

Do demographic characteristics matter in the acquisition of sexual health knowledge among female adolescents with visual impairment in Ghana? A mixed-method study

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Abstract

Objective

For every young female adolescent, sexual health knowledge remains one of her greatest assets in navigating the many challenges that sexually related issues present; however, sexual health knowledge acquisition becomes an arduous task, especially with female adolescents who are visually impaired. The theory of gender and power (Connell, 1987) was used to investigate sexual health knowledge among female adolescents with visual impairment and the influence of demographic characteristics. Using an embedded mixed-methods design, the study selected five inclusive Senior High Schools (SHSs), where 71 female adolescents with visual impairment (FAVI) participated in the quantitative component; however, 14 were purposively selected for the qualitative component.

Results

The study revealed that the participants demonstrated a below-average level of sexual health knowledge, with 41 (58%) scoring below the expected level. Furthermore, the study showed that participants' understanding of sexual health was largely limited to sexual intercourse, with little appreciation of its broader dimensions, such as sexual rights, reproductive health, disease prevention, consent, and healthy relationships. Finally, the demographic characteristics, namely, age and religious background, influenced the sexual health knowledge of FAVI; however, the grade of participants and the degree of impairment did not influence the sexual health knowledge of FAVI.

Background

Female adolescents constitute a substantial proportion of the global population. The United Nations Population Fund (UNFPA) reports that approximately 1.2 billion adolescents worldwide are between the ages of 10 and 19, with females accounting for about half of this population [1,2]. Africa has one of the world's youngest populations, with adolescents constituting a significant share of its population. The United Nations Economic Commission for Africa (UNECA) estimates that approximately 23% of the continent's population comprises young people aged 10–19 years, nearly half of whom are female [3,4]. Similarly, adolescents constitute a considerable proportion of Ghana's population. According to the Ghana Statistical Service (GSS), adolescents aged 10–19 years account for over 22% of the country's population, with females representing approximately half of this age group [5].

Adolescence is a critical developmental stage characterised by profound physical, emotional, psychological, and cognitive changes. During this period, adolescents encounter numerous challenges that may adversely affect their health and overall well-being. These challenges include adolescent pregnancy, gender-based violence, limited access to quality education, early and forced marriage, and sexual and reproductive health concerns [6,7,8]. In addition, academic demands, social relationships, and family expectations often contribute to elevated stress levels among female adolescents [8].

Among these challenges, sexual health remains one of the most critical issues confronting female adolescents [9]. As they navigate the physical and emotional changes associated with puberty, many adolescent girls lack access to comprehensive and accurate sexual health education, making them vulnerable to misinformation and misconceptions [10]. Consequently, they may engage in risky sexual behaviours, such as unprotected sexual intercourse, thereby increasing their risk of sexually transmitted infections (STIs) and unintended pregnancies. Furthermore, sociocultural norms and taboos surrounding discussions of sexuality often discourage open communication about sexual health and limit adolescents' access to appropriate information and support [11]. The persistent stigma associated with female sexuality further constrains young women from seeking information and advocating for their sexual and reproductive health needs.

These sexual health challenges are even more pronounced among adolescents with disabilities, particularly those with visual impairment. Visual impairment affects millions of people worldwide, including a substantial number of children and adolescents. The World Health Organisation estimates that approximately 1.4 million children under the age of 15 are blind [12]. In Ghana, although persons with visual impairment constitute a relatively small proportion of the population, they remain an important and vulnerable group requiring targeted health interventions. The Ghana Statistical Service [5] reports that thousands of Ghanaians live with visual impairment, including many adolescents.

Female adolescents with visual impairment face multiple barriers that heighten their vulnerability to poor sexual health outcomes. These include increased exposure to sexual abuse, limited access to accessible sexual health information, inadequate sexual health education, and insufficient disability-inclusive sexual and reproductive health policies and services [13]. [13], further observed that although adolescents actively engage in sexual relationships, many possess inadequate knowledge of sexual and reproductive health. This knowledge deficit has significant physical, psychological, educational, social, and economic consequences. Moreover, visual impairment may increase susceptibility to sexual exploitation because perpetrators often perceive these adolescents as less capable of recognising, resisting, or reporting abuse [13]. Despite these vulnerabilities, relatively little research has specifically examined the sexual health of female adolescents with visual impairment. This limited evidence constrains the development of effective interventions and policies and may undermine progress towards achieving the Sustainable Development Goals (SDGs), particularly the commitment to leave no one behind.

Sexual health knowledge is fundamental to enabling individuals to make informed and responsible decisions regarding their sexual and reproductive health [14, 15]. Comprehensive sexual health knowledge encompasses an understanding of the physical, emotional, psychological, and social dimensions of sexuality and equips individuals to develop healthy relationships based on dignity and mutual respect. It also provides essential information on contraception, STI prevention, and the avoidance of unintended pregnancies, thereby promoting safer sexual practices [16]. Furthermore, adequate sexual health knowledge helps dispel myths and misconceptions, reduces stigma surrounding sexuality, and empowers individuals to recognise and report sexual abuse and exploitation.

Consequently, improving sexual health knowledge contributes significantly to overall health and well-being.

Adequate sexual health knowledge also influences individuals' perceptions of their susceptibility to sexually transmitted infections, including HIV/AIDS, syphilis, gonorrhoea, and other reproductive tract infections, as well as their understanding of the potential health consequences of these conditions [17, 18]. In recognition of this, the Ghana AIDS Commission has prioritised sexual and reproductive health within national health policy by supporting sexual and reproductive health services that provide education, STI screening, and treatment. Nevertheless, despite these policy efforts, there remains limited empirical evidence on the level of sexual health knowledge among female adolescents with visual impairment in Ghana. This knowledge gap highlights the need for research to generate evidence that can inform inclusive sexual health education programmes, policies, and interventions tailored to the unique needs of this vulnerable population.

Theoretical underpinning of the study (Theory of gender and power, Connell, 1987)

The theory of gender and power was developed by an Australian sociopsychologist, Raewyn Connell, to address the affective nature of relationships [19]. This theory emphasises that 'gender' is a social system, not simply a question of personal identity. The theory investigates the causes of sexual inequity, as well as gender and power imbalances, and has been extended to a variety of sexual and reproductive health spheres, including sexually transmitted infections prevention, gender inequality in women's health, and sexuality and education [20, 21]. In this study, we theorised whether female adolescents with visual impairment have no say in their choice or decision about sexual health. Are female adolescents with visual impairment vulnerable because of their condition or impairment? Sexual inequality: could it be the case that female adolescents do not have the power to decide their sexual preference? These issues interest the researchers, as the theory could serve as a basis for advancing the argument.

Research Question

Based on the research objective, the study is guided by the following research questions

1. What is the level of sexual knowledge among female adolescents with visual impairment?
2. To what extent do demographic characteristics influence sexual health knowledge among female adolescents with visual impairment?

Materials and Methods

Research Design

This study used an embedded mixed-methods design. An embedded mixed-methods design is described by [23] as the researcher combining the collection and analysis of both quantitative and qualitative data within a traditional quantitative or qualitative research design. Through the census survey method, 71

participants aged 10 to 24 completed the quantitative survey, and 14 were purposively selected for the qualitative interview. Data were collected using a self-developed questionnaire [24, 25]. The data collection process employed an interviewer-administered questionnaire approach. In this approach, the interviewer reads the questionnaire items aloud to the interviewee for recording [26, 27]. In this case, the researchers read the questionnaire items aloud for respondents to answer. Each questionnaire took approximately 15 to 20 minutes to be completed. In all, 71 questionnaires were administered across the five Inclusive Senior High Schools.

Data analysis procedure

Research question one had both closed- and open-ended items. The closed-ended items were analysed quantitatively, whilst the open-ended items were analysed qualitatively. The closed-ended scale was “yes”, “no”, and “not sure”. The scoring of the closed-ended items was yes=1, no=0, and not sure=0. “not sure” was assigned zero (0) because it does not depict respondents’ certainty about sexual health knowledge or false responses about their sexual health knowledge. It was used to reduce guessing and prevent participants from selecting false responses. The mean was used as a norm-referenced criterion to group students as below average (BA) or above average (AA). Using the mean together with its standard error. Mean =6.3239, Standard Error = .26754. Therefore,

$$6.3239 + .26754 = 6.05636$$

$$6.3239 - .26754 = 6.59144$$

The lower bound of the mean was 6.05636, and the upper bound was 6.59144. Therefore, any score below 6.05636 was below average (BA), and any score above 6.59144 was above average (AA). Frequencies and percentages were used to describe the number of students who were above average and below average. The thematic approach to qualitative data analysis by [29] guided the analysis of qualitative data generated from the open-ended section of the questionnaire. Thematic analysis by [29] comprises six phases: familiarising with the data, generating initial codes, searching for themes, reviewing themes, naming themes, and writing the report. Similarly, data from research question two, the influence of demographic characteristics (age) on sexual health knowledge, were analysed using a one-way ANOVA. However, an independent t-test was used to analyse data on Religious background [Christianity, Islam, and Traditional], participants' grade [Grade 10 & 11], and degree of impairment [partially sighted, totally blind]. According to [28], to examine the influence of an independent variable with two or more levels on a dependent variable, one should use an independent t-test or ANOVA, respectively.

Results

Background information of participants

Background information showed that 8 (11.3%) of the respondents (n=71) were between 10-14 years of age, while those between 20-24 years constituted 43 (60.5%) of the total respondents. The results further show that respondents from Form 1 constituted 26 (36.6%) of the total, while those from Form 2 constituted 45 (63.4%). Not all 31 (43.7%) of respondents were partially sighted, while 40 (56.3%) were totally blind. Finally, religious background showed that 45 (63.4%) of respondents were Christians, while 26 (36.6%) were from the Islamic fraternity.

Table 1: Level of sexual knowledge among female adolescents with visual impairment

	Frequency	Percentage	Mean	Std. deviation
	41	58	6.3239	2.4711
	30	42		
Total	71	100		

Source: Field Data (2021)

Table 1 shows that 41 (58%) had below-average scores, while 30 (42%) had above-average scores. This indicates that the knowledge most respondents had about sexual health was below average. Because the participants' scores on each test were assumed to be normally distributed, further analysis used the coefficient of variation (CV) to assess whether the students' sexual health knowledge was homogeneous or heterogeneous. Participants' achievement on the sexual health knowledge instruments was described as heterogeneous, with a coefficient of variation (CV) calculated as $CV = (SD/M) \times 100$. All CV values for the distribution of scores above the criterion of 33% mean that the group is heterogeneous, and those below the criterion suggest the group is homogeneous. Thus, a mean of 6.32 and a standard deviation of 2.47 yield a CV of 39.08%. Based on the means and standard deviations of the students' sexual health knowledge scores, students' performance could be described as heterogeneous.

Analysis of open-ended data of research question one

Procreation

The majority of the participants were of the view that sexual health connotes having sexual intercourse with the aim of giving birth. The participants understood sexual health as a means of procreation or giving birth through sexual intercourse. However, sexual health goes beyond just giving birth.

A participant recounted that...sexual health to me, it means a man and woman having sexual intercourse. It is through this that babies are born. For a couple to give birth, they need to have sexual intercourse. Sexual health is what will bring the children we expect to have. No one can have children without sexual intercourse (a 16-year-old FAVI 4).

Absence of disease

Other participants understood sexual health as the absence of disease, specifically citing infections such as HIV/AIDS, Gonorrhoea, Syphilis, and Chlamydia. Inasmuch as health is part of sexual health, participants were not outrightly wrong or did not depart from the truth when they understood it to be one's ability to avoid diseases. A participant was of the view that *sexual health is being free from sexually related diseases such as HIV/AIDS, Gonorrhoea, Syphilis, and Chlamydia* (a **19-year old FAVI 8**).

The understanding of sexual health appeared to be limited to only having sexual intercourse and being free from sexually transmitted diseases. The definition of sexual health as understood by the respondents was limited to having sexual intercourse; however, the meaning of sexual health goes beyond sexual intercourse as understood by female adolescents with visual impairment.

Awareness of sexually transmitted diseases

High levels of awareness enable individuals to make informed decisions about their sexual behaviour, devise preventive mechanisms, and seek timely interventions and treatment when necessary. A participant recounted that *having unprotected sexual intercourse can lead to sexually transmitted diseases. If you have sexual intercourse with an infected person, you can get sexually transmitted diseases* (a **13-year-old FAVI 3**). Even though the participants knew about sexually transmitted diseases, their knowledge was limited. Their level of understanding or appreciation did not reflect the full meaning of sexual health. By implication, participants' knowledge of the causes of STDs was limited to sexual intercourse.

Abstinence

Female adolescents' visual impairment perceived sexual health as abstinence from sexual intercourse. To them, this perspective was a way of not getting pregnant. They realise the link between sexual health and one's ability to stay away from an unwanted pregnancy. According to one participant, *a teenage pregnancy can be prevented through abstinence from sexual intercourse. It is the best method so that, as female students, we can avoid getting pregnant...without sexual intercourse, there would be no teenage pregnancy* (a **21-year-old FAVI 10**).

Abstinence is usually perceived as one of the most effective sexual and reproductive health practices because it involves distancing from sexual activity, hence eradicating the risk of STDs and unintended pregnancy when practised consistently.

Freedom from sexual coercion

Freedom from sexual coercion is a basic aspect of sexual health and human rights. On when and under what circumstances sexual acts take place, they shared their views on how and when sexual intercourse should occur. A participant observed that *...I understand sexual health to mean that a person should not be forced or coerced into sexual acts in any form. You agree to have sexual intercourse when you want it.*

Sexual intercourse should be by choice and not by force. It must be agreed upon before you can have an affair with anyone (a 15-year-old FAVI 7). The open-ended data analysed demonstrated awareness of sexual intercourse, the causes of sexually transmitted diseases, saw sexual health as a way of preventing teenage pregnancy, and ways of avoiding sexual coercion. However, their understanding appeared limited, as evidenced by their superficial explanations when asked to define sexual health.

To what extent do demographic characteristics (age, grade, degree of impairment, and religious background) influence sexual health knowledge?

Table 2: Age Range and Sexual Health Knowledge

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	91.415	2	45.708	9.085	.000
Within Groups	342.134	68	5.031		
Total	433.549	70			

Source: Field Data

The results from Table 2 showed that there was a statistically significant difference among age groups (10-14, 15-19, and 20-24) and sexual health knowledge as determined by one-way ANOVA $F(2,68) = 9.085, p = (.000)$. This means that sexual health knowledge differs significantly across the three age groups, indicating that age is an important factor associated with variations in participants' level of sexual health knowledge. Specifically, the observed differences suggest that at least one age group possesses a significantly different level of sexual health knowledge compared to the others. Post hoc analysis indicated that FAVI's sexual health knowledge level within the 10-14 age group was statistically different from that of the 15-19 and 20-24 age groups. That is, participants aged 10-14 had a lower level of sexual health knowledge than those aged 15-19 and 20-24.

Table 3: Religious background, Grade level, Degree of impairment

	(t)	M	SD	p
Demographic Characteristics				
Religious Background	2.038	6.3239	2.4711	0.045
Grade Level	-0.411	6.3239	2.4711	0.682
Degree of Impairment	0.127	6.3239	2.4711	0.660

Source: Field Data (2021)

From Table 3, the results indicate that religious background (Islamic and Christian) was statistically associated with sexual health knowledge, as shown by the Independent t-test, $t(69)=2.038, p=0.045$. That is, those within the Christian group possessed a high level of sexual health knowledge as compared to those within the Islamic group. We also examined whether FAVI grade (Grades 10 and 11) influenced sexual health knowledge. The results show that participants' grade (Grade 10 and Grade 11) did not differ significantly in sexual health knowledge, as indicated by an independent-samples t-test, $t(69) = -0.411, p = .682$. This means sexual health knowledge was comparable between Grade 10 and Grade 11 participants, suggesting that grade level was not associated with differences in sexual health knowledge in this sample. Similarly, the results showed that the degree of impairment (partially sighted and total blindness) did not differ statistically in sexual health knowledge, as indicated by the independent-samples t-test, $t(69) = 0.127, p = .660$.

Discussion

The purpose of this objective was to examine the level of sexual health knowledge among female adolescents with visual impairment (FAVI). Both quantitative and qualitative data were collected to address the research question. The quantitative findings revealed that the participants demonstrated a below-average level of sexual health knowledge, with 41 (58%) scoring below the expected level. The qualitative findings further showed that participants' understanding of sexual health was largely limited to sexual intercourse, with little appreciation of its broader dimensions, such as sexual rights, reproductive health, disease prevention, consent, and healthy relationships. This superficial understanding corroborates the quantitative findings, confirming that the participants possessed limited sexual health knowledge. These findings underscore the need for targeted sexual health education for both female adolescents with visual impairment and their parents or caregivers.

Limited sexual health knowledge has important implications for female adolescents with visual impairment and persons with disabilities in general. Female adolescents with visual impairment with inadequate knowledge of sexual health may be less likely to understand the importance of contraception and other preventive measures, thereby increasing their risk of sexually transmitted infections (STIs), unintended pregnancy, and other adverse sexual and reproductive health outcomes [30, 31, 32]. Inadequate knowledge may also impair their ability to make informed decisions regarding their sexual and reproductive health [33], thereby compromising their overall well-being [34]. The findings of this study are consistent with previous research [35, 36]. For instance, [35], who examined adolescents' knowledge and awareness of sexual and reproductive health in Kashmir, found that girls had lower levels of sexual and reproductive health knowledge than boys. This finding aligns with the present study, which similarly found that female adolescents with visual impairment possessed limited sexual health knowledge.

However, the findings contrast with those reported by [37, 38, 39, 40, 41]. For example, [38] found that adolescents demonstrated relatively high levels of sexual health knowledge, while [41] reported a mean sexual and reproductive health knowledge score of 2.33 out of 4.00, indicating a comparatively higher

level of knowledge than that observed in the present study. One possible explanation for these differences is the variation in study contexts. Whereas [41] conducted their study in a developed setting, the present study was conducted in Ghana, a developing country where discussions surrounding sexual health remain culturally sensitive. Consequently, adolescents, particularly those with visual impairment, may have fewer opportunities to receive accurate and comprehensive sexual health information than their counterparts in countries where sexuality education is more openly discussed and widely implemented.

Furthermore, the results showed that demographic characteristics, specifically age and religious background, influenced the sexual health knowledge of female adolescents with visual impairment (FAVI). However, grade level (Grade 10 and Grade 11) and degree of impairment (partial sight and total blindness) did not significantly influence their sexual health knowledge. Participants aged 15 years and above demonstrated higher levels of sexual health knowledge than those aged 10–14 years.[18] found that older adults were more likely to have accurate knowledge of sexually transmitted infections (STIs) compared to younger individuals, although younger participants demonstrated more up-to-date knowledge of HIV/AIDS. Similarly, [42] reported that older individuals had better knowledge of contraception, while younger individuals were more knowledgeable about emergency contraception. These findings underscore the influence of age as a determinant of sexual health knowledge.

The results further indicated that Christian participants demonstrated higher levels of sexual health knowledge than their Muslim counterparts. Sexual health knowledge and attitudes toward sexuality vary both within and between religious groups. Some religious traditions emphasise sexual abstinence or promote beliefs that may not fully align with contemporary scientific understanding of sexual health. In contrast, other religious groups may encourage open discussion of sexuality and provide access to comprehensive sexual health education. [22] also found that religion was significantly associated with risky sexual behaviour among senior high school students in the Hohoe Municipality of Ghana. These findings support the present study, in which religion was found to significantly influence sexual health knowledge.

Based on the findings, it may be concluded that inadequate sexual health knowledge can negatively affect the well-being of female adolescents with visual impairment by increasing their vulnerability to sexually transmitted infections, unintended pregnancies, and other sexual and reproductive health challenges. The findings also suggest that sexual health knowledge tends to improve with age, likely due to increased exposure to information and lived experiences. We finally conclude that demographic characteristics (age, religion) indeed influence sexual health knowledge of female adolescents with visual impairment in Ghana.

Limitations of the study

The main limitation we encountered involved administering the questionnaire. Because the participants were visually impaired and couldn't read the questionnaire themselves, we used an interviewer-

administered approach, which can introduce bias if the researcher records responses inaccurately. Interviewer-administered questionnaires usually collect data from relatively uneducated, illiterate, and disabled individuals [26, 27]. Second, we collected data solely from visually impaired students and did not include healthcare providers or families, whose views on the subject of investigation could influence the findings and conclusions.

Declarations

Consent for publication

Not applicable

Competing interest

The authors declare that they have no competing interests

Ethics and consent

Written consent was sought from the Ghana Federation of Disability Organisations, and in accordance with the University of Cape Coast Institutional Review Board ethical standards, ethical clearance and protocols were sought and duly followed (CES-ERB/ucc.edu/V5/21–85). Informed consent was also obtained from parents of FAVI through their Heads of Schools and Teachers since the interviews/data were collected while they were in schools. In this regard, the Heads and Teachers acted as the Gatekeepers. We also conducted the study in accordance with the ethical principles outlined in the American Psychological Association's Ethics Code and the Helsinki Declaration.

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Declaration

This study received no funding from any source.

Author Contribution

A.B wrote the background to the study I.V wrote the methodology for the study I.A did the quantitative analysis U.A did the qualitative analysis E.B wrote the discussion of the findings All authors reviewed the manuscript

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Data Availability

Data underpinning this study are either contained in the manuscript or would be made available when the need arises. There are no restrictions on anonymised data sources. Data collection instruments such as a semi-structured interview guide and consent forms are also available upon request.

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