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HIV/AIDS: Safe sex practices, condom use and knowledge among students attending selected tertiary institutions in the Gambia

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Abstract

Background: Safe sex practices (including the use of condoms correctly and consistently) remain one of the most effective technologies and/or strategies available to prevent HIV/AIDS and other sexually transmitted infections (STIs). However, the use of condoms can reduce transmission of HIV, though not completely. The majority of young people use condoms to prevent unwanted pregnancies and fail to bother being at risk of contracting HIV.

Aim: The aim of this study was to assess safe sex practices, use of condoms, and the knowledge of HIV/AIDS among students attending selected tertiary institutions in Kanifing Municipal Council (KMC), The Gambia.

Materials and Methods: 272 students aged between 18 and 25 participated in this study and anonymously responded to pre-test self-administered questionnaires. This study was conducted in four purposely selected tertiary institutions in KMC. The data was analyzed using SPSS version 26. Bivariate analysis was used to compare gender-based parameters. Multivariate analysis (using Chi-square and Fisher exact statistics) was used to determine the association between the levels of knowledge of HIV/AIDS and the dependent variables such as age at first sex, first partner, second partner, sex for favor, and use of condoms.

Results: 30.1% of the respondents were sexually active, and only 62.2% of them reported condom use. Consistent use of condom was low (24.4%), with males being more consistent than females. Knowledge of the partner's HIV status was limited (14.6%). Pregnancy prevention was the primary concern during sexual activity, overshadowing the risk of HIV and other STIs. Knowledge of HIV/AIDS was high (87.0%). However, misconceptions still persist, as 11.5% believed that HIV could be transmitted through mosquito bites or sharing food. Despite high awareness of testing facilities, 69.5% had never tested for HIV citing stigma, and low perceived risk as barriers. Abstinence was the most preferred HIV prevention method (53.6%), followed by condom use (25.4%). No statistically significant association was found between knowledge of HIV/AIDS and the dependent variables, indicating that knowledge of HIV/AIDS alone does not translate into safer sexual practices.

Conclusion: There is urgent need for targeted interventions, including enhanced sexual education, accessible testing services, and campaigns addressing misconceptions and gender-based barriers in order to reduce HIV transmission among young adults in The Gambia.

Keywords: HIV; AIDS; Safe Sex Practices; Condom Use; Knowledge; Students; Young Adults; Tertiary Education; Kanifing; The Gambia

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1. Introduction

Unprotected penetrative heterosexual intercourse is considered one of the primary determinants, and risk factors for acquiring HIV among young people [33]. Most young people are reluctant to use condoms during sexual intercourse. Even when they do, their primary motivation is often to prevent unintended pregnancies, while they tend to overlook the risk of contracting sexually transmitted infections (STIs) such as HIV, syphilis, and gonorrhea [47]. This explains why individuals aged 10–24 years recorded the highest incidence rate of STIs worldwide between 1990 and 2019 [70]. Gametes are ova and sperm cells that are haploid and have one copy of each type of chromosome i.e. 1–22 X or 1–22 Y [23]. Pregnancy occurs when a sperm cell fertilizes an ovum *in vivo* or *in vitro*.

A survey conducted in the sub-Saharan African region in 2011 revealed that only 49.0% of males and 30.0% of females (less than half in each gender) aged 15–24 used condoms the last time they had sex with someone other than their regular partner [57]. A previous study conducted in The Gambia indicated that a significant 84.9% of individuals aged 15–49 who had more than one sexual partner in the past year did not use condoms during their last sexual encounter [38]. Another study in The Gambia found that only 36.7% of never-married young people reported using condoms during their first sexual intercourse [38]. In 2014, another study reported that condom use during the last high-risk sexual encounter was estimated at 43.3% among individuals aged 15–24 [56]. Despite ongoing sensitization campaigns, condom use remains insufficient to effectively protect young people from HIV.

Correct and consistent condom use remains one of the most efficient, and effective strategies available to prevent sexually transmitted infections (STIs), including HIV/AIDS, and unintended pregnancies [68]. While condom use has increased in many countries with high HIV prevalence, some countries continue to experience a decline [57]. It is important to note that condom use does not eliminate the risk of HIV transmission, but consistent and correct use has been shown to reduce the transmission of HIV and other STIs by 75–95% [68, 69]. Moreover, a modeling study on the global impact of condom use on the HIV epidemic found that current HIV prevalence levels would have been five times higher without condom use. The study estimated that approximately 117 million HIV cases have been prevented since 1990 due to increased condom use [48]. However, the effectiveness of condoms can be compromised by spillage, breakage, or incorrect use, which may reduce their overall efficacy [69].

Cluster of differentiation (CD) markers are an internationally recognized systematic nomenclature for cell surface molecules, and are used to discriminate between cells of the hematopoietic system [21, 22]. Of clinical importance is CD4 count in HIV/AIDS patients as they have reduced immunity, and are prone to low CD4 count [22]. It has also been widely reported from different studies that chronic metabolic disorders have the ability to compromise immunity due to the activation of different systemic, immune inflammatory processes. Metabolic disorders e.g. hypertension, adiposity (obesity), diabetes mellitus, and dyslipidemia collectively known as Metabolic Syndrome Diseases (MSDs) are diseases related to one another and have very high morbidity and mortality rates [9, 10, 12, 27, 29, 58]. In addition, reports from different studies have shown that hypertension, adiposity (obesity), diabetes mellitus, dyslipidemia, asymptomatic hyperuricemia [28, 60, 62], systemic immune inflammation activation, and fibrogenesis can lead to nephropathy [13, 14, 17, 18, 19, 24, 26, 59, 61, 66].

Nonetheless, many people living with HIV are unaware of their status. An individual infected with HIV can potentially transmit the virus to others without showing or recognizing symptoms of the disease. In 2023, 5.4 million (13.5%) of the 39.9 million people living with HIV (PLWH) were unaware of their infection [52]. In addition, 1.3 million new HIV cases, and 630,000 AIDS-related deaths were recorded globally [52]. Individuals who are unaware of their HIV status risk infecting others or becoming infected themselves if they engage in unprotected sex with partners whose HIV status is also unknown [36]. A lack of knowledge about one's own HIV status and that of sexual partners is considered a sexual risk behavior. This poses a significant public health challenge, as unawareness of one's HIV status hinders efforts to prevent the spread of the virus [5].

Comprehensive knowledge of how HIV is transmitted, prevented, and treated is essential for promoting safe sexual practices and reducing the spread of the infection. Poor HIV knowledge among the general population remains a public health concern. Even in the most affected regions, such as sub-Saharan Africa and South America, levels of HIV knowledge are low [57]. The 2013 Millennium Development Goal Report documented that only 36.0% of young men and 28.0% of young women had adequate knowledge about HIV [57]. In The Gambia, 2014 records indicated that only 29.1% of young adults aged 15–24 had comprehensive and accurate knowledge of HIV/AIDS [56]. Recently, a 27.1% prevalence of comprehensive HIV knowledge among reproductive-age women in The Gambia was reported [53].

Currently, there is insufficient up-to-date data on safe sex practices including condom use and HIV/AIDS knowledge among young adults (especially students) in The Gambia, who represent the most HIV-affected age group. Most of the

available contextual data were reported over a decade ago, and a recent study focused solely on women of reproductive age [53]. This highlights the urgent need for a study that updates existing data and focuses on the most affected age group which is 18-25 years. These factors necessitated this current study.

2. Material and methods

2.1. Study Area

This study was carried out in the communities located within the Kanifing Municipal Council (KMC) of The Gambia. The Gambia is organized into seven administrative divisions: two municipalities (Banjul, the capital, and Kanifing) and five regions (West Coast, Lower River, Central River, Upper River, and North Bank). KMC is known for having a high concentration of diverse schools, with students attending these schools coming from both within the Kanifing communities and beyond [50].

2.2. Study Design

This study is a cross-sectional descriptive study using a quantitative approach to assess and evaluate safe sex practices including condom use and the knowledge of HIV/AIDS among students aged 18 to 25 attending tertiary institutions within the Kanifing Municipal Council, The Gambia.

2.3. Study Population

The study focused on students aged 18–25 years from purposively selected tertiary institutions within the Kanifing Municipal Council. The tertiary institutions chosen for the research include the American International University West Africa (AIUWA), University of The Gambia (UTG) Kanifing Campus, the Management Development Institute (MDI), and The Gambia Tourism and Hospitality Institute (GTHI). These tertiary institutions were intentionally selected to ensure representation across diverse fields of study offered in them.

2.4. Sample Size

The sample size was calculated using the Cochrane formula for cross-sectional studies [31, 32, 40, 41, 42, 43, 54]:

$$\mathrm{n} = \frac{Z^2 PQ}{d^2}$$

Where:
n = sample size
Z = standard normal variate set at 1.96, which corresponds to a 95% confidence level
P = proportion in population extracted from the literature of a previous related study = 23% or 0.23 [8]
Q = 1 – d = 1 – 0.23 = 0.77
d = degree of accuracy desired (absolute precision), which is 5.0% (0.05)

$$\mathrm{n} = \frac{1.96^2 \text{x } 0.23 \text{ x } 0.77}{0.05^2} = 272 \text{ respondents}$$

2.5. Inclusion Criteria

- Students who were between 18 and 25 years, the age bracket for young adults were included.
- Students with >2 months to graduate and readily available.
- Duly registered students in the selected tertiary institutions.
- Students who voluntarily consented to participate in the study without any financial benefits.

2.6. Exclusion Criteria

- Students who were 17 years and below or 26 years and above were excluded.
- Students with <2 months to graduate.
- Non-duly registered students in the selected tertiary institutions.
- Students who did not voluntarily consent to participate in the study without any financial benefits.

2.7. Sampling Techniques

A multistage sampling method was utilized for the study. All departments, treated as strata, were included, along with the years of study (clusters) within each department. A total of 272 students were systematically chosen from each cluster based on probability proportionate to the size of the respective cluster. Clusters with a smaller number of students were combined to ensure adequate representation.

2.8. Data Collection

Quantitative data collection was carried out by the one of the researchers with the help of well-trained research assistants. The questionnaires were distributed and collected immediately after the respondents have completed them. At the end of each data collection day, the researcher who collected the data reviewed all responses to ensure completeness, clarity, and consistency. Data collection was conducted using a set of pre-tested and self-administered structured questionnaires. The questionnaires, written in English, were divided into four sections: Section A collected information on socio-demographic characteristics of the respondents, Section B focused on condom knowledge and sources of condom knowledge of the respondents, Section C gathered data on condom use and other preventive measures and reasons during sexual intercourse, and Section D assessed the knowledge of HIV/AIDS among the respondents.

2.9. Reliability and Validity of Study Instruments

The data collection tool was validated through a thorough review of relevant literature and consultations with field experts. The questionnaire questions were refined following a pilot test conducted with 15 randomly selected respondents from a similar target population outside the Kanifing Municipal Council (KMC). The pilot test yielded an overall Cronbach's Alpha value of 0.81, indicating a strong reliability. In general, a Cronbach's Alpha value of 0.70 and above is considered reliable.

Research assistants were carefully selected for their ability to effectively engage with young people of diverse sexual orientations, and underwent intensive training specific to the study. These measures were implemented to ensure the reliability and validity of the study instruments.

2.10. Variables

The independent variables were presumed to predict and influence the dependent variables e.g. knowledge of HIV/AIDS. The dependent variables relied on the independent variables to occur. These dependent variables include age at first sex (age at sexual debut), sex for reward or favor (transactional sex), condom use during sex, etc. These variables were assessed, identified, and coded.

2.11. Measurement of Study Variables

The knowledge of HIV/AIDS among the respondents was assessed and scored. Variables related to knowledge were chosen from the questionnaire based on their relevance to addressing the research questions. Eight questions were selected and scored to determine the level of knowledge of HIV/AIDS. Each "Yes" response was assigned 1 point, while "No" responses received 0 point, resulting in a maximum possible score of 8 points per respondent. Levels of knowledge were categorized as follows: ≤4 points indicated low knowledge, and >4 points indicated high knowledge.

2.12. Data Analysis

Quantitative data were analyzed using SPSS version 26. Bivariate analysis was employed to describe the gender-based difference between the variables. Multivariate analysis, including Chi-square and Fisher's exact tests, was used to examine associations between the independent and the dependent variables.

2.13. Ethical Considerations

This study was conducted with necessary approvals secured from the School of Medicine and Allied Health Sciences Research and Scientific Committee of the University of The Gambia, the Joint National Institute for Medical Research Council (MRC) Unit, and The Gambian Government Ethics Committee. In addition, permission was obtained from the administrations of the participating tertiary institutions. Identities of the respondents were kept anonymous, and they provided verbal consent before completing and signing the consent forms. The respondents agreed to participate in the study without any financial incentive. Each respondent was thoroughly briefed about the study process, and all collected data were treated with strict confidentiality. Participants maintained full autonomy throughout the study and had the

unequivocal right to withdraw within two weeks of joining the study without any need to provide a reason or facing any consequence.

3. Results

Table 1 Socio-demographic characteristics of the respondents

Variable	Frequency (*n*)	Percentage (%)
Age (Years)		
18-19	30	11.0
20-21	103	37.9
22-23	90	33.1
24-25	49	18.0
Mean age = 21.8±2.4 years		
Gender		
Male	74	27.2
Female	198	72.8
Nationality		
Gambian	265	97.4
Non-Gambian	7	2.6
Tribe		
Fula	62	22.8
Jola	32	11.8
Mandinka	109	40.1
Serahuli	7	2.6
Serer	16	5.9
Wolof	44	16.2
Marital Status		
Divorced	4	1.5
Married	17	6.25
Single	250	91.9
Widow	1	0.4
Who do you currently live with?		
Your mother	75	27.6
Your father	25	9.2
Both your mother and father	121	44.5
Your grandmother	13	4.8
Your grandfather	2	0.7
Aunt	19	7.0
Uncle	5	1.8

Sibling	12	4.4

Table 1 shows that the majority of the respondents were aged 20–21 years (37.9%), followed by 22–23 years (33.1%), then 24–25 years (18.0%), and finally 18–19 years (11.0%). The mean age of the respondents was 21.8±2.4 years. Females (72.8%) were more than males (27.2%). The vast majority of the respondents were Gambians (97.4%), with a small proportion being non-Gambians (2.6%). The Mandinka tribe was the most represented (40.1%), while the least was Serahuli (2.6%). Most respondents were single (91.9%), with smaller proportions being married (6.25%), divorced (1.5%), or widowed (0.4%). The majority lived with their mother and father (44.5%).

Table 2 Condom knowledge and sources of condom knowledge of the respondents

Condom knowledge	**Frequency (*n*)**	**Percentage (%)**
Yes	229	84.2%
No	43	15.8%
Radio		
Yes	45	16.5%
No	176	63.5%
Television		
Yes	78	28.7%
No	194	71.3%
Internet		
Yes	32	11.8%
No	240	88.2%
Health workers		
Yes	75	27.6%
No	197	72.4%
Newsletters/Magazines		
Yes	15	5.5%
No	257	94.5%
Relatives/Friends		
Yes	174	64.0%
No	98	36.0%

Table 2 illustrates that the majority (84.2%) of the respondents know about condoms, while only 15.8% indicated they do not know about condoms. On the sources of condom knowledge, only 16.5% of the respondents reported learning about condoms through the radio. Television also served as a source as 28.7% cited television as their source of condom knowledge. Internet was reported as the source of condom knowledge by 11.8% of the respondents, then health workers (27.6%), newsletters/magazines (5.5%), and relatives/friends (64.0%).

Table 3 Condom use, safe sex practices (other preventive measures), and reasons for safe sex practices during sexual intercourse

Variables	**Gender**					***p-value***
	Male		**Female**			
	n	**%**	***n***	**%**		
Have you ever had sexual intercourse?						
Yes	45	16.5	37	13.6		
No	29	10.7	161	59.2		
Have you ever heard of condoms?					R^2	<0.01
Yes	44	53.7	35	42.6		
No	1	1.2	2	2.4		
Do you know of a place where a person can get condoms?					†	<0.01
Yes	41	50.0	30	36.6		
No	4	4.9	7	8.5		
If you wanted to, could you get a condom for yourself?						
Yes	35	42.6	18	22.0		
No	10	12.2	19	23.2		
Have you ever used a condom?					†	<0.01
Yes	37	45.1	14	17.1		
No	8	9.6	23	28.0		
Was a condom used every time you had sexual intercourse in the last 12 months?					†	<0.01
Yes	14	17.1	6	7.3		
No	31	37.8	31	37.8		
Do you know about the HIV status of your sex partner?						
Yes	5	6.1	7	8.5		
No	40	48.8	30	36.5		
Warnings and worries during and after sexual intercourse						
Other STIs	9	11.0	6	7.3		
HIV	6	7.3	5	6.1		
Pregnancy	25	30.5	30	36.5		
Preventive Measures						
Condom	3	13.0%	5	19.1%		
Contraceptive pills	8	34.8%	3	14.3%		
Withdrawal	6	26.1%	6	28.6%		
Rhythm method	2	8.7%	1	4.8%		
Implant	0	0.0%	1	4.8%		
Injectable	0	0.0%	2	9.5%		

Female condom	1	4.3%	0	0%		
Others	9	39.1%	7	33.3%		
The last time you had sex, did you or your partner use any method (other than a condom) to avoid or prevent a pregnancy					R^2	<0.277
Yes	17	21.0%	13	16.0%		
No	28	34.0%	24	29.0%		

Table 3 reveals that 30.1% (*n*=82) of the respondents had engaged in sexual intercourse, with 45 males and 37 females reporting sexual activity. Among these, 53.7% of males and 42.6% of females have heard of condoms. A significant gender difference ($p<0.01$) was observed in condom awareness.

Regarding access to condoms, 86.6% of sexually active respondents (50.0% males and 36.6% females) know where to obtain condoms, with a significant gender difference ($p<0.01$). 64.6% (42.6% males and 22.0% females) reported they could access condoms if needed. Condom use was reported by 62.2% (45.1% males and 17.1% females), with a significant gender difference ($p<0.01$). However, only 24.4% (17.1% males and 7.3% females) reported consistent condom use in the last 12 months, showing a significant gender gap ($p<0.01$).

Knowledge of the HIV status of a partner was low as only 14.6% (6.1% males and 8.5% females) of the respondents were aware of it. Concerns during/after sexual intercourse included pregnancy (30.5% males and 36.5% females), while other STIs and HIV were less frequently reported. Preventive measures included condoms (13.0% males and 19.1% females), contraceptive pills (34.8% males and 14.3% females), and withdrawal (26.1% males and 28.6% females), with other listed methods rarely used. Non-condom methods to avoid or prevent a pregnancy were used by 21.0% of males and 16.0% of females, with no significant gender difference ($p=0.277$).

Table 4 Knowledge of HIV/AIDS among the respondents

Variable	**Frequency (*n*)**	**Percentage (%)**
Have you ever heard of an infection/illness called HIV/AIDS?*		
Yes	246	90.4
No	26	9.6
Can people reduce their chances of getting the HIV virus by having just one uninfected sex partner who has no other sex partners?*		
Yes	209	77.7
No	63	22.3
Can people get the HIV virus from mosquito bites?*		
Yes	34	11.5
No	238	88.5
Can people get the HIV virus by sharing food with a person who has HIV?*		
Yes	37	13.8
No	235	86.2
Can people reduce their chances of getting the HIV virus by using a condom every time they have sex?*		
Yes	223	81.8
No	49	17.8
Is it possible for a healthy-looking person to have HIV?*		

Yes	225	82.9
No	47	17.1
Do you know of a place where people can go to get tested for HIV?*		
Yes	205	75.5
No	67	24.5
Where is that?		
Government hospital	108	48.9
Government health center	58	24.9
Family planning clinic	11	5.0
Private hospital/clinic	18	8.1
Pharmacy/drugstore	1	0.5
Private medical doctor	7	3.2
NGO/ hospital/clinic	21	9.5
Have you ever tested yourself for HIV?*		
Yes	83	30.5
No	189	69.5
Did you get the result of your HIV test?		
Yes	83	100
If you know that your partner has HIV, would you refuse him/her sex?		
Yes	147	53.9
No	125	46.1
Would you ask for a condom?		
Yes	144	52.8
No	128	47.2
If you know that your partner has sex with another person, would you refuse him/her sex?	?	
Yes	162	59.9
No	110	40.1
Would you ask for a condom?		
Yes	147	54.6
No	125	45.4

Please note: * = selected questions to evaluate knowledge of HIV/AIDS among the respondents

Table 4 outlines that among the 272 respondents, 90.4% have heard about HIV/AIDS, and 77.7% know that sticking to one uninfected sexual partner who has no other sex partners can reduce the chance of getting HIV. The majority (88.5%) were aware that mosquito bites could not transmit HIV, and neither do people get HIV by sharing food with HIV-infected persons (86.2%).

A good number of the respondents (81.8%) agreed that the chances of getting HIV can be reduced by using a condom every time they have sex, and most of the respondents (82.9%) understood that a healthy-looking person could have HIV. 75.5% responded that they know which facilities conduct HIV tests and identified government hospitals and health

centers as major sites for the HIV screening test. Nevertheless, the majority (69.5%) had not gone for a HIV test although among 30.5% who had gone for a HIV test, all got their results (100%).

A little over half of the respondents (53.9%) said that they would refuse to have sex with their partners if they knew their partners were HIV positive or have sex with other persons (59.9%). Similarly, a little over half (54.6%) agreed they would use or ask their sex partners to use condoms.

As illustrated in Figure 1 below, the responses of the respondents to preventive measures for contracting HIV indicated that the majority (53.59%) preferred abstinence, followed by condom use (25.41%), and then sticking to one HIV-free partner (12.71%). A small proportion (6.63%) preferred to know their partner's HIV status, while 1.66% preferred other preventive measures.

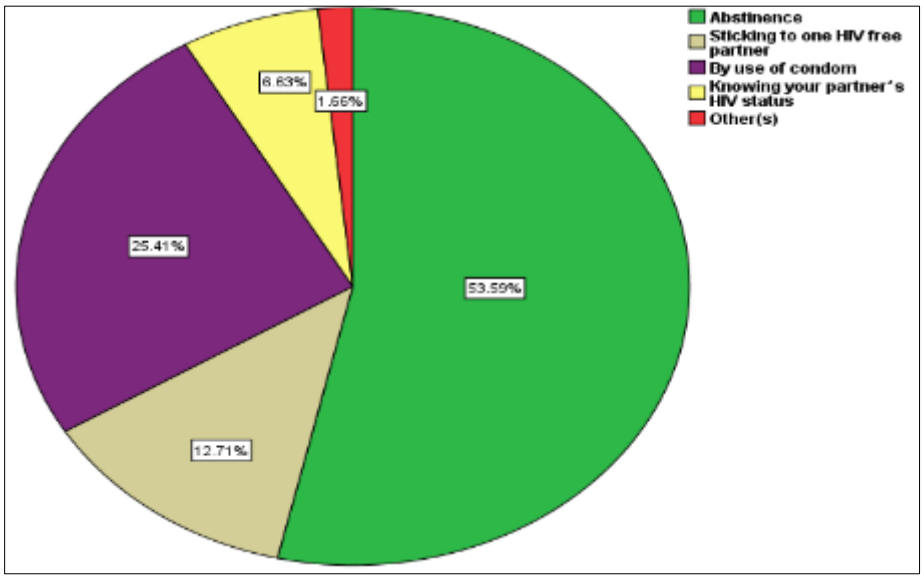

Figure 1 HIV preventive measures

Table 5 Association between knowledge of HIV/AIDS and the dependent variables

Variable	**Knowledge of HIV/AIDS**				***p*- value**
	High		**Low**		
Overall knowledge score	87.0%		13.0%		
	n	*%*	*n*	*%*	
Age of first sex partner (years)					0.644
≤6	0	0.0	2	2.4	
7–29	63	76.8	10	12.2	
30–52	6	7.3	1	1.20	
Age of second sex partner (years)					1.00
≤17	1	2.8	0	0.0	
18–29	25	69.4	4	11.1	
30–41	5	13.9	1	2.8	
Age at first sex (years)					0.532
≤8	1	1.2	0	0.0	
9–14	8	9.6	1	1.2	

15–20	42	51.2	10	12.2	
21–25	19	23.2	1	1.2	
Do you engage in sex for a reward or favor?					0.132
Yes	16	19.5	3	3.6	
No	53	64.6	10	12.2	
Do you use condoms during sex?					0.443
Yes	44	53.6	11	13.4	
No	7	8.5	20	24.4	

From Table 5, the majority (87.0%) of the respondents demonstrated a high overall knowledge of HIV/AIDS, but a substantial number (n=189, 69.5%) did not know their HIV status and that of their sex partners for those who are sexually active. There was no statistically significant association between knowledge of HIV/AIDS among the respondents and the dependent variables e.g. age of first sex partner, age of second sex partner, age at first sex, sex for reward or favor, and condom use during sex (p>0.05).

4. Discussion

The majority of students in the surveyed tertiary institutions were aged 20–23 years, with only about one-tenth falling within the 18–19 years age range. Since the selection of students was regardless of their academic year, this suggests that most tertiary students in The Gambia are admitted during their late adolescence or early adulthood. Females made up more than two-thirds of the respondents, indicating higher enrolment rates among women compared to men. This aligns with the finding of a previous similar study in tertiary institutions within The Gambia that reported a higher proportion of female participants [54]. The Mandinka tribe was the most represented among the respondents, reflecting their significant presence in the study area and their higher rates of academic enrolment. In addition, most participants were single and lived with both parents that could be attributed to the mean age of 21.8 years, a stage in life where many young adults in Africa are still pursuing tertiary education or apprenticeships, and are financially dependent on their parents/guardians.

This current study found that more males have heard of condoms compared to females. This aligns with the results of previous studies that showed that males have higher condom awareness than females and that males are more likely to obtain condoms than women [1, 34]. This is often due to social and cultural factors that encourage male responsibility for condom procurement. With regards to access to condoms, males know where to obtain condoms better than females, a finding which agrees with another study in Kenya where men had greater access than women [35]. The social norms, cultural, and logistical barriers that discourage women from actively seeking condoms, and limiting women's autonomy in condom procurement are implicated here.

Consistent and effective use of condoms can reduce transmission of HIV and other STIs. This current study recorded that over half (62.2%) of sexually active respondents use condoms during sex. However, consistent condom use among this group was very low (24.4%), with males being more consistent than females. These findings align with the WHO reports that highlighted the decline in condom use among adolescents to approximately 59.0% in 2022 [68]. Similarly, a South African study reported that only 27.0% of rural South African young adults consistently use condoms [6].

On the other hand, other studies reported lower or higher consistency in condom use. A previous study conducted in The Gambia reported that 1.7% of never-married young people consistently use condoms each time they had sex in the past 12 months [38]. Other studies reported low consistent condom use among young adults in Ghana [2], Uganda [46], and Nigeria [49], and that females were more likely to have used condoms than males. Low consistency in condom use could be related to inadequate sexuality education, low public sensitization on HIV/AIDS, and relationship and power imbalances where women were less likely to decide on condom use. In the US, condom use among sexually active young adults was higher (70.0–80.0%) [7], likely due to better access to condoms and effective sex education programs.

Moreover, this current study found that only 14.6% of the respondents knew the HIV status of their sex partner, which aligns with the report of a previous study indicating limited disclosure of HIV status among sex partners [39]. The stigma and fear of relationship conflicts were attributed to this. Meanwhile, this lack of knowledge increases vulnerability to HIV and other STIs, reinforcing the need for interventions promoting mutual HIV testing and disclosure.

Consistent with the study in two German cities, this current study further finds that the majority of the sexually active students reported that pregnancy was a major fear and worry they considered during and after each sexual intercourse, therefore making them primarily use condoms to prevent unintended pregnancies as they fail to bother being at risk of contracting HIV [45]. This trend suggests condoms were not primarily seen as tools for preventing STIs but as contraceptive tools. This finding from this current study also aligns with finding from another study that reported withdrawal and hormonal contraceptives as often preferred over condoms due to perceived convenience and trust in partners [4].

Nevertheless, results from different studies have pointed out how treatment in patients with Metabolic Syndrome Diseases (MSDs) can be optimized. For instance, Sodium-Glucose Linked Transporter 2 (SGLT-2) inhibitors e.g. Dapagliflozin [11, 15, 16, 25, 30, 63, 64, 65], and Glucagon-like Peptide 1 Receptor Agonists (GLP-1 RAs) e.g. Liraglutide [20] have been found to improve the efficacy of treatment and clinical course of type 2 diabetes mellitus and hypertension in patients with such combined diseases.

In agreement with the outcomes of previous studies [44, 55], this current study reveals that most of the students had a high level of knowledge about HIV transmission and prevention, largely due to higher institution-based education programs that support dissemination of HIV-related information. However, this finding disagrees with the finding from a previous study conducted in The Gambia, which reported that only a small number of young people know about HIV/AIDS [50]. This discrepancy in the findings calls for further studies since the aforementioned study did not clearly state whether it was conducted among students in educational institutions or among uneducated young people in the various communities within The Gambia.

Misconceptions about HIV transmission persist as 11.5% of the respondents agreed that HIV can be transmitted via mosquito bites or by sharing food (13.8%), even as dispelling these myths is progressive. This implies there is a need for more emphasis on continuous HIV education programs. Likewise, the high number (81.8%) of the respondents who agreed that consistent condom use reduces the risk of HIV and that sticking to one uninfected partner reduces the risk of infection (77.7%) is comparable to the findings from a study conducted in Ghana among university students [3]. A major barrier to early testing is the misconception that visible symptoms are HIV indicators [67]. This current study identified that most of the respondents know that a healthy-looking person could have HIV.

The majority of the respondents knew facilities that conduct HIV screening. However, despite the high awareness, many have not gone for HIV tests, making HIV testing rates relatively low. This is similar to finding from a study in Kenya, where only 38.5% of university students had undergone at least one HIV test [37]. The fact that all individuals who tested received their results is encouraging, as it suggests that testing services in The Gambia are efficient and accessible. In concordance with another report [51], those who are sexually active did not know the HIV status of their sex partners. This concern still poses a more serious challenge to public health as a lack of knowledge about one's own HIV status and that of the partner is considered a sexual risk behavior. Nevertheless, the reluctance of young adults to get tested may stem from stigma, fear of a positive result, or a lack of perceived risk. These are common barriers in similar populations [37].

If the sex partner is HIV-positive, over half of the respondents would refuse to have sex (53.9%), or ask for a condom (54.6%), or refuse sex on suspicion of multiple sex partners (59.9%). This is similar to a study that recorded that over half of the respondents used condoms and agreed they would use condoms in a similar situation [6]. These findings highlight the nonchalant attitude displayed by some young adults towards HIV infection. Abstinence was the most preferred HIV prevention method, followed by condom use, and sticking to one HIV-free sex partner. The dominance of abstinence as a preventive measure could be religious doctrine related, proper upbringing, or public sensitization. Only 6.63% prioritized knowing their sex partner's status, highlighting low HIV testing uptake and indicating the need for greater awareness of the role of partner testing in HIV prevention in The Gambia.

There was no statistically significant association between knowledge of HIV/AIDS and all the dependent variables examined ($p>0.05$), supporting and contradicting several previous studies. For example, a previous study in Tanzania suggested that individuals with higher HIV knowledge tend to choose partners of similar age to reduce perceived risk [67]. The lack of statistically significant association between knowledge of HIV/AIDS and age of sexual debut in this current study could be due to socio-cultural influences and parental neglect that drive early sexual engagement, regardless of knowledge levels. However, reports suggested that young people with higher HIV knowledge tend to delay sexual initiation, possibly due to greater awareness of risks [55]. This current study suggests that knowledge of HIV/AIDS alone may not be a sufficient deterrent. Economic and social factors likely play a significant role in transactional sexual behaviors. While high knowledge of HIV/AIDS was linked to increased condom use, many

individuals with adequate knowledge still engaged in unprotected sex due to cultural norms, partner influence, or perceived trust in relationships.

Nonetheless, one of the limitations of this current study is the study area which is an urban setting. Thus, the results obtained may not really reflect the true picture within the entire country of The Gambia. This explains why the prospect for further research would be to conduct a similar study in a rural area of The Gambia and compare results.

5. Conclusion

Students in tertiary institutions within the Kanifing Municipal Council (KMC) of The Gambia have a high knowledge of HIV/AIDS, but poorly observe safe sex practices e.g. condom use. Condom use remained inconsistent. Gender disparities were evident, with males showing higher condom awareness and access than females. Misconceptions about HIV transmission persisted, and testing rates were low. Despite the high knowledge of HIV/AIDS, factors such as stigma, cultural norms, and relationship dynamics hinder the translation of knowledge into safe sex practices. There exists an urgent need for targeted interventions, including enhanced sex education, accessible testing services, and campaigns addressing misconceptions and gender-based barriers. Strengthening these efforts is crucial to reducing HIV transmission and promoting safe sex practices among young adults in The Gambia.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors guarantee responsibility for everything published in this manuscript, as well as the absence of a conflict of interest, and the absence of their financial interest in performing this research and writing this manuscript.

Authors Contribution

All authors contributed in different aspects of the research.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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