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HIV self-testing uptake and associated factors among students and staff in a public university in Uganda: evidence from an analytic cross-sectional study

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Abstract

Background Human Immunodeficiency Virus self-testing (HIVST) improves access to HIV testing services by enhancing privacy and convenience. However, evidence on HIVST uptake and its associated factors among university populations in Uganda remains limited. This study determined HIVST uptake and identified factors associated with HIVST uptake among students and staff at Muni University, Uganda.

Methods This analytic cross-sectional study was conducted between 7 February 2026 and 20 March 2026. Data were collected using a structured self-administered questionnaire. HIVST uptake was defined as self-reported ever use of an HIV self-test kit to test one's own HIV status. Descriptive statistics were used to summarize participant characteristics, and a multivariable Poisson regression model identified the factors independently associated with HIVST uptake. Adjusted prevalence ratios (aPRs) with 95% confidence intervals (CIs) were reported.

Results Among 272 participants, HIVST uptake was 39.7% (108/272). In adjusted analyses, HIVST uptake was associated with having two or more sexual partners in the past six months (aPR = 1.44, 95% CI: 1.03-2.00), alcohol or drug use (aPR = 1.47, 95% CI: 1.28–1.68), and knowledge of a partner's HIV status (aPR = 1.58, 95% CI: 1.40–1.78). Conversely, daily income of ≥2 dollars was associated with a lower likelihood of HIVST uptake (aPR = 0.68, 95% CI: 0.51–0.91).

Conclusion HIVST uptake among Muni University students and staff is nearly 40%. The HIVST uptake is influenced by sexual behavior, substance use, economic status, and HIV-related risk awareness. These findings should be leveraged to support university-based HIVST uptake to ensure early HIV diagnosis and treatment.

Keywords Behavioral risk factors · HIV self-testing · HIV testing uptake · Uganda · University

Background

Human immunodeficiency virus (HIV) infection remains a major global public health challenge [1]. By the end of 2023, approximately 39.9 million people were living with HIV worldwide, and about 630,000 people had died from HIV-AIDS-related diseases [2]. In Uganda, current data indicate that 1.4 million people are living with

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HIV [3]. These data reflect the continuing burden of the epidemic globally and nationally [4]. Despite substantial progress in prevention and treatment, early diagnosis of HIV remains essential for effective epidemic control [5]. Early HIV detection enables timely initiation of antiretroviral therapy (ART), reduces HIV transmission, and improves survival outcomes [6]. Expanding access to HIV testing services, therefore, remains a critical priority in the global HIV response [7]. HIV self-testing (HIVST) is an innovative HIV testing strategy in which an individual collects their own biological sample, performs the test, and interprets the result privately [8]. HIVST has been promoted as an additional HIV testing approach that can increase testing coverage and reduce barriers associated with conventional facility-based HIV testing services, such as social stigma, accessibility, privacy and convenience [9]. These factors directly impede timely diagnosis, providing a compelling rationale for the integration and scale-up of HIVST.

Universities host diverse student and staff populations with varying socio-cultural backgrounds. These settings are associated with behavioral risk factors, such as multiple sexual partnerships and inconsistent condom use, which may increase vulnerability to HIV infection [10, 11]. HIVST has emerged as a promising approach to increase testing uptake, particularly among populations facing stigma, confidentiality concerns, or barriers to accessing facility-based services. Uganda's National HIV treatment guidelines recommend two approaches to HIV testing services, namely provider-initiated testing and counseling (PITC) and client-initiated counseling and testing (CICT) [12]. Furthermore, the guidelines recommend that HIVST should be performed for children aged 1–14 years via caregiver assisted oral screening, adolescent girls and young women and boys, individuals aged 50 years and beyond, men including partners of pregnant women and lactating mothers, key populations (men having sex with men, lesbians, bisexuals, transgender, etc.), and the general population through the private sector. No clear guidance has been provided for school-based HIVST [13].

HIVST has been widely promoted among key populations due to their elevated risk of HIV acquisition. Although university staff and students are not considered priority populations, HIVST has potential benefits in these populations as the university setting is characterized by risky sexual behaviors such as transactional sex, condomless sex, sex under the influence of alcohol, and multiple sexual relationships, among others [14]. Additionally, university students and staff are a sub-population that may similarly value privacy and convenience concerning HIV testing services.

In Uganda, evidence on the uptake and determinants of HIVST within university populations is limited, highlighting an important gap for research and intervention. Previous studies have mainly focused on acceptability, feasibility, and perceptions of HIVST rather than identifying behavioral and socio-demographic predictors of uptake [15]. Therefore, we determined HIVST uptake and identified the associated factors among students and staff at a public university in Uganda. Generating evidence on HIVST uptake in academic settings is important for informing targeted HIV prevention and testing strategies by the Uganda Ministry of Health and Ministry of Education and Sports.

Methods

Study design and setting

We conducted an analytic cross-sectional study in which data on the outcome and explanatory variables were collected at a single point in time. This study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [16]. The study was conducted at Muni University, the sixth public university in Uganda, located in Arua City, the West Nile sub-region. As of February 2026, the university had approximately 2,841 students and comprises six faculties: Health Sciences, Education, Technoscience, Science, Agriculture and Environment, and Management Sciences. The University has a Health Center II (a parish-level health facility) designed to serve about 5,000 people based on Uganda's health system. The clinic provides preventive, promotive, basic outpatient curative, and outreach services, operating mainly as

an outpatient department. The clinic provides HIV testing services as part of preventive services but not HIVST services [17].

Study population and eligibility criteria

The study population included staff and students of Muni University. Participants were recruited by two trained research assistants. Staff recruitment took place during regular working hours (8:00 am-5:00 pm) in their respective offices, whereas students were recruited in lecture halls and classrooms. Recruitment was not conducted in halls of residence because these facilities accommodate both students and non-students, potentially leading to the inadvertent recruitment of individuals who did not meet the study eligibility criteria. Eligible participants were aged ≥ 18 years and present at the university during the study period. Individuals who were unreachable after 2–3 follow-up attempts were excluded.

Sample size determination

The sample size was determined using the Krejcie and Morgan formula (1970). In the absence of prior data on HIVST uptake at the university, a prevalence of 50% was assumed to maximize variability. With a 5% margin of error and a source population of 1,672 individuals at the time of the study (1,400 students on campus and 272 staff), the required sample size was 313 participants. Using the Krejcie and Morgan formula,

$$Sample\ size\ (n) = n = X^2 NP(1-P) \div \left[d^2(N-1) + X^2 P(1-P)\right]$$

whereby,

- n = Required sample size.
- N = Population size = 1,672.
- X^2 = The Chi-square value for 1 degree of freedom at 95% confidence level = 3.841.
- P = HIVST uptake = 50% (0.5) since it was unknown.
- d = Margin of error = 5% = 0.05.

Accordingly, $n = 3.841^2 \times 1672 \times 0.5(1-0.5) \div [0.05^2(1672-1)+3.841^2 \times 0.05(1-0.05)] = 313$.

No additional allowance was made for non-response or refusal. The sample was proportionately allocated to students ($n = 257$) and staff ($n = 56$).

Sampling method and procedure

A stratified random sampling approach was employed. Both staff and student samples were stratified by faculty, and a simple random sampling was performed within each faculty using computer-generated random numbers in Stata version 15 to select a representative number of participants (Table 1).

Data collection instrument

Data were collected using a structured, self-administered questionnaire developed based on existing literature on HIV testing services and HIVST. The questionnaire was prepared in English by the Principal Investigator and was pretested among 16 respondents (8 staff and 8 students) at another university, with equal sex distribution (8 females and 8 males). The pretesting aimed at identifying questions that were unclear, redundant, repetitive, illogical, and inappropriate. Feedback was obtained after the pretesting and was used to refine clarity and improve the accuracy of the questions.

Table 1 Proportional distribution of the study participants across faculties ($n=313$)

Faculty	Total	Proportion	Number sampled
A. Staff			
Health Sciences	27	0.1	6
Education	9	0.03	2
Technoscience	19	0.07	4
Science	25	0.09	5
Agriculture and Environment	13	0.05	3
Management Sciences	10	0.04	2
Library	6	0.02	1
Research	2	0.01	0
Others	161	0.59	33
Total	272	1	56
B. Students			
Health Sciences	307	0.11	101
Education	1,133	0.4	76
Technoscience	119	0.04	5
Science	274	0.1	18
Agriculture and Environmental Science	232	0.08	15
Management Science	307	0.11	22
Total	2,841	1	257

During the data collection, the two research assistants (1 female vs. 1 male) approached eligible participants, provided study information, obtained written informed consent, and distributed the questionnaires. The research assistants had prior research experience in quantitative data collection involving people with HIV. Besides, they were trained in responsible conduct of research, ethical research conduct, and questioning techniques for 2 days before the data collection. Participants were given 1–2 days to complete the questionnaire before collection. The questionnaire included sections on socio-demographic characteristics, HIV-related risk behaviors, knowledge of HIV, and knowledge and uptake of HIV self-testing. Data were collected between 7 February 2026 and 20 March 2026.

Study variables and measurements

The dependent variable was uptake of HIVST, measured as a binary outcome (Yes/No). HIVST uptake was defined as self-reported ever use of an HIV self-test kit to test one's own HIV status. Test results are reported as reactive, non-reactive, or invalid. However, this was not the focus of the current study. The independent variables included:

- Socio-demographic characteristics: age, sex, marital status, faculty, religion, income level, employment status, and distance to the nearest health facility. Age was measured as the absolute number of years lived and subsequently categorised as 20–24, 25–34, and ≥35 years. Sex was categorised as female or male, and marital status as married or single. Faculty included the six faculties of Science, Health Sciences, Technoscience, Management Science, Agriculture and Environmental Sciences, and Education. Religion was categorized as Catholic, Anglican, or other. Monthly income was measured as the amount of money earned in Uganda Shillings (UGX) and subsequently converted to United States dollars (USD) using an exchange rate of 1 USD = 3,650 UGX. Employment status was categorised as employed or unemployed, and distance to the nearest health facility was categorised as <5 km or ≥5 km.
- Behavioral risk factors: sexual partnership status, number of sexual partners, multiple partnerships, unprotected sex, and alcohol or drug use. Sexual partnership was measured based on a history of having a sexual partner in the past 3 months (yes or no). The number of sexual partners was categorised as none, one, or two or more; individuals who reported two or more sexual partners in the past 3 months were considered to be engaged in

multiple sexual partnerships. Unprotected sexual intercourse was defined as heterosexual intercourse without a condom. Alcohol or drug use was measured by self-report and defined as drinking alcohol or using drugs.

- Knowledge and perception variables: knowledge of HIV transmission, knowledge of HIV prevention, perceived HIV risk, and knowledge of partner's HIV status. Knowledge of HIV transmission was measured based on whether participants knew how HIV is transmitted from an infected person to an uninfected person. Knowledge of HIV prevention was measured based on whether participants knew methods for preventing HIV acquisition. Perceived HIV risk was measured based on participants' assessment of their own risk of HIV acquisition, categorised as none, low, or high. Knowledge of a sexual partner's HIV status was measured based on whether participants knew their partner's HIV status.

Data management

Raw data from completed questionnaires were entered into Microsoft Excel. Before analysis, data were checked for inconsistencies and outliers. Completed questionnaires were stored in sealed envelopes and kept in a locked cabinet to ensure confidentiality.

Data analysis

Statistical analyses were performed using Statistical Package for Social Sciences Research (SPSS) version 20. Descriptive statistics were computed as frequencies and percentages for categorical variables. The mean and standard deviations were computed for continuous variables as they were normally distributed. Bivariate analysis involved cross-tabulation of independent variables with HIVST uptake.

Differences in proportions were assessed using the Chi-square test for variables with adequate cell counts and Fisher's exact test for small cell counts. For continuous variables, mean differences were assessed using Student's t-test as the data were normally distributed.

To determine factors independently associated with HIVST uptake, mixed-effects Poisson regression with robust standard errors was performed to estimate the unadjusted/crude and adjusted prevalence risk ratios (PRs) and the corresponding 95% confidence intervals (CIs). Faculty was included as a random effect to account for clustering due to shared environments and potential peer influence. Variables included in the multivariable model were those considered clinically and biologically relevant in the literature, as well as those statistically significant at bivariate analysis. Statistical significance was set at $p < 0.05$. Odds ratios were not reported because the outcome was common and would overestimate the magnitude of association. Multicollinearity was assessed using variance inflation factors (VIF), and variables with VIF > 5 were not included simultaneously in the final model. We assessed potential interaction by including interaction terms between the exposure and potential effect modifiers in the regression models. Effect modification was evaluated by comparing stratum-specific effect estimates and assessing the statistical significance of the interaction terms.

Ethical considerations

Ethical approval was obtained from the TASO Research Ethics Committee (Reference No: TASO-2025-651). Administrative clearance was granted by the Department of Nursing, Faculty of Health Sciences, Muni University. All participants provided written informed consent after receiving detailed study information, including the purpose of the study, procedures, potential risks and benefits, and the right to withdraw at any time without penalty. Confidentiality was maintained through the use of unique identification codes and secure storage of study materials. This study was conducted in accordance with the Declaration of Helsinki principles: autonomy, beneficence, justice, and nonmaleficence.

Results

Distribution of participant characteristics by HIVST uptake

We studied 272 participants, corresponding to approximately an 87% response rate. Table 2 shows HIVST uptake and differences in HIVST uptake across several independent factors. Among the 272 participants, HIVST uptake was reported by 39.7%. The uptake of HIVST was higher among males than females (40.5% vs. 37.7%, $p=0.665$), and among students than staff (40.5% vs. 37.5%, $p=0.686$). HIVST uptake was highest in the Health Sciences faculty (62.4%) compared with Education (26.3%) and other faculties (26.2%, $p<0.001$), and among third- and fourth-year students compared with first-year students and second-year students (53.1% vs. 30.3%, $p=0.001$). Participants who had a sexual partner in the past three months (44.1% vs. 26.5%, $p=0.010$), two sexual relationships in the past six months (57.5%, $p=0.022$), alcohol or drug users (53.5% vs. 29.5%, $p<0.001$), knew their partner's HIV status (48.7% vs. 29.6%, $p=0.004$), had unprotected sex (45.3% vs. 26.8%, $p=0.004$), or reported high perceived HIV risk (55.8% vs. 27.6%, $p=0.010$) were more likely to report HIVST uptake.

Mixed-effects modified poisson regression results for factors associated with HIVST uptake at the unadjusted and adjusted levels

In the unadjusted analysis (Table 3), participants aged≥35 years were more likely to report HIVST uptake compared with those aged 20–24 years (uPR = 1.35, 95% CI: 1.20–1.53). Males (uPR = 1.18, 95% CI: 1.11–1.25), individuals earning > USD 2 per day (uPR = 1.21, 95% CI: 1.05–1.39), those reporting two sexual partners in the past six months (uPR = 1.90, 95% CI: 1.26–2.88), alcohol or drug use (uPR = 1.74, 95% CI: 1.58–1.92), knowledge of a partner's HIV status (uPR = 1.61, 95% CI: 1.35–1.93), history of unprotected sex (uPR = 1.83, 95% CI: 1.04–3.24), and higher perceived HIV risk also showed a higher likleihood of HIVST uptake.

After statistical adjustment for potential confounders (Table 2), we found no evidence of an association between age and HIVST uptake among participants aged 25–34 years (aPR = 0.92, 95% CI: 0.52–1.64) or ≥35 years (aPR = 1.48, 95% CI: 0.84–2.59), compared with those aged 20–24 years. Having one sexual partner in the past six months was also not associated with HIVST uptake (aPR = 0.87, 95% CI: 0.38–2.04). However, earning more than two dollars per day (aPR = 0.68, 95% CI 0.51–0.91), having two or more sexual partners compared to none (aPR = 1.44, 95% CI: 1.03-2.00), alcohol or drug use (aPR = 1.47, 95% CI: 1.28–1.68), and knowledge of a partner's HIV status (aPR = 1.58, 95% CI: 1.40–1.78) were associated with HIVST uptake.

Cluster-level variation

In the random-effects model, we found a modest variation in HIVST uptake across faculties (variance = 0.15, 95% CI: 0.07–0.33), corresponding to an intraclass correlation coefficient (ICC) of approximately 4.4%. This ICC indicated that a small proportion of the total variation in HIVST uptake was attributable to differences between faculties. After adjustment, the between-faculty variance slightly decreased (variance = 0.12, 95% CI: 0.06–0.25), with a corresponding ICC of approximately 3.5%, suggesting limited residual clustering after accounting for individual-level characteristics. Model fit improved in the adjusted model (AIC = 360.50 vs. 407.80).

Discussion

We assessed the uptake of HIVST and the associated factors among students and staff at Muni University, Uganda. Our study revealed that nearly four in 10 university students and staff have used HIVST, and HIVST uptake is more likely among participants with two or more sexual partners in the past six months, those who use alcohol or drugs, and those who know their sexual partner's HIV serostatus. However, it is less likely among participants

Table 2 Distribution of participant characteristics by HIVST uptake

Variable		HIVST		
	All ($n=272$)	No ($n=164$)	Yes ($n=108$)	p-value
Age group	No. (%)	No. (%)	No. (%)	0.838
20–24	166 (61.3)	102 (61.4)	64 (38.6)	
25–34	54 (19.9)	33 (61.1)	21 (38.9)	
≥35	51 (18.8)	29 (56.9)	22 (43.1)	
Age, mean (SD)	27.0 (7.7)	26.9 (7.5)	27.3 (8.0)	0.628
Sex				0.665
Female	77 (28.3)	48 (62.3)	29 (37.7)	
Male	195 (71.7)	116 (59.5)	79 (40.5)	
Marital status				0.414
Married	65 (23.9)	42 (64.6)	23 (35.4)	
Single	207 (76.1)	122 (58.9)	85 (41.1)	
Faculty				<0.001
Education	76 (27.9)	56 (73.7)	20 (26.3)	
Health Sciences	101 (37.1)	38 (37.6)	63 (62.4)	
Others	95 (34.9)	70 (73.7)	25 (26.3)	
Participant type				0.686
Student	215 (79.3)	128 (59.5)	87 (40.5)	
Staff	56 (20.7)	35 (62.5)	21 (37.5)	
Year of study ($n=215$)				0.001
1–2	119 (55.3)	83 (69.8)	36 (30.3)	
3–4	96 (44.7)	45 (46.9)	51 (53.1)	
Distance to nearest health facility				0.249
<5 km	196 (72.1)	114 (58.2)	82 (41.8)	
≥5 km	76 (27.9)	50 (65.8)	26 (34.2)	
Employment status				0.7
Unemployed	198 (72.8)	118 (59.6)	80 (40.4)	
Employed	74 (27.2)	46 (62.2)	28 (37.8)	
Average monthly income/day (USD)				<0.001
≤2	192 (70.6)	115 (59.9)	77 (40.1)	
>2	80 (29.4)	49 (61.3)	31 (38.8)	
Had a sexual partner (past 3 months)				0.01
No	68 (25.0)	50 (73.5)	18 (26.5)	
Yes	204 (75.0)	114 (55.9)	90 (44.1)	
Number of sexual relationships (past 6 months)				0.022
None	124 (45.6)	81 (65.3)	43 (34.7)	
One	101 (37.1)	63 (62.4)	38 (37.6)	
Two	47 (17.3)	20 (42.6)	27 (57.4)	
Alcohol/drug use				<0.001
No	156 (57.4)	110 (70.5)	46 (29.5)	
Yes	116 (42.6)	54 (46.6)	62 (53.4)	
Know partner's HIV status				0.004
No	88 (36.4)	62 (70.5)	26 (29.5)	
Yes	154 (63.6)	79 (51.3)	75 (48.7)	
Had unprotected sex (past 3 months)				0.004
No	82 (30.2)	60 (73.2)	22 (26.8)	
Yes	190 (69.9)	104 (54.7)	86 (45.3)	
Perceived HIV risk				0.01
None	58 (21.3)	42 (72.4)	16 (27.6)	
Low	162 (59.6)	99 (61.1)	63 (38.9)	
High	52 (19.1)	23 (44.2)	29 (55.8)	
Know HIV transmission				0.019
No	8 (2.9)	8 (100.0)	0 (0.0)	
Yes	263 (97.1)	155 (58.9)	108 (41.1)	

Table 2 (continued)

Variable	HIVST			
	All ($n=272$)	No ($n=164$)	Yes ($n=108$)	p-value
Know HIV prevention				0.416
No	1 (0.4)	1 (100.0)	0 (0.0)	
Yes	271 (99.6)	163 (60.2)	108 (39.8)	

Table 3 Mixed-effects modified Poisson regression results for factors associated with HIVST uptake at the unadjusted and adjusted levels

Variable			Unadjusted analysis	Adjusted analysis
	Level	Null model	uPR (95% CI)	aPR (95% CI)
Fixed effects				
Age group	20–24		1	1
	25–34		1.07 (0.67, 1.70)	0.92 (0.52, 1.64)
	35 and above		1.35***(1.20, 1.53)	1.48 (0.84, 2.59)
Sex	Female		1	
	Male		1.18***(1.11, 1.25)	
Marital Status	Married		1	
	Single		0.94 (0.62, 1.43)	
Participant	Student		1	
	Staff		1.15 (0.80, 1.65)	
Religion	Catholic		1	
	Anglicans		1.13 (0.66, 1.93)	
	Others		0.95 (0.64, 1.39)	
Distance to the nearest health facility (km)	<5		1	
	≥5		1.01 (0.83, 1.24)	
Employment status	Unemployed		1	
	Employed		1.19 (0.99, 1.44)	
Average income per day (dollars)	≤2		1	1
	>2		1.21**(1.05, 1.39)	0.68** (0.51, 0.91)
Has a sexual partner	No		1	
	Yes		1.72 (0.86, 2.45)	
Number of sexual relationships in the past 6 months	None		1	1
	One		1.18 (0.56, 2.52)	0.87 (0.38, 2.04)
	Two or more		1.90** (1.26, 2.88)	1.44* (1.03, 2.00)
Alcohol/drug use	No		1	1
	Yes		1.74***(1.58, 1.92)	1.47*** (1.28, 1.68)
Know partner(s)' HIV status	No		1	1
	Yes		1.61***(1.35, 1.93)	1.58*** (1.40, 1.78)
Ever had unprotected sex	No		1	
	Yes		1.83* (1.04, 3.24)	
Perceived HIV risk	None		1	
	Low		1.55*(1.03, 2.33)	
	High		2.27*(1.20, 4.28)	
Random effects				
Group-level Variance		0.15 (0.07, 0.33)		0.12 (0.06, 0.25)
Akaike Information Criteria (AIC)		407.80		360.50

uPR: Unadjusted Prevalence Risk Ratio; aPR: Adjusted Prevalence Risk Ratio; Statistical significance codes at 5% level: *$p<0.05$, **$p<0.01$, ***$p<0.001$

who earned, on average, more than two dollars per day. These findings highlight that economic, behavioral, HIV-risk-related awareness, and substance use factors are important drivers of HIVST uptake in a university setting. These factors may be leveraged to contribute to designing tailored interventions to increase HIVST uptake.

The finding that HIVST uptake was nearly four in every ten university staff and students indicates substantial uptake within the university setting and is comparable to findings from China, where uptake was around 38.2% [18], and northern Nigeria, where it was 35.8% [19]. However, our estimated HIVST uptake is lower than that reported in Zimbabwe at 56% [20] and south-western Uganda at 43.2% [21], but higher than estimates from Makerere University at 19% [22] and another study in China at 15.6% [23]. These variations in HIVST uptake may reflect differences in the availability of HIVST kits, national policy implementation, intensity of awareness campaigns, and population characteristics, including whether studies focused exclusively on students or included both staff and students. Overall, our findings suggest that HIVST is an increasingly utilized testing modality among university populations, likely driven by its convenience, privacy, and potential to overcome barriers associated with facility-based testing. This underscores an important opportunity to further scale up HIVST as part of targeted HIV prevention strategies in university settings.

The finding that HIVST uptake is more likely among participants reporting two or more sexual partners in the past six months and those who use alcohol or drugs may be explained by increased perceived vulnerability to HIV. It is important to recognize that multiple sexual relationships (having two or more sexual partners) are one of the indicators of risky sexual behavior, with the others being condomless (unprotected) sex in the past 3 months, sexual intercourse with a commercial sex worker in the past 3 months, and sexual intercourse under the influence of substance use in the past 3 months [14]. Each of these components of risky sexual behavior is associated with increased vulnerability to HIV acquisition and, consequently, may contribute to HIVST. People who use alcohol or drugs also face a significant risk of HIV acquisition, as these substances have a disinhibitory effect. Suggest individuals easily engage in risky sexual practices—unprotected sexual intercourse, sex with commercial sex workers, and transactional sex, among others. A study conducted in China showed that HIVST is strongly associated with high-to-moderate HIV-related sexual risk behaviors [18, 23], which is consistent with our findings. Having only one sexual partner in the past six months also showed a non-significant trend toward less likelihood of undertaking HIVST. The finding might be explained by a relatively lower perceived risk of HIV acquisition among those in stable partnerships, hence reducing the need for HIVST, consistent with results of a study conducted in Ghana [24].

Our finding that participants who knew their partner's HIV serostatus had a higher likelihood of HIVST suggests that awareness of a partner's status may motivate individuals to seek testing. Although we did not ascertain the specific serostatus of partners, it is plausible that this awareness influences testing behavior. For example, individuals with partners known to be HIV-negative may undertake HIVST to confirm their own status, whereas those with partners with HIV may test to determine their own risk of infection. This finding underscores the potential importance of HIV-related knowledge and awareness in improving uptake of HIV testing. In Uganda, a quasi-experimental study assessing the effect of comprehensive knowledge of HIV on extramarital sexual relationships and consistent condom use found no association with engagement in extramarital sexual relationships, but reported increased consistent condom use among individuals involved in such relationships [25]. The finding is also consistent with previous studies in Malawi, Zimbabwe, and Ethiopia [26, 27] as well as China [23]. The past studies all reported a high perceived risk of HIV infection as being positively correlated with HIVST uptake.

The study's finding that participants with a daily income of at least two US dollars were less likely to report uptake of HIVST is unexpected and contrasts with the commonly observed positive association between higher socioeconomic status and health service utilization. From a health behavior perspective, higher-income individuals tend to have greater access to conventional, facility-based HIV testing services, and this may diminish the perceived benefits or necessity of HIVST. The finding may also reflect competing priorities, time constraints, or alternative access to health services among those with higher socioeconomic status, consistent with previous findings [27]. From a behavioral economics standpoint, present bias and competing demands on time may further reduce engagement with HIVST uptake, particularly when the perceived immediate benefits are low. It is

also possible that this association reflects unmeasured contextual factors, such as differences in risk perception, health literacy, or exposure to HIVST promotion campaigns. Given the cross-sectional design and the potential for residual confounding, these findings should be interpreted with caution. Further research, particularly using longitudinal and mixed-methods approaches, is needed to better understand the mechanisms underlying this relationship and assess its consistency across settings.

Study strengths and limitations

The strengths of the study include sampling participants from all faculties, which enhances the generalisability of the findings. Participants were allocated proportionately according to the population size of each faculty, ensuring that faculties contributed participants in proportion to their population size and reducing the risk of over- or under-representation of students and staff from the different faculties. In addition, the use of prevalence risk ratios rather than odds ratios helped avoid overestimating the magnitude of the association.

This study has certain limitations. The study was conducted at a single public university (Muni University), which may limit the generalizability of the findings to other university settings in Uganda. The use of a cross-sectional study design precludes causal inference and restricts interpretation to associations. Data were self-reported and therefore subject to social desirability and recall bias.

However, efforts were made to minimize these biases by providing clear explanations of HIVST and assuring participants of anonymity. The possibility of residual confounding due to unmeasured variables cannot be excluded. Although our study was guided by a conceptual framework, the lack of a specific theory or model to explore in depth the behavioral factors driving HIVST remains a limitation. We did not adjust the sample size for non-response or refusal, so the final sample size may have been lower than the number required to achieve the desired precision. Therefore, the potential for non-response bias cannot be excluded. Despite these limitations, this study provides novel evidence on the prevalence and factors associated with HIVST uptake among university students and staff in this setting.

Conclusion and recommendation

This study showed that HIVST uptake among Muni University students and staff is nearly 40%. The HIVST uptake is influenced by sexual behavior, substance use, economic status, and HIV-related risk awareness. These findings should be leveraged to support university-based HIVST to ensure early HIV diagnosis and treatment.

Abbreviations

AIC	Akaike information criterion
AIDS	Acquired immunodeficiency syndrome
HIV	Human immunodeficiency virus
HIVST	HIV self-testing
ICC	Intraclass correlation coefficient
PR	Prevalence ratio
SPSS	Statistical package for social sciences research
USD	United States Dollars

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Author contributions BB, BM, and RAA conceptualized and designed the study. BB acquired the data. EM and JI analysed and interpreted the data. BB, EM, and JI drafted the manuscript. BB, EM, JI, BM, and RAA critically revised the manuscript.

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

Declarations

Ethics approval and consent to participate Ethical approval was obtained from the TASO Research Ethics Committee (Reference No: TASO-2025-651). Administrative clearance was granted by the Department of Nursing, Faculty of Health Sciences, Muni University. All participants provided written informed consent after receiving detailed study information, including the purpose of the study, procedures, potential risks and benefits, and the right to withdraw at any time without penalty. Confidentiality was maintained through the use of unique identification codes and secure storage of study materials. This study was conducted in accordance with the Declaration of Helsinki principles: autonomy, beneficence, justice, and nonmaleficence.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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