

**Factors influencing adolescent access to sexual and reproductive health services in Bo City  
Sierra Leone**

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## ABSTRACT

**Background:** Adolescents' access to Sexual and Reproductive Health and Rights (SRHR) services is essential for their overall health and well-being. However, in resource-limited settings such as Bo City, Sierra Leone, access remains constrained by socio-cultural norms, stigma, and weak healthcare infrastructure. This study applied Andersen's Behavioral Model to examine factors influencing adolescents' utilization of SRHR services in Bo City, focusing on barriers and facilitators to access.

**Methodology:** A cross-sectional survey was conducted among 419 adolescents and young adults aged 15–24 years in Bo District. Participants were selected using simple random sampling, and data were collected through structured questionnaires assessing socio-demographic characteristics, knowledge, attitudes, and SRHR service utilization. Descriptive statistics, chi-square tests, and logistic regression analyses were performed to identify associations between Andersen model domains and SRHR service use.

**Results:** Findings revealed that 47.0% of respondents acquired SRHR knowledge through schools. Utilization of services was limited by structural barriers, including financial constraints and distance to facilities, and by social factors such as stigma and parental consent requirements. Adolescents aged 17–19 years were less likely to use SRHR services than those aged 20–24 years. Peer support and reduced stigma emerged as key facilitators of service utilization, while religion, education level, and parental support showed no significant association.

**Conclusion:** The study highlights the need for comprehensive interventions expanding youth-friendly services, strengthening education, raising community awareness, and reforming policies to enhance adolescent autonomy and equitable access to SRHR services in Sierra Leone.

## Keywords:

Adolescents, Sexual and Reproductive Health and Rights, Barriers, Andersen's Behavioral Model, Bo City.

## INTRODUCTION

Sexual and reproductive health and rights (SRHR) refers to a collection of human rights that are guaranteed in international human rights treaties, other inter-governmental agreements and consensus documents, and national laws (UNDG 2017). These human rights include civil and political rights as well as economic, social, and cultural rights, all of which are essential for ensuring the equal right of women and men to enjoy the maximum attainable standard of sexual and reproductive health and make decisions concerning their sexuality and reproduction, including the number, timing of birth and spacing of their children, free from discrimination, coercion, and violence (UNSD 2023; WHO 2022). Central to reproductive rights are legal protections for contraception, abortion, fertility treatment, and access to information, ensuring individuals' autonomy over decisions about their reproductive capabilities (WHO 2014). Recognizing the importance of family planning to boost economic growth and improve future generations' health and well-being, the Government of Sierra Leone

developed its first Family Planning Costed Implementation Plan with the Health Policy Plus Project (Government of Sierra Leone 2019). The plan details the necessary program activities and costs associated with achieving national goals, such as increasing the modern contraceptive prevalence rate among all women of reproductive age.

The total demand for family planning (FP) among currently married women in Sierra Leone between the ages of 15-49 is 41.6% (SSL and ICF International 2014). However, the demand satisfied by the use of modern contraceptive methods is only 37.5%. There are a variety of factors that contribute to the resultant high unmet need for family planning. According to the 2008 Demographic and Health Survey (SLDHS), the most-cited reasons women give for not using contraceptives are opposition of partner or self (37%), a lack of knowledge of a method or source (12%), health concerns or fear of side-effects (14%), and religious prohibition (9%). Cost and access to FP services and methods also play a role in increasing Sierra Leone's unmet needs (SSL and ICF Macro 2009).

With a population of approximately 8 million people in Sierra Leone (Statistics Sierra

Leone 2016), the country faces significant challenges in delivering Sexual and Reproductive Health and Rights (SRHR) services. The health system in Sierra Leone has struggled with issues such as limited resources, inadequate infrastructure, and high rates of maternal and child mortality (World Bank 2023). The civil war, which lasted from 1991 to 2002, exacerbated these problems, leading to widespread disruption of health services (Richards 2005). Adolescents constitute a substantial proportion of the population in Sierra Leone. According to the 2019 SLDHS, individuals aged 10-19 years make up about 24.2% of the total population (Statistics Sierra Leone and ICF 2020). This age group is particularly vulnerable to sexual and reproductive health issues, including early pregnancies, sexually transmitted infections (STIs), and inadequate access to contraception and sexual health education (UNFPA WCARO 2020).

Research has highlighted that these issues are exacerbated by limited access to sexual and reproductive health (SRH) services, stigmatization, and economic challenges, which hinder young people's ability to seek and utilize these services effectively (Akwara et al. 2023; Janighorban et al. 2022; Mulubwa

et al. 2021). Studies have consistently highlighted barriers such as stigma, misinformation, and inadequate service availability as critical factors impeding adolescents' access to necessary health services (Aloysius Odii et al. 2024; Tirado et al. 2020). For instance, Munea et al., (2022), found that cultural stigma and a lack of privacy in healthcare settings significantly deterred adolescents from seeking sexual health services in Northwest Ethiopia. Specifically, a study in the Bono East Region of Ghana highlighted that adolescents often face challenges in accessing SRHR services due to insufficient information, lack of trained healthcare providers, and inadequate facilities tailored to their needs (Okyerere et al. 2024). These barriers significantly impact the utilization of these crucial health services, leading to suboptimal health outcomes for young people in the region (Decker et al. 2021; UNFPA 2021).

Similarly, these barriers underscore the urgent need for targeted interventions and improved access to youth-friendly health services to address the SRHR needs of adolescents in resource-limited contexts like Bo district, Sierra Leone. Understanding the current knowledge, attitudes, and practices

concerning SRHR among adolescents and young adults in Bo City is critical for designing effective interventions and policies. To better understand the determinants of SRHR service utilization, this study applies Andersen's Behavioral Model of Health Services Use, which conceptualizes access as a function of predisposing, enabling, and need factors. The model has been widely used to explain patterns of health-seeking behavior and was adapted here to include barrier-related factors particularly relevant to adolescent SRHR, such as stigma and confidentiality concerns. This study applied Andersen's Behavioral Model to examine factors influencing adolescents' utilization of SRHR services in Bo City, focusing on barriers and facilitators to access.

## METHOD

### Study area:

The study was conducted in Bo City, the urban center of Bo District in Sierra Leone's Southern Province one of the country's most populous regions (Figure 1). Bo City, the second-largest city and administrative headquarters of the district, is often called the "Heart of Sierra Leone" due to its strategic location and economic importance. The city

hosts a vibrant mix of ethnic groups, including the Mende, Temne, and Limba. Its youthful population faces persistent challenges related to healthcare, education, and employment. Access to Sexual and Reproductive Health and Rights (SRHR) services remains limited, hindered by traditional beliefs, stigma, financial constraints, and inadequate health infrastructure. Although Bo's healthcare system includes both public and private facilities, most residents depend on under-resourced government hospitals and clinics. This study focuses on Bo City to explore the factors influencing adolescents' access to SRHR services, offering insights to improve health equity and outcomes among young people in this dynamic urban setting.

### Study Design

A cross-sectional survey was used to gather data from adolescents and young adults in the Bo district. The targeted population was adolescents (aged 15-19) and young adults (aged 20-24) residing in Bo District. A sample size of 400 participants was calculated using a confidence level of 95% and a margin of error of 5%, considering the population size and expected response rate using Cochran's

formula. (Cochran 1977). An additional 10% was added to account for potential non-response, resulting in a target sample of approximately 419 participants. Simple random sampling was used to ensure representation from the selected sections in Bo City. The sections were divided into strata based on urban and rural settings, and participants were randomly selected from each stratum.

## Data Collection

Data was collected using a structured questionnaire developed specifically for this study. The instrument was not adapted from existing validated tools such as the WHO SRHR modules or the Demographic and Health Surveys (DHS); instead, it was self-constructed based on literature review and expert input and field-tested through a pilot survey involving 30 adolescents in a neighboring community. Feedback from the pilot informed revisions to improve clarity and cultural relevance.

To ensure linguistic accessibility, the questionnaire was translated into Krio and Mende, the dominant local languages in Bo City. Back-translation was conducted by independent bilingual reviewers to verify

semantic consistency and minimize misinterpretation.

## Conceptual Framework and Analytical Approach

This study employed a modified version of the Andersen Behavioral Model of Health Services Use to guide the selection of variables and analytical approach (R. M. Andersen 1995; R. Andersen and Newman 1973) (as shown in Figure 2). The framework was adapted to reflect the unique sociocultural and structural determinants influencing adolescent access to sexual and reproductive health and rights (SRHR) services in Bo City, Sierra Leone. Specifically, we operationalized Andersen's Behavioral Model by grouping measured variables into predisposing (age, sex, education), enabling (peer and family support, youth-friendly services, distance), need (perceived susceptibility/previous SRHR use), and barriers (stigma, confidentiality concerns).

These domains informed both the questionnaire design and the statistical modeling strategy, including chi-square tests and logistic regression. By contextualizing SRHR access within this framework, the study aligns with global health service

utilization models while incorporating locally relevant constructs that affect adolescent health-seeking behavior.

## Data Analysis

Statistical analysis was performed using SPSS (version 25.0) and Microsoft Excel. Descriptive statistics were used to summarize participant characteristics. Pearson's chi-square tests were applied to examine bivariate associations between socio-demographic and contextual factors and SRHR service utilization. Odds ratios (OR) and adjusted odds ratios (AOR) with 95% confidence intervals (CI) were estimated to use multivariable logistic regression to identify factors independently associated with SRHR service use. Variables were selected for regression analysis based on their theoretical relevance within the Andersen Behavioral Model framework (predisposing, enabling, and barrier factors), rather than solely on bivariate significance. A two-tailed p-value of  $<0.05$  was considered statistically significant.

## Ethics Approval and Consent to Participate

- Ethics Approval: This study received ethical approval from the Njala University Research and

Development Committee (RDC), which serves as the Institutional Review Board (IRB) for research involving human participants at Njala University.

- Ethical Standards: All procedures involving human participants were conducted in accordance with the ethical standards of the Njala University RDC and the principles of the Declaration of Helsinki (2013 revision).
- Consent to Participate: Written informed consent was obtained from all participants aged 18 years and above. For participants aged 15–17 years, written assent was obtained in addition to parental or guardian consent, in compliance with national ethical guidelines.

## RESULT

This study was guided by a modified version of the Andersen Behavioral Model of Health Services Use, adapted to reflect the unique sociocultural and structural determinants influencing adolescent access to SRHR services in Bo City, Sierra Leone. The framework categorized associators into four

domains predisposing, enabling, need, and barrier factors which informed both the questionnaire design and analytical strategy.

## **Socio-demographic characteristics of study participants**

The study engaged 419 adolescents and young adults from Bo City, Sierra Leone, providing a comprehensive overview of the population's socio-demographic profile (Table 1). The majority, 280 (66.8%), of the participants were females, compared to males, 33.2%. The mean age of participants was 19.8 years ( $SD \pm 2.754$ ), with the age group of 20–24 years slightly higher (53.5%) than those in 15-19 years (46.5%). Most participants are single (64.4%), with smaller proportions married (23.6%), and cohabiting (11.9%). The educational background varies, with the majority at the secondary level (45.3%) and a substantial number having tertiary (19.6%) or primary education (18.1%). The religious distribution is almost evenly split, with Christians at 52.0% and Muslims at 48.0%. This demographic spread provides a diverse sample representing different age groups, marital statuses, educational levels, and religions, potentially impacting SRHS utilization patterns.

## **Awareness and utilization of Sexual Reproductive Health services**

Out of the total participants who had visited health facilities for any of the SRHR services, the majority got knowledge about SRHS from schools (47.0%) as the primary source of information about SRHS, followed by mass media (Radio, TV, Facebook, WhatsApp forum, etc.) (43.4%), Health workers (43.4%) and finally from community organizations (34.6%) (Figure 3).

Access to information through media and school programs underscores the role of educational and media interventions in enhancing SRHS awareness. These sources emphasize that a supportive environment and accessible information channels are vital in promoting SRHS utilization.

## **Factors that facilitate SRHS utilization**

The study revealed (from Table 2) that the utilization of SRHR services varied significantly by age, with adolescents aged 19 years demonstrating the highest service use (55 participants) compared to younger ages such as 17, where only 2 participants reported use ( $p < 0.0001$ ). Gender differences were not

statistically significant ( $p = 0.076$ ), although females (203) accessed services more frequently than males (89). Educational attainment showed a marginal association with service use ( $p = 0.059$ ), with secondary education participants exhibiting the highest usage rates, while tertiary education participants were proportionally fewer users. Marital status and religion did not significantly influence SRHR service utilization, with single participants and individuals identifying as Christian or Muslim showing comparable service usage rates.

Family support did not significantly impact service use ( $p = 0.647$ ), though those with family support reported higher utilization rates. Conversely, peer support emerged as a significant factor, with adolescents who received peer support being more likely to use SRHR services ( $p = 0.008$ ). Other factors, such as youth-friendly health services ( $p = 0.211$ ), community awareness programs ( $p = 0.914$ ), and access to information through media or school programs ( $p = 0.626$ ), did not show a significant association with service use.

Multivariable logistic regression was used to identify independent associated factors of using SRHR services. Variables with  $p < 0.2$  in bivariate analyses and variables identified a priori (age, sex) were included. We assessed multicollinearity ( $VIF < 2$  acceptable), ran Hosmer-Lemeshow for goodness-of-fit, and reported AORs with 95% CIs. Robust standard errors were used to account for clustering by word (from Table 3).

After adjustment, adolescents reporting peer support had higher odds of ever using SRHR services (AOR 2.03; 95% CI 1.17-3.52;  $p = 0.012$ ). Adolescents aged 17-19 had substantially lower odds relative to those 20–24 (AOR 0.12; 95% CI 0.04–0.34;  $p < 0.001$ ). The final model had an AUC of 0.72, indicating acceptable discrimination.

Younger adolescents aged 17–19 years were significantly less likely to utilize SRHR services compared to older participants, with adjusted odds ratios (AORs) reflecting substantially lower utilization rates ( $p < 0.001$ ). For instance, adolescents aged 18 had an AOR of 0.123, indicating considerably reduced odds of service use compared to older peers. While being male slightly increased the likelihood of SRHR service utilization (AOR = 1.459), this effect was not statistically

significant ( $p = 0.138$ ). Educational attainment also appeared to influence service use; participants with primary and secondary education had reduced odds compared to those with tertiary education. However, these associations were not significant after adjustments (e.g., for secondary education [AOR = 0.727,  $p = 0.385$ ]). Similarly, marital status did not emerge as a significant associator, with single participants showing slightly higher odds of utilization (AOR = 1.065,  $p = 0.883$ ). Religion also had no significant effect, as Muslim participants had higher, yet statistically insignificant, odds of SRHR service use compared to Christians (AOR = 1.18,  $p = 0.491$ ).

Other factors, such as family support, youth-friendly health services, community awareness programs, and access to information, showed no significant impact on SRHR service utilization. For instance, participants with family support had an AOR of 0.961 ( $p = 0.889$ ), while those with access to youth-friendly health services had an AOR of 1.031 ( $p = 0.927$ ), neither of which were significant. However, peer support emerged as a critical factor, with participants reporting peer support being significantly more likely to

utilize SRHR services (AOR = 2.026,  $p = 0.012$ ).

The chi-square test and regression statistics collectively highlight critical factors influencing the utilization of SRHR services among adolescents in Bo City. The chi-square analysis reveals significant associations between age and peer support with SRHR service utilization, suggesting that these factors play a pivotal role in service uptake. Regression statistics further underscore the impact of age, showing significantly lower odds of utilization among younger adolescents (17–19 years) compared to older groups, while peer support emerged as a strong associator, emphasizing the influence of social networks. Other variables, such as gender, marital status, educational level, religion, family support, youth-friendly health services, community awareness programs, and access to information, showed no significant effect, highlighting the nuanced interplay of demographic, social, and environmental factors in shaping SRHR service access in Bo City.

## Attitudes toward SRHS utilization

The study highlights the varied utilization patterns and attitudes of adolescents and young adults toward SRHS (Table 4). The most utilized services were for treating sexually transmitted infections (48.7%) and family planning/contraceptives (43.0%), reflecting high demand for preventative care. The moderate use of pregnancy-related services (23.6%) and sexual health counseling (17.9%) indicates a growing interest in holistic care but underscores barriers such as limited availability and cultural inhibitions. Abortion services were the least utilized (11.9%), primarily due to stigma and restrictive legal or cultural contexts.

Adolescents' attitudes toward SRHS reveal a mix of supportive and restrictive perspectives. While 68.7% support teaching contraceptives and safe sex education, 64.4% believe adolescents should not make SRHS decisions without parental consent, highlighting autonomy as a significant barrier. Optimism regarding access to SRHS was evident, with 64.4% agreeing or strongly agreeing that services were available, yet 36% perceived gaps in accessibility

## Challenges in SRHS utilization

The most common barriers (from Table 5 of the study) to SRHS access include distance to health facilities (63.2%), financial constraints (59.2%), fear of stigma (54.7%), and lack of information (50.8%). Cultural and religious beliefs (50.6%) and shame (45.1%) also significantly impede access. Parental consent (38.4%) and marital status (31.7%) were additional barriers. This suggests that structural (distance, financial) and social factors (stigma, cultural beliefs) significantly limit SRHS access, suggesting the need for comprehensive, multi-faceted interventions to address these obstacles.

## DISCUSSION

The study of 419 adolescents and young adults in Bo City, Sierra Leone, reveals critical socio-demographic insights impacting SRHS utilization. A significant gender imbalance was observed, with females comprising 66.8% of the participants. The average age was 19.4 years, with a notable concentration of respondents (51.6%) aged 15-19 years, highlighting a critical age group for SRHS interventions. Marital status varied, with most participants being single (63.7%), while educational backgrounds ranged

widely, with secondary education being the most common (45.3%). Additionally, the nearly equal distribution of religious affiliations, Christians at 52% and Muslims at 48%, underscores the importance of culturally sensitive health strategies. These diverse characteristics emphasize the need for multifaceted, inclusive approaches to effectively address and enhance SRHS utilization among various adolescent subgroups in the region.

The study highlights the critical role of awareness and information dissemination in the utilization of SRHS among adolescents. Among participants who had visited health facilities for SRHR services, the majority (47.0%) reported obtaining knowledge about SRHS from schools, followed closely by mass media (43.4%), health workers (43.4%), and community organizations (34.6%). This underscores the importance of educational and media interventions in enhancing SRHS awareness. Access to information through these channels is vital for promoting SRHS utilization, emphasizing the need for supportive environments and accessible information to improve health outcomes. As said by Fantaye et al., (Fantaye et al. 2020), effective educational interventions for the

promotion of sexual and reproductive health and rights for school-age children in low- and middle-income countries are vital for promoting SRHS utilization.

The study identified critical factors influencing the utilization of SRHS among adolescents and young adults in Bo City, Sierra Leone. The study revealed significant associations between age and peer support with SRHR service utilization, suggesting their critical role in shaping access. Age has been widely documented as a pivotal determinant of SRHR service use, with younger adolescents often facing barriers such as stigma, lack of autonomy, and limited knowledge about services (Chandra-Mouli, Lane, and Wong 2015). The significant association between peer support and service use aligns with existing literature highlighting the importance of social networks in encouraging health-seeking behavior among adolescents (Viner et al. 2012).

Regression statistics provided further insight into these associations, confirming age and peer support as strong associators of SRHR service utilization. The lower odds of utilization among younger adolescents (17–19 years) as compared to their older

counterparts reflect developmental and structural barriers unique to this age group, such as dependence on caregivers and limited financial resources (Patton et al. 2016). On the other hand, the significant role of peer support underscores the influence of social connections in creating safe spaces for discussing sensitive health topics, thereby encouraging service use (Bearinger et al. 2007). Conversely, variables such as gender, marital status, educational level, religion, family support, youth-friendly health services, community awareness programs, and access to information showed no significant effect. This finding aligns with studies suggesting that structural and systemic issues often outweigh demographic factors in determining SRHR access (UNFPA 2018).

The absence of significant associations for other variables highlights the complexity of health service utilization, which is often influenced by a combination of individual, societal, and systemic factors. For instance, while gender is often cited as a determinant of SRHR access, the lack of significance in this study might reflect improved gender parity in SRHR services in Bo City, or it could point to barriers that are equally shared among males

and females (WHO 2018). Similarly, the lack of association between educational attainment and service use could indicate that educational programs in the region are not adequately addressing SRHR topics, a common issue in resource-constrained settings (Chandra-Mouli, Lane, and Wong 2015).

Furthermore, it is possible that neither the providers of these services nor the systems in which they operate are geared towards meeting the needs and fulfilling the rights of adolescents in Bo City. To address this widely recognized gap, efforts need to build competence and empathy in teachers, healthcare workers, social workers, and others. Training and supporting service providers and reorienting the systems they are part of are crucial to delivering the many effective promotive, preventive, and curative interventions available (WHO 2018). Such efforts must go beyond perfunctory, top-down approaches to involving adolescents, community members, service providers, and managers to identify the factors contributing to the poor quality and reach of these services and to define and implement evidence-based approaches that are tailored to the local context

The study illustrates diverse attitudes and utilization patterns of SRHS among adolescents and young adults. The high utilization rates of services like STI treatment (66.6%) and family planning/contraceptives (56.6%) reflect the significant demand for preventative care among this group. Such preferences align with global trends emphasizing the importance of accessible preventive healthcare for adolescents, as they are particularly vulnerable to sexually transmitted infections and unintended pregnancies (Brindis et al. 2020).

Adolescents' attitudes toward SRHS also reflect a blend of progressive and restrictive views. While 68.7% support teaching contraceptives and safe sex, a substantial 64.4% believe that adolescents should not make SRHS decisions without parental consent, which reveals autonomy as a significant barrier. This aligns with findings from other studies where both socio-cultural and health facility factors influence the utilization of SRH services in Zimbabwe (Kurebwa 2020; Laar et al. 2024). Although 64.4% of participants agreed or strongly agreed that adolescents have access to SRHS, 36% perceived gaps in service availability, reflecting challenges such as stigma, lack of

youth-friendly facilities, and socio-cultural restrictions.

The study also identifies multiple barriers to SRHS utilization among adolescents and young adults, with structural and social factors playing significant roles. Distance to health facilities (63.2%) and financial constraints (59.2%) emerged as the most common obstacles, reflecting infrastructural challenges prevalent in resource-limited settings. These findings align with global research emphasizing that inadequate healthcare infrastructure and economic barriers disproportionately impact adolescents' access to essential reproductive health services (Kurebwa 2020; Laar et al. 2024). According to (UNFPA 2018), sexual reproductive right is important to the overall wellbeing of adolescents, particularly access to rights-based services and commodities such as family planning, and access to health providers regarding negotiations and decision-making within sexual relationships. These encounters contribute to gender equality, better child and maternal health, the prevention of sexually transmitted infections (STI) including HIV, and poverty reduction.

Yet, many young people face barriers to accessing reproductive health information and care. Even those able to find accurate information about their health and rights may be unable to access the services they need (UNFPA 2018). Often, these barriers are unique to their stage in life and associated special needs, perceptions, and abilities. Hence, a variety of issues must be addressed to make SRH services more youth-friendly, attract young people, meet their needs, and retain them for continuing care.

In the study, social barriers such as fear of stigma (54.7%) and lack of information (50.8%) significantly hinder SRHS access. Adolescents often face judgment and discrimination from peers and community members when seeking reproductive health services, leading to reluctance to access care. These findings are consistent with studies from other low-resource settings where stigma and misinformation deter adolescents from seeking timely SRHS (Laar et al. 2024; Ninsiima, Chiumia, and Ndejjo 2021a). Parental consent requirements (38.4%) and marital status (31.7%) also impede SRHS utilization, particularly for unmarried adolescents who may lack the autonomy to make independent health decisions. Similar

findings have been reported in studies where adolescents depend on parental approval, limiting their ability to seek confidential care by Ninsiima et al., (Ninsiima, Chiumia, and Ndejjo 2021b) and Munea et al (Munea et al. 2022b) in Northwest Ethiopia. These challenges highlight the need for legal and policy reforms to ensure adolescent-friendly healthcare services that respect confidentiality and autonomy.

Comparable adaptations of the Andersen model have been employed in low- and middle-income countries to examine maternal health, HIV service uptake, and youth-friendly care. A systematic review by (Alkhaldeh et al. 2023) highlights the model's flexibility across diverse health conditions and populations. Similarly, (Lederle, Tempes, and Bitzer 2021) emphasize its utility in structuring both qualitative and quantitative health services access in low-resource urban African settings. Its adaptability allowed integration of context-specific barriers significant to young people. However, the model should be viewed as a flexible framework rather than a predictive tool, given the study's cross-sectional design.

research, particularly when modified to include context-specific barriers.

## CONCLUSION

This study used the Andersen Behavioral Model to examine adolescent access to sexual and reproductive health services in Bo City, Sierra Leone. Organizing determinants into predisposing, enabling, need, and barrier domains provided a structured lens for understanding service utilization. Predisposing factors such as age and education influenced use; while enabling factors especially peer support were strong facilitators. Barriers including stigma, lack of confidentiality, and distance to facilities highlighted persistent social and structural challenges to adolescent health-seeking behavior.

Findings demonstrate that although developed in a different context, the Andersen Model remains relevant for explaining SRHR

## Challenges and Limitations of the study

The study faced several challenges that should be acknowledged. As a cross-sectional survey, it cannot establish causal relationships between predisposing, enabling, and barrier

factors and SRHR service use. The reliance on self-reported data raises the possibility of recall and social desirability bias, especially on sensitive issues such as sexual activity and service utilization. Furthermore, because the research was conducted in a single urban district, the findings may not be fully generalizable to rural areas of Sierra Leone or other settings. Finally, some constructs, such as stigma and confidentiality, were measured using single items, which may have limited the reliability of these measures.

### **Authors' contributions**

MMK, SMTW, and SF contributed to the manuscript's writing, literature review and interpretation, and data analysis. RW, AV, and KR contributed to the manuscript's literature review and data analysis. All authors read and approved of the final manuscript.

### **Data Availability**

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

### **Ethics Approval and Consent to**

#### **Participate**

This study received ethical approval from the Directorate of Research and Development (DRD), Njala University, which serves as the Institutional Review Board (IRB) for research involving human participants at Njala University. All procedures involving human participants were conducted in accordance with the ethical standards of the Njala University DRD and the principles of the Declaration of Helsinki (2013 revision).

Written informed consent was obtained from all participants aged 18 years and above. For participants aged 15-17 years, written assents were obtained in addition to parental or guardian consent, in compliance with national ethical guidelines.

#### **Declaration of conflicting interest**

The authors declare no competing interests.

#### **Clinical Trial Registration**

This study did not involve a clinical trial. Clinical trial number: not applicable.

#### **Consent to Publish**

No identifying information of participants is included in this manuscript. Consent to Publish: not applicable.

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## Figure and Tables

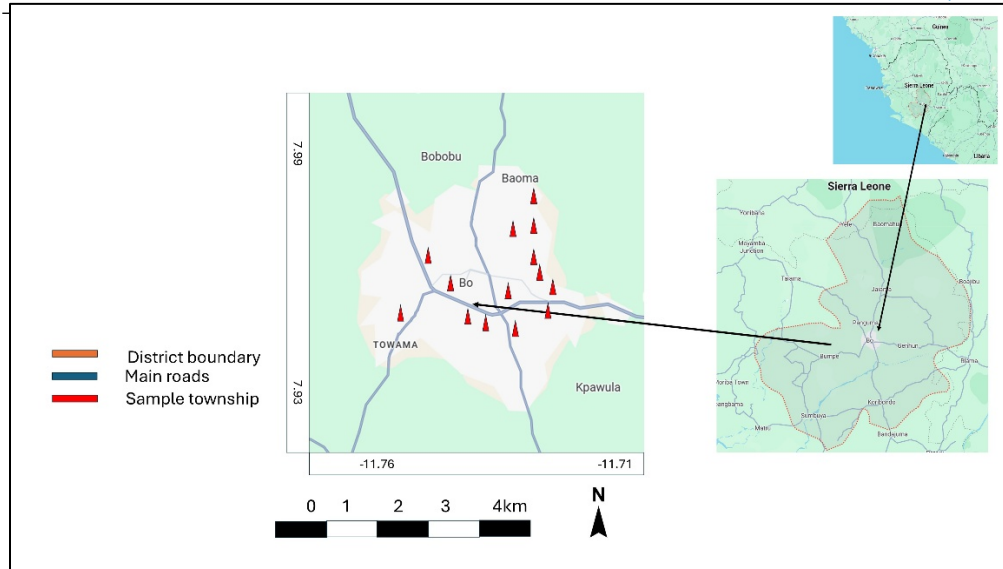


Figure 1: Geographic Distribution of SRHR Survey Sites in Bo City, Sierra Leone. Map displays GPS locations of adolescent SRHR survey respondents across major towns (divisions) of Bo City.”

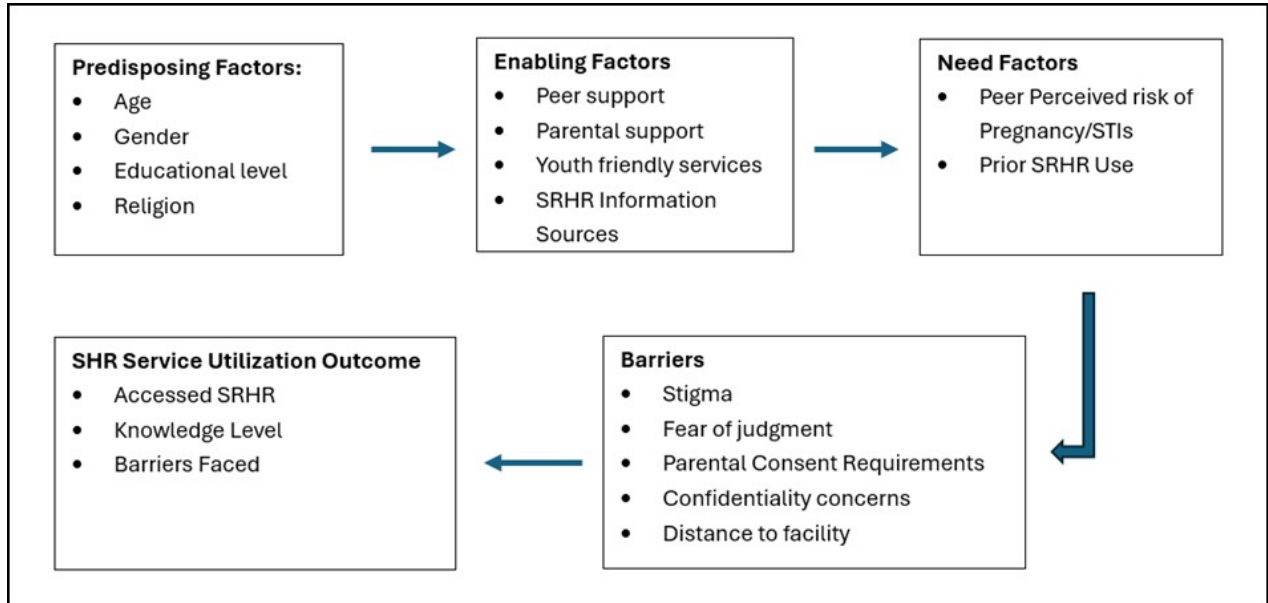


Figure 2: Modified Andersen Framework for SRHS Access

This framework applies a modified Andersen Behavioral Model to adolescent sexual and reproductive health in Sierra Leone, integrating predisposing, enabling, need, and barrier factors that influence service utilization. It includes locally relevant elements such as stigma, peer support, and perceived confidentiality reflecting key determinants of adolescent health-seeking behavior in resource-limited contexts.

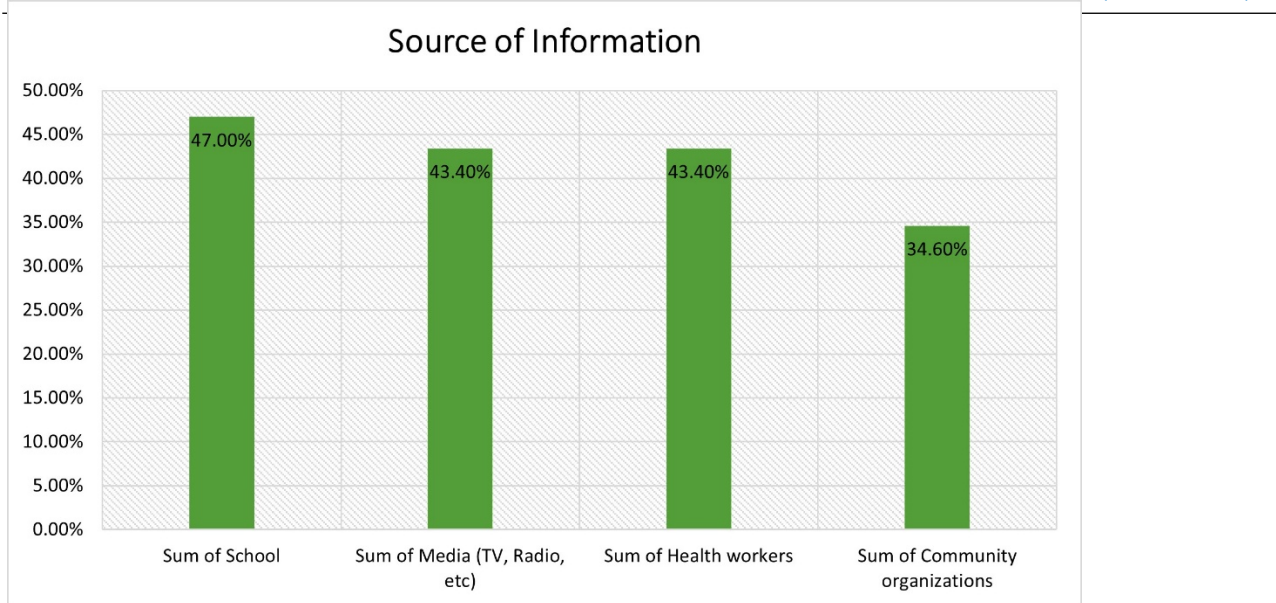


Figure 3: Source of information about SRHS.

**Table 1: Socio-demographic characteristics of study participants, Bo City**

<b>Characteristics</b>		<b>Frequency</b>	<b>Percent</b>
<b>Sex</b>	Female	280	66.8
	Male	139	33.2
<b>Age</b>	15-19	216	46.5
	20-24	203	53.5
<b>Marital Status</b>	Single	270	64.4
	Married	99	23.6
	Cohabiting	50	11.9
<b>Educational Level</b>	Illiterate	71	16.9
	Primary	76	18.1
	Secondary	190	45.3
	Tertiary	82	19.6
<b>Religion</b>	Christian	218	52
	Muslim	201	48

Table 2: Chi-Square Test

		Ever use SRHS Services		Pearson Chi-Square	p-value
		No	Yes		
<b>Age</b>	15 years	12	19	55.609	<0.0001
	16 years	13	17		
	17 years	2	32		
	18 years	7	34		
	19 years	4	55		
	20 years	23	45		
	21 years	9	12		
	22 years	12	36		
	23 years	12	17		
	24 years	33	25		
	<b>Sex</b>	Female	77		
Male		50	89		
<b>Current Educational Level</b>	Illiterate	20	51	7.437	0.059
	Primary	21	55		
	Secondary	51	139		
	Tertiary	35	47		
<b>Marital Status</b>	Cohabiting	13	37	0.88	0.644
	Married	33	66		
	Single	81	189		
<b>Religion</b>	Christian	62	156	0.752	0.386
	Muslim	65	136		
<b>Support from family</b>	No	46	99	0.21	0.647
	Yes	81	193		
<b>Peer support</b>	No	67	113	7.137	0.008
	Yes	60	179		
<b>Youth-friendly health services</b>	No	86	179	1.567	0.211
	Yes	41	113		
<b>Community awareness programs</b>	No	79	180	0.012	0.914
	Yes	48	112		
<b>Access to information (media, school programs)</b>	No	72	173	0.238	0.626
	Yes	55	119		

**Table 3: Multivariate Logistic Regression**

Parameters	Variables	Crude Odds Ratio (COR)		Adjusted Odds Rati (AOR)	
		P-value	COR (95% CI)	p-value	AOR (95% CI)
Age	15 years	0.105	0.478 (0.196, 1.165)	0.101	0.428 (0.155, 1.181)
	16 years	0.229	0.579 (0.238, 1.41)	0.203	0.502 (0.173, 1.45)
	17 years	<0.001	0.047 (0.01, 0.217)	<0.001	0.038 (0.008, 0.193)
	18 years	<0.001	0.156 (0.059, 0.41)	<0.001	0.123 (0.042, 0.359)
	19 years	<0.001	0.055 (0.018, 0.172)	<0.001	0.048 (0.015, 0.158)
	20 years	0.01	0.387 (0.188, 0.798)	0.003	0.301 (0.138, 0.66)
	21 years	0.272	0.568 (0.207, 1.558)	0.223	0.494 (0.158, 1.538)
	22 years	0.001	0.253 (0.11, 0.582)	0.002	0.249 (0.103, 0.599)
	23 years	0.174	0.535 (0.217, 1.32)	0.157	0.503 (0.194, 1.303)
	24 years (ref)	.	.	.	.
Sex	Male	0.076	1.481 (0.959, 2.287)	0.138	1.459 (0.886, 2.401)
	Female (ref)	.	.	.	.
Current Educational Level	Illiterate	0.064	0.527 (0.267, 1.037)	0.055	0.452 (0.2, 1.017)
	Primary	0.049	0.513 (0.263, 0.999)	0.146	0.572 (0.269, 1.215)
	Secondary	0.011	0.493 (0.286, 0.848)	0.385	0.727 (0.354, 1.492)
	Tertiary (ref)	.	.	.	.

Marital Status	Single	0.579	1.213 (0.613, 2.403)	0.883	1.065 (0.458, 2.479)
	Married	0.341	1.445 (0.677, 3.084)	0.991	0.995 (0.406, 2.439)
	Cohabiting (ref)	.	.	.	.
Religion	Muslim	0.386	1.203 (0.792, 1.825)	0.491	1.18 (0.737, 1.891)
	Christian (ref)	.	.	.	.
Support from family	No	0.647	1.107 (0.716, 1.711)	0.889	0.961 (0.549, 1.681)
	Yes	.	.	.	.
Peer support	No	0.008	1.769 (1.162, 2.693)	0.012	2.026 (1.165, 3.523)
	Yes	.	.	.	.
Youth-friendly health services	No	0.211	1.324 (0.853, 2.057)	0.927	1.031 (0.541, 1.965)
	Yes (ref)	.	.	.	.
Community awareness programs	No	0.914	1.024 (0.667, 1.573)	0.305	1.436 (0.72, 2.865)
	Yes (ref)	.	.	.	.
Access to information	No	0.626	0.9 (0.591, 1.373)	0.177	0.653 (0.352, 1.212)
	Yes (ref)	.	.	.	.

**Table 4: Frequently used SRHS**

Categories	Variables	Frequency	Percent
Types of SRHS	STI treatment	204	48.7
	Family planning/ contraceptives	180	43.0
	Pregnancy-related services	99	23.6
	Sexual health counseling	75	17.9
	Abortion services	35	8.4
	Adolescents have access to SRHS	Agree	133
Disagree		86	20.5
Strongly agree		137	32.7
Strongly disagree		63	15
Adolescents should be taught about contraceptives and safe sex practices	No	79	18.9
	Not Sure	52	12.4
	Yes	288	68.7
Adolescents have the right to make decisions about SRHS without parental consent	No	270	64.4
	Unsure	27	6.4
	Yes	122	29.1

**Table 5: Barriers to SRHS Utilization**

Barriers	Frequency	Percent
Ashamed	189	45.1
Lack of information	213	50.8
Distance to health facilities	265	63.2
Cultural & religious beliefs	212	50.6
Fear of stigma	229	54.7
Parental consent requirements	161	38.4
Financial constraints	248	59.2

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Marital status	133	31.7
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