%), sharing the same plate with an infected person 24 (11.5%) are means through STIs can be contracted.

Table 4: Knowledge of Clinical manifestations of Sexually transmitted infections

Questions	Options	Frequency	Percentage (%)
Signs & symptoms	Weight loss	153	73.2
	Burning pain while urinating	168	80.4
	Wound/sore in the genital area	165	79
	Body rash	74	35.4
	Frequent urination	110	52.6
	Anal discharge	81	38.8
	Penile discharge	156	74.6
	Lower abdominal pain	116	55.5
	Blood in urine	173	82.8
	Painful sexual intercourse	201	96.2
	Chest pain	24	11.5
	Painful, swollen testicles	131	62.7
	Vaginal discharge	197	94.3
Complications	Neonatal conjunctivitis	118	56.5
	Preterm labour	127	60.8
	Ectopic pregnancy	100	47.8
	Death	185	88.5
	Prostate cancer	100	47.8
	Still birth	122	58.4
	Miscarriage	185	88.5
	Cervical cancer	133	63.6
	Infertility	205	98.1
	Testicular cancer	119	56.9
	Impotence	200	95.7
	Unwanted pregnancy	19	9.1

Table 4 showed the awareness of Nursing students on the health consequences of sexually transmitted infections. Majority of the respondent 201 (96.2%) choose painful sexual intercourse as one of the signs and symptoms of STIs, while 197 (94.3%) stated that vaginal discharge, 173 (82.8%) stated that Blood in urine, while 168 (80.4%) stated that burning pain while urinating is one of the signs and symptoms of sexually transmitted infections, while 165 (79%) believed that wound/sore in the genital area is one of the signs and symptoms of STIs, while 156 (74.6%) stated that penile discharge, 153 (73.2%) stated that weight loss, 116 (55.5%) stated that lower abdominal pain, 131 (62.7%) stated that painful, swollen testicles, while 110 (52.6%) stated that frequent urination, while 81 (38.8%) stated that anal

discharge, 74 (35.4%) stated that body rash, and 24 (11.5%) stated that chest pain are signs and symptoms of sexually transmitted infections.

Also from the table 205 (98.1%) believed that infertility is one of the complications of STIs, while 200 (95.7%) believed that impotence to be a complication of STIs, while 185 (88.5%) stated death as a complication of STIs, 185 (88.5%) stated miscarriage as a complication of STIs, while 133 (63.6%) stated cervical cancer as a complication, 122 (58.4%) stated stillbirth as a complication of STIs, while 119 (56.9%) believed that testicular cancer is one of the complication of STIs, while 118 (56.5%) stated that neonatal conjunctivitis is a complication of STIs, 127 (60.8%) opined that preterm labour is a complication of STIs, while 100 (47.8%) opined that prostate cancer is one of the complications of STIs, while 100 (47.8%) agreed that ectopic pregnancy is a complication of STIs, and 19 (9.1%) are of the opinion that unwanted pregnancy is a complication of STIs.

Table 4: Knowledge of prognosis and Protective strategies for sexually transmitted infection

Questions	Options	Frequency	Percentage (%)
Prevention of STI	Yes	204	97.6
	No	5	2.4
Complete cure of STI	Yes	32	15.3
	No	177	84.7
Abstinence	Yes	209	100
	No	0	0
Use of condom	Yes	181	86.6
	No	28	13.4
Multiple sexual partners	Yes	185	88.5
	No	24	11.5
Use of herbs	Yes	38	18.2
	No	171	81.8

Table 4 showed that the majority of the respondent 204 (97.6%) believed that sexually transmitted infections can be prevented. Unfortunately, greater percentage of the respondents 177 (84.7%) indicated that sexually transmitted cannot be cured. The table also showed that all the respondent 209 (100%) indicated abstinence as a method to prevent sexually transmitted infections while a lower number 181 (86.6%) indicated that the use of condom during sexual activity can avoid contracting sexually transmitted infections. The table also revealed that 185 (88.5%) indicated that avoiding multiple sexual partners can help prevent contracting sexually transmitted infections. Interestingly, some respondents 38 (18.2%) indicated that they use herbs to prevent sexually transmitted infections.

Discussions

The findings revealed that the majority of the respondents 202 (96.7%) are aware of sexually transmitted infections, while 7 (3.3%) are not aware of sexually transmitted infections (STIs). Interestingly, findings from the study showed that the majority of the respondents are aware of STIs, which further reflects how education plays a crucial role in raising awareness about STIs. Also, the pervasive nature of information in this digital age might have contributed significantly to raising awareness. This conforms to the study carried out by Amu *et al.,* in 2015 on Awareness and Knowledge of Sexually Transmitted Infections among Secondary School Adolescents in Ado Ekiti, Southwestern Nigeria. The findings showed Four hundred and ninety-nine (92.4%) respondents had heard about sexually transmitted infections before. Our finding is also in line with another study in Nigeria that revealed 84.7% awareness of STIs among unmarried youths(Oluwole *et al*.,2020). The higher percentage seen in our study may be because our respondents are both married and unmarried.

The study also found that majority of the respondent 201 (96.2%) chose painful sexual intercourse as one of the signs and symptoms of STIs, while 197 (94.3%) stated that vaginal discharge, 173 (82.8%) stated that Blood in urine, while 168 (80.4%) stated that burning pain while urinating is one of the signs and symptoms of sexually transmitted infections, while 165 (79%) believed that wound/sore in the genital area is one of the signs and symptoms of STIs, while 156 (74.6%) stated that penile discharge, 153 (73.2%) stated that weight loss, 116 (55.5%) stated that lower abdominal pain, 131 (62.7%) stated that painful, swollen testicles, while 110 (52.6%) stated that frequent urination, while 81 (38.8%) stated that anal discharge, 74 (35.4%) stated that body rash, and 24 (11.5%) stated that chest pain are signs and symptoms of sexually transmitted infections. The findings from this study revealed that the respondents have understanding of the diverse arrays of signs and symptoms associated with STIs.This conforms carried out by Amu *et al.,* in 2015 on Awareness and Knowledge of Sexually Transmitted Infections among Secondary School Adolescents in Ado Ekiti, South Western Nigeria. The findings showed that the most important symptoms mentioned were weight loss (77.4%), painful micturition (68.9%), and genital ulcer (54.1%)

This study also revealed that not all respondents believe that sexual transmitted infections affect both gender. This somewhat worrisome as sexual transmitted infections are known to affect all gender (male and female) and believing that it is not for both gender is likely to create a negative attitude to prevention and control of STIs among young people.However STI's affect more women than men due to reproductive tract biology of women (Van Gerwen*et al*, 2022)

The findings show that some of the respondents do not know the disease conditions that are STIs despite their level of education and age range. This may be because some of the respondents are in the second year of their career and may not have been exposed to information. Notwithstanding, poor knowledge of diseases that constitute STIs is likely to promote exposure to the diseases considering that majority of the respondent are between the ages of 20 to 24years. This is quite contrary to the findings of Koray et al (2022) in Ghana where most of senior high school students demonstrated a good knowledge of STI's with their symptoms.

We also found that good number of respondents are not sure of how to contact STIs.While majority of the respondents knew that STIs will be contacted through unprotected sex, blood and blood products.some people believed that using one toilet and eating in the same plate can transmit STIs.This is a pointer to the level of stigmatization and discrimination experienced by people diagnosed with STIs.Previous study in Nigeria revealed that high level of health related stigmatization and discrimination among PLHIV in Nigeria(Adekoya et al., 2024).Also in a similar study in India, Al-gburi et al (2023) discovered that people had negative attitudes towards those infected with STI's making them to suffer social and institutional stigmatization.

We also found that all the respondent 209 (100%) indicated abstinence as a method to avoid contracting sexually transmitted infections. This study revealed that the majority of the respondent 204 (97.6%) believed that sexually transmitted infections can be prevented. This is in conformity with the study carried out by Habu *et al.,* in 2018 on the Awareness and Practice of prevention of Sexually Transmitted Infections among adolescents in Demonstration Secondary School, University Maiduguri, that found that the majority of the respondents (72.7%) agreed that STIs are preventable.

REFERENCES

Adam, F. (2020). Sexually transmitted infections (STIs): Types and symptoms. www.medicalnewstoday.com. https://www.medicalnewstoday.com/articles/sexually-transmitted-diseases#syphilis

Adekemi.S.O., Odukoya, O. O., Onajole, A. T., & Odeyemi, K. A. (2013). Sexually transmitted infections: prevalence, knowledge and treatment practices among female sex workers in a cosmopolitan city in Nigeria. *African journal of reproductive health*, *17*(1), 94–102.

Adekoya, P., Lannap, F., Ajonye, F., Amadiegwu, S., Okereke, I., Elochukwu, C., Aruku, C., Oluwaseyi, A., Kumolu, G., Ejeh, M., Olutola, A., & Magaji, D. (2024). Experiences of Stigmatization and Discrimination in Accessing Health Care Services Among People Living with HIV (PLHIV) in Akwa Ibom State, Nigeria. *HIV/AIDS - Research and Palliative Care*, *Volume 16*, 45–58. https://doi.org/10.2147/hiv.s447551.

Al-Gburi, G., Al-Shakarchi, A., Al-Dabagh, J. D., & Lami, F. (2023). Assessing knowledge, attitudes, and practices toward sexually transmitted infections among Baghdad undergraduate students for research-guided sexual health education. Frontiers in Public Health, 11. https://doi.org/10.3389/fpubh.2023.1017300

American academy of family physician (2019). Sexually Transmitted Infection Symptoms (STIs). Familydoctor.org. Retrived from https://familydoctor.org/condition/sexually-transmitted-infections-stis/amp/

Amirkhanzadeh, B.Z., &Cong, X. (2019). Knowledge of Sexually Transmitted Diseases Among College Students in the USA. *Journal of Client-Centered Nursing Care, 5*(2), pp. 73-80. https://doi.org/10.32598/JCCNC.5.2.73

Amu, E.O., &Adegun, P.T. (2015). Awareness and Knowledge of Sexually Transmitted Infections among Secondary School Adolescents in Ado Ekiti, South Western Nigeria.*Journal of Sexually Transmitted Diseases,* 2015, pp.1-7. https://doi.org/10.1155/2015/260126

Archibong, M. (2016). ScholarWorks Perceptions about Sexually Transmitted Diseases in AkwaIbom State of Nigeria: A Qualitative Study of Young Adults Age 18-24. https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=3620&context=dissertations

Boskey, E. (2021). Causes and Risk Factors of STDs. Verywell Health. https://www.verywellhealth.com/std-causes-3133097

Bridges, E., & Hauser, D. (2014). Sexuality Education.Advocates for Youth. https://www.advocatesforyouth.org/resources/fact-sheets/sexuality-education-2/

Buba, S.S., Haruna, H., Kaidal, A. (2021). Factors influences the Screening and Counseling on Sexually transmitted infections among Adults in Maiduguri Metropolis of Borno State, North-Eastern, Nigeria. Med Mycol Open Access.*7*(6:8).

Chiwa, M.D., Singh, V.V., Abubakar, M.I., & Abdalla, E.A.M. (2019). A Statistical Survey on Awareness and Knowledge of Sexually Transmitted infections (STIs) in North-eastern Nigeria. *Journal of Statistical and Econometric Methods.8*(2), pp.27-36.https://www.researchgate.net/publication/329944546

Chrysa, V., Maria, S. V., Effie, P., Fragiski, A. A., Panagiotis, S., Dimitrios, I. S., & Maria, A. (2021). Awareness, Knowledge and Risky Behaviors of Sexually Transmitted Diseases among Young People in Greece.*Int J Environ Res Public Health.* 2021 Oct; *18*(19): 10022. Published online 2021 Sep 23. doi: 10.3390/ijerph181910022

Chuang, B., Tsai, C.-H., Hsieh, H., &Tumurtulga, T. (2013). Applying health belief model to explore the adoption of telecare. International Conference on Interaction Sciences. https://www.semanticscholar.org/paper/Applying-health-belief-model-to-explore-the-of-Chuang-Tsai/4e871300f91bafa81deab555d374080bfdc97edf

Creswell, J.W., & Creswell, J.D. (2018). Research design: qualitative, quantitative, and mixed methods approaches. Sage publications.

Drago, F., Ciccarese, G., Zangrillo, F., Gasparini, G., Cognoro, L., Riva, S., Javor, S., Cozzani, E., Broccolo, F., Esposito, S., &Parodi, A. (2016). A Survey of Current Knowledge on Sexually Transmitted Diseases and Sexual Behaviour in Italian Adolescents. Intenational*Journal of Environmental Research and Public Health, 13*(4), 422. https://doi.org/10.3390/ijerph13040422

El-Duah, E., Harris, M.J., & Appiah-Brempong, E. (2021). Knowledge on Sexually Transmitted Infections among school-going Adolescent in the Sunyani west district of Ghana. Ghana J. Sci. *62* (2), 36 - 43. https://dx.doi.org/10.4314/gjs.v62i2.

Ezeala-Adikaibe, B., Nwatu, C., Young, E., Okafor, C., &Onwuekwe, I. (2017). Knowledge and practice of female secondary school students about HIV and sexually transmitted

infections in Enugu, South East Nigeria. *Nigerian Journal of Medicine,26*(1), 11.https://doi.org/10.4103/1115-2613.278826

Freitas, I.G., Eloi, H.M., Felix, A.M.S. (2022). Knowledge of nursing students about sexually transmitted infections. Rev baianaenferm. 2022;36:e43593.

Gambo A., Lawton, J.G., Mitchell, A.B., Abimiku, A.G., Tapdiyel, J., Bassey, O., Riedel, D.J., Swaminathan, M., Joy, C.C., Devos, J.R., Patel, H., Charurat, M.E., & Stafford, K.A. (2022). Prevalence of HIV drug resistance in Nigeria: results from a cross-sectional, population-based survey of Nigerian adults with unsuppressed viral load. *37*(2), 3333-339. https://doi.org/10.1097/qad.0000000000003413

Garcia, M. R., Leslie, S.W & Wray, A. A. (2021). Sexually Transmitted Infections.PubMed; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK560808/

Habu, H., Emmanuel, O.C., Inuwa, A., Dathini, H., Maigari, B., Lona, N., Haruna, A., &Alih, F.I. (2018). Awareness and Practice of Prevention of Sexually Transmitted Diseases Among Demonstration Secondary School Students, University of Maiduguri, Borno State. *Journal of Health Education Research & Development,06*(03). https://doi.org/10.4172/2380-5439.1000266

Jacqueline Drew (2022). How to calculate sample Size for a survey. https://www.tenato.com/market-research/what-is-the-ideal-sample-size-for-a-survey/

Karamouzian, M., Shahesmaeili, A., Khajehkazemi, R., Hooshyar, S.H., Fallahi, H., Haghdoost, A.A., &Sharifi, H. (2017). Awareness of and Knowledge About STIs Among Nonmedical Student in Iran. *International Perspectives on Sexual and Reproductive Health, 43*(1), pp.21-28. https://doi.org/10.1363/43e3217

Koray, M. H., Adomah-Afari, A., Punguyire, D., &Naawa, A. (2022). Knowledge of sexually transmitted infections among senior high school adolescents in the Wa Municipality of Ghana. Global Health Journal, 6(2), 95–101. https://doi.org/10.1016/j.glohj.2022.04.002

LaMorte, W. (2022). The Health Belief Model.Boston University School of Public Health. https://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html

Mahmud, T. (2020). Knowledge about Sexually Transmitted diseases among the students of selected Madrashas of Dhaka city. https://doi.org/10.1101/2020.06.20.20136515

Mayo Clinic. (2021). Sexually transmitted diseases (STDs) - Symptoms and causes.Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/sexually-transmitted-diseases-stds/symptoms-causes/syc-2035124

Meghana, V., Raja, N., Shannon, S., & Musie, G. (2022). Associations between Awareness of Sexually Transmitted Infections (STIs) and Prevalence of STIs among Sub-Saharan African Men and Women.*MDPI Open Access Journals. 7*(8), 147; https://doi.org/10.3390/tropicalmed7080147

Nagesh, T. S., & Akhilesh, A. (2017). Knowledge and attitude about sexually transmitted infections other than HIV among college students. *38*(1): 10–14. doi: 10.4103/2589-0557.196888

Nwabueze, S.A., Azuike, E.C., Ezenyeaku, C.A., Aniagboso, C.C., Azuike, E.D., Iloghalu, I.C., Ebulue, C.C., Epundu, U.U., &Nwone, O.F. (2014). Perception of Sexually Transmitted Infection-Preventive Measures among Senior Secondary School Students in Nnewi-North Local Government Area, Anambra State, Nigeria.*Open journal of preventive medicine. 04(*09), pp. 708-716. https://doi.org/10.4236/ojpm.2014.49080

Nzoputam, C., Adam, V.Y., &Nzoputam, O. (2022). Knowledge, Prevalence and Factors Associated with Sexually Transmitted Diseases among Female Students of a Fderal University in Southern Nigeria. Venerology, *1*(1), 81-97. https://doi.org/10.3390/venerology1010006

Ogunbamowo, W.B., Basirat, O.O. (2022). The place of Health Promotion and Education in Sexually Transmitted Infections Prevention among Young People in Nigeria.*Journal of Research and Contemporary Issues in Human kinetics and Health Education.*Pp. 254-263. https://www.researchgate.net/publication/361421560

Oluwole, E.O., Oyekanmi, O.D., Ogunyemi, D.O., &Osanyin, G.E. (2020). Knowledge, attitude and preventive practices of sexually transmitted infections among unmarried youths in an urban community in Lagos State, Nigeria.*African Journal of Primary Health Care & Family Medicine, 12*(1), pp. 1-7. https://doi.org/10.4102/phcfm.v12i1.2221

Petry, S., Padilha, M.I., Kuhnen, A.E., Meirelles, B.H.S. (2019). Knowledge of nursing students on the prevention of sexually transmitted infections. Rev Bras Enferm. 2019;*72*(5):1145-52. doi: http://dx.doi.org/10.1590/0034-7167-2017-0801

Rashida, B., Mostak, H., Rubina, K., Jannatun, N., Arifa, P., Anjoli, R.R., Mollika, R., Munnashi, B., Shahnaj, P. (2023). Nurses' Knowledge and Practice Regarding Sexually Transmitted

Diseases at 250 Bedded Bangamata Sheikh FazilatunnessaMujib General Hospital, Sirajganj, Bangladesh. DOI: 10.36348/sjnhc.2023.v06i11.005

Risk Factors of STDs. (2021). Family Care of Kent. https://www.familycareofkent.com/risk-factors-of-stds/

Samuel, G.K., &Kue, J.B. (2021). Knowledge of Sexually Transmitted Infection among Secondary School Students in Ogba/Egbema/Ndoni Local Government Area of Rivers State.*African Journal of Biology and Medical Research, 4(*3), pp.39-48. https://doi.org/10.52589/ajbmr-ohj9ueoe

Sexually Transmitted Diseases Awareness &Information(2023). Sexually Transmitted Diseases Awareness & Information. Jacksoncountyor.org. Retrieved from https://jacksoncountyor.org/hhs/Public-Health/CDC/STD-Awareness-Info#:~:text=Practice%20Abstinence%3A%20The%20most%20reliable

Silverberg, B., Moyers, A., Hinkle, T., Kessler, R., Russell, N.G. (2022). CDC Update: Treatment and Complications of Sexually Transmitted Infections (STIs). *Venerology* 1, 23-46, https://doi.org/10.3390/venerology1010004

Slobodan, S., Vladimir, V., Svetlana, D., Svetlana, R., Snezana, R., Danijela, R., Katarina, B., Jelena, A., Jelena, T.P., & Ivana, S.V. (2021). Differences Regarding Knowledge of Sexually Transmitted Infections, Sexual Habits, and Behavior Between University Students of Medical and Nonmedical Professions in Serbia. Volume *9* - 2021 | https://doi.org/10.3389/fpubh.2021.692461

Sobze, M.S., Tiota, A.T., Dongho, G.B.D., Tankui, G.A.F., Fokam, J., Tsi, K.-A., Fotso, J.R., Azeufack,Y.N., Nkamedjie, P.P., Sali, A.B.B., Mabvouna,R.B., Ercoli, L., Colizzi, V., & Russo, G. (2017). Youth Awareness on Sexually Transmitted Infections, HIV and AIDS in Secondary Schools in the DschangMuncipality (Cameroon): The Mobile Caravan Project. *Journal of Public Health in Africa,* *7*(2), 614.https://doi.org/10.4081/jphia.2016.614

Trochim, W.M. (2021). Simple Random Sampling. Research Methods Knowledge Base. Retrieved from https://conjointly.com/kb/simple-random-sampling/

Tshewang, N., Kinzang, Y., & Ripa, C. (2023). Knowledge and preventive practice on Sexually Transmitted Infections among first year students in Nursing Colleges of Bhutan. *Bhutan Health Journal.9*(1). https://doi.org/10.47811/bhj.151

Van Gerwen, O. T., Muzny, C. A., & Marrazzo, J. M. (2022). Sexually transmitted infections and female reproductive health. Nature microbiology, 7(8), 1116–1126. https://doi.org/10.1038/s41564-022-01177-x

World Health Organization (WHO). (2021). Sexually transmitted infections (STIs). https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis).

Yaya, S., & Bishwajit, G. (2018). Age at First Sexual Intercourse and Multiple Sexual Partnerships Among Women in Nigeria: A Cross-Sectional Analysis. *Frontiers in medicine*, *5*, 171. https://doi.org/10.3389/fmed.2018.00171

Yilkal, T. A., Mulusew, A. A. (2020). Prevention of Sexually Transmitted Infections and Associated Factors Among Night School Students in Bahir Dar City, Ethiopia. https://doi.org/10.1177/1178633720927374