

Barriers to HIV prevention among adolescents in Njombe, Tanzania: Knowledge gaps and accessibility of sexual and reproductive health services

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Abstract

Background: HIV remains a significant global public health issue, claiming 36.3 million lives worldwide. In 2020, approximately 1.75 million adolescents aged 10-19 were living with HIV globally, with sub-Saharan Africa accounting for 88% of these cases. Tanzania has a national HIV prevalence of 4.8% among individuals aged 15-49, with the Njombe region reporting the highest prevalence at 11.4%. Despite efforts to combat HIV, adolescents often receive less focus in intervention programs, resulting in inadequate adolescent-friendly services and low HIV testing coverage. This study aimed to assess the barriers to HIV prevention among adolescents in Njombe, focusing on their knowledge and access to Sexual and Reproductive Health Rights (SRHR) services.

Methods: A descriptive research approach was used, targeting adolescents aged 15-19 from Agnes Trust and Mpechi secondary schools in Ramadhani and Mji Mwema wards. A total of 155 students were selected through purposive sampling. Data was collected using structured questionnaires and analyzed using STATA version 17.

Results: The study revealed that 67.1% of adolescents had good knowledge of HIV prevention, with females demonstrating slightly better knowledge (70.11%) than males (63.24%). However, only 69.68% had access to SRHR services, with counselling and testing (31.61%) and health education (30.97%) being the most common services received. Despite this, condom use remained low, with only 3.7% taking condoms during SRHR service participation.

Conclusion: While adolescents in Njombe have a good understanding of HIV prevention, there are significant gaps in the consistent use of preventive measures like condoms. Enhanced community awareness, better access to SRHR services, and targeted interventions for male adolescents are recommended to address these gaps and reduce HIV prevalence among adolescents in the region. Further research is needed to explore additional factors contributing to the high HIV prevalence in Njombe.

Keywords: HIV Prevention, adolescents, Njombe Region, sexual and reproductive health rights (SRHR), knowledge gaps, condom use

Introduction

HIV remains a formidable global public health challenge, responsible for approximately 36.3 million deaths worldwide. Despite notable progress in the development of antiretroviral therapies and preventive measures, the epidemic continues to affect vulnerable populations, particularly adolescents, disproportionately. In 2020, about 1.75 million adolescents aged 10-19 were living with HIV globally, with sub-Saharan Africa accounting for a staggering 88% of these cases (WHO, 2020).

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This demographic shift is concerning, as it highlights the increasing burden of HIV among young people. Adolescents face unique risks and vulnerabilities contributing to this growing epidemic, including biological susceptibility, behavioral risks, and socioeconomic challenges (Bossonario et al., 2022; Lewis et al., 2022). Additionally, adolescent girls are six times more likely to contract HIV than their male peers, primarily due to gender-based inequalities and limited access to education and health services (UNICEF, 2021). These disparities underscore the urgent need for targeted interventions tailored to the specific needs of adolescents in HIV prevention efforts.

In Tanzania, the national HIV prevalence among individuals aged 15-49 was reported at 4.8% in 2019, with the Njombe region exhibiting the highest prevalence at 11.4% (UNAIDS, 2020). Despite concerted efforts by the government and various non-governmental organizations to curb the spread of HIV, adolescents remain a largely neglected demographic in intervention programs. Most initiatives tend to focus on children through programs such as Prevention of Mother-to-Child Transmission (PMTCT) and adults through Antiretroviral Therapy (ART) treatments, leaving a significant gap in adolescent-specific services. (Nel et al., 2020). As a result, adolescents often have limited access to youth-friendly health services, including HIV testing and counselling, leading to lower rates of HIV status awareness and treatment uptake among this age group.

Addressing the HIV epidemic among adolescents requires a comprehensive understanding of the barriers they face in accessing preventive and treatment services. (WHO, 2013). This study focuses on the Njombe region, known for its high HIV prevalence, to assess adolescents' knowledge of HIV and their access to Sexual and Reproductive Health Rights (SRHR) services. By identifying gaps in knowledge and service provision, this research aims to inform more effective intervention strategies tailored to the needs of adolescents. Previous studies have highlighted the importance of SRHR services in reducing HIV transmission among young people, yet many adolescents in Tanzania still struggle to access these essential services due to social stigma, lack of awareness, and inadequate healthcare infrastructure (Ivanova et al., 2019).

This study is significant as it provides critical insights into the barriers to HIV prevention among adolescents in Njombe and informs policy and practice to enhance SRHR service delivery. The findings will contribute to the broader body of knowledge on adolescent health and HIV prevention, offering evidence-based recommendations for improving service accessibility and effectiveness. By addressing the specific needs of adolescents, stakeholders can develop targeted interventions that not only increase HIV awareness and testing rates but also promote safer sexual behaviors and better health outcomes. Ultimately, this research aims to support the global goal of ending the AIDS epidemic by 2030 by ensuring that no adolescent is left behind in the fight against HIV.

Methods

Study area

This study was conducted in the Njombe region in the Southern Highlands of Tanzania. Njombe is bordered by Makambako town and Mufindi district to the north, Morogoro region to the east, and Njombe town to the south. The study focused on the Ramadhani and Mji Mwema wards, two urban areas within the Njombe region (Figure 1). According to the 2012 Population and Housing Census (PHC), Ramadhani ward has a population of 16,305, while Mji Mwema ward has a population of 13,929 (URT, 2022). The region's high HIV prevalence, reported at 11.4%, makes it a critical area for studying barriers to HIV prevention among adolescents.

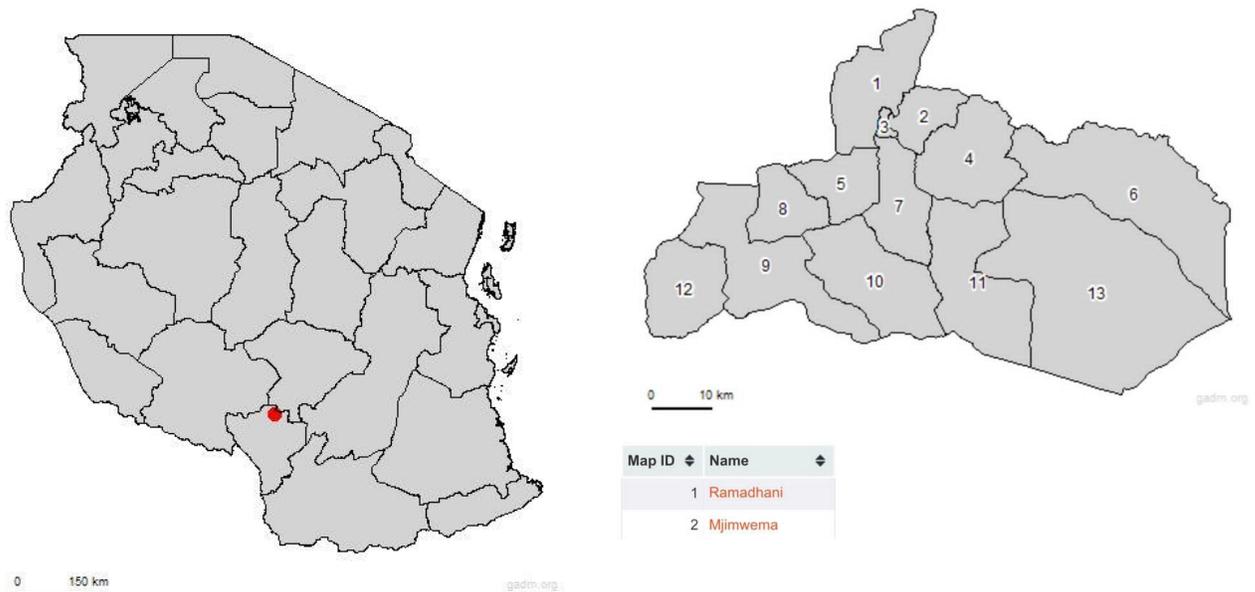


Figure 1: A map of Tanzania and Njombe region. Ward 1 is Ramadhani ward and Ward 2 is Mji Mwema ward

Study population

The study population consisted of adolescents aged 15-19 from Agnes Trust and Mpechi secondary schools in the Njombe urban district. These schools were selected to provide a representative sample of the adolescent population in the region. The inclusion criteria were adolescents aged 15-19 who were residents of the Ramadhani and Mji Mwema wards and provided informed consent to participate in the study. Adolescents below 15 or above 19 were excluded from the study.

Study design

A descriptive cross-sectional research design was employed to gain insights into the barriers to HIV prevention among adolescents in Njombe. This design is suitable for obtaining a snapshot of the current status of knowledge, attitudes, and practices related to HIV prevention and access to SRHR services among the target population.

Sampling procedure and sample size

Purposive sampling was used to select the study participants. The sample size was calculated using the formula for determining sample size for a population proportion with a 95% confidence level and a 5% margin of error (Charan & Biswas, 2013). Based on the estimated HIV prevalence of 11.4% in Njombe (UNAIDS, 2020), the sample size was determined as follows:

$$n = \frac{z^2 * p(1 - p)}{e^2}$$

Where n=sample size

p=estimated proportion in the study obtained from the previous study, for Njombe P =11.4% (UNAIDS, 2020)

Z=standard normal deviation set at 1.96, which corresponds with a 95% confidence interval

e =standard error set at 0.05(5%) marginal error

$$n = \frac{1.96^2 \times 0.114 (1-0.114)}{(0.05)^2} = 155$$

Therefore, the required sample size for this study was 155 participants.

Data collection

The primary data for this study were gathered through a structured questionnaire administered to the sampled population, focusing on three key areas: general demographics, knowledge and experience, and access to SRHR services. Demographic information included age, gender, school, and ward of residence. The knowledge and experience section assessed participants' understanding of HIV prevention methods, their sources of HIV-related information, and personal experiences with HIV prevention. Finally, the questionnaire explored the accessibility and utilization of SRHR services, including the types of services received and the methods of service provision. This comprehensive approach aimed to provide a holistic view of the participants' backgrounds, knowledge, and experiences related to HIV prevention and SRHR services.

Questionnaire design

The questionnaire was structured into three parts and utilized multiple-choice and open-ended questions to collect quantitative and qualitative data. Part A focused on general demographics, gathering information such as age, gender, school, and ward of residence. Part B delved into knowledge and experience, assessing participants' understanding of HIV prevention, their sources of information, and personal experiences related to the topic. Part C addressed SRHR services, examining access to these services, the types of services received, and the methods of service provision. This comprehensive design allowed for thoroughly exploring the participants' backgrounds, knowledge, and experiences regarding HIV prevention and SRHR services.

Data analysis

Data were checked for completeness, entered, cleaned, and analyzed using the Statistical Package for Social Sciences (STATA) version 17. Descriptive statistics summarised the data, including means for numerical variables and frequencies and percentages for categorical variables. The relationship between variables, such as knowledge of HIV prevention and gender, was analyzed using chi-square tests. Results were presented in tables, figures, and narrative form.

Ethical considerations

Ethical approval for the study was obtained from the University of Dar es Salaam – Mbeya College of Health and Allied Sciences (UDSM-MCHAS) ethical review board. Permission to conduct the research was also obtained from the Njombe region administration. Informed consent was obtained from all participants after explaining the study's aim, procedures, benefits, and risks. Participants were assured of their right to withdraw from the study at any time without any consequences. Confidentiality of the information was maintained by using codes instead of participants' names and ensuring that data were used solely for research purposes.

Results

Participant demographics

The study enrolled 155 adolescents aged 15-19 from Agnes Trust and Mpechi secondary schools in the Njombe urban district. The mean age of the participants was 16.42 years. The sample comprised

56% females (87 participants) and 44% males (68 participants). Most participants were from Agnes Trust Secondary School, representing 54% (83 participants), while 46% (72 participants) were from Mpechi Secondary School. The participants were almost evenly distributed between the two wards: 54% from Ramadhani (83 participants) and 46% from Mji Mwema (72 participants) (Table 1).

Table 1: Background characteristics of participants from our study

Variable	n	%
DISTRICT		
NJOMBE URBAN	155	100
WARD		
RAMADHANI	83	54
MJI MWEMA	72	46
SCHOOL		
AGNES TRUST SECONDARY SCHOOL	83	54
MPECHI SECONDARY SCHOOL	72	46
AGE GROUP (MEAN AGE 16.42)		
(15-16)	89	57
(17-18)	58	37
(19-20)	8	5
SEX		
MALE	68	44
FEMALE	87	56

Knowledge of HIV/AIDS

Basic knowledge of HIV/AIDS

The study found that 67.1% (104 participants) of adolescents had good knowledge of HIV/AIDS prevention, while 32.9% (51 participants) had poor knowledge. This was determined based on their ability to correctly answer five key HIV knowledge questions: understanding what HIV is, recognizing that consistent condom use reduces the risk of HIV, knowing that healthy-looking individuals can have HIV, acknowledging that mosquito bites cannot transmit HIV, and knowing that HIV cannot be spread by sharing food (Table 2).

Table 2: Knowledge of adolescents on HIV/ADS

Basic Knowledge	n	%
GOOD KNOWLEDGE	104	67.10
POOR KNOWLEDGE	51	32.90
TOTAL	155	100.00

Relationship between knowledge and gender

The relationship between knowledge of HIV/AIDS and gender was statistically significant ($p < 0.05$). Among the female participants, 70.11% (61 out of 87) had good knowledge compared to 63.24% (43 out of 68) of male participants. This indicates a higher level of knowledge among female adolescents in the study (Table 3).

Table 3: Relationship between knowledge and gender

Basic Knowledge	Sex		Total	Key Frequency Expected Frequency
	Female	Male		
Good Knowledge	61 58.	43 45.6	104 104.0	
Poor Knowledge	26 28.6	25 22.4	51 51.0	
Total	87 87.0	68 68.0	155 155	

Pearson chi2 (1) = 0.8183 Pr = 0.0366

Sources of knowledge

The primary sources of HIV knowledge among the participants were mass media (television, newspapers, radio), at 48%, followed by schools, at 29.68%. Other sources included parents and the community (18.71%), books (3.23%), and conferences (0.65%) (Figure 2).

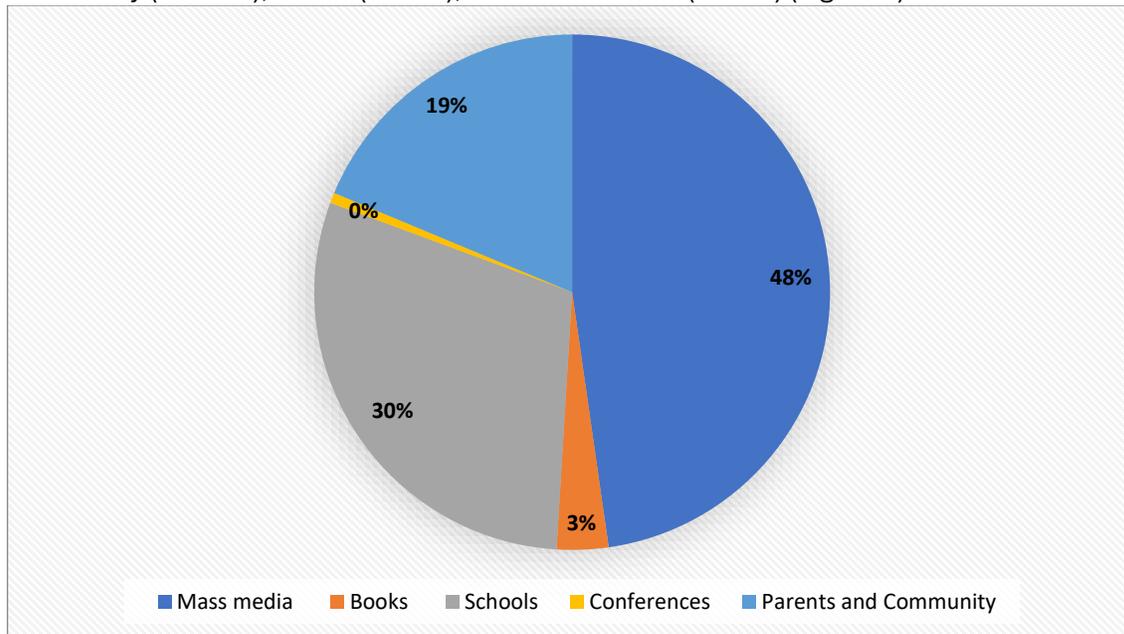


Figure 2: A pie chart showing Sources of knowledge

Sexual debut and condom use

Among the 155 participants, 16.6% (26 participants) reported being in sexual relationships. Of those, 30.7% (8 participants) had initiated sexual intercourse. However, only 37.5% (3 out of 8) of these sexually active adolescents reported using condoms during intercourse. The relationship between sexual debut and condom use was statistically significant ($p < 0.05$) (Table 4).

Table 4: Relationship between sexual debut and condom use

Sexual debut	Condom use		Total	Key
	No	Yes		
No	11	7	18	Frequency
	1.6	1.4	18.0	
Yes	3	5	8	Expected Frequency
	0.7	0.6	8.0	
Total	14	12	26.0	
	14.0	12.0		

Pearson chi2 (4) = 162.4066 Pr = 0.000

Access to SRHR services

General Access to SRHR Services

Regarding access to SRHR services, 69.68% (108 participants) reported having accessed these services, while 30.32% (47 participants) had not. This indicates that a significant portion of adolescents still lack access to essential SRHR services (Figure 3).

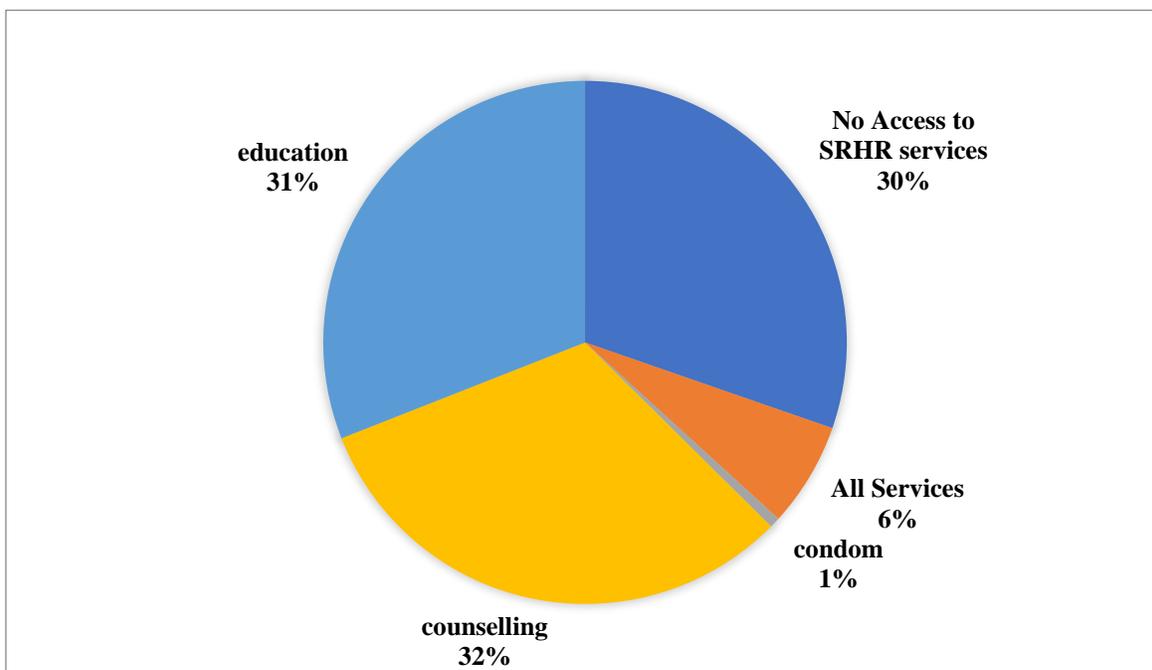


Figure 3: A pie chart showing access to SRHR services and types of services received.

Types of SRHR services received

The most common SRHR services received by adolescents were counselling and testing (31.61%) and health education (30.97%). A notably low percentage (0.65%) reported receiving condoms. This suggests a gap in the provision of comprehensive SRHR services, particularly in promoting and distributing condoms.

Methods of provision of SRHR services

Adolescents received SRHR services primarily through seminars (53.7%), followed by all sources combined (25%). Other methods included journals (10.19%), youth clubs (9.26%), and posters (1.85%). This reflects a reliance on group-based educational approaches over individual or media-based methods (Table 5).

Table 5: Method of provision of SRHR services

Method of provision	N	%
Journal	11	10.19
Seminars	58	53.7
Youth clubs	10	9.26
Posters	2	1.85
All sources	27	25

Participation in SRHR services

Participation Rates

A significant majority, 85% (132 participants), reported participating in SRHR services, while 15% (23 participants) did not. This indicates a relatively high level of engagement with available SRHR services among the study population.

Ways of participation

Among those who participated in SRHR services, 53.7% were willing to test for HIV, 29.63% attended conferences, and 3.7% took condoms. A combined approach involving multiple methods of participation was reported by 12.96% of the participants. These findings suggest that while there is good participation in some SRHR activities, condom uptake remains low (Figure 4).

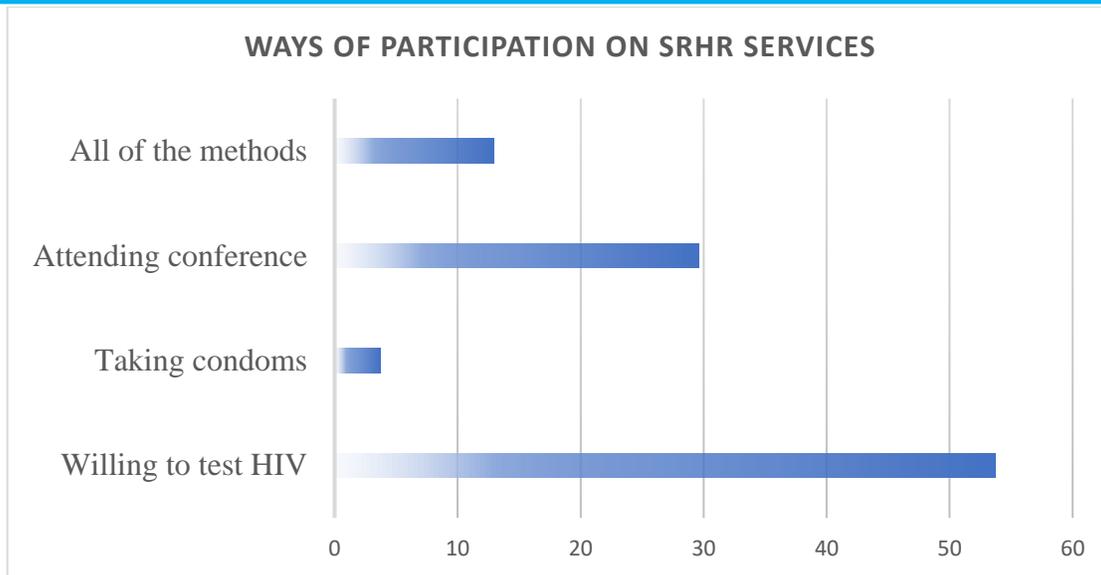


Figure 4: A bar chart showing a percentage of ways of participation of adolescents to SRHR services

Discussion

The findings of this study reveal a significant level of knowledge about HIV prevention among adolescents in Njombe, with 67.1% demonstrating a good understanding. This aligns with other studies that highlight the positive impact of education on HIV awareness. (UNICEF, 2021). However, the gender disparity in knowledge, where females exhibited slightly higher knowledge levels than males, suggests that targeted educational interventions for males might be necessary. This gender difference in HIV knowledge has been documented in various contexts, emphasizing the need for gender-sensitive approaches in health education. (UNAIDS, 2020). By addressing these gaps, health programs can better equip all adolescents with the necessary knowledge to prevent HIV.

Despite the high level of knowledge, the study uncovered critical gaps in behaviour, particularly concerning condom use. Among sexually active adolescents, only 37.5% reported using condoms, highlighting a significant risk for HIV transmission. (Conserve et al., 2012; Guiella & Madise, 2007). This finding is consistent with other research indicating that knowledge alone cannot change behaviour. (Ivanova et al., 2019). Effective HIV prevention requires not only awareness but also access to preventive tools and consistent behaviour change. Programs need to focus on practical strategies to increase condom use, such as making condoms more accessible and promoting their use through targeted campaigns.

Access to SRHR services was relatively high, with 69.68% of adolescents having accessed these services. However, the types of services received varied, with counselling and testing being the most common. (Ninsiima et al., 2021; Wakjira & Habedi, 2022). The notably low provision of condoms (0.65%) is concerning and points to a gap in comprehensive SRHR services. Effective HIV prevention requires a holistic approach that includes education, testing, counselling, and access to preventive tools like condoms. (Nel et al., 2020). Enhancing the availability of condoms and integrating their distribution into SRHR services could significantly improve prevention efforts.

The study also highlighted the preferred methods of SRHR education among adolescents. Seminars were the predominant method, suggesting that group-based educational approaches are effective in this context. However, relying on seminars indicates that other methods, such as individual counselling, media campaigns, and peer education, might be underutilized. Diversifying the methods of SRHR education could enhance reach and impact, ensuring that all adolescents, including those who might not attend seminars, receive accurate and comprehensive information. (Ngilangwa et al., 2016). Future programs should consider a multi-faceted approach to SRHR education.

This study had several limitations. First, the reliance on self-reported data may introduce bias, as participants might not accurately recall or may underreport sensitive behaviors. Second, the study was conducted in only two wards of Njombe, which may limit the generalizability of the findings to other regions. Third, the cross-sectional design provides a snapshot in time but cannot establish causality. Despite these limitations, the study provides valuable insights into the barriers to HIV prevention among adolescents in Njombe, highlighting critical areas for intervention and further research.

Conclusion

This study highlights the significant knowledge adolescents in Njombe possess about HIV prevention, yet it underscores the persistent gaps in actual preventive behaviours, particularly condom use. Despite a high level of awareness, with 67.1% of adolescents demonstrating good knowledge, this did not translate into consistent condom use, revealing a critical disconnect between knowledge and practice.

The findings indicate that while access to SRHR services is relatively high, there are notable deficiencies in the comprehensive provision of these services, especially in the distribution of condoms. Addressing these gaps requires a multi-faceted approach that combines enhanced education, increased accessibility to preventive tools, and targeted behavioural interventions. Additionally, the study emphasizes the need for gender-sensitive educational programs, as females exhibited higher knowledge levels than males. To ensure broader reach and impact, future interventions should focus on diversifying SRHR education methods, including individual counselling, media campaigns, and peer education. Despite the study's limitations, including the reliance on self-reported data and its limited geographic scope, the insights gained are invaluable for informing policy and programmatic efforts aimed at reducing HIV prevalence among adolescents. By addressing these identified barriers and implementing targeted strategies, stakeholders can significantly improve HIV prevention efforts and support the global goal of ending the AIDS epidemic by 2030.

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Author contributions

JDS and VC designed the study. JDS and VC conducted and contributed to data analysis. JDS and CNM interpreted the data. JSD and CNM prepared the original manuscript. All co-authors contributed to subsequent revisions. All authors read and approved the final manuscript.

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Conflict of interest

The authors declare that they have no competing financial and non-financial interests.

Availability of data and material

All data generated or analyzed during this study is included in this published article.

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