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A CROSS-SECTIONAL STUDY OF KNOWLEDGE AND PRACTICES RELATED TO SEXUAL AND REPRODUCTIVE HEALTH AMONG ADOLESCENTS IN 'UNRESTRICTED ENVIRONMENTS' IN GHANA: A POLICY IMPLEMENTATION CONTEXT VIEW

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ABSTRACT

Background: Sexual and reproductive health (SRH) is key to the growth and development of adolescents. Inadequate information exposes adolescents to some challenges. This becomes more pronounced as they move from restricted unrestricted environments such as pertains universities where there is virtually no control. It is importantto assess their knowledge of issues related to adolescent sexual and reproductive health (ASRH) needs and how that knowledge influences their sexual practices. ***Objective:*** To assess the knowledge and practice of adolescents in public universities across Ghana on their SRH needs. ***Study Participants:*** 672 adolescents from the three selected public institutions who met the inclusion criteria and consented to the study. ***Study Setting:*** The Study Setting was the University of Professional Studies Accra (UPSA); Kwame Nkrumah University of Science and Technology (KNUST), Kumasi; and the University for Development Studies (UDS) in Tamale, all in Ghana. ***Study Design:*** A cross-sectional study of adolescents in public universities across Ghana. ***Results:*** The study found that over 80% of university respondentshad high knowledge of ASRH issues. However, more than two-thirds (67%) of the respondents indicated that they had no knowledge that sexually transmitted infections (STIs) could be transmitted through unprotected sex. Regarding their sexual practices, the study found that 70% of the respondents were sexually active however, the prevalence of contraceptive use among them was extremely low (7%). ***Conclusion:*** A high level of knowledge on SRH issues among a large proportion of sexually active adolescents does not correspond to levels of practising safe sex making themsusceptible to STIsand unplanned pregnancies. Knowledge was thus disproportionally associated with safe sexual practices among adolescents in the unrestricted environments surveyed. Implementing behavioural change interventions through sexual education and improved access to ASRH services could improve the situation. These findings are thus relevant for SRH policy reforms and implementation programmes.

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INTRODUCTION

Globally, adolescents face numerous challenges in meeting their sexual and reproductive health needs [1, 2]. This is because adolescents are often exposed to various forms of SRH risks. UNICEF [3] has indicated that concerns about adolescent reproductive health have risen owing to increasing incidences of early unplanned pregnancies and high rates of STIs, especially among young people in low and middle-income countries (LMICs) [4]. In spite of these concerns, there is still low uptake of contraceptives among adolescents living in LMICs, including Ghana. Less than a quarter (21%) of married adolescents use modern contraceptive methods, while 67% of married adolescent women who want to avoid pregnancy for at least the next two years do not use any method of contraception [5] (World YWCA, 2014). In Ghana, research conducted by Esantsi et al. [6] in 2015 on adolescents in slums - unrestricted environments with virtually no parental control and low levels of education - revealed that about 32% of the males and 34% of

the femaleshad hadsexual intercourse at some time in their lives. The findings further revealed that the respondent adolescents knew about contraceptives; however, only 46% of the males and 49% of the females used contraception to prevent pregnancy at their first sexual encounter. 52% of the males and 51% of the females used contraceptives to prevent pregnancy at their last sexual intercourse. The same study also found evidence of perceptions of negative healthcare provider attitudes and adolescent practices that show a poor knowledge-practice gap. Therefore, it could be intuitively assumed that in unrestricted environments, adolescents could lose their sense of control and discretion in decision-making. A report from the Alan Guttmacher Institute 7] found that young people are at risk or already struggling with the consequences of unplanned pregnancies or STIs, including HIV/AIDS. The report suggestsstakeholders putting in measures to minimize the ASRH risks and secure a healthy future for adolescents by identifying ASRH needs and utilizing SRH services. The challenges associated with reproductive health service utilization in Ghana propelled the government to take steps to facilitate access to reproductive health services (RHS). These steps manifested in drafting the Ghana Family Planning Costed Implementation Plan (GFPCIP) in 2015. The GFPCIP aimed to increase the utilization of modern contraceptive prevalence to 30% among married females and 40% among unmarried but sexually active females in Ghana by 2020. However, the aim of the GFPCIP has not yet been fully realized because the subject matter of SRH is usually not discussed at home due to social, cultural, and religious reasons [8].

Hence, a poor SRH knowledge-practice gap subsists among adolescents. Although substantial research work has been done on ASRH, there seems to be a wrong intuitive assumption that adolescent students at the tertiary level of education are more mature. Although there are some opportunities to meet counsellors on ASRH issues, adolescents in such unrestricted environments do not utilise such services, worsening the knowledge-practice gapsince these institutions have no frameworks compared to the previous restrictive environments. The ARH policy of Ghana focuses on four categories of beneficiaries. These include in-school adolescents, out-of-school adolescents, special groups, and secondary groups. The in-school adolescents are adolescents and young people in primary, junior,and senior high schools, training institutions, and tertiary institutions [9]. The policy identifies that, as a socialising agent, the school is to provide an avenue for learning new skills and acquiring values, including those on SRH [9]. It, however, does not give guidelines on its implementation, nor is thereany ASRH programme running in public universities to support the policy. Again, Ghana's policy is not explicit on the SRH needs of adolescents in unrestricted environments, thereby leaving the policy planning and implementation gap that this paper seeks to address.

METHODS

Study setting and design: Ghana is a West African country situated on the coast of the Gulf of Guinea. It shares borders with Burkina Faso to the northwest and north, Togo to the east, and La Côte d'Ivoire to the west. The economy of Ghana is a mixture of private and public enterprises, mainly categorized as the services sector, agricultural sector, and manufacturing sector. Ghana's educational system is considered one of the best developed in West Africa.The university environment is less restricted or unrestricted as far as the adolescent-parent relationship is concerned.As of 2017, there were ninepublic universities. The study focused on a public university in each of the three ecological zones of Ghana, namelythe southern, middle, and northern belts. A cross-sectional study using a structured questionnaire was conducted among adolescent university students.Respondents were within the age range of 16 to 19 and were studyingin the three selected public universities.

Sample Size and Sampling Technique: Based on the Yamane 1969 sample size estimation formulae, a sample size of 672 was ideal, out of a sampling frame of an estimated 2529 adolescent students for all three universities. There was no way of independently verifying the adolescent figures given by the respective registries of the three universities. The selection of one public university from each of the three ecological zones of Ghana was based purely on the convenience sampling approach. The total sample size was proportionately distributed among the three selected study sites based on their adolescent student population, thus: UDS - 195; KNUST – 331, and UPSA – 146. Only adolescents who consented to enroll in the study were included.

Study Variables, Data Collection, and analysis: Demographic variables of interest in the study included the age, sex, name of the university, and current level or year of enrolment of respondents. The categories of the variables were compared to the ASRH knowledge and practices among adolescents. Knowledge refers to the information and skills adolescents have acquired on ASRH through experience and education. This was measured using twelve statements of facts and information on ASRH. Respondents were required to indicate 'Yes' or 'No' to those statements. Practice refers to the respondent's actual application or use of facts, information, ideas, or belief on SRH. This was measured using a seven-statement test on the application or use of facts, information, ideas, or belief on SRH, requiring respondents to indicate the relevant practices on SRH that is applicable to them. Data collected for the study was from primary sources. To wit, structured questionnaires on knowledge and practices of ASRH needs were administered to adolescent respondents who were students in the three selected public universities. The questionnaires were self-administered to ensure accurate data collection and to enhance the validity and reliability of the research instruments and, consequently, the findings.

Data Management and Analysis: The data obtained was edited, entered into the R statistical software, and cleaned for analysis. Descriptive statistics were run and presented in tables to show the distribution and trend of knowledge and practices of respondents on their SRH needs. Bivariate analyses were also done. Variables such as male and female were cross-tabulated to assess relationships between knowledge and practice-related variables using Pearson Chi-square at a 95% confidence interval and 5% significance level.

Ethical Considerations: Ethical approval was sought from Committee on Human Research Publication and Ethics, College of Health Sciences, KNUST, Kumasi; Directorate of Research and Consultancy, UPSA; and Regional Health Directorate, Ghana Health Service (GHS), Tamale, in the case of the UDS students since the students use the GHS health facilities. The ethical guidelines for interviewing adolescents who are minors are provided for under the approval given by the respective institutions. During the data collection stage, each participant signed an informed consent, indicating their willingness to participate in the research. Ethical dilemmas concerning interviewing adolescents on SRH issues remain an existential challenge confronting many researchers [10].

RESULTS

Socio-demographic Background of Respondents: All study respondents were undergraduate students aged from 16 to 19 years. They were selected from the three public universities in Ghana. From Table 1, about 40% of the respondents were 19 years, 29% were 18, and less than 20% were aged 17 and 16. Males were slightly more than females, and about half of the respondents were from KNUST. Most of the students (87.6%) were in their first year of tertiary study, with the remaining being in their second year at the university. Respondents were mostly Christians (57.9%), about a third (29%) were Muslim, and the remaining 13% believed in African Traditional Religion (ATR). The respondents were mostly of the broad Akan ethnolinguistic background (50.3%), with other ethnic groups constituting 49.7%. This ethnic mix could be surmised by the fact that most respondents were students of KNUST from the middle belt ecological zone, which suggests that students choose universities to close to their homes for ease of accommodation.

Table 1. Demographic characteristics of respondents

Characteristic	Frequency n=672	Percentage (%)	Characteristic	Frequency n=672	Percentage (%)
The age group of respondents			Religious affiliation		
16 years	90	13.4	Christianity	389	57.9
17 years	112	16.7	Islam	195	29.0
18 years	196	29.2	ATR	88	13.1
19 years	274	40.8	Total	672	100.0
Total	672	100.0	Ethnicity of respondents		
Gender of respondents			Akan	338	50.3
Male	338	50.3	Ga/Dangme	134	19.9
Female	334	49.7	Ewe	112	16.7
Total	672	100.0	Guan	58	8.6
Respondent's university			Mole-Dagbani	30	4.5
UPSA	14	21.7	Total	672	100.0
KNUST	331	49.3	Current level in school		
UDS	195	29.0	100	589(87.6)	87.6
Total	540	100.0	200	83(12.4)	12.4
			Total	672(100.0)	100.0

Table 2. Knowledge of Adolescents on SRH

Knowledge	Total	Yes	NO	DON'T KNOW
Heard of contraceptives/condoms	n=672	546	28	98
	(100.0%)	81.4	4.2	14.6
Contraceptives, including condoms used to prevent pregnancy and sexually transmitted infections	n=672	538	56	78
	(100.0%)	80.1	8.3	11.6
Getting sexually transmitted infections because of witchcraft or other supernatural means	n=672	84	537	51
	(100.0%)	12.5	79.9	76
Getting infected with sexually transmitted infections by having unprotected sex	n=	447	448	77
	(%)	21.9	66.7	11.5
A woman can get pregnant when she has sexual intercourse during her ovulation (period)	n=	319	245	108
	(%)	47.5	36.5	16.1
Important to treat sexual partners or a person diagnosed with an STI	n=	622	0	50
	(%)	92.6	0.0	7.4
Girls enter puberty earlier than boys	n=	250	116	306
	(%)	37,2	17.3	45.5
Lack of proper hygiene during menstruation can lead to infection	n=	474	0	198
	(%)	70.5	0.0	29.5
An adolescent can abstain from sex and still perform well in school	n=	500	62	110
	(%)	74.4	9.2	16.4
Condoms can protect against pregnancy and STIs	n=	538	56	78
	(%)	80.1	8.3	11.6
Reproductive health need(s)	n=	175	425	72
	(%)	26.0	63.2	10.7
Number of sexual partners	n=	368	114	190
	(%)	54.8	17,0	28.3

Table 3. Practice of Adolescents on SRH

Practice	Frequency	Percent (%)
Always seek assistance/counselling/care for your reproductive health needs		
Yes	300	44.6
No	372	55,4
Reproductive health needs for which respondents mostly seek assistance/counselling/care		
Sexual desire	48	17,5
Menstruation	152	55.5
Relationship	74	27.0
Have a boy/girlfriend		
Yes	478	71.1
No	197	28.9
Had sex before		
Yes	468	69.4
No	204	30.4
Use of any form of contraception		
Yes	406	60.4
No	49	7.3
Don't know	217	32.3
Sought counselingservice on your reproductive health needs whilst on campus		
Yes	500	74
No	172	25.6
Discuss your reproductive health needs with your parents/guardians		
Yes	608	90.5
No	64	9.5
Discuss your reproductive health needs with other friends		
Yes	267	39.7
No	205	30.5
Don't know	200	29.8

Knowledge related to Sexual and Reproductive Health Needs of Adolescents: The majority (81.4%) had heard of contraceptives such as condoms, and 80.1% knew that condoms could be used to prevent pregnancy and STIs. The results showed that about 80% of the respondents knew that the myth that one could get STIs through witchcraft and supernatural means was not true. However, more than two-thirds (66.7%) of the respondents did not know that STIs are transmitted through unprotected sex. Although a majority of the respondents indicated that STIs are not transmitted through unprotected sex, the overwhelming majority (92.6%) knew that it was important to treat a person diagnosed with any STIs. Further, only 37.2% of the respondents knew that girls start puberty earlier than boys. More than half do not know a woman could get pregnant during ovulation. 16.1% indicated" Don't No" to the question of a woman getting pregnant during her ovulation and (36.5%) indicated "No". On the other hand, 70.5% were aware that lack of or poor hygiene during menstruation could lead to infections. The results indicate that almost two-thirds (63.2%) of the respondents have SRH needs, with about 11% not knowing if they have any SRH needs.

concerning issues about their menstruation, implying that most of the adolescents who sought counselling were female. This was followed by 27% who sought counselling on romantic relationships, while the remaining 17.5% sought counselling on their sexual desires. Regarding their active sexual practices, 71.1% of respondents had either a boyfriend or a girlfriend and had had sex before (69.6%), with only 7.3% having ever used some form of contraception. Although the majority of the adolescents were sexually active, the majority (74.4%) had not sought SRH counselling or assistance while they were in the unrestricted environment. Regarding discussions on SRH needs with third parties, a little over 90% indicated that they discussed their SRH needs with parents/guardians, and almost 40% said they discussed their SRH needs with friends. From table 4, knowledge of reproductive health showed a $p< 0.05$, implying a high statistical significance. Of the male and female respondents, the latter was a little more informed than the former. The following three answer categories returned p values greater than 0.05, namely, 1) getting infected with sexually transmitted infections by having

Table 4. Bivariate analysis of sex and Adolescent knowledge on SRH

Knowledge	sex		Pearson chi square	P-value
	Male N =338	Female N =334		
	N (%)	N (%)		
Heard of contraceptives/condoms	284 (84.0)	262 (78.4)	4.169	0.124
Contraceptives including condoms used to prevent pregnancy and sexually transmitted infections	278 (82.2)	260 (77.8)	79.179	0.000*
Getting sexually transmitted infections because of witchcraft or other supernatural means	28 (3.8)	56 (16.8)	11.119	0.004*
Getting infected with sexually transmitted infections by having unprotected sex	70 (20.7)	77 (23.1)	5.141	0.077
A woman can get pregnant when she has sexual intercourse during her ovulation (period)	134 (39.6)	185 (55.4)	23.864	0.000*
Important to treat sexual partners or a person diagnosed with an STI	288 (85.2)	334 (100)	53.38	0.000*
Girls enter puberty earlier than boys	118 (34.8)	132 (39.5)	83.535	0.000*
Lack of proper hygiene during menstruation can lead to infection	140 (41.4)	334 (100)	277.387	0.000*
An adolescent can abstain from sex and still perform well in school	244 (72.2)	256 (76.6)	3.462	0.177
Condoms can protect against pregnancy and STIs	278 (82.2)	260 (77.8)	79.197	0.000*
Reproductive health needs	88(26)	87(26)	0.003	0.998
Number of sexual partners				
One	88(26)	102(30.5)		
More than one	206(60.9)	162(48.5)	12.199	0.002*

*Statistical significance at 5%

Table 5. Bivariate analysis of sex and respondent practice of SRH

Practice	sex		Pearson chi square	P-value
	Male N = 338	Female N =334		
	N (%)	N (%)		
Always seek assistance/counselling/care for your reproductive health needs	56 (16.6)	244 (44.6)	216.894	0.000*
Reproductive health needs for which you mostly seek assistance/counselling/ care				
Sexual desire	16 (53.3)	32 (13.1)	48.177	0.000*
Menstruation	0 (0)	152 (62.3)		
Relationship	14 (46.7)	60 (24.6)		
Have a boy/girlfriend	282 (83.4)	196 (58.7)	50.111	0.000*
Had sex before	218 (64.5)	250 (74.9)	8.517	0.004*
use of any form of contraception				
None	208 (61.5)	198 (59.3)	2.001	0.368
Once	102 (30.2)	115 (34.4)		
More than once	28 (8.3)	28 (8.3)		
Sought counselling services on reproductive health needs whilst on campus	264 (78.1)	236 (70.7)	4.893	0.027*
discuss reproductive health needs with parents/guardians				
Never	138(40.8)	67 (20.1)	34.373	0.000*
Sometimes	88 (26)	112 (33.5)		
Always	112 (33.1)	155 (46.4)		
discuss reproductive health needs with other friends				
Sometimes	24 (7.1)	40 (12)	4.634	0.031*
Always	314 (92.9)	294 (88)		

*Statistical significance at 0.05 or less

Practices related to Sexual and Reproductive Health Needs of Adolescents: The SRH practices among respondents were assessed using seven questions that focused on seeking counselling. The results showed that 55.4% of adolescents in unrestricted environments did not seek counselling for SRH needs, while 44.6% sought counselling. 55.5% of the adolescents who sought counselling, did so

unprotected sex; 2) an adolescent can abstain from sex and still perform well in school; and 3) ever heard of contraceptives such as condoms. All three measures imply that no effect was observed. Regarding respondents' practices on SRH, all indicators of SRH practice except the use of any form of contraception had a statistically significant relationship, that is, $p< 0.05$. as seen in Table 5.

DISCUSSIONS

In Ghana, adolescents from the basic level of education to the senior high school level are mostly under the control and direct supervision of parents/guardians at home and teachers in the schools. It is, therefore, presumed that such adolescents will get the needed guidance from parents and teachers regarding their SRH needs. However, when these adolescents move to the university or tertiary institutions, guidance and control become less restricted. They are left to make decisions regarding their SRH needs with little to no knowledge. The study's findings pointed out that most respondent adolescents in unrestricted environments in Ghana have basic knowledge of SRH needs. This finding is consistent with a similar study conducted among college students in Ethiopia, where Ayalew et al. [11] found that about 60% of their study respondents were knowledgeable about SRH. Contrary to the high level of knowledge among adolescents, girls in Bangladesh were found to have less than satisfactory knowledge of SRH [12]. The level of knowledge among adolescents could be attributed to different factors. In this instant study, the level of adolescents' knowledge of SRH needs was high, which may be attributed to their level of education. The adolescents who participated in the study were university students; as such, they had more opportunities for learning or reading about SRH. Even though the study by Zakaria et al. [12] showed that adolescents' knowledgeof SRH was less than satisfactory, further analysis revealed that older adolescent girls who were Science students in higher secondary grades had high levels of knowledge of SRH. Such students were found to haveread about or watched SRH issues within the media space.

It is important to highlight that although adolescents' knowledge of SRH is high, most of the adolescents indicated they were unaware that STIs were transmitted through unprotected sex and that a woman could get pregnant during ovulation. This is an important risk factor as STIs are major adolescent health threats. For instance, it is reported that adolescent girls and young women account for at least one-third of 357 million curable STI cases occurring each year globally [13, 14]. STIs have long-term reproductive health consequences related to fertility [15, 16], pregnancy outcomes [15], and cervical cancer [16]. It is, therefore, important to focus on interventions that address STIs in adolescent health issues. Per the findings of the instant study, educating adolescents comprehensively about STIs has become imperative. The instant study shows that more than half of the adolescents in unrestricted environments had sexual partners and were sexually active (64.5% of male and 74.9% of female respondents). Similarly, in Uganda, 70% of young adults were found to have ever had sex, with about two-thirds being sexually active, having had sex in the last 12 months [17]. The percentages found in Ghana in the instant study and that of Uganda are higher than what Ndongmo et al. [18] found in Zambia among adolescents living with HIV. The Zambian study found that 40% of this population was in a sexual relationship. What is alarming among the sexually active adolescents in the instant study is the low prevalence of contraceptive use. This current study found that only 7% of the adolescents reported using any form of contraceptives, although almost 70% of them reported having had sex before. In the Ugandan study, close to two-thirds of women (58%) reported being sexually active, and one-third of men (32%) had not used condoms the last time they had sex [17].

The low prevalence of contraceptive use among sexually active adolescentspresents a fertile ground for the transmission of STIs and the occurrence of unplanned pregnancies. Studies have found several socio-economic factors that create vulnerability for adolescents in contracting STIs [19]. The challenges include difficulty in accessing contraception and safe abortion and risks of co-occurring STI [20]. On the other hand, a study in the United States presents a positive result on the prevalence of contraceptive use among adolescents. That study, among high school girls in Oregon revealed that 93.9% of student respondents reported at least one form of contraceptive use in their last intercourse [21], thereby reducing the chances of STI transmissions and the occurrence of unplanned pregnancies.

Only a few of the adolescents indicated that they have SRH needs, and a majority do not also seek counselling for SRH needs. This could be explained from two main angles; either the adolescent is unaware of the SRH services available, or the services are not provided in a conducive environment. It was, however, found that the overwhelming majority discuss their SRH needs with their parents/guardians. The American finding is consistent with the Zambian finding by Ndongmo et al. [18], which revealed that about 55% of the adolescents living with HIV discussed and took advice from parents/guardians on SRH issues. In addition, 61% of the adolescent girls in the aforementioned study in Bangladesh by Zakaria et al. [18] felt at ease discussing SRH issues with their mothers and relatives. Adolescents discussing SRH needs with parents/guardians have been found to correlate with the adolescents' level of knowledge on SRH. For instance, an aforementioned reference found in Ethiopia that students who discussed SRH issues with parents were 3.35 times more likely to be knowledgeable about SRH than those who did not [7]. The instant study was modelled on a similar concept by Boateng et al. [22] conducted in Ghana in 2013 among HIV-positive mothers at three study sites, but this time, all in the middle belt ecological zone. That study found that a mother's knowledge and understanding of the prevention of mother-to-child transmission could influence their adherence to antiretroviral therapy (ART) treatment programmes. That study, therefore, recommended that educational interventions were necessary to develop positive behaviour andenhance adherence to ART.

The literature provides ample evidence that adolescent SRH needs have been well-researched. However, most studies conducted were not conceptualized around unrestricted environments such as a university setting. The instant study is thus significant at least in the Ghanaian environment as it attempts to analyse SRH needs of adolescents within the context of unrestricted environments. It was quite surprising that adolescents at the university level of education had less knowledge of the relationship between STItransmission and unprotected sex. Only 20.7% of male respondents and 23.1% of female respondents knew that they could get infected with STIs by having unprotected sex, as seen in Table 4. This has implications for the management of STIs among tertiary education students since many of the adolescents may have had their first sexual encounter when they entered unrestricted environments. Further, many of the respondents in this instant study revealed they did not know a woman could get pregnant during ovulation (39.6% of male and 55.4% of female respondents knew). This implies that adolescents in unrestricted university environments risk getting pregnant or impregnating someone while unprepared for the consequences of pregnancy. This has implications for continuing their studies and all stakeholders' investments in their education.Therefore, the need for interventions to educate adolescents on STIs,the transmission of STIs, and their concomitant effects, and updating the Ministry of Health's policy on SRH to cater toadolescents' needs in unrestricted environments cannot be overemphasized.

Strengths and limitations: This study cuts across Ghana's three ecological zones, transcending different geographical, socio-cultural, and economic settings. These three zones surveyed show a fair representation of Ghana, suggesting clearly that the findings could be fairly representative of adolescent SRH needs in unrestricted environments in Ghana. However, due to funding and time limitations, only one public university was selected from each ecological zone, and adolescents in private and other tertiary institutions were excluded. That notwithstanding, covering the three ecological zones of Ghana has important policy implications since the survey settings are microcosms of Ghana's different socio-cultural, economic, and geo-political melting pots. In recent years public universities in Ghana have made conscious efforts to ensure gender equity in enrolment and to bring in students from all backgrounds with moderate fees determined by the Parliament of Ghana. This makes public universities more equal places where adolescents from all walks of life converge and connect on multiple levels from their adolescence and form lifelong bonds and partnerships.

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Conflict of Interest: The authors have no conflict of interest.

Authors' contributions: MGE and PA-B conceived and conceptualized the research. MGE led the implementation of the study, while PA-B and EAK provided supervisory roles from the beginning till the end of the research. MGE wrote the first draft. MJK supported the data collection and analysis. All authors reviewed and agreed on the manuscript before submission for publication.

CONCLUSION

There is a wide knowledge-practice gap between knowledge and the use of contraceptives and counselling services among adolescents in unrestricted environments. Adolescents in unrestricted environments are sexually active but have sub-optimal knowledge of the relationship between unprotected sex and transmission of STIs, predisposition to STIs including HIV, and unplanned pregnancies. The current situation makes adolescents in unrestricted environments more vulnerable to STI infections, including HIV, and unplanned pregnancies. This will no doubt have implications for unmarried adolescents' overall health and studies and the spread of STIs, including HIV. This paper is useful for policymakers in informing and designing safety and prevention interventions to improve the current adolescent sexual and reproductive health policy for educational institutions in Ghana.

Strengths and Limitations of Study: The onset of the Coronavirus Disease 2019 (COVID-19) pandemic made data collection challenging as the universities were closed but the researcher overcame this by using social media platforms to reach respondents.

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