



THE STATUS OF STIS AMONG STUDENTS IN HIGHER LEARNING INSTITUTIONS IN KABWE AND KAPIRI MPOSHI DISTRICTS, ZAMBIA

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ABSTRACT

The study was conducted among full time students in two Higher Learning Institutions (HLIs) where STIs were reported to be a serious concern. It was envisaged that the drivers of high rate of transmission would be established since it has the potential to affect students' reproductive health as well. Therefore, this study was conducted to investigate the status of STIs among students in HLIs in Kabwe and Kapiri Mposhi Districts, Zambia. The objectives of this study were to establish the current status of STIs transmission rate in selected higher learning institutions; identify the drivers of STIs transmission in the two learning institutions and suggest strategies of containing the STIs transmission among students in the selected higher learning institutions in central province. The study took a mixed methods approach and adopted a convergent parallel design. The data were collected by use of Semi-structured Questionnaires (SSQ) comprising closed and open-ended questions, Focus Group Discussions (FDGs) and Key Informant Interviews (KII). Secondary data was obtained from the institutional clinics records. The study population consisted of students, health personnel, student counsellors as well as Deans of student affairs from both selected institutions. The study targeted 150 respondents. The students were randomly selected while the rest were purposively selected. The study findings were thematically analysed. The study revealed high cases of STIs among students and that unprotected sex, multiple sexual partners, drug abuse, the morning- after-pill among others were behind the high cases. The study further revealed that Syphilis and HIV were the common infections.

KEYWORDS : STIs, Students, Reproductive health, Higher Learning Institutions, meaningful education.

INTRODUCTION

Sexually Transmitted Infections (STIs) are a crucial part of the global burden of diseases with impact on sexual and reproductive health (SRH) worldwide (Mcharo, *et al.*, 2022). Mcharo, *et al* add that a number of bacteria and viruses have been shown to cause STIs with severe SRH complications. The World Health Organisation (WHO) emphasized that STIs have a profound impact on sexual and reproductive health globally and that more than 1 million STIs are acquired every day and that each year, one out of twenty adolescents contract an STI. WHO (2022) studies estimated that in 2020 alone there were 374 million new infections with one of the four curable STIs i.e Chlamydia, Gonorrhoea, Syphilis and Trichomoniasis.

STIs especially among young people from 10 to 24 years, are said to have serious reproductive consequences beyond the immediate impact of the infection itself such as infertility, pelvic inflammatory disease, and increased risk of acquiring and transmitting HIV (Mcharo, *et al.*, 2022). Other negative consequences of STIs especially in women include: ectopic pregnancies, abortions, stillbirths, neonatal death, low-birth weight and prematurity, sepsis, and congenital infections. Studies have shown that viral STIs such as HPV have been associated with increased risk of malignancies such as cervical cancer, and Herpes Simplex Virus (HSV) (mainly type 2) increase susceptibility to HIV in mature epidemics.

For Higher Learning Institutions (HLIs), STIs affect students' health and well-being, may lead to drop-outs, missing classes, emotional distress and STIs complications (Mcharo, *et al.*, 2022). Magu (2015) argue that most students at HLIs

have the freedom from parents/guardians' control, tend to form new social networks and engage in sexual relationships. Hence, there is increase in unsafe sexual activities among students in universities propelled by the influence of alcohol and/or other substances of abuse. A number of studies on sexual practices among students reveal that there is high prevalence of substance abuse and perceived risks due to pleasure and making relationships better. Literature demonstrates that the commonly abused substances were alcohol and cigarettes with a small portion of students taking marijuana and smokeless tobacco. Evidence also show that sexually active young people were not using condoms consistently in their sexual encounters. Literature further indicates that STIs such as Chlamydia and HSV-2 are of concern among young adults attending HLIs (WHO, 2022). Additionally, clinics on university campuses that provide students with information and services do not provide the privacy and non-judgmental environment within which student can effectively utilize these services ((Sakea, 2017:106).

Young people and the students in HLIs in Zambia are the bedrock of the nation's future. Investing in their health should therefore not be compromised so that they realise positive health and education. Education realisation remains a pipe-dream if the young people are burdened by ill-health as a result of increased STIs. Meaningful education can only be actualised through a sustained reductions in new STIs infections, thereby enabling them to reach their full educational potential and ultimately contribute to more effectively to the development of their communities and their countries as graduate, professionals, and young leaders.

HLIs are potential havens of increased STIs and as such it should be a concern of everyone (WHO, 2022). Recent media reports on the rate of STIs transmission at one of the higher learning Institutions in central province motivated the proposed study. The study was conducted to investigate the status of STIs among students in higher learning institutions in Kabwe and Kapiri district, Zambia. It was envisaged that the drivers of high rate of transmission would be established to avoid the potential to affect students' reproductive health. The objectives of this study were to establish the current status of STIs transmission rate in selected higher learning institutions, identify the drivers of STIs transmission in the two learning institutions and suggest strategies of containing the STIs transmission among students in the selected higher learning institutions.

Research Methods and design, setting and population

The study used mixed methods. The research included both qualitative and quantitative research questions in order to collect in-depth information from various respondents and consolidate the findings. It used qualitative approach and semi-structured interview guide to get views of the respondents as researchers interacted directly with them in their natural setting (Creswell, 2003). While quantitative approach was used to gather information from the randomly chosen participants who answered the questionnaires with closed questions

A Convergent parallel research design was used. The purpose of convergent parallel design mixed methods is to provide a comprehensive analysis of the research problem by converges or merges quantitative and qualitative data. In this design, the researchers typically collect both forms of data at the same time, prioritize the methods equally, keep the data analysis independent, mix the results during the overall interpretation and try to look for convergence, divergence, contradictions or relationships of two sources of data (Bian, 2018). The researchers interviewed and administered a questionnaire to a sample of individuals in order to get people's attitudes, opinions or habits.

The study population consisted of students, health personnel, student counsellors as well as Deans of student affairs from both selected institutions. The study targeted 150 respondents categorised as follows: 142 students of which 42 were subjected to focus group discussions while 100 were given questionnaires, 4 health personnel, 2 Deans of students affairs, and 2 student counselors were subjected to interviews. To sample the target population, the students were randomly selected while the rest were purposively selected. 150 respondents were enough in a mixed method research because sufficient number of respondents provided gave in-depth information to answer the research questions under scrutiny. To get desired information the researchers observed the following: constructed questions that solicited the wanted information, identified the individuals they surveyed, identify how the survey would be conducted and summarized the data to provide the designed descriptive information (Kothari, 2020).

Data Analysis was done quantitatively as well as thematically. The quantitative data were analysed using the statistical package for social sciences (SPSS) version 20 to run the descriptive statistics of the data collected while the qualitative data was analysed through themes identification from the data collected.

Ethics

Ethical approval was requested and granted by the Kwame Nkrumah University Ethics Review Committee (Reference Number: KNU/2022REC09/001), and National Health Research Authority (Reference Number: NHRA000002/ 11/ 10/

2022. Participants' study information was kept in two separate storage sites for confidential data the other one for public consumption, and only the Principal Investigator and Research Assistant had access to any information that could directly identify the participant. Participants' rights to refuse participation or withdrawal was exercised, and no further information was collected following refusal to participate or withdrawal. All eligible participants who agreed to participate in this study received study information and provided written informed consent to participate prior to any study related activity.

RESULTS

Descriptive Statistics

Participants by Gender.

The survey mapped full time students across two Universities.

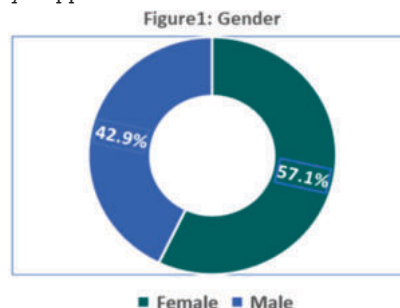


Figure 1 illustrates that the survey comprised 42.9% male students and 57.1% female students from Mulungushi and Kwame Nkrumah Universities in Central Province of Zambia. There were slightly more females who took part in the study compared to the males who provided insightful qualitative findings.

The Awareness of the Existence of STIs in Sampled Universities

Figure 2: Students aware of existence of STIs in Higher Learning Institutions.

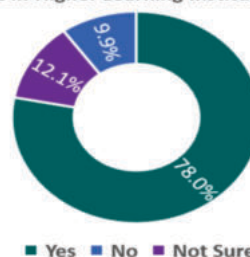


Figure 2 shows the proportions of students in sampled universities who were aware of the existence of STIs in higher learning institutions. The majority students representing 78.0% were aware of the existence of STIs, 9.9% students were not aware and 12.1% expressed ignorance about the existence of STIs among students.

The proportion of students exposed to STIs in sampled Universities.

Figure 3: Percentage of students exposed to STIs

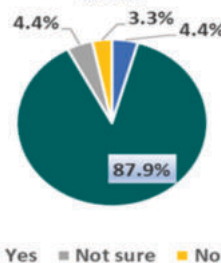


Figure 3.0 illustrate the proportions of students who were

exposed to STIs preceding the survey. The results show that many respondents had not been exposed to any STI representing 87.9% against 4.4% who were infected by the disease and 4.4% of them were not sure.

The perception on the common STIs in sampled Universities

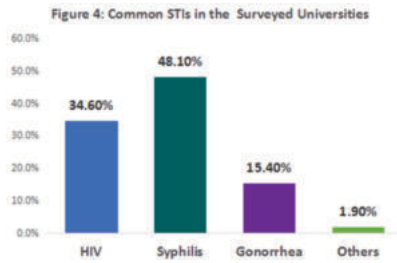


Figure 4.0 shows the perception of students on the commonest STIs prevalent in the sampled universities. Syphilis was the commonest infection accounting for 48.1% among the students. This was followed by HIV/AIDS accounting for 34.6% while Gonorrhoea was rated the least infection at 15.4%.

Students using Condoms Protection Against Contracting STIS

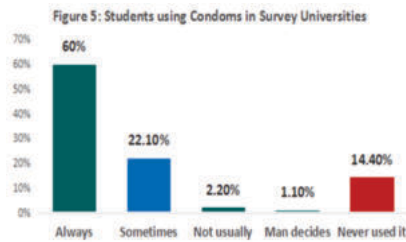
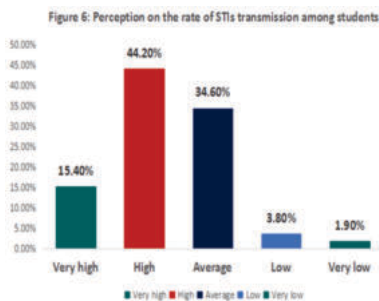


Figure 5.0 shows parentage of students that are using condoms in the sample. Most of the respondents used condoms as a means of preventing themselves from contracting STIs representing 60% while 22.0% were inconsistently using condoms during sexual encounters. Most importantly, 14.3% said they have never used condoms and would never use them in the future.

The incidence of STIs transmission among students

Figure 6.0 shows that the rate of STI transmission among students. Most students argued that the rate of transmission was high at 60%. This was followed by those who indicated that the rate was low accounting for slightly above 4%.



Qualitative Findings

Focus Group Discussions

42 students in the two institutions were subjected to six (6) focus group discussions of seven (7) members each. The common findings from group consensus were that STIs were common and a serious problem among students and that the majority of the students were aware about the existence of sexually transmitted infections (STIs) among themselves. One female (PP1) respondent remarked:

'It is serious, almost every term we see students seeking medication outside school'

It was revealed that most students prefer to seek medication outside the university. Further, some of the respondents in the group admitted having suffered from the STIs and said that: *'Yes, we are aware about STIs. Some of us are victims of, especially Syphilis and HIV.'*

Another respondent (PP5) added:

'In the first term of 2021, my two roommates had Syphilis.'

The second aspect that emerged from the focus group discussions was that Syphilis and HIV/AIDS were the most common STIs among students and were as a result of practicing unprotected sex. In all the focus group discussions, one respondent (PP2) said:

'HIV and Syphilis are very common but a lot of students prefer to hide and seek advice from their trusted peers. This is because it is difficult to open up for fear of stigmatised.'

In as far as condom use was concerned, the respondents affirmatively submitted that there was low condom use among students because they argued that sex using a condom was not enjoyable.

This is what one participant (PP8) said;

'Only few students use condoms, the rest say sex is not enjoyable with a condom' (sic).....not really, maybe four (4) out of 10 use condoms.'

The third issue that emerged from the focus group discussion was that the major drivers of STIs transmission were alcohol and drug abuse and unprotected sex. The respondents indicated that male students prefer unprotected sex because they spend a lot of money on their girlfriends. Female student respondents confirmed that their boyfriends on campus force them to have unprotected sex. On alcohol, one revealed (PP7):

'At the end of every term, students hold beer parties at their boarding houses. When they get drunk, they engage in sexual activities without using any protection. As a result, many of them get infected.'

As regards drug abuse, the majority of the respondents revealed that the Morning-after-pill was being abused by most female students who feared to get pregnant. The pill was widely accessed by students through open adverts as shown below:



Figure 7: Advert of Morning After Pill (MAP) on University A Campus

The above open advert speaks volumes about how much unprotected sex was being practiced by the students as confirmed by one respondent (PP7) that, *'Students are involved in unprotected sex among themselves because they are not scared of getting sick but falling pregnant. So they rely on Morning After Pill (MAP) to protect themselves from getting pregnant. MAP is now readily available since students are selling it on campus. Because it is on high demand, I am planning of getting into that business because my business of selling water will slow down as we get into the rainy season.'*

This picture is in tune with the quantitative data from the

questionnaires which shows the rate of STIs among students to be high at 44.2% and an average of 34.6% while low rate and very low rate stood at 3.8% and 1.9% respectively as shown in Figure 6.0. However, this finding is at variance with the quantitative data from the questionnaires which indicates that there was high condom use among students as shown in Figure 5.0.

Having multiple sexual partners emerged as one of the key drivers of STIs transmission among students. It was revealed that students especially those that were financially or materially handicapped ended up having so many sexual partners which included not only their fellow students but also sugar daddies popularly known as 'blessers.'. One respondent (PP6) affirmed:

'Most students have at least three (3) boyfriends some within campus while others are outside campus such as taxi drivers and sugar daddies. Some students have to raise money for their upkeep and for school fees. That is why they end up with having multiple sexual partners through an arrangement called 'transactional sex.'

And when asked to suggest what should be done to end the STIs transmission among students, the respondents said that students needed to be helped to understand the dangers of engaging in unprotected sex, as well as teaching them on the effectiveness of condom use. They added that there was need to not only conduct vigorous sensitization on STIs on campus but also entice students to always use condoms whenever they have sexual encounters.

Key Informant Interviews (KII)

The eight (8) key informant interviewees included the clinic staff, Deans of Students Affairs, Students counsellors and Students affairs officers. The informants said that they handled a lot of students cases ranging from relationships, suicide, family, drug addiction, pornography/masturbation, abortions, self-ham, STIs, mental health, sexual harassment to academic related. The interviews revealed that STIs such as Syphilis and HIV/AIDS were common infections among students. The informants said that most students tend to hide their illnesses and one could only identify them through loss of weight. It was further revealed that not all students access services at their local university clinics due to confidentiality issues. Hence, the clinic records were not a true reflection of the situation obtaining on the ground.

The study also revealed that there were a number of drivers to STIs transmission among students in the two selected higher learning institutions. These included multiple relationships, poverty, hunger, competition, peer pressure, alcohol and drug abuse, low condom usage arising from the introduction of Morning After Pill (MAP) which was cited to be one of the major drivers of unprotected sex because, as one informant (PP8) indicated:

'There is a lot of unprotected sex among students because they are not scared of getting sick but pregnancy. So they rely on Morning After Pill (MAP) to protect them from getting pregnant. Morning After Pill is now readily available and they even advertise it openly among themselves. In this case, condoms are a second option for them. Students openly say, 'it is better to get sick that get pregnant.' There are a lot of abortion cases involving students, an indication that there is live sex out there among students.'

Alcohol and drug abuse was also reported to be one of the major drivers of STIs transmission among students. The informants indicated that the abuse of alcohol and drugs makes students compromise on preventive measures against STIs when they get drunk. One informant (PP4) said:

'When they are high, they don't think about protecting themselves against STIs.'

The study also revealed that there was a big number of female students who were professional sex workers. One key informant (PP3) remarked:

'They have face book accounts to market themselves. They also sell their fellow female students- they cash in. So far, three (3) have confessed being involved in professional prostitution and indicated that they even organize a group of students for sugar daddies.'

It was further revealed that female students have even gone to the extent of selling nude pictures at a cost of K5 while nude videos were being sold at K25 per video.

On measures that should be put in place to curtail the transmission of STIs among students, the informants suggested that there is great need to intensify sensitization among students, preach abstinence, bring closer to them the issues of condoms because the supply is not very steady as one informant (PP2) remarked,

'Three (3) near riots happened due to shortage of condoms', The informants submitted that there is need to furnish new students with enough information during orientation and also carry out some research on why students are not accessing the services as expected The informants also suggested for intensified counselling services for both male and female students as well as training more peer counsellors. It was suggested that there is need for more youth friendly spaces for students and one key informant (PP1) added:

'Form a lot of clubs and associations that create awareness because information relating to STIs and prevention is almost dry [sic]. There is no literature which creates awareness. There is also need to design new ways of condom distribution - i.e identity neutral and reliable hot-spots where condoms can be accessed by students.'

One of the key informants also revealed that there was a place nick named 'Sodom and Gomorrah' among the boarding houses located in Katondo compound where illicit activities such as Casual sex and alcohol abuse were the order of the day. As a result, a lot of pregnancies have been reported.

Clinic Records

Document study was also conducted on the records from the institutional clinics. The study showed that there were ten (10) common health issues the staff were handling on daily basis which included: Ear, Nose, Throat (ENT), skin disease, Malaria, Diarrhoea, Hypertension, Muscle, Digestive trauma, STIs among others. As regards the STIs cases, the table below shows the status of the infections:

Figure 7.0: Number of STI Cases Attended to: (University A) - 2022

Month	M	F	Observation/ Comments
Jan	05	02	We sensitised the clients on the importance of using condoms
Feb	06	00	We sensitised the clients on the importance of using condom and behaviour change.
Mar	06	00	We sensitised the clients on the importance of using condom and behaviour change.
Apr	02	02	We sensitised the clients on the importance of using condom and behaviour change.
May	00	01	We sensitised the clients on the importance of using condom and behaviour change.
Jun	03	05	We sensitised the clients on the importance of using condom and behaviour change.

Jul	08	06	We sensitised the clients on the importance of using condom and behaviour change.
Aug	06	00	We sensitised the clients on the importance of using condom and behaviour change.
Sep	08	05	We sensitised the clients on the importance of using condom and behaviour change.

Figure 9.0: Number of STI Cases Attended to: (University B) 2021 - 2022

Month	2021 M/F	2022 M/F	Observation/ Comments
Jan	15	32	We told the clients the disadvantage of not using condoms and also the best way of preventing pregnancies
Feb	09	16	We sensitised the clients on the importance of condom use and behaviour change
Mar	30	50	We advised clients to have safe sex i.e. use of condoms if they could not abstain
Apr	37	24	We advised the clients against disregarding condom use and behaviour change
May	33	14	We sensitised the clients on the importance of condom use and behaviour change
Jun	12	28	We sensitised the clients on the importance of condom use and behaviour change
Jul	14	04	We advised the clients to seek advice from trust worthy people for their sexual well-being
Aug	31	07	We sensitised the clients on the importance of condom use and behaviour change
Sep	30	30	We advised clients to have safe sex.

The above finding from University B shows combined figures for both male and female for the years 2021 and 2022.

DISCUSSION

This study yielded important findings to determine the status of STIs among students at two selected Higher Learning Institutions in Kabwe and Kapiri Mposhi districts, central province of Zambia. The common findings from group consensus were that STIs were the most common and serious health problems among students and that most of the students were aware of the existence of sexually transmitted infections (STIs) among themselves. Findings revealed that common diseases include fungal infections and other urinary tract infections others include anxiety, stress and depression. According to the respondents these diseases are the result of STIs that are prevalent in the universities. Such diseases are not only found at higher learning information but it is a common trend in Zambia. Ngalamika et al (2017: 1) stated that "Zambia has been significantly affected by the STIs and HIV epidemics with an estimated 1 million people living with HIV half of them women ... and a high prevalence of curable STIs in adults aged 15-49."

Further the study findings indicated that all the respondents in the selected learning institutions were aware of the existence of sexually transmitted infections among students (78%) as can be seen in Figure 2.0. When asked how serious the cases of STIs were on campus, respondents indicated that the problem was very serious and needed immediate attention. They pointed out that the sensitization of the dangers of unsafe sex was urgently needed. One of them further lamented, "How I wish abstinence could be made compulsory among students." By implication, the awareness did not seem to provide a platform for students to regulate their sexual behavior as can be seen by the high infection rate for University B from January to August 2022 (Figure 9.0).

However, one of the respondents was quick to point out that the social media exaggerated the prevalence of STIs in these institutions. By implication, the awareness did not seem to provide a platform for students to regulate their sexual behavior as can be seen by the high infection rate for University B from January to August 2022 (Figure 9.0). From the clinical records, one would conclude that University B had higher STI cases than University A probably because of its location away from town such that students had no option but to seek medical attention within campus compared to students from University A who opted to seek medical services outside the university because of being located within town where there many other health facilities. As at September 2022, University B had 30 STI cases compared to 13 recorded cases for University A.

In the current study, Syphilis (48.1%), HIV (34.6%) and Gonorrhoea (15.4%) were the most common infections while others (1.9%) as shown in Figure 4.0 had the least occurrence. This is in line with what Sajiwandani and Baboo (2016: 45) discovered that the higher prevalence of sexually transmission diseases (STDs) such as syphilis and gonorrhea is one of the health problems among the major diseases in Zambia today in spite of the available medical care for these diseases. The dual further said in addition there is a new and more serious Autoimmune Deficiency Syndrome (AIDS) among the STIs. This evidenced that STIs is a common problem among youths between 15-49 of age in Zambia. The above finding, however, is at variance with Mcharo et al. (2022) whose study in Mbeya, Tanzania revealed that Chlamydia (11%) and Herpes Simplex Virus-type 2 (6.1%) were the most common STIs while NG (1.9%) and HIV (0.7%) infections had the least occurrence. In support of the findings from Focus Group Discussion, the 2002 National HIV/AIDS/STIs/ TV Policy (2002:9) revealed that STIs are increased by poor socio-economic status, the practice of dry sex, unprotected sex with multiple partners as well as sexual activities at an early age.

The findings revealed that there were many causes of increase of STIs in higher learning institution. According to the students the major causes of increased STIs among them were; unprotected sex, having sex with multiple sexual partners, financial game, loneliness, peer pressure, strict parents resulting no freedom at home, university life and many others. One of the respondents lamented that, "we do it for fun so, there is no need of protection, how would you enjoy it I mean?" Another respondent indicated that "there is no freedom at home our parents guard us like children who are under five years as a result when we are here, we are free to express ourselves in any way." In addition, one more respondent reacted how loneliness contributed to raise of STIs among students in the selected institutions and said "In my case I fell victim of circumstances because of my personality. I am naturally an introvert and do not easily socialize, one boy noticed me and became very close to me. Before I could realised it, we were literally living as husband and wife. I guess he had other partners because the final results of our relationship was an STI." This was evidence that STIs circulated among the students within the selected institutions because the use of condoms was not appreciated. Instead, the Morning-After-Pill (MAP) was in fashion as students were more concerned about pregnancy than STIs. This finding is in agreement with Khalajabadi (2018) who found out that 'sexually active young people in Iran were more concerned about pregnancy than HIV/STIs in their sexual relationships.' probably this justifies why in the current study, the Morning-after-pill was openly advertised as shown in figure 7.

The current study further revealed that alcohol and drug abuse among students contributed to infections and that males dictated on lack of condom use as it was believed that

greater sexual satisfaction was achieved without the use of a condom. One Focus Group remarked, 'only few students use condoms, the rest say it is not enjoyable with a condom ...not really, maybe four (4) out of 10 use condoms.' This finding is in tune with Magu (2015:68) whose study in Kenya had a similar finding.

As solutions to end STIs among students, the respondents had the following suggestions: management should consider introducing a decent dress code for university students. The Dean of students should make condoms available in abortion blocks. The university counsellors should be more proactive in sensitizing students on STIs because some of the students are ignorant about STIs. Comprehensive sexuality education should be taught or offered in first year to prevent students from falling prey to sexual disasters. Some of the respondents from University B suggested a bigger venue for counselling services to allow for emotional management among those seeking counselling services.

CONCLUSION

Findings from this study revealed that there were high cases of STIs among students in the two selected HLIs despite the awareness rate being at 78%. The study further revealed that clinical records could not be relied upon as a true reflection of the prevalence rate on the ground because most students opted to seek medical services outside campus particularly at University A. The findings also indicate that there were a number of drivers to increased transmission among students of which unprotected sex, multiple sexual partners, Morning-after-pill, alcohol and drug abuse were cited to be prominent. They study further revealed that Syphilis, HIV and Gonorrhoea were the most common infections among students in the two higher learning institutions. The study recommends that the university counsellors should be more proactive in sensitising students on STIs because some of the students are ignorant about STIs. Additionally, comprehensive sexuality education should be offered in first year to prevent students from falling prey to sexual disasters. There is need for more youth friendly spaces for students and steady supply of condoms in strategic points. There is need train more student counsellors.

Contribution:

Findings from this study will add on body of knowledge and literature of the existing limited numbers of studies conducted among university students in Zambian Higher Learning Institutions (HLIs) as regards the status of STIs. The findings may also help policy makers, ministry of Health, and Higher Learning Institutions to come up with strategies of how to curtail STIs transmission among students. In Zambia, a good number of young people do not attain post-primary/secondary education and the number is even lower to HLIs. Therefore, our study findings may not be generalized to many young people who have not reached higher education level.

Information on circumcision, PrEP, PEP and current contraception use was not collected and this is acknowledged as a potential study limitation.

Acknowledgement

We tender our sincere thanks to all the students who took part in this study, as well as the Higher Learning Institutions Administration for giving us permission to conduct this study within their respective institutions. We also extend our thanks to the research ethical committee for clearing our study. We further acknowledge valuable contribution from Mr. Joseph Mate for his technical support during data analysis.

Competing Interests:

The authors have declared that no competing interests exist. As authors, we declare that we have no financial or personal relationship(s) that may have inappropriately influenced us in writing this article.

Author Contributions:

The authors confirm contribution to the paper as follows: study conception and design: Dr. Jive Lubungu, Dr. Oliver Magasu; Data collection: Mr. Wilson Kameya, Ms. Chibwe Mwape, Ms. Ireen Moonga, Ms. Audrey Muyuni, Ms Donalia Nyirenda, & Ms Maria Ibrahim; analysis and interpretation of results: Dr. Jive Lubungu, Ms Ireen Moonga, Audrey Muyuni, Mr. Sharper Sikota. All authors reviewed the results and approved the final version of the manuscript.

Funding:

This work was solely supported by the researchers themselves since there was no funding agency that came on board. The researchers contributed resources toward data collection, printing of research instruments and data analysis package. By virtue of being a self-funded study, the funders had a role to play in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Data availability:

Data used to back the analysis in this study were from existing literature, which are openly available at locations cited in the reference section.

Disclaimer:

The views expressed in the submitted article are our own as researchers and not an official position of the administrative institutions from which the study was conducted or any other person consulted during the study.

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