RESEARCH

A cross-sectional study of the factors associated with the acceptance of oral HIV self-testing among medical students at Joseph Ki-Zerbo University in Ouagadougou in 2021

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Background. New screening techniques are being used to diagnose HIV infection.
Objective. To identify factors associated with the acceptance of oral HIV self-testing among medical students using the socio-ecological model.
Method. We conducted a descriptive, analytical cross-sectional study among medical students from October 2020 to September 2021, with data collection carried out from 10 to 25 March 2021.
Results. A total of 508 students participated, of whom 15.75% (*n*=80) had heard of oral HIV self-testing. The acceptance rate was 92.52% (*n*=470). Additionally, 76.52% (*n*=345) were willing to buy the self-test at a preferential price of less than Franc African Financial Community (FCFA) 1 000. Logistic regression analysis revealed a statistically significant relationship between acceptance of oral HIV self-testing and the importance placed on pre-test counselling (odds ratio (OR) 6.45, 95% CI 0.93 - 40.33; *p*=0.049).
Conclusion. Oral HIV self-testing is widely accepted among medical students. However, pre-test counselling could further increase its use and help achieve the first 95 of the United Nations' ambitious targets.

Keywords. Oral HIV self-test; associated factors; students; socio-ecological model.

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Screening is an essential component of HIV management. Globally, 21% of people living with HIV (PLHIV) remain undiagnosed.[1] In West and Central Africa, less than two-thirds (64%) of PLHIV are aware of their HIV status.[2] In Burkina Faso, the adult HIV prevalence rate was 0.6% in 2021, indicating a decrease from previous years according to UNAIDS.[3] In addition, HIV incidence among people aged 15 to 49 has also dropped considerably over the decades, from 4.8% in 1990 to 0.1% in 2021.[3] However, prevalence remains relatively high among key populations, reaching 6.8% among sex workers and 27.1% among homosexual men and men who have sex with men.[4] Despite progress in expanding HIV testing, uptake remains low among young people. In France, a secondary analysis observational study found a sharp decline in screening test use among 18 - 24-year-olds. Similarly, in sub-Saharan Africa, a high rate of young people remain unaware of their HIV status.[5] Delayed diagnosis contributes to the persistence of the HIV epidemic and increases morbidity and mortality, making widespread screening essential. Early detection of HIV would improve the management of opportunistic infections and other AIDS-related pathologies. It is therefore important to place major emphasis on HIV testing. In three decades, very significant progress has been made in the development and refinery of diagnostic tools for HIV infection. Rapid diagnostic tests (RDTs) are crucial tools in low-resource countries, helping to overcome the challenges of access to healthcare by offering a rapid and effective screening solution. These tests are particularly useful for reaching at-risk populations who, for a variety of reasons, do not have easy or regular access to healthcare facilities. Thanks to their simplicity, rapidity and low cost, they represent an important opportunity to improve screening coverage, particularly among vulnerable people.[6] RDTs have improved over the years, becoming easier to use. Today, they can be performed in healthcare settings or through self-testing. These tests provide rapid results, are simple to administer and offer a practical solution for improving access to care, particularly in remote areas. In 2016, the World Health Organization (WHO) recommended self-testing as an innovative strategy to expand HIV testing services and, more specifically, to achieve the first 95-95-95 target: ensuring that 90% of PLHIV know their status by 2020.[7]

The HIV self-test is a Rapid Diagnostic Orientation Test (TROD) that allows individuals to determine their HIV status by collecting their own sample – either gingival fluid or capillary blood by finger prick – performing the test and interpreting the result. This is typically done in private or in the presence of a trusted person.[8] HIV self-testing helps identify more undiagnosed people earlier, empowering individuals to seek care before they become symptomatic. By bringing services closer to users, it generates demand for screening, particularly among those who face barriers to accessing traditional healthcare services.[8] Studies have shown strong acceptance of oral HIV self-testing in the general population.[5,9] However, no studies have documented its acceptance in Burkina Faso. This gap justifies the present study, which examines factors associated with the acceptance of oral HIV self-testing among students, contributing to efforts to achieve the first target of UNAIDS' 95-95-95 goals.[10]

Methods

The cross-sectional study was conducted in the commune of Ouagadougou with an analytical focus in a university setting from October 2020 to September 2021. The study targeted medical students enrolled in the Health Sciences Training and Research Unit (UFR/SDS) of Joseph Ki-ZERBO University (UJKZ) for the 2020 - 2021 academic year. A stratified random sampling method was used, dividing the study population into homogeneous groups (strata) based on academic level: License 1, License 2, License 3, Master 1, Master 2 and Doctorate 1. This stratification reflects differences in age, experience and academic goals. Licence students share characteristics typical of the early stages of their academic careers, master's students focus on specialisation and career preparation and PhD students are homogeneous in their research orientation and advanced expertise. This stratification helps to explain the differences in priorities and needs according to advancement in the academic career.

Ethical considerations

To conduct the study, authorisation was obtained from the director of the UFR/SDS. Participation in the study was voluntary, and students were informed of the study objectives. Anonymity, identity protection and confidentiality of data were strictly maintained. The study was approved by the Ethics Committee for Research and Ethics (CERS) under deliberation (ref. no.: 2021-03-075) on 10 March 2021.

Study site

The study took place at UJKZ in Ouagadougou, the political capital capital of Burkina Faso.

Random samples were selected from each stratum in proportion to the stratum size relative to the overall study population. Table 1 presents the sample size by class.

The data collection tool consisted of four parts: (1) socio-demographic characteristics; (2) sexual behaviours and testing; (3) knowledge of oral HIV self-testing and (4) the most acceptable price for an oral HIV self-test. Data were collected using a self-administered paper questionnaire. The questionnaire was adapted from validated studies in SA and Congo.[11]. Before administering the questionnaire, students were presented with an information brochure on oral HIV self-testing. The study's purpose and procedures were explained, and written consent was obtained. A pre-test with 50 students was conducted to ensure clarity and comprehension of the questions. Since French is the language of instruction at UFR/SDS UJKZ, the questionnaire was developed in French.

Data analysis

After data collection, the data were verified for completeness and accuracy. Variables were then coded, and data entry was performed using Epi-Info software (Centers for Disease Control and Prevention, USA) with a customised form based on the questionnaire. Once entered, the database was extracted and imported into R software (R Core Team, USA) for analysis. All statistical analyses were conducted using R software.

The means and standard deviations (SDs) were calculated for normally distributed quantitative variables, while frequencies (in number and percentage) were determined for all qualitative variables of interest. A univariate logistic regression analysis was then performed to assess the relationship between the acceptance of oral HIV self-testing and each independent variable. Variables with a p-value<0.20 in the univariate analysis were included in a multiple logistic regression model using a stepwise forward selection approach. Statistical significance was established at $p<0.05$.

Results

The respondents included 323 male students (63.58%) and 185 female students (36.42%). The most represented age group was 20 - 24 years, accounting for 53.94% (n=274) of participants. The rate of pregnant students was 0.98% (n=5). Most participants were of Burkinabè nationality (94.69%, n=481). Table 2 presents the distribution of students by socio-demographic characteristics.

Following the bivariate analysis, independent explanatory variables with a significance level below 20% were selected for inclusion in the final multiple logistic regression model. These variables included condom use during the last sexual intercourse in the past 12 months, knowledge of HIV status, perceived importance of HIV testing, history of HIV testing and perceived importance of pre and post-test counselling importance. Table 3 presents the study variables associated with the acceptance of oral HIV self-testing at the 20% significance threshold.

In the multivariate analysis, we maintained the same reference methods as in the bivariate analysis. $P<0.05$ was considered a significant threshold. At the end of the multivariate analysis, the following variables: knowledge of HIV status, importance of screening, condom use, history of HIV testing and post-test counselling were not found to be associated with the acceptance of oral HIV self-testing. However, pre-test counselling at the community level was identified as the factor associated with the acceptance of oral HIV self-testing among medical students at UJKZ in 2021, according to the socio-ecological model. Table 4 presents the multivariate analysis of associations between acceptance of oral HIV self-testing and study factors.

Table 1. Sample size by class			
Stratum	**Number**	**Score**	**Sample size per class, *n***
Licence 1	414	10.7	49
Licence 2	428	11.0	51
Licence 3	552	14.2	66
Master 2	858	22.1	102
Master 2	980	25.2	116
Doctorate 1	654	16.8	78
Total	3 886	100.0	462

Discussion

The results of our study showed that 92.52% (*n*=470) of participants accepted the oral HIV self-test. This high acceptance rate could be explained, in part, by the fear of stigma. Indeed, in our society, HIV infection is experienced by many as a tragedy from an individual and social point of view. Thus, students would fear the discriminatory and accusatory stare associated with visiting a health centre for testing, especially since the university is often seen as a breeding ground for the spread of HIV infection.[12]

On the other hand, the fear of disclosing HIV status may favour the acceptance of self-tests. Health personnel – who are responsible for maintaining confidentiality – are sometimes perceived as a potential source of information leakage regarding one's serological status.[13] However, the disclosure of this information by a doctor has serious consequences. Nevertheless, the fear of status disclosure may motivate students to accept self-testing, which better safeguards their privacy.

Self-testing could reduce the stigma and breaches of confidentiality associated with traditional screening methods. It would be desirable for promotional programmes to make oral self-testing more accessible to students.[14]

Compared with similar studies from other countries such as the Democratic Republic of Congo (DRC), where the acceptance rate among students in a peri-urban area was 81.4%, the acceptance rate in our study was notably higher.

These different high acceptance rates observed in these studies suggest that the introduction of new HIV screening technologies, as advocated by the WHO, would likely be well-received. This could significantly contribute to achieving the first of the ambitious UNAIDS's 95-95-95 targets.[15]

Awareness of the existence of oral HIV self-testing

Most students were unaware of the existence of oral HIV self-testing, with only 15.75% of students having ever heard of it. This lack of awareness can be explained primarily by the relatively recent introduction of self-tests. They were first introduced in the US in 2012, and Burkina Faso only recently adopted them in its care protocols.[16]

The lack of awareness can also be explained by the perception that HIV/AIDS is no longer a topical issue. On one hand, improvements in treatments have contributed to increased life expectancy and advances in medicine have reduced the severity associated with HIV infection. For students, even if they were to test positive, the availability of antiretroviral therapy would allow them to live longer, continue their university education, work and even start a family. These therapeutic advancements have alleviated concerns about survival after an HIV diagnosis.[17]

On the other hand, HIV/AIDS tends to be trivialised for several reasons. First, many students, being separated from their family environment and adjusting to a new environment, are more focused on immediate concerns such as geographical distance, financial independence and academic performance. As a result, their priorities are directed toward addressing the daily hassles of student life, with less attention given to seeking information about HIV/AIDS.[18]

Second, the COVID-19 pandemic has shifted the world's gaze away from HIV/AIDS, which has claimed many lives for a long time. The pandemic has altered the priorities of young scholars, as students are now more concerned with their professional prospects owing to the economic and social consequences of COVID-19 on their daily lives, to the detriment of focusing on HIV/AIDS.[19]

The lack of awareness about the existence of oral HIV self-testing could limit students' access to this option, contributing to delayed

Table 2. Distribution of students according to socio-demographic characteristics in 2021	
Variables	**Frequency (*N*= 508), *n* (%)**
Age, years	
<20	16 (3.15)
20 - 24	274 (53.94)
25 - 29	214 (42.13)
≥30	4 (0.79)
Sex	
Male	323 (63.58)
Female	185 (36.42)
Nationality	
Burkinabe	481 (94.69)
Foreigner	27 (5.31)
Study level	
License 1	60 (11.81)
License 2	65 (12.80)
License 3	70 (13.78)
Master 1	101 (19.88)
Master 2	114 (22.44)
PhD	98 (19.29)
Physiological state (presence of pregnancy)	
No (Absence of pregnancy)	503 (99.02)
Yes (Pregnancy)	5 (0.98)

PhD = Doctor of Philosophy.

Table 3. Link between the different study variables and the acceptance of oral HIV self-testing among medical students at the 20% threshold in 2021

Variables	Acceptance, *n*		*p*-value
	Yes	No	
Age, years			0.914
<20	16	0	
20 - 24	249	25	
25 - 29	201	13	
≥30	4	0	
Sex			0.874
Male	302	168	
Female	21	17	
Nationality			1.000
Burkinabe	445	25	
Others	36	2	
Study level			0.846
License 1	2	58	
License 2	6	59	
License 3	7	63	
Master 1	12	89	
Master 2	7	107	
Doctorate 1	4	94	
Presence of pregnancy			0.982
Yes	5	465	
No	0	38	
Do you have a fixed partner?			0.179
Yes	338	132	
No	20	18	
Condom use at last sexual intercourse (within the past 12 months)			0.094
Yes	418	54	
No	28	8	
Knowledge of HIV status			0.021
Yes	381	89	
No	22	16	
Importance given to HIV testing?			0.021
Yes	460	10	
No	31	7	
Have you ever had an HIV test?			0.031
Yes	395	75	
No	24	14	
Would you be ready to use the self-test with your partner?			2.476
Yes	429	41	
No	12	26	
What type of self-test do you prefer (oral or blood)?			0.343
Oral	213	257	
Blood	24	14	
Is pre-test counselling important?			0.007
Yes	448	22	
No	27	11	
Is post-test counselling important?			0.039
Yes	455	14	
No	33	5	
At what selling price would you be willing to buy the self-test (in FCFA)?			0.888
0	145	18	
<1 000	250	14	
1 000 - 2 500	63	4	
2 500 - 5 000	7	1	
5 000 - 10 000	4	1	
≥10 000	1	0	

FCFA = Franc African Financial Community.

Table 4. Multivariable analysis of associations between acceptance of oral HIV self-testing and study factors

Variables	Adjusted odds ratio (95% CI)	*p*-value
Condom use at last sexual intercourse (within the past 12 months)		0.183
No	1.00	
Yes	2.80 (0.58 - 12.80)	
Is HIV testing important?		0.738
No	1	
Yes	0.53 (0.00 - 13.53)	
Knowledge of HIV status		0.525
No	1	
Yes	2.47 (0.08 - 30.79)	
Have you ever had an HIV test?		0.991
No	1	
Yes	0.98 (0.04 - 41.24)	
Is pre-test counselling important?		0.049*
No	1	
Yes	6.45 (0.93 - 40.33)	
Is post-test counselling important?		0.420
No	1	
Yes	0.32 (0.01 - 4.98)	

*$p<0.05$
CI = Confidence interval.

screening. However, the oral HIV self-test could facilitate early detection and timely care, preventing disruptions to their academic journey. It is therefore imperative that action be taken, given the implications of this lack of awareness. Actions such as advertising campaigns, awareness programmes and distribution efforts should be implemented.

Compared with similar studies in South Africa =(SA) and the Democratic Republic of the Congo, where 46.9% of students in 2015 and 54.4% in 2018.[20,21] were aware of oral HIV self-testing, our study found lower awareness rates. These differences may stem from higher general awareness of HIV infection in SA and Congo.[20]

Perceived acceptable price of oral HIV self-tests

Our study found that 67.91% of students were willing to buy the self-test, while 32.09% preferred to receive it for free.

The willingness to pay expressed by students is justified by the concerns about the potential negative effects of free distribution on the quality of the self-tests and the risk of misuse. For students, purchasing the self-test appears to act as a protective factor, whereas free access may be perceived as a sign of poor quality.

Among students willing to buy the self-test, 76.52% FCFA1 000 (~ZAR29.44, as of February 2025) was found to be acceptable. This can be attributed to the students' precarious financial situation. Most Burkinabè students rely on public financial aid for their studies, which is intended to cover essential expenses such as meals, housing, transport and basic needs. Thus, given this poor financial situation and no additional income, students would a price below the proposed amount reasonable and not financially burdensome.[22]

The public health implications of student's willingness to purchase the self-test suggest that this could help reduce costs. It would be beneficial for the state to consider subsidising the cost of the self-test, particularly if the price exceeds Franc African Financial Community= FCFA1 000 to prevent cost from becoming a significant obstacle. However, the implementation and monitoring of this subsidy should be strengthened to avoid misuse and ensure that the price remains acceptable.

In comparison with our findings, a study in SA and the Democratic Republic of Congo reported a higher willingness to pay for the self-test, with rates of 74.7% and 78.4%, respectively.[20,21] However, contrary to our study, Pai *et al.*[23] found that the preferential price limit for purchasing the oral self-test kit was USD20 (~FCFA10 000).[23] This difference could be explained by the difference in the cost of living and quality of life in Canada compared with Burkina Faso.

Factors associated with acceptance of oral HIV self-testing

Our study identified a single associated factor, the perceived importance of pre-test counselling, which according to the socio-ecological model, is a community level factor (OR 6.45, 0.93 - 40.33; p=0.04893).

Students who considered pre-test counselling important were six times more likely to accept oral HIV self-testing. Several reasons could explain this association. Counselling helps reduce misunderstanding, alleviate anxiety related to HIV and address denial that could arise from test results.[20]

Students often lack a comprehensive understanding of HIV/AIDS, and even less so about the newer oral self-test, as corroborated by our results regarding their knowledge of the self-test. Receiving counselling would help students better understand HIV/AIDS, as well as the techniques and interpretation involved in using the self-test.

In addition to ignorance, the prejudices that accompany HIV/AIDS cause fear and anxiety, especially when taking the test. Counselling would dispel the fears and provide reassurance to students interested in using the self-test.

Finally, a positive test result could occur, and having received prior advice creates a benchmark – the advisor – whom students can turn to for follow-up and support.[20,24]

Self-testing services must be accompanied by counselling. This could be achieved through services such as free telephone hotlines. Health services should prioritise pre-test counselling as a key strategy for promoting self-testing.

Found that the perception of the importance of both pre and post-test counselling (OR 2.91, 95%CI 1.63 - 5.19; $p<0.0001$) was significantly associated with the acceptance of oral HIV self-testing. These results align with ours, emphasising the importance of counselling in the acceptance of oral HIV self-testing.[20]

Strengthening screening methods

The study provides new insights into the acceptance of oral HIV self-testing among medical students, identifying key aspects that could improve screening strategies and achieve desired targets in this region.

Southern Africa remains one of the regions most heavily affected by the global HIV epidemic, improving screening methods is essential in combating the spread of the virus. Our study highlights the importance of pre-test counselling in promoting HIV self-testing acceptance, which plays a crucial role in encouraging voluntary testing and reducing the stigma associated with the practice.

The findings of the present study suggest that integrating culturally and locally tailored pre-test counselling could be a highly effective strategy to increase self-testing acceptance. This approach would involve the development of community awareness programmes that emphasise the value of pre-test counselling. Achieving this could involve training community health workers, collaborating with community and religious leaders, and using targeted communication channels to reach various population groups.

Conclusion

Our study found a 92.52% acceptance rate of oral HIV self-testing among medical students at Joseph Ki-Zerbo University in Ouagadougou. The key factor associated with acceptance was the importance students placed on pre-test counselling. Although awareness of the self-test was low among the majority of students, there was a strong willingness to purchase it should it become available.

These results reflect the critical need for counselling services to encourage the use of oral HIV self-testing among medical students.

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Data availability statement. The data generated and analysed during the present study are available from the corresponding author upon reasonable request.

Conflicts of interest. None.

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