

Original Research Article

HSI Journal (2021) Volume 2 (Issue 2): <https://doi.org/10.46829/hsijournal.2021.12.2.2.230-237>



Open
Access

Knowledge about sexually transmitted infections among sexual and reproductive health clinic attendants in Ghana

Sedinam AA Atupra¹, Titus Beyuo^{2*}, Emma R Lawrence³

¹ Department of Medicine, University of Ghana Medical School, College of Health Sciences, University of Ghana, Accra, Ghana; ² Department of Obstetrics & Gynaecology, University of Ghana Medical School, College of Health Sciences, University of Ghana, Accra, Ghana; ³ Department of Obstetrics & Gynecology, University of Michigan Medical School, Ann Arbor, Michigan, USA.

Received July 2021; Revised August 2021; Accepted October 2021

Abstract

Background: Prevention and treatment of sexually transmitted infections (STIs) are important to reduce associated morbidity and mortality. Awareness and knowledge about STIs promote healthy reproductive health behaviours.

Objective: This study assessed the knowledge about STIs and their prevention among sexual and reproductive health clinic attendants.

Methods: A survey was administered to attendants at two sexual and reproductive health clinics in Ghana. Questions included demographics, utilization of reproductive services, knowledge about STIs, and personal behaviours regarding STI prevention. An STI Knowledge Score was created by summing correct responses to thirty-three factual questions on STI transmission, prevention, and symptoms.

Results: Of 155 participants, 85.8% reported any knowledge about STIs, and 56.8% had been educated about STIs by healthcare providers at the sexual and reproductive health clinic. Initial education about STIs was most encountered at school (56.3%). Most participants correctly identified gonorrhoea (87.1%), syphilis (65.8%), and human immunodeficiency virus (94.8%) as STIs, however, less than half correctly identified chlamydia (46.5%) and hepatitis B (45.2%). Regarding knowledge of transmission, 93.5% knew that STIs are transmitted through unprotected intercourse, however, 36.1% incorrectly believed that STIs could be spread by sharing cups and spoons. The majority (90.2%) correctly identified condoms as a method of STI prevention. On a 33-point STI Knowledge Score, participants had a mean [\pm standard deviation (SD)] of 21 (\pm 1.2). overall, 21.2% of participants had "poor" knowledge, 50.4% had "satisfactory" knowledge and 28.4% had "excellent" knowledge. Overall, 79% of participants felt that they were prepared to share information about STIs with others. A higher level of knowledge was associated with a greater preparedness to share.

Conclusion: Attendants of sexual and reproductive health clinics have a high awareness about STIs, however important knowledge gaps exist. We highlight the importance of sexual and reproductive health clinics providing comprehensive STI counselling.

Keywords: Sexually transmitted infection, reproductive health, sexual health, Ghana

INTRODUCTION

Sexually transmitted infections (STIs) are a group of infections acquired primarily through sexual intercourse [1]. Transmission can also occur via infected blood and through mother to child transmission in utero, during delivery, or through breastfeeding. STIs can lead to a range of health consequences including pain, infertility, immunosuppression, and even death [1]. Risk factors for the acquisition of STIs include multiple sexual partners,

unprotected sexual intercourse, and age < 35 years [2]. Clinically relevant bacterial and viral STIs include chlamydia, gonorrhoea, syphilis, herpes simplex virus, human papillomavirus (HPV), human immunodeficiency virus (HIV), and hepatitis B. The first four STIs are curable with antibiotic treatment. Although the latter four are not curable, prompt diagnosis and treatment can mitigate symptoms and prevent long-term health sequelae [1,3]. Importantly, many STIs are initially asymptomatic or present with mild and nonspecific symptoms, which can delay treatment and lead to continued transmission [4]. Globally, the prevalence of STIs is increasing, with approximately one million new STIs every day. The World

* Corresponding author
Email: drbeyuo@gmail.com

Health Organization reports significant health impacts from STIs, including 300,000 yearly neonatal deaths secondary to syphilis, 530,000 yearly cases of cervical cancer due to HPV, and 1.7 million yearly new cases of HIV [1]. Rates of STIs are even higher in low and middle-income countries (LMIC) like Ghana [5–7]. In Sub-saharan Africa, STIs contribute to 17% of the overall burden of disease and are one of the leading causes of morbidity among reproductive-age women [8]. In Ghana, national rates of STIs have been estimated at 3.4% of the population with prevalence as high as 28% among symptomatic individuals [6,9]. The Ghana Ministry of Health (MOH) has a comprehensive policy on STI prevention and treatment, which includes sexual health education, public awareness campaigns, and focused screening and education across multiple levels of the healthcare system [10,11]. The MOH asserts that knowledge about the transmission, prevention, and health impacts of STIs plays an important role in reducing their prevalence [11]. In low-resource settings like Ghana, unique barriers to STI diagnosis and treatment include cultural norms, low health literacy, and prohibitive costs of STI screening and treatment [12,13].

Individual-level factors also play a role in barriers to STI diagnosis, with lower rates of testing among adolescents [12], unmarried or unemployed individuals [14], and those concerned about stigma from family members [15]. These systems-level and individual-level challenges can be conceptualized within the Health Belief Model, which predicts the uptake of health behaviours based on perceived risk, susceptibility and severity, benefits and benefits to action, self-efficacy, and cues to action. Knowledge of STIs is a key driver in determining individuals' perceived risk of acquiring STIs, susceptibility to STIs and severity of health impacts from STIs. In Ghana, sexual and reproductive health clinics, which provide education, screening, and treatment of STIs, are an important component of national health policy to combat these challenges [11]. However, little is known about the knowledge of STIs among the well-defined population of sexual and reproductive health clinic attendants in Ghana and other low-resource settings. This research addresses this gap by assessing the knowledge of STIs and their prevention among sexual and reproductive health clinic attendants in Ghana. A greater understanding of STI knowledge among sexual and reproductive health clinic attendants will inform public health campaigns to encourage clinic attendance and address gaps in acquired knowledge.

MATERIALS AND METHODS

Study design

This was a cross-sectional study, using a survey design. Data was collected between May 2020 and August 2020. Ethical clearance was granted by the Department of Community Health of the University of Ghana Medical School (#UGMS-CHDR/066/2020). Both clinic sites provided permission for the study to be conducted among clinic attendants at their clinic locations. Since this study

was conducted during the COVID-19 pandemic, the research assistants followed all clinic protocols for personal protective equipment and hand hygiene. Study recruitment and activities were performed at sexual and reproductive health clinics following participants clinic visits to limit additional travel for research purposes. Recruitment and study procedures were carried out by research assistants. Recruitment was performed at two separate sites, both of which were sexual and reproductive health clinics located in the Greater Accra Region of Ghana.

Study settings

The first site was the Accra branch of the Planned Parenthood Association of Ghana, located in the urban capital city of Ghana. This is the headquarters of the leading Non-Governmental Organization (NGO) providing sexual and reproductive health services in Ghana. The second site was the Shai-Osudoku District Hospital, in a peri-urban area two hours from central Accra. This is a government facility established in 1970, comprising seventeen departments including a sexual health centre. These two sites were selected to represent a diversity of public and private centres and urban and peri-urban locations.

Study procedures

Participants were defined as all people who attended the sexual and reproductive health clinic at the two selected sites during the study period. Participants were eligible for inclusion whether they were presenting to the clinic for the first time or presenting for a follow-up visit. The sample size was based on recruiting all eligible clinic attendants during the identified 3-month study period, rather than power calculations. Every clinic attendant was approached for enrollment. After written informed consent was obtained, structured questionnaires were completed by participants. Depending on the level of literacy and language preference, participants had the option to read and complete the questionnaire on their own in English or have the questions verbally administered in the language of their choosing. The questionnaires were written in English, an official language in Ghana. The questionnaire could be verbally administered in English, Twi, or Ga, depending on the preference of the participant. The questionnaire was developed by the researchers for this study, and pre-tested among a group of participants expected to be similar to the study participants.

The questionnaire was divided into four parts. The reliability of all items in the questionnaire was assessed by determining the Chronbach's Alpha which was 0.895. All questions were structured with categorical response options. The first part focused on demographics, with questions including age, gender, and level of education. The second section focused on the utilization of services at the sexual and reproductive health centre, including types of services received, satisfaction with services, and duration and frequency of services. The third part focused on knowledge about STIs, including sources of acquisition of knowledge. A series of factual true/false and multiple-choice questions were then asked about STI types,

symptoms, transmission, and prevention. Finally, the fourth part focused on personal behaviours regarding STI prevention.

Statistical analysis

Data were entered from paper data collection forms into excel, assessed for completeness and then uploaded into Statistical Package for Social Sciences (SPSS) version 24 for analysis. To describe demographics and care utilization variables, frequencies and percentages were used for categorical variables, and means and standard deviations were used for continuous variables. Correct responses to factual questions about STI knowledge were summed to create a 33-point STI Knowledge Score. A score less than 50% of correct responses (16 or fewer out of 33 possible points) was defined as “poor” knowledge, a score between 50% and 75% of correct responses (17 to 25 out of 33

possible points) was defined as “satisfactory knowledge” and a score greater than 75% of correct responses (26 or higher out of 33 possible points) was defined as “excellent” knowledge. Chi Square test was used to compare level of knowledge with perceived preparedness to educate others about STIs. Statistical significance was defined as $p < 0.05$, and all tests were two-tailed.

RESULTS

During the study period, there were 168 people eligible for inclusion and 155 (92%) agreed to participate. Of all participants, 95 (61.3%) were attendants at the Accra branch of the Planned Parenthood Association of Ghana and 60 (38.7%) were attendants at the Shai-Osudoku District Hospital. The majority were female ($n = 132$,

Table 1: Demographic characteristics of study participants

| Variable | Frequency (%) |
|------------------------|---------------|
| Sex | |
| Male | 23 (14.8%) |
| Female | 132 (85.2%) |
| Age (years) | |
| <15 | 1 (0.6%) |
| 15-20 | 17 (10.3%) |
| 21-25 | 42 (27.1%) |
| 26-30 | 37 (23.9%) |
| 31-35 | 32 (20.6%) |
| >35 | 26 (17.4%) |
| Marital status | |
| Single | 83 (53.5%) |
| Married | 65 (41.9%) |
| Divorced | 5 (3.2%) |
| Widowed | 2 (1.3%) |
| Religion | |
| Christain | 122 (78.8%) |
| Muslim | 32 (20.6%) |
| African traditional | 1 (0.6%) |
| Education level | |
| None | 15 (9.7%) |
| Primary | 15 (9.7%) |
| Junior high school | 45 (29.0%) |
| Secondary | 38 (24.5%) |
| Tertiary | 42 (27.1%) |
| Sexually active | |
| Yes | 143 (92.3%) |
| No | 12 (7.7%) |

Table 2: Utilization of Sexual and Reproductive Health Clinic Services

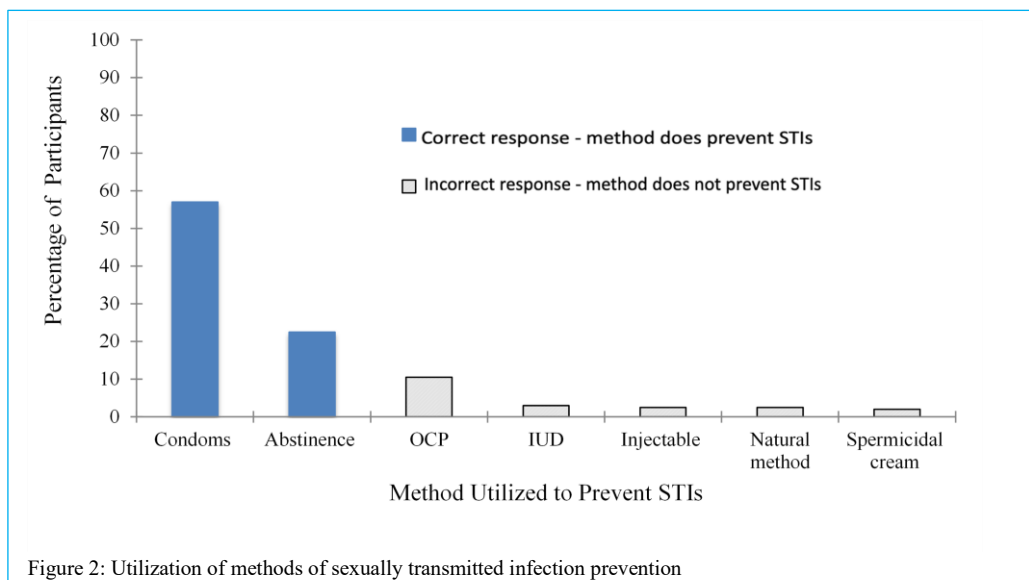
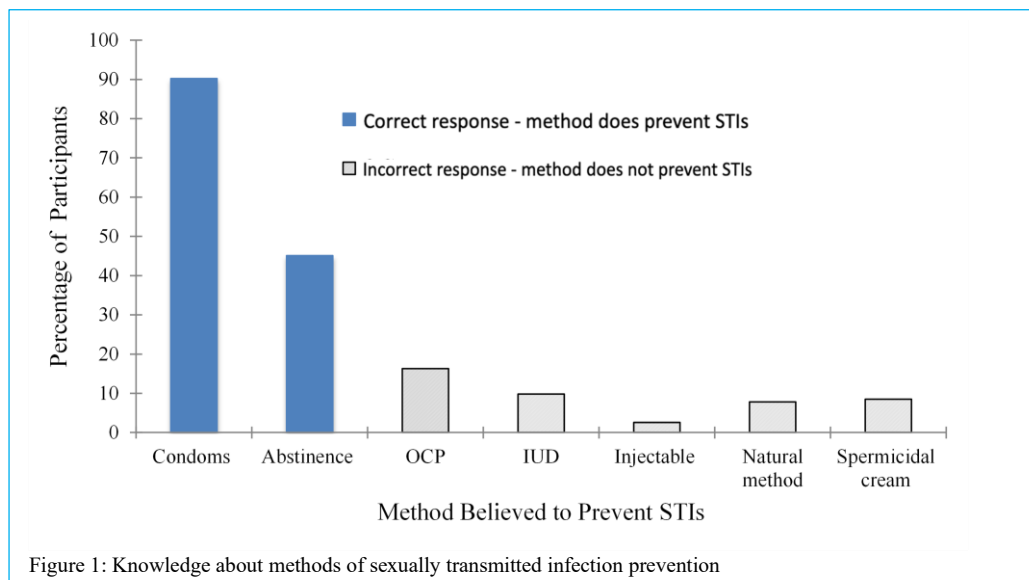
| Variable | Frequency (%) |
|-------------------------------------|------------------------|
| Type of service | |
| Family planning | 80 (51.6%) |
| Abortion care | 21 (13.5%) |
| STI counseling | 10 (6.5%) |
| HIV testing | 11 (7.1%) |
| STI treatment | 15 (9.7%) |
| Cervical cancer screening | 5 (3.7%) |
| Breast cancer screening | 3 (1.9%) |
| Other | 10 (6.5%) |
| Duration of utilization | |
| ≤ 6 months | 50 (32.7%) |
| > 6 months to 1 year | 34 (21.9%) |
| > 1 year to 3 years | 46 (29.7%) |
| > 3 years | 25 (15.7%) |
| Number of visits (mean ± SD) | |
| | 6 ± 3.4 (range 1 - 28) |
| Satisfied with services | |
| Yes | 149 (%) |
| No | 6 (%) |

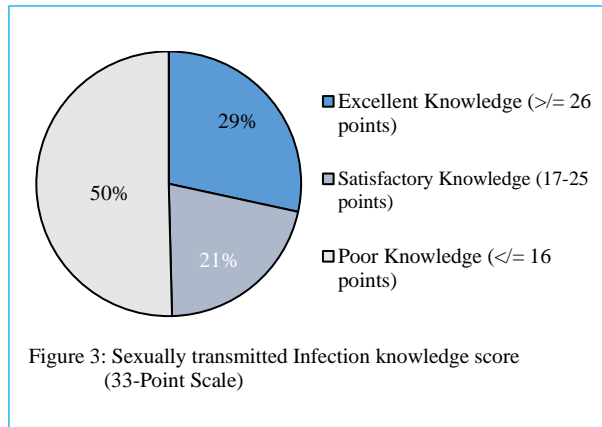
Table 3: Association between Preparedness to Share Knowledge with Others and Knowledge Level

| Knowledge level | Readiness to share knowledge (%) | | |
|-----------------|----------------------------------|------|----------------|
| | Yes | No | <i>p</i> value |
| Excellent | 77.3 | 22.7 | ≤ 0.001* |
| Satisfactory | 61.5 | 38.5 | |
| Poor | 18.2 | 81.8 | |

85.2%) and between the ages of 21 – 35 years ($n = 111$, 71.6%) (Table 1). Half of the participants ($n = 65$, 53.5%) were married and the vast majority ($n = 143$, 92.3%) were sexually active. There was a wide range of education levels represented, from no formal education ($n = 15$, 9.7%) to tertiary education ($n = 42$, 27.1%). Regarding utilization of sexual and reproductive health clinic services, most participants ($n = 80$, 51.6%) presented for family planning and contraception (Table 2). Visits specific to STIs included STI counseling ($n = 10$, 6.5%), HIV testing ($n = 11$, 7.1%), and STI treatment ($n = 15$, 9.7%). The duration of access to the clinic services ranged from less than six months ($n = 50$, 32.7%) to greater than three years ($n = 25$, 15.7%), with a mean frequency of clinic visits of $6 (\pm 3.4)$ and range of 1 – 28 visits. The majority of participants ($n = 133$, 85.8%) reported knowing STIs, and 56.8% ($n = 88$)

had been educated about STIs by healthcare providers at the sexual and reproductive health clinic. Initial education about STIs was most commonly encountered at school ($n = 87$, 56.3%), followed by the sexual and reproductive health clinic ($n = 32$, 20.8%) and electronic resources including the internet ($n = 11$, 7.4%) (Supplementary Data 1). Regarding knowledge about specific STIs, the majority of participants correctly identified gonorrhea ($n = 135$, 87.1%), syphilis ($n = 66$, 65.8%), and HIV ($n = 147$, 94.8%) as STIs (Supplementary Data 2). However, less than half correctly identified chlamydia ($n = 72$, 46.5%) and hepatitis B ($n = 70$, 45.2%) as STIs. When possible symptoms of STIs were listed, each correct symptom was selected by 52.9% ($n = 82$) to 74.2% ($n = 115$) of participants. Regarding knowledge of transmission, 93.5% ($n = 145$) correctly responded that STIs are transmitted through





unprotected intercourse, however, 36.1% ($n = 56$) incorrectly believed that STIs could be spread by sharing cups and spoons. The majority ($n = 140$, 90.2%) correctly identified condoms as a method of STI prevention, although only 45.1% ($n = 70$) correctly identified abstinence (Figure 3). A minority of participants incorrectly believed that other methods of contraception could prevent STI transmission, including oral contraceptive pills ($n = 25$, 16.3%) and intrauterine devices ($n = 15$, 9.8%). Personal strategies utilized to prevent STI transmission included condoms ($n = 88$, 57%) and abstinence ($n = 34$, 22.5%) (Figure 4). On a 33-point STI Knowledge Score, participants had a mean of 21 (± 1.2). Of all participants, 21.2% ($n = 32$) had “poor” knowledge, 50.4% ($n = 78$) had “satisfactory” knowledge and 28.4% ($n = 44$) had “excellent” knowledge (Figure 5). Overall, 79% ($n = 122$) of participants reported that they had the self-efficacy to share information about STIs with others. When comparing preparedness to share information across levels of knowledge, a higher level of knowledge was associated ($p < 0.001$) with a greater preparedness to share (Table 3). Of participants with “excellent” knowledge, 77.3% ($n = 34$ of 44 participants with excellent knowledge) felt prepared to share information with others, compared to just 18.2% ($n = 6$ of 32 participants with poor knowledge) among participants with “poor” knowledge.

DISCUSSION

We demonstrate that attendants of sexual and reproductive health clinics have a high awareness about STIs, however important knowledge gaps exist. This is consistent with other studies in LMIC which demonstrate high general awareness of STIs, but much lower levels of knowledge about modes of transmission, prevention, and associated symptoms [16–18]. Almost all participants in our study correctly identified HIV as an STI likely attributed to the awareness spread by organizations like the Ghana AIDS Commission. Since HIV has serious health consequences, this widespread knowledge about HIV should be viewed as an important success of public health education efforts. In contrast to knowledge about HIV, less than half of participants knew that chlamydia and hepatitis B were

STIs, despite chlamydia being the most prevalent curable STI with 127 million new infections in 2016 worldwide and an estimated 240 million people living with Hepatitis B worldwide [1]. This is consistent with a study in India demonstrating that 99% of students had heard about STIs, but only 64% had knowledge of STIs other than HIV [16], and a study in India demonstrating the highest awareness about HIV (78%) [17]. Most participants correctly knew that STIs were transmitted through unprotected sexual intercourse and having multiple sexual partners increases the risk of transmission. Despite the vast majority identifying condoms as a method to prevent STIs, only half report personally utilizing condoms. A similar disconnect between knowledge and utilization was also demonstrated in a South African study, which attributed these differences to uneven power dynamics in sexual relationships [19]. These findings can be conceptualized within the constructs of the Health Belief Model, which explains health behaviours based on risk susceptibility and severity, benefits and benefits to action, self-efficacy, and cues to action [20].

Despite knowledge about STI prevention, personal perception of risk susceptibility and severity may play a role in lower utilization rates. Importantly, some participants incorrectly believed their non-barrier contraceptive method protected them from STIs, including 11% of participants reporting using oral contraceptive pills. Oral contraceptive pills are a common method of contraception, with 151 million women utilizing them worldwide [21]. Users of non-barriers methods need to understand that they are not protected against STI transmission. Regarding overall STI knowledge, although 86% of our participants reported having some knowledge about STIs, only 28% demonstrated excellent knowledge based on factual questions. The level of overall knowledge was also assessed in a study of Nigerian adolescents in secondary school, with only 6.9% demonstrating good knowledge [17].

Higher STI knowledge has been associated with older age and higher education levels [22]. Thus, in our study, the older age of participants and subgroup of participants with tertiary education likely explains our higher demonstrated level of knowledge. Further, we targeted a population receiving care at reproductive health clinics, who presumably are more educated about STIs compared to the general population. Similar to our findings, studies from India [16], Nigeria [17], and Northern Ghana [23], report that school, the internet, and the media are all major sources of knowledge about STIs. Importantly, a study of adolescents in the Northern Region of Ghana demonstrated that most adolescents relied primarily on their peers for information on reproductive health [23]. Particularly among adolescents, school-based curriculum and peer outreach programs have been effective in increasing the utilization of STI services [24]. Of note, the majority of existing studies on STIs in LMIC are among school-based reproductive age-based samples, rather than a facility-level sample, like in our study. Sexual and reproductive health

clinics offer a focused environment for education on STIs. Underutilization of these clinics in low-resource settings has been attributed to concerns about privacy and confidentiality, stigma, and negative attitudes of staff members especially toward unmarried patients [25,26]. In addition, challenges to access include long travel times and the perceived or actual cost of services [25,27]. Consistent with the Health Belief Model, the high perceived severity of STIs has been shown to increase the utilization of sexual health services, while high perceived barriers have decreased the utilization of sexual health services [28]. Even after individuals can access care, challenges to comprehensive education provided by these clinics include low health literacy of attendants and limitations in time and resources. Although all participants in our study had just received clinical services at the sexual and reproductive health clinic, only 57% had been educated about STIs at the clinic. Since more than half of participants had presented for reasons other than STI screening or treatment, including contraception care, this highlights the importance of integrating STI education into all reproductive health services.

This study contributes to the literature by evaluating the levels of knowledge about STIs, and specific gaps in knowledge, among sexual and reproductive health clinic attendants in an LMIC. The study was conducted at the sexual and reproductive health clinics, following clinical encounters, to ensure logistic simplicity for participants. Due to the study being carried out at the clinics, there is a potential for participants to feel pressured to respond positively about the clinic and their perceived knowledge. This possibility was minimized by an informed consent process, ensuring confidentiality, and the research team being separate from the clinical team. Verbal translation of questions into local languages was used to allow the inclusion of non-literate and non-English speaking participants. However, only participants with English literacy had the option to self-administer the questionnaire. Two centres, a government-funded peri-urban clinic and an NGO urban clinic, were selected to promote the diversity of participants.

All participants were grouped for analysis, which may have resulted in clinic-specific differences being missed. However, no rural locations were included in this study, where education and health literacy is often the lowest. Thus, findings may not be generalizable to populations that are not in urban areas or populations outside of Ghana. Since recruitment was completed during the COVID-19 pandemic, clinic attendance was less than expected. This potential limitation was addressed by extending the study period to meet recruitment targets. Finally, this study did not include a group of participants who had never received services from a sexual and reproductive health clinic. Additional research is needed to evaluate whether STI knowledge is greater among attendants of sexual and reproductive health clinics, compared to the general population. Findings from this descriptive study can be used to inform a larger study that evaluates socio-

demographic predictors of STI knowledge, including sex and gender, among attendants of sexual and reproductive health clinics.

Conclusion

Prevention and treatment of STIs, and their associated morbidity and mortality, are an integral part of reproductive health care. Awareness and knowledge about STIs promote healthy reproductive health behaviours, including prevention of transmission, routine screening, identification of symptoms, and prompt treatment before complications develop. We demonstrate that among attendants of sexual and reproductive health clinics in Ghana, general awareness about STIs is high, however, key knowledge gaps persist. Thus, in low-resource settings like Ghana, sexual and reproductive health clinics are important sources of STI knowledge. However, these sexual and reproductive health clinics must continue to improve their comprehensive STI education to address important gaps in knowledge that persist after counselling.

DECLARATIONS

Ethical considerations

Ethical approval was granted by the Department of Community Health of the University of Ghana Medical School (#UGMS-CHDRC/066/2020). Informed consent was obtained from all participants. Both clinic sites provided permission for the study to be conducted among clinic attendants at their clinic locations.

Consent to publish

All authors agreed to the content of the final paper.

Funding

None

Competing Interests

No potential conflict of interest was reported by the authors.

Author contributions

The study idea was conceptualized, and the protocol was developed by TB and SAA. Data collection was carried out by SAA with oversight from TB. Manuscript preparation was performed by EL. Statistical analysis was performed by TB in collaboration with EL. All authors edited and approved the final manuscript.

Acknowledgements

Our acknowledgement goes to all project staff for their support in the production of this manuscript.

Availability of data

Data is available upon request to the corresponding author.

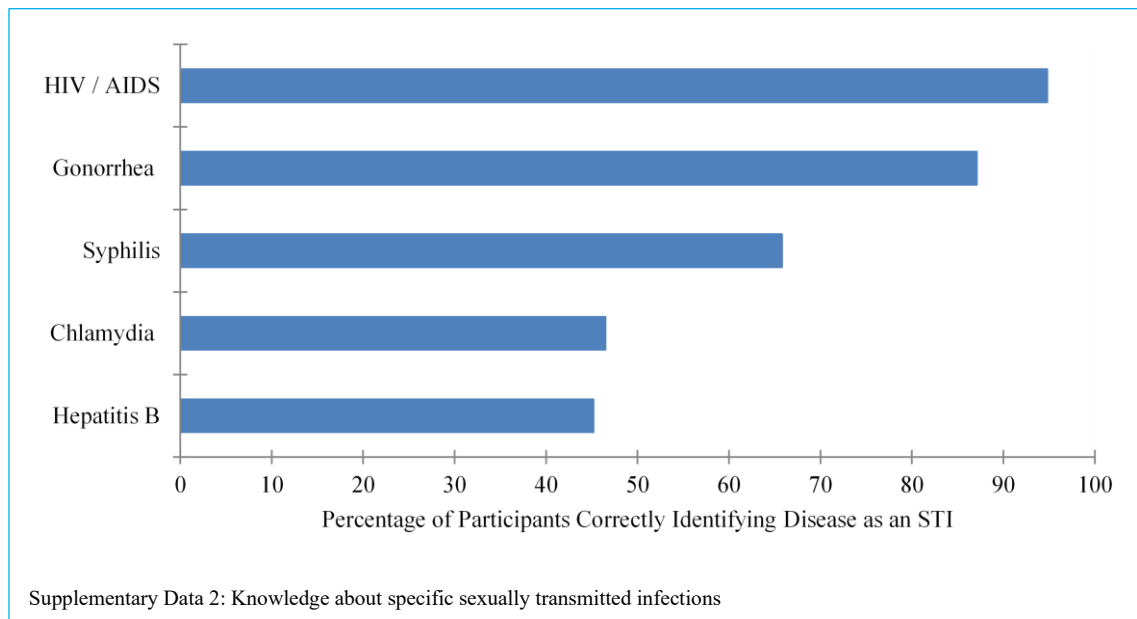
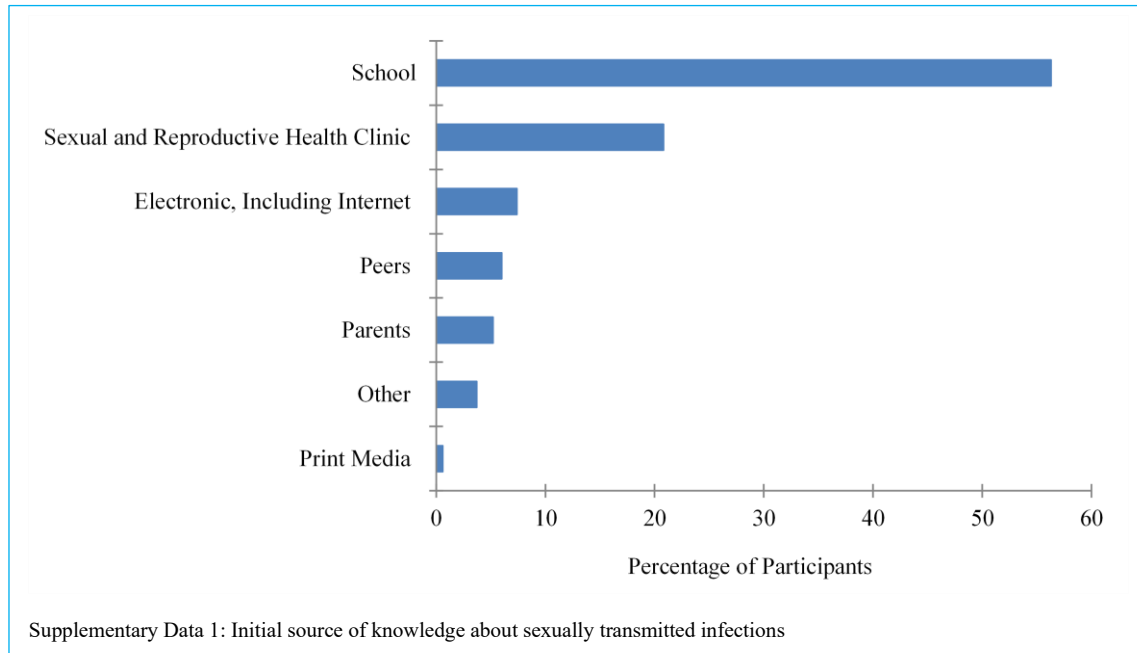
REFERENCES

1. WHO Sexually transmitted infections (STIs). https://www.who.int/health-topics/sexually-transmitted-infections#tab=tab_1. Accessed 9 Oct 2021

2. Nayyar C, Chander R, Gupta P, Sherwal BL (2015) Evaluation of risk factors in patients attending STI clinic in a tertiary care hospital in North India. *Indian J Sex Transm Dis* 36:48–52 . <https://doi.org/10.4103/0253-7184.156715>
3. Wagenlehner FME, Brockmeyer NH, Discher T, Friese K, Wichelhaus TA (2016) Klinik, Diagnostik und Therapie sexuell übertragbarer Infektionen. *Dtsch Arztebl Int* 113:11–22 . <https://doi.org/10.3238/arztebl.2016.0011>
4. Al Sharqi A, Thompson C, Clutterbuck DJ (2006) How many sexually transmitted infections (STIs) will we miss? An algorithm to assess risk factors for STI. *Int J STD AIDS* 17:558–559 . <https://doi.org/10.1258/095646206778145532>
5. Kularatne RS, Niit R, Rowley J, Kufa-Chakezha T, Peters RPH, Taylor MM, Johnson LF, Korenromp EL (2018) Adult gonorrhea, chlamydia and syphilis prevalence, incidence, treatment and syndromic case reporting in South Africa: Estimates using the Spectrum-STI model, 1990–2017. *PLoS One* 13:e0205863 . <https://doi.org/10.1371/journal.pone.0205863>
6. Dela H, Attram N, Behene E, Kumordjie S, Addo KK, Nyarko EO, Kyei NNA, Carroll JNA, Kwakye C, Duplessis CA, Adams N, Garges E, Letizia AG (2019) Risk factors associated with gonorrhea and chlamydia transmission in selected health facilities in Ghana. *BMC Infect Dis* 19:425 . <https://doi.org/10.1186/s12879-019-4035-y>
7. Davey DLJ, Shull HI, Billings JD, Wang D, Adachi K, Klausner JD (2016) Prevalence of curable sexually transmitted infections in pregnant women in low- and middle-income countries from 2010 to 2015: A systematic review. *Sex Transm Dis* 43:450–458 . <https://doi.org/10.1097/OLQ.0000000000000460>
8. Ali Abdulai M, Baiden F, Afari-Asiedu S, Gyabaa-Febril L, Adjei KK, Mahama E, Tawiah-Agyemang C, Newton SK, Asante KP, Owusu-Agyei S (2017) The Risk of Sexually Transmitted Infection and Its Influence on Condom Use among Pregnant Women in the Kintampo North Municipality of Ghana. *J Sex Transm Dis* 2017:1–12 . <https://doi.org/10.1155/2017/8642685>
9. Odonkor ST, Nonvignon J, Adu J, Okyere M, Mahami T (2012) Sexually Transmitted Diseases (STDS) Among Adolescents In Second Cycle Institutions In Accra , Ghana : Trends In Sexual Behaviors. *Int J Recent Trends Sci Technol* 3:9–17
10. Ford J V., Barnes R, Rompalo A, Hook EW (2013) Sexual health training and education in the U.S. *Public Health Rep* 128:96–101 . <https://doi.org/10.1177/0033549131282s111>
11. Ghana AIDS Commission (2013) National HIV and AIDS, STI policy. In: NACP report, 2014. http://www.ghanaisds.gov.gh/gac1/pubs/Ghana_National_HIV_and_AIDS_STI_Policy.pdf
12. Newton-Levinson A, Leichter JS, Chandra-Mouli V (2016) Sexually Transmitted Infection Services for Adolescents and Youth in Low- and Middle-Income Countries: Perceived and Experienced Barriers to Accessing Care. *J. Adolesc. Heal.* 59:7–16
13. Mayaud P, Mabey D (2004) Approaches to the control of sexually transmitted infections in developing countries: Old problems and modern challenges. *Sex. Transm. Infect.* 80:174–182
14. Martin K, Olaru ID, Buwu N, Bandason T, Marks M, Dauya E, Muzangwa J, Mabey D, Dziva Chikwari C, Francis SC, Tembo M, Mavodza C, Simms V, Mackworth-Young CRS, Machiha A, Kranzer K, Ferrand RA (2021) Uptake of and factors associated with testing for sexually transmitted infections in community-based settings among youth in Zimbabwe: a mixed-methods study. *Lancet Child Adolesc Heal* 5:122–132 . [https://doi.org/10.1016/S2352-4642\(20\)30335-7](https://doi.org/10.1016/S2352-4642(20)30335-7)
15. Avuvika E, Masese LN, Wanje G, Wanyonyi J, Nyaribo B, Omoni G, Baghazal A, McClelland RS (2017) Barriers and facilitators of screening for sexually transmitted infections in adolescent girls and young women in Mombasa, Kenya: A qualitative study. *PLoS One* 12:e0169388 . <https://doi.org/10.1371/journal.pone.0169388>
16. Subbarao NT, Akhilesh A (2017) Knowledge and attitude about sexually transmitted infections other than HIV among college students. *Indian J Sex Transm Dis* 38:10–14 . <https://doi.org/10.4103/0253-7184.196888>
17. Amu EO, Adegun PT (2015) Awareness and Knowledge of Sexually Transmitted Infections among Secondary School Adolescents in Ado Ekiti, South Western Nigeria. *J Sex Transm Dis* 2015:1–7 . <https://doi.org/10.1155/2015/260126>
18. Bankole A, Biddlecom A, Guiella G, Singh S, Zulu E (2007) Sexual behavior, knowledge and information sources of very young adolescents in four sub-Saharan African countries. *Afr J Reprod Health* 11:28–43 . <https://doi.org/10.2307/25549730>
19. Mack N, Wong C, McKenna K, Lemons A, Odhiambo J, Agot K (2015) Human resource challenges to integrating HIV pre-exposure prophylaxis (PrEP) into the public health system in Kenya: A qualitative study. *Afr J Reprod Health* 19:54–62 . <https://doi.org/10.4314/ajrh.v19i1>
20. Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K, Weaver J (2015) The Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation. *Health Commun* 30:566–576 . <https://doi.org/10.1080/10410236.2013.873363>
21. United Nations (2019) Contraceptive Use by Method 2019. In: *Contracept. Use by Method* 2019. <https://www.un-ilibrary.org/content/books/9789210046527>. Accessed 9 Oct 2021
22. Adegun PT, Solomon O a, Adegoke S a, Ade-Ojo IP, Fape MO (2013) Knowledge of sexually transmitted Infections among patients attending outpatient clinics at University Teaching Hospital, Ado-Ekiti, Nigeria. *J Public Heal Epidemiol* 5:110–114 . <https://doi.org/10.5897/JPHE11.117>
23. Kyilleh JM, Tabong PTN, Konlaan BB (2018) Adolescents' reproductive health knowledge, choices and factors affecting reproductive health choices: A qualitative study in the West Gonja District in Northern region, Ghana. *BMC Int Health Hum Rights* 18:6 . <https://doi.org/10.1186/s12914-018-0147-5>
24. Aninanya GA, Debpuur CY, Awine T, Williams JE, Hodgson A, Howard N (2015) Effects of an adolescent sexual and reproductive health intervention on health service usage by young people in northern Ghana: A community-randomised trial. *PLoS One* 10:e0125267 . <https://doi.org/10.1371/journal.pone.0125267>
25. Abraham G, Yitbarek K, Morankar SN (2019) Determinants of adolescents reproductive health service utilization in Ethiopia: a systematic review of quantitative evidence. *Adolesc Health Med Ther* Volume 10:49–58 . <https://doi.org/10.2147/ahmt.s193219>
26. Pandey PL, Seale H, Razee H (2019) Exploring the factors impacting on access and acceptance of sexual and reproductive health services provided by adolescent-friendly health services in Nepal. *PLoS One* 14:e0220855. <https://doi.org/10.1371/journal.pone.0220855>
27. Ogundele OJ, Pavlova M, Groot W (2018) Examining trends in inequality in the use of reproductive health care services in Ghana and Nigeria. *BMC Pregnancy Childbirth* 18:492 . <https://doi.org/10.1186/s12884-018-2102-9>
28. Gebreyesus H, Teweldemedhin M, Mamo A (2019) Determinants of reproductive health services utilization among rural female adolescents in Asgede-Tsimbla district Northern Ethiopia: A community based cross-sectional study. *Reprod Health*. <https://doi.org/10.1186/s12978-019-0664-2>

Thank you for publishing with





Thank you for publishing with

