ORIGINAL ARTICLE

Knowledge, Attitudes and Practices on Sexually Transmitted Infections (STI) Prevention among Adolescents in Mbala District, Zambia

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ABSTRACT

Background: This study explores knowledge and attitude on prevention of STIs among 163 adolescents in Mbala district. With the increased outpatient department (OPD) cases of sexually transmitted infections (STIs) among the adolescents, concerns have emerged regarding various factors such as lack of knowledge on prevention, attitude of adolescents and preventive practices because adolescents often lack access to relevant health information. The aim of this study is to investigate knowledge, attitude, and practices on prevention of sexually transmitted infections STIs among adolescents in Mbala district of Northern Province, Zambia.

Methods: A cross-sectional study was conducted at selected health facilities in Mbala district offering primary healthcare services to adolescents aged 10 to 19 years. A simple random sampling method was used to select the participants using a lottery method.

Results: The results indicated that 66 (40%) adolescents had high knowledge level, and 98 (60%) adolescents had negative attitude on prevention of STIs while 85 (52%) adolescents had inadequate prevention practices towards STIs.

Conclusions: The study revealed that knowledge levels were high among adolescents though low knowledge levels were expressed on correct signs and symptoms of STIs. The study further, revealed that adolescents had negative attitude and inadequate preventive practices towards STIs prevention. Thus, there was a need to engage school administrators to incorporate adolescent health and STI prevention education into the curriculum using locally relevant and culturally sensitive materials and to develop a peer education program where adolescents would train other adolescents using relatable messages that are effective for the target age group.

INTRODUCTION

Sexually transmitted infections (STIs) are major universal public health concern.[1] Infections cause an acute illness, infertility, disability, and death.[2] Young people and adolescents are among the vulnerable groups for sexually transmitted infections (STIs), globally the burden of sexually transmitted infection (STI) incidence is on the rise in the United States.[3] In a global report, there was an annual estimate of 357–376 million curable new cases of STIs that were diagnosed among adolescents and adults coupled

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with a lack of knowledge and available services about STIs, adolescents are more likely to practice unprotected sex and have multiple sexual partners and thereby have a higher chance of getting infected with STIs. [4] In Zambia, health management information system (2017-2021), the number of new sexually transmitted infections has been rising from 237531 cases in 2017 to 503325 cases in 2021.[5] The current study reveals that most of the participants had their first sexual encounter at the age of 16 and 20 years.[6] This implies that women engage in sexual activity at a much younger age and that this age group (16-20 years) are at a higher risk of contracting STIs.[6]

Adolescence is often considered a period of relatively good health, however, adolescents (aged 10 to 19 years) face particular health risks, especially in relation to reproduction and sexuality.[7]

The burden of morbidity and mortality worldwide resulting from sexually transmitted pathogens compromises quality of life as well as sexual and reproductive health and newborn and child health.[8] The consequences of untreated sexually transmitted infections (STIs) are often worse among young women and men at 49% to 51%?. Women and men aged 15-19 have lower levels of knowledge of these HIV prevention methods than people aged 20 and older who are often at greater risk because they may have shorter relationships with more partners or engage in other risky behaviours.[9, 10] Incidence and prevalence estimates suggest that young people aged 15–24 years acquire half of all new Sexually transmitted diseases (STDs) and that one in four sexually-active adolescent females has an STD, such as chlamydia or human papilloma virus (HPV).[11] Further, adolescents compared with older adults, sexually active adolescents aged 15–19 years and young adults aged 20–24 years are at higher risk of acquiring STDs for a combination of behavioural, biological, and cultural reasons.[11]

Sexually transmitted infections impose a substantial strain on the budgets of both households and national health systems in middle and low-income countries and have an adverse effect on the overall well-being of individuals.[8] Countries with poor STI control have been most vulnerable to HIV epidemics, while improvements in STI control parallel or precede declines in HIV incidence and prevalence.[12] There is growing evidence that countries controlling STIs are more likely to halt and reverse their HIV epidemics than those that do not.[12] Therefore, some of the gaps might be many countries basic STI services are in disarray as programme resources are determined by decisions relating to a single disease entity, such a fractured paradigm is as counterproductive for HIV as it is to STIs.[12]

Adolescents do not have communication on sexual matters with their parents, as a result most information for their scattered knowledge comes from peers of the same sex who themselves lack adequate information about reproductive health.[13] This difference might be due to lack of trust or faithfulness, decreased pleasure, lack of knowledge of condom benefits, less fear of contracting HIV/ AIDS as it can now be controlled by medication, influence of tradition and scarcity of female condoms and the perception by women that it is complicated to insert.[13] In Zambia one of the gaps may be that the message, “condoms are not 100% safe,” is being widely interpreted as condoms may not work sufficiently well to make them worth using.[1 4]

Despite all the effort the government and other stakeholders have put in place to mitigate the problem of STIs, the incidences of STIs continue to rise in men and women in the reproductive age and it is estimated that up to 10% of all outpatients' attendances at health facilities are related to STIs. According to Zambia STIs treatment guidelines, the incidence of STIs constituted 1.4% of outpatient attendance in 2021 and this trend is on the rise.[15]

Most adolescents are able to explore and experiment in ways that contribute positively to their health and development; some do take up behaviours that undermine their health or behaviours that can lead to significant health problems later on in life.[16] Other studies conducted mostly in the urban areas of Zambia show that the majority of young people engage in risky sexual behavior despite evidence suggesting widespread awareness about STIs. The most affected age groups are the sexually active population of between 15-25 years and are among

the major causes of outpatient attendances both in public and private institutions. 5

There has been a growing trend Recently on STI cases being recorded among the adolescents in Mbala district despite the government efforts in trying to reduce sexual and reproductive health cases such as STIs including HIV and AIDS. This study makes a significant contribution to addressing gaps in STI prevention among adolescents in Mbala (Zambia) by providing evidence-based insights into the specific challenges and barriers they face. Through identifying knowledge deficits, behavioral patterns, and obstacles, the research informs targeted interventions and policy recommendations. The findings highlight the need for culturally appropriate, youth-friendly education and healthcare services, ultimately enhancing STI prevention efforts and improving adolescent health outcomes in Zambia. The aim of the study was to investigate knowledge and attitude on prevention of STIs among the adolescents in Mbala district of Northern Province, Zambia.

METHODOLOGY

Research Design

This was a cross-sectional study conducted at selected health facilities in Mbala district offering primary healthcare services to the community. Mbala district was purposively selected based on the acceptability and background information available on STIs. The target population was all adolescent males and females in the catchment area, aged 10 to 19 years, who were seeking care at health facilities.

Sample selection

Random sampling method was used to select the participants using a lottery method. Each participant's unique identifier was written on a separate slip of paper. The slips were uniform in size and shape to ensure fairness and were folded consistently to prevent any distinguishing marks from being visible. All the folded slips were placed into a container and then it was thoroughly shaken or stirred to randomize the order of the slips. Without looking, a designated individual reached into the container and drawn a slip at random. The identifier on the selected slip determined the chosen participant and was recorded and the process was repeated multiple times until selected number required was reached.

Sample size

The **s**ample size of 163 respondents was calculated according to Lwanga and Lemeshow formula[17]. 11% expected prevalence of STI prevention knowledge/attitude based on previous studies and estimates for the population of 9656 adolescents was used putting into account 10% non-response rate.

Data Collection

Data was collected using a structured self-administered questionnaire with close ended questions. The research instrument was checked for validity by at least two subject matter experts. The content validity was ensured by taking suggestions from experts and lectures that looked at its relevancy and consistence to the study. Reliability was upheld by using the same instrument to collect data from the respondents this helped to addres biases. A Pilot study was done at Tulemane Clinic to determine the feasibility of the proposed study, reliability and validity of the research instrument and no adjustment was done to the instrument as it happened to address all the variables. All adolescents aged 10 to 19 years in Mbala seeking care were included in the study but excluded all adolescents above 19 years and below the age of 10 years.

Data Analysis

Data collected was checked for errors, completeness and consistency and categorised as well as coded according to variables. Data was entered into Statistical Package for Social Sciences (SPSS) software for processing and analysis. Participant's demographic variables were presented using cross tabulations, frequency tables and bar chart. The chi-square test was used to determine associations between categorical variables knowledge level, attitude, and demographic factors while binary logistic regression was performed to assess the predictors of knowledge and attitudes toward STI prevention and effects respectively between the dependent variable and the independent variables at 0.05 significance level.

Ethical Considerations

Adolescents below the age of 18 (legal age for consent) an assent to participate was used but participants aged 18 and above had written consent to participate without coercion. Ethical clearance was granted by University of Zambia Biomedical Research Ethics Committee (UNZABREC) on 31st January 2022, REF. NO. 2151-2021; written permission was granted by the National Health Research Authority on 10th FFebruary2022, REF. NO. NHRA 000009/10/02/2022, and thereafter, by the Northern Province Health Office, Mbala District Heath Office and the study settings.

RESULTS

Data was collected from 163 participants of whom 94 were females and 69 were males in health facilities in Mbala district using self-administered questionnaire from adolescents aged 10 to 19 years old.

Table 1 Relationship between variables

Variables		Prevention of STI		Total	p – value
		Adequate	Inadequate		
Age group	10 to 14 years	11 (6.7%)	14 (8.6%)	25 (15.3%)	0.675
	15 to 19 years	67 (41.1%)	71 (43.6%)	138 (84.7%)	
	Total	**78 (48.0%)**	**85 (52%)**	**163 (100%)**	
Sex	Male	33 (20.2%)	36 (22.1%)	69 (42.3%)	0.995
	Female	45 (27.6%)	49 (30.1%)	94 (57.7%)	
	Total	**78 (47.8%)**	**85 (52.1%)**	**163 (100%)**	
Denomination	UCZ	38 (23.3%)	32 (19.6%)	70 (42.9%)	0.088
	Catholic	15 (9.2%)	21 (12.9%)	36 (22.1%)	
	SDA	11 (6.7%)	23 (14.1%)	34 (20.9%)	
	Pentecostals	14 (8.6%)	9 (5.5%)	23 (14.1%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Education	None	11 (6.7%)	6 (3.7%)	17 (10.4%)	0.015
	Primary	25 (15.3%)	14 (8.6%)	39 (23.9%)	
	Secondary	82 (50.3%)	14 (8.6%)	96 (58.9%)	
	Tertiary	10 (6.1%)	1 (0.6%)	11 (6.7%)	
	Total	**128 (78.5%)**	**35 (21.5%)**	**163 (100%)**	
Income	Farming	26 (16.0%)	24 (14.7%)	50 (30.6%)	0.004
	Employed	2 (1.2%)	2 (1.2%)	4 (2.4%)	
	Unemployed	12 (7.4%)	13 (8.0%)	25 (15.3%)	
	Sex exchange (Others)	38 (23.3%)	46 (28.2%)	84 (51.5%)	
	Total	**78 (48.0%)**	**85 (52.0%)**	**163 (100%)**	

Condom use	Agree	47 (28.8%)	55 (33.7%)	102 (62.6%)	0.628
	Disagree	31 (19.0%)	30 (18.4%)	61 (37.4%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Influence	Agree	53 (32.5%)	44 (27.0%)	97 (59.5%)	0.035
	Disagree	25 (15.3%)	41 (25.2%)	66 (40.5%)	
	Total	78 (47.9%)	85 (52.1%)	163 (100%)	
Family planning use	Agree	45 (27.6%)	44 (27.0%)	89 (54.6%)	0.529
	Disagree	33 (20.2%)	41 (25.2%)	74 (45.4%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Good Practice	Don't use condoms	16 (9.8%)	31 (19.0%)	47 (28.8%)	0.014
	Have multiple partners	11 (6.7%)	20 (12.3%)	31 (19.0%)	
	Lack of information	13 (8.0%)	8 (4.9%)	21 (12.9%)	
	All of the above	38 (23.3%)	26 (16.0%)	64 (39.3%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Prevention	Correct condom use	18 (11.0%)	34 (20.9%)	52 (31.9%)	0.046
	One faithful partner	6 (3.7%)	5 (3.1%)	11 (6.7%)	
	Through abstinence	13 (8.0%)	18 (11.0%)	31 (19.0%)	
	All of the above	41 (25.2%)	28 (17.2%)	69 (42.3%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Knowledge	High	49 (30.1%)	17 (10.4%)	66 (40.5%)	0.000
	Average	11 (6.7%)	26 (16.0%)	37 (22.7%)	
	Low	18 (11.0%)	42 (25.8%)	60 (36.8%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	
Attitude	Negative	54 (33.1%)	11 (6.7%)	65 (39.9%)	0.000
	Positive	24 (14.7%)	74 (45.4%)	98 (60.1%)	
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**	

Table 1 showed that 128 (79%) participants indicated that regardless the education level, adolescents have had sex in exchange for money while 35 (21%) participants did not. Hence, there was statistically significant relationship between education level and having sex in exchange for money p= 0. 015.

Results above indicated that 69 (42%) participants had knowledge on prevention but only 41 (25.2%)

had adequate practice. There was a statistically significant relationship between knowledge and Preventive practice, p=0. 046, while 64 (39%) participants knew all the causes of STIs but only 38 (23.3%) adolescents had adequate preventive practice on STIs. Hence, there was statistically significant relationship between the two. p=0. 014. Results also showed that 97 (60%) participants agreed that influence had an impact on STIs prevention but 66 (40%) disagreed. However, 53 (33%) participants had adequate preventive practice while 44 (27%) had inadequate preventive practice hence had statistically significant relationship, p= 0. 035.

Majority of 66 (40%) participants had high knowledge levels on STIs but 49 (30.1%) participants who had high knowledge had also adequate preventive practice while 42 (26%) respondents with low knowledge had inadequate practice and 26 (16%) participants with average knowledge had inadequate preventive practice. Therefore, there was statistically significant relationship between knowledge and preventive practice, p= 0. 001.

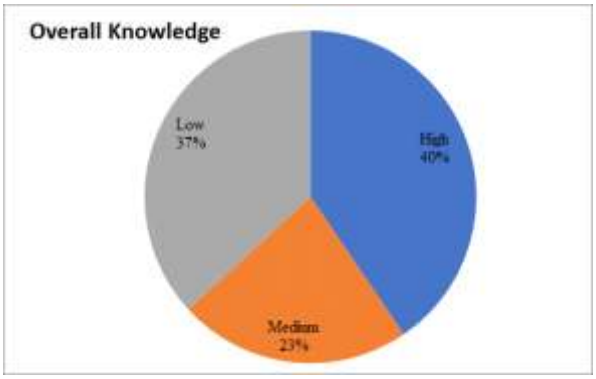

Figure 1: Adolescent Overall Knowledge levels on STIs

Figure 1; indicated the overall knowledge of adolescents on STIs, 66 (40%) participants had high Knowledge levels, and 60 (37%) participants had low Knowledge levels while 37 (23%) had average knowledge on STIs transmission and prevention.

Further, 98 (60%) participants had negative attitude while 65 (40%) had positive attitude on STIs prevention. However, 74 (45.4%) participants who had negative attitude had inadequate preventive practice while 54 (33.1%) participants with positive attitude had adequate preventive practice hence there was significant statistical relationship between attitude and preventive practice p-v=0.001

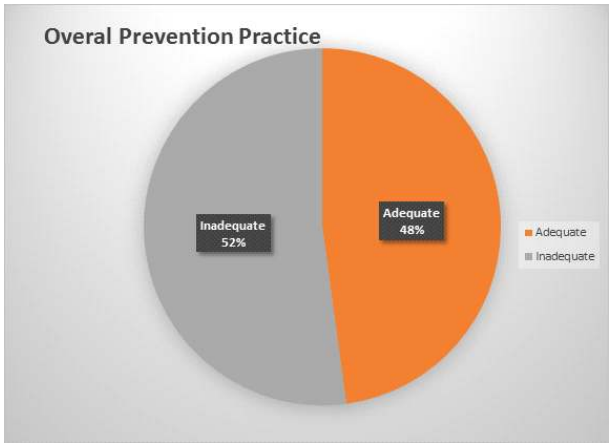

Figure 2: Adolescents Overall Prevention Practice on STIs

Figure 2; above indicates the overall prevention practice of adolescent in which more than half participants 85 (52%) had inadequate overall prevention practice towards STIs prevention while 78 (48%) participants had adequate prevention practice towards STIs.

Table 2 Regression analysis for dependent variable and independent variables

Variable		preventive of STIs			P-value	Odds ratio
		Adequate	**Inadequate**	**TOTAL**		
Education level	None	11 (6.7%)	6 (3.7%)	17 (10.4%)	0.015	0.495
	Primary	25 (15.3%)	14 (8.6%)	39 (23.9%)		
	Secondary	82 (50.3%)	14 (8.6%)	96 (58.9%)		
	Tertiary	10 (6.1%)	1 (0.6%)	11 (6.7%)		
	Total	**128 (78.5%)**	**35 (21.5%)**	**163 (100%)**		
Income	Farming	26 (16.0%)	24 (14.7%)	50 (30.6%)	0.004	1.090
	Employed	2 (1.2%)	2 (1.2%)	4 (2.4%)		
	Unemployed	12 (7.4%)	13 (8.0%)	25 (15.3%)		
	Sex exchange (Others)	38 (23.3%)	46 (28.2%)	84 (51.5%)		
	Total	**78 (48.0%)**	**85 (52.0%)**	**163 (100%)**		
Influence	Agree	53 (32.5%)	44 (27.0%)	97 (59.5%)	0.035	2.625
	Disagree	25 (15.3%)	41 (25.2%)	66 (40.5%)		
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%))**		
Good Practice	May not use condoms	16 (9.8%)	31 (19.0%)	47 (28.8%)	0.014	0.872
	Have multiple partners	11 (6.7%)	20 (12.3%)	31 (19.0%)		
	Lack of information	13 (8.0%)	8 (4.9%)	21 (12.9%)		
	All of the above	38 (23.3%)	26 (16.0%)	64 (39.3%)		
	Total	**78 (47.9%)**	**85 (52.1)**	**163 (100%)**		
Prevention	Correct use of condom	18 (11.0%)	34 (20.9%)	52 (31.9%)	0.046	0.835
	One faithful partner	6 (3.7%)	5 (3.1%)	11 (6.7%)		
	Through abstinence	13 (8.0%)	18 (11.0%)	31 (19.0%)		
	All of the above	41 (25.2%)	28 (17.2%)	69 (42.3%)		
	Total	**78 (47.9%)**	**85 (52.1%)**	**163 (100%)**		
Knowledge	High	49 (30.1%)	17 (10.4%)	66 (40.5%)	0.000	1.279
	Average	11 (6.7%)	26 (16.0%)	37 (22.7%)		
	Low	18 (11.0%)	42 (25.8%)	60 (36.8%)		
	TOTAL	**78 (47.9%)**	**85 (52.1%)**	**163 (100%))**		
Attitude	Positive	54 (33.1%)	11 (6.7%)	65 (39.9%)	0.000	12.214
	Negative	24 (14.7%)	74 (45.4%)	98 (60.1%)		
	TOTAL	**78 (47.9%)**	**85(52.1%)**	**163 (100%)**		

Preventive practices of the adolescent according to demographic characteristics, knowledge and attitude using a Chi-square test analysis indicates that there was an association between preventive practice and education, influence, practice, income, knowledge and attitude but there was no association between prevention and gender, age, family planning, condom use as well as denomination.

Therefore, the results indicate that education, influence, practice, income, knowledge and attitude predicted prevention of STIs among adolescents (Table 4.18). Thus, were more likely to achieve adequate preventive practices according to adjusted odds ratio (AOR) and its 95% confidence interval report with a *p* value <0.05 used to determine statistically significant association.

DISCUSSION

This study findings were based on the analysis of 163 responses from the study participants. The study revealed that majority 138 (84.7%) participants were aged between 15 to 19 years. This means that the age group between 15 to 19 years was the commonest among adolescents in Mbala district and was more likely to be involved in sexual activities.

Knowledge

The study revealed that majority 91 (56%) adolescents had low knowledge levels on prevention of STIs in Mbala. This study was in line with the study conducted in Zambia, where it was revealed that health information messages are usually disseminated using mass media,[16] while a study done in Saudi Arabia indicated that knowledge gained from parents was only 11.2% but the main source of knowledge was Internet.[17, 18] This study showed that 99 (60.7%) adolescents did not use condoms during sex. This was in line with a study conducted in Zambia in which the findings suggest economically vulnerable, unemployed, unmarried women were most likely to report non-use of male condoms; they may have a low sense of empowerment and have been found to be the least able to negotiate safer sex practices such as condom use.[16] However, study done among adolescents in Ruhr-area Germany revealed that despite ready availability of different effective strategies of primary and secondary prevention of STI, their uptake remains impeded by widespread lack of knowledge among adolescents and young adults.[1?] The study also indicated majority of 107 (65.6%) adolescents had low knowledge on correct signs, complication and prevention of STIs and use of HPV vaccines. These results were associated to a study done in Zambia which showed primary outcomes highlight lack of school-based sexuality education was associated with deficiencies in knowledge regarding safer sex practices.[2°]

Despite adolescent having low knowledge in some areas, the study revealed that majority of 152 (93.3%) adolescents had high knowledge on STIs transmission. These findings were not in line with results of Zambia Demographic Health survey (ZDHS) which indicated that women and men aged 15-19 years have lower levels of knowledge of these HIV prevention methods than people aged 20 and older.[1°] Further, overall knowledge levels in this study on STIs among adolescents were high 66 (40%) and the chi-square analysis (P.V-0.001) has also demonstrated that there was significant relationship between knowledge and preventive practice. Therefore, awareness and understanding of health risks and preventive strategies are crucial for the adoption of preventive practices.[5] These findings suggest that adolescents in Mbala might benefit from comprehensive sexual education programs within schools and the community to enhance knowledge and address misconceptions thereby encouraging open discussion on safe sex practices and promoting regular screenings which could aid in STI prevention because adolescents with higher health knowledge were more likely to engage in preventive health behaviors.

Attitudes

The study revealed that 99 (60.7%) adolescents follow what health care providers say to seek care, this study result indicated participants had positive attitude towards staff and prevention of STIs but

other studies reported adolescents face negative attitude of nurses, community, influenced by peers, shortage of treatment and lack of services throughout weekends, long queues, waiting time, distance and family responsibility, lack of knowledge concerning and towards health care systems and services rendered for adolescents at the clinic.[21]

The study found that 86 (52.8%) participants disagreed to polygamy contributing to high incidences of STIs among the adolescents. The results were not in conformity to a study done in Ethiopia which revealed that polygamy was mentioned as one of the social cultural factors contributing to the high prevalence of HIV among the Majang community.[22] The results also indicated that 101 (62.0%) participants disagreed to being influenced towards making decision to seek health care services by anyone if found with the STIs. Other studies reported barriers to STI services among young people in each of the World Health Organization (WHO) categories focusing on quality and friendliness in health services: availability, accessibility, acceptability and equity, for example issues related to service availability.[23] Adolescents agreed 89 (54.6%) that family planning had contributed to high cases of STIs. This finding was in line with the study in Congo DR where adolescents who used oral contraceptives (OCs) had significantly more male sexual partners than those who never used OCs and had an earlier sexual debut by almost two years.[2 4]

Further, the study revealed that the overall attitude of adolescents on STIs 98 (60%) had negative attitude towards preventions of STIs. This negative attitude could be the reason why adolescents in Mbala continue presenting themselves with STIs at health centres despite giving continuous health education to them by health care providers to have STIs prevented.

Preventive Practice

This study revealed that majority 103 (63.2%) of the participants did not have sexual intercourse with different partners during the last 3 months. These results were similar to a survey done by ZDHS in Zambia, it indicated that overall, 2% of women aged 15-49 reported that they had two or more partners in the past 12 months and 15% of men aged 15-49 reported that they had two or more partners in the past 12 months.[1°] The study showed 124 (76%) participants would invite their partner to be treated together if found with STIs. The results were not similar to a study done in South Africa which reported stigma, dissolution of the relationship and patient confusion regarding the need for partner notification as challenges to partner notification.[25] Adolescents were willing to invite their partners for treatment but health facilities in Mbala often lack dedicated spaces for adolescent services, compromising privacy and discouraging youth from seeking care. Therefore, the government needs to provide infrastructure that will not compromise privacy and discourage youths from seeking services.

This study also revealed that majority of participants, 110 (67.5%), did not use condom in the last sexual intercourse. The findings conformed with a previous study done in Zambia which indicated over half (59%) of urban, young Zambians reported non-use of male condoms at most recent sexual intercourse[16], this may be due to frequent stockouts of condoms and contraceptives which give adolescents' limit options for STI prevention. However, in 14 countries in Africa showed a high proportion of condom usage at last sexual intercourse among females in countries such as Kenya and Gabon.[26] Therefore, government through Ministry of Health needs to ensure constant supply of condoms and other reproductive commodities so that adolescents can access them whenever need arises. Other findings indicated 84 (51.5%) adolescents had sex in exchange for money and other material things for survival. Similar study in sub-Saharan Africa showed that receiving gifts, primarily money and clothes, to engage in sex is a common practice within adolescent sexual relationships in the four countries of this study.[27] Other than adolescent having sex in exchange for

money, their families who protect perpetrators, especially if they are breadwinners and decide to remain silent or settle cases outside formal legal systems, discouraged adolescents and some parents to report and to have access to related health services. Government should provide a legal and healthcare system linked for adolescents that will ensure enough healthcare providers trained to deliver adolescent-friendly sexual and reproductive health (SRH) services, leading to consistent service provision.

Further, this study revealed that the overall prevention practice of adolescent, seen in 85 (52%) participants, was inadequate towards STIs prevention because some parents disapproved adolescents' use of contraceptives by beating them sometimes, which discouraged youths from seeking STIs prevention services. Hence healthcare providers continue sensitizing parents on the importance of adolescents using adolescent services. Furthermore, STI services have been associated with promiscuity leading to fear of being judged, preventing adolescents from accessing necessary care. Therefore, Ministry of Health and its partners to develop new preventive educational messages which will ensure barriers are removed and adolescents are served, regardless of them being in rural or urban areas.

CONCLUSION

This study showed that adolescents had low knowledge on correct signs, complication, and prevention of STIs as well as use of HPV vaccines for STIs prevention. Adolescents did not use condom during sex in their last sexual intercourse and they disagreed to polygamy contributing to high incidences of STIs among the adolescents. Adolescents had sex in exchange for money and other material things as their source of income. The study revealed that adolescents had negative attitude and inadequate preventives practice towards STIs prevention. Therefore, there was need to engage school administrators to incorporate adolescent health and STI prevention education into the curriculum using locally relevant and culturally sensitive materials, develop a peer education program where adolescents would train other adolescents and ensure that the messages were relatable and effective for the target age group while strengthening partnerships with local health clinics to offer free STI testing and contraception.

RECOMMENDATIONS

Adolescents in Mbala may lack information on condom use to prevent STIs, hence new strategies are needed to reinforce condom usage among adolescents. Government needs to use mobile health units to bring STI education and healthcare services to rural or hard-to-reach areas of Mbala, ensuring broader access to care. Ministry of youth and sports, ministry of health and cooperating partners needs to develop recreation programs at local level for adolescents. Negative attitude needs to be addressed by District Health Office and facilities by conducting workshops for parents and community leaders, like chiefs, to address the stigma around STI prevention and encourage open conversations about sexual health. Harmful cultural beliefs like polygamy need to be discouraged by influential leaders like chiefs and village headmen. The study further, recommends strategies to deliver positive and preventive practices to adolescents such as using local radio stations, posters, and community events to broadcast messages on STI prevention and adolescent health, this would ensure the information reaches a wide audience.

LIMITATIONS

The study was conducted at selected facilities in Mbala district; therefore, generalization of the findings should be done with caution because of contextual differences.

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Conflicts of Interest

The authors declare no conflicts of interest

Author contributions

1. Cosmas Zyaambo, -Conception and design of study.
2. Mutambo Joseph, - Revising the article
1. Mathews Mwansa, -Acquisition of data and analysis
2. Mpundu Makasa, -Revision of the draft manuscripts and final approval of the version to be published.

REFERENCES

1. Chesson HW, Mayaud P, Aral SO. Sexually transmitted infection: impact and cost-effectiveness of prevention. In: Major Infectious Diseases. 3rd ed. Washington: 2017. Available from: https://www.ncbi.nlm.nih.gov/books/NBK525195/DOI:10.1596/978-1-4648-0524_ch10.
2. World Health Organization (WHO). Global incidence and prevalence of selected sexually transmitted infections 2008. Geneva: 2012.
3. Shannon CL, Klausner JD. The growing epidemic of sexually transmitted infections in adolescents: a neglected population. *Curr Opin Pediatr*. 2018;30(1):137–143. https://doi.org/10.1097/MOP.0000000000000578.
4. Kassie AA, Gudayu TW, Araya BM. Knowledge, attitude, and preventive practices towards sexually transmitted infections among preparatory school students in West Gojjam Zone, Ethiopia. 2020. https://doi.org/10.1155/2020/6894394.
5. Ministry of Health, Zambia. Zambia sexually transmitted infections treatment guidelines. Lusaka: Ministry of Health; 2023 Jan.
6. Hazemba MCK. Factors associated with sexually transmitted infections among women of child-bearing age in Makululu Compound of Kabwe district, Zambia. *Texila Int J Public Health*. 2022;10(3).
7. Denno DM, Hoopes AJ, Venkatraman C. Effective strategies to provide adolescent sexual and reproductive health services and to increase demand and community support. *J Adolesc Health*. 2015. https://doi.org/10.1016/j.jadohealth.2014.09.012.
8. World Health Organization. Global health sector strategy on sexually transmitted infections 2016–2021: towards ending STIs. Geneva, Switzerland: 2016.
9. Centers for Disease Control and Prevention. Incidence, prevalence, and cost of sexually transmitted infections in the United States. 2013.
10. Zambia Statistics Agency, Ministry of Health (MOH) Zambia, and ICF. Zambia Demographic and Health Survey 2018. Lusaka, Zambia, and Rockville, Maryland, USA: Zambia Statistics Agency, Ministry of Health, and ICF; 2019.
11. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance. USA: 2018.
12. Steen R, Wi TE, Kamali A, Ndowa F. Control of sexually transmitted infections and prevention of HIV transmission: mending a fractured paradigm. *Bull World Health Organ.* 2009 Nov;87(11):858-65. doi: 10.2471/blt.08.059212. PMID: 20072772; PMCID: PMC2770276.
13. Keto T, Tilahun A, Mamo A. Knowledge, attitude and practice towards risky sexual behaviors among secondary and preparatory students of Metu town, southwestern Ethiopia. *BMC Public Health*. 2020; 20:1394. https://doi.org/10.1186/s12889-020-09371-4.
14. Gordon G, Mwale V. Preventing HIV with young people: a case study from Zambia. *Reprod Health Matters*. 2006 Nov;14(28):68-79. doi: 10.1016/S0968-8080(06)28266-1. PMID: 17101424.

15. Ministry of Health. National Reproductive Health Policy. Lusaka: 2008.
16. Ministry of Health. Zambia National Health Strategic Plan 2017–2021. Lusaka: 2017.
17. Lwanga S, Lemeshow S. Sample size determination in health studies: a practical manual. Available from: http://www.tbrieder.org/publications/books,english/lemeshow,samplesize.
18. El-Tholoth HS, Alqahtani FD, Aljabri AA, et al. Knowledge and attitude about sexually transmitted diseases among youth in Saudi Arabia. *Urol Ann*. 2018 Apr-Jun;10(2):198-202. doi: 10.4103/UA.UA_14_17. PMID: 29719334; PMCID: PMC5907331.
19. Pinchoff J, Boyer CB, Mutombo N, Chowdhuri RN, Ngo TD. Why don't urban youth in Zambia use condoms? The influence of gender and marriage on non-use of male condoms among young adults. *PLoS One*. 2017;12(3): e0172062. https://doi.org/10.1371/journal.pone.0172062.
20. Skaletz R, Potthoff A, Nambiar S, Wach J, Kayser A, Kasper A, Brockmeyer NH. Age-specific evaluation of sexual behavior, STI knowledge, and infection among asymptomatic adolescents and young adults. 2020. https://doi.org/10.1016/j.jiph.2020.04.005.
21. Butts SA, Kayukwa A, Langlie J, Rodriguez VJ, et al. HIV knowledge and risk among Zambian adolescent and younger adolescent girls: challenges and solutions. *Sex Educ*. 2018;18(1):1-13. doi: 10.1080/14681811.2017.1370368. PMID: 31275062; PMCID: PMC6606053.
22. Mboweni R, Sumbane G. Factors contributing to delayed health-seeking behaviors among adolescents. *Glob J Health Sci*. 2019; 11:67. doi: 10.5539/gjhs. v11n13p67.
23. Qanche Q, Wondimu W, Asefa A, Yosef T, Midaksa G, Nigussie T. Factors contributing to high HIV prevalence in Majang Zone, Southwest Ethiopia. *J Multidiscip Healthc*. 2021 Nov 25; 14:3273-3283. doi: 10.2147/JMDH.S331708. PMID: 34858030; PMCID: PMC8630364.
24. Fehring RJ, Bouchard T, Meyers M. Influence of contraception use on the reproductive health of adolescents and young adults. *Linacre Q*. 2018 May;85(2):167-177. doi: 10.1177/0024363918770462. Epub 2018 Apr 25. PMID: 30046195; PMCID: PMC6056802.
25. Chitneni P, Beksinska M, Dietrich JJ, Jaggernath M, et al. Partner notification and treatment outcomes among South African adolescents and young adults diagnosed with a sexually transmitted infection via laboratory-based screening. *Int J STD AIDS*. 2020 Jun;31(7):627-636. doi: 10.1177/0956462420915395. Epub 2020 May 13. PMID: 32403988; PMCID: PMC7357572.
26. Ali MM, Merdad L, Bellizzi S. Socioeconomic variations in risky sexual behavior among adolescents in 14 sub-Saharan Africa countries who report ever having had sex. *Int J Equity Health*. 2021; 20:11. https://doi.org/10.1186/s12939-020-01352-8
27. Moore AM, Biddlecom AE, Zulu EM. Prevalence and meanings of exchange of money or gifts for sex in unmarried adolescent sexual relationships in sub-Saharan Africa. *Afr J Reprod Health*. 2007 Dec;11(3):44-61. PMID: 18458736; PMCID: PMC2367111.
28. Phillimon Ndubani and Bengt Höjer. *Health Policy and Planning*, Volume 16, Issue 1, in March 2001, pages 107–112.
29. Newton-Levinson A, Leichliter JS, Chandra-Mouli V. Sexually transmitted infection services for adolescents and youth in low- and middle-income countries: perceived and experienced barriers to accessing care. *J Adolesc Health*. 2016 Jul;59(1):7-16. doi: 10.1016/j.jadohealth.2016.03.014. PMID: 27338664; PMCID: PMC5289742.
30. Ndongmo TN, Ndongmo CB, Michelo C. Sexual and reproductive health knowledge and behavior among adolescents living with HIV in Zambia: a case study. *Pan Afr Med J*. 2017 Feb 20; 26:71. doi: 10.11604/pamj.2017.26.71.11312. PMID: 28451048; PMCID: PMC5398862.
31. Nyasulu P, Fredericks M, Basera TJ, Broomhead S. Knowledge and risk perception of sexually

transmitted infections and relevant health care services among high school students in the Platfontein San community, Northern Cape Province, South Africa. *Adolesc Health Med Ther*. 2018 Nov 16; 9:189-197. doi: 10.2147/AHMT.S154401. PMID: 30532607; PMCID: PMC6247973.

32. Chirwa-Kambole E, Svanemyr J, Sandøy I, Hangoma P, Zulu JM. Acceptability of youth clubs focusing on comprehensive sexual and reproductive health education in rural Zambian schools: a case of Central Province. *BMC Health Serv Res*. 2020 Jan 16;20(1):42. doi: 10.1186/s12913-020-4889-0. PMID: 31948452; PMCID: PMC6966797.
33. World Health Organization. Global strategy for the prevention and control of sexually transmitted infections: 2006–2015: Breaking the chain of transmission. Geneva, Switzerland: WHO; 2007.
34. Zin NM, Ishak I, Manoharan K. Knowledge, attitude and practice towards sexually transmitted diseases amongst the inmates of women shelters homes at Klang Valley. *BMC Public Health*. 2019 Jun 13;19(Suppl 4):639. doi: 10.1186/s12889-019-6863-5. PMID: 31196029; PMCID: PMC6565535.
35. Svanemyr J. Adolescent pregnancy and social norms in Zambia. *Culture, Health & Sexuality*. 2020;22(6):615-629. doi: 10.1080/13691058.2019.1621379. https://doi.org/10.1080/13691058.2019.1621379
36. Ministry of Health. GARPR Zambia Country Report, Monitoring the Declaration of Commitment on HIV and AIDS and the Universal Access. Lusaka, Zambia; 2014.
37. The Association of Chartered Certified Accountants. Key health challenges for Zambia. Lusaka, Zambia; 2013.
38. Francis SC, Mthiyane TN, Baisley K, et al. Prevalence of sexually transmitted infections among young people in South Africa: a nested survey in a health and demographic surveillance site. *PLoS Med*. 2018 Feb 27;15(2): e1002512. doi: 10.1371/journasl.pmed.1002512. PMID: 29485985; PMCID: PMC5828358.