

Research



Acceptability of HIV self-testing in African students: a cross-sectional survey in the Democratic Republic of Congo

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Abstract

Introduction: the empowerment of young people aged 15-24 years is a key component of an effective AIDS response. HIV self-testing (HIVST) is progressively being implemented in the Democratic Republic of Congo (DRC). **Methods:** socio-demographic and behavioural factors associated with acceptability of HIVST were evaluated among university students in Bunia, DRC. A representative cross-sectional study was conducted using a self-administered semi-structured questionnaire. **Results:** a total of 1,012 students were recruited. Acceptability of unsupervised HIVST was higher in the group of young students as compared with older students and was markedly associated with prior knowledge on HIVST. **Conclusion:** adapted communication about HIVST appears likely essential to increase the supply and use of HIVST among students in DRC.

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Introduction

The empowerment of young people aged 15-24 years is a key component of an effective AIDS response. High rate of youth in sub-Saharan Africa is unaware of its HIV status [1]. HIV self-testing (HIVST) can increase coverage of essential HIV services. Two HIVST approaches, supervised and unsupervised, have been proposed by WHO [2]. In unsupervised self-testing strategy, the self-tester performs the self-test on his own without any help and counselling and linkages are offered either by health care structures or communities or over the phone by trained counsellors or eventually through pharmacies [3]. However, in supervised self-testing, the self-tester may be assisted by healthcare or non-health care professional as counsellor to read the test results and provide counselling [3]. In the Democratic Republic of Congo (DRC), HIVST is being currently progressively implemented [4, 5]. Ituri is one of the eastern DRC post-conflict provinces with a high prevalence of HIV infection among young people because of the cross-border commercial activities with Uganda, sexual violence, child soldier phenomena and the use of young people in mining [6]. The aim of the study was to evaluate socio-demographic factors and behavioural factors associated with acceptability of supervised and unsupervised HIV self-testing among students from three major higher education institutions in the city of Bunia, capital city of the Ituri, DRC.

Methods

From October to December 2018, a formative evaluation design using the quantitative study was employed to assess the acceptability of HIVST among students. A representative cross-sectional study was conducted using a self-administered semi-structured questionnaire. The survey was conducted in the *Université de Bunia (UNIBU)*, *Université Shalom de Bunia (USB)*, and *Institut Supérieur Pédagogique de Bunia (ISP/BUNIA)*. Inclusion criteria were age (≥ 18 years), to be regularly enrolled for the academic year 2016-2017, and to have willingness to provide verbal consent. Participants were trained for the instructions for use of a pilot immunochromatographic HIV self-test using typical pictures showing the principal steps of self-testing [5]. The questionnaire was redacted on the basis of (i) the different approaches and access to HIVST proposed by WHO (2); (ii) the literature review on the supervised and unsupervised HIVST [3]; and (iii) the literature review on the acceptability of the HIVST and the validation of the questionnaire among the students [7, 8]. The

study was conducted following STROBE guidelines for reporting quantitative data [9]. The socio-demographic factors, the HIV counselling and testing practices (HCT) behaviours and the sexual behaviours were addressed according to the following topics: sex, age group, partnership and civil status, educational level, ever tested for HIV, sexual activity, number of sex partners in past six months, knowledge about HIV self-testing.

To assess the opinions on HIVST, students were asked if they were aware of HIVST, whether they would use HIVST as a testing option, their reaction when HIVST is reactive (positive), and their reaction when HIVST is nonreactive (negative) and their opinion on the results of self-testing of sexual partners. To assess their preferences, students were asked about their preference for self-test access, their willingness of substitution in which users replace HCT with self-testing, their cost preference and their willingness to pay the HIVST, and their preference for counselling. Ethical clearance for this study was obtained from Ethics Committee of the School of Public Health of Kinshasa's University. All participants gave their verbal informed consent to participate in this study. All data were entered into an Excel file and analyzed on SPSS 20.0 (Chicago, IL). Means \pm standard deviations were calculated for quantitative variables and proportions for categorical variables. The Pearson's χ^2 test or Fisher's exact test were used for comparison of the frequencies. The strength of statistical associations was measured by crude and adjusted odds ratios (OR) and their 95% confidence intervals. The P-value < 0.05 was considered as statistically significant. Missing values were replaced by the single imputation using regression method.

Results

A total of 1,080 participants were recruited. Of those 68 students were excluded because they did not give their consent. Finally, 1,012 students participated in the survey, including 34.1% (n = 345) from UNIBU, 33.8% (n = 342) from USB, and 32.1% (n = 325) from ISP/BUNIA; and equal proportion of male (50.1%) and females (49.9%). More than three-quarters (84.0%) of participants were single. The mean age of the students was 23 ± 4 years; the majority (70.7%; n = 715) were young students (age-24 years). More than half (53.7%; n = 543) had yet received HIV counselling and testing practices in the past. The majority (88.8%; n = 899) reported previous sexual intercourse; among those, 18.7% (n = 168) had simultaneously (11.3%; n = 102) or serially (7.3%; n = 66) multiple

sexual intercourses in previous six months. A minority (13.2%; n = 119) consistently used condoms. Note that, all participants were heterosexual. Data show that only 6% (n = 54) reported that they knew the HIV status of their sexual partners. Less than half of participants (45.5%; n = 460) reported being already informed about the HIV self-testing. Overall, the acceptability of HIVST as a testing option was 81.4% (n = 824). The willingness to see the doctor for confirmation and care after a reactive HIVST was high among old (age > 24 years) students (86.9%; n = 258) than young (80.7%; n = 577; P = 0.02). Concerning the rate of substitution, 40.4% (n = 409) of participants agreed to take the place of HCT for self-testing strategy. The majority (77.9%; n = 557) of young students reported that post-test counselling should be essential for use of HIV self-testing. Regarding the willingness to buy HIV self-test, 58.4% (n = 591) of students had a favourable opinion to buy it, and the mean of price was 3 US \$ (range, 0-22). In bivariate analysis, the variables significantly associated with the acceptability of supervised and unsupervised HIVST were the following: "sex", "age group", "partnership and civil status", "educational level", "past-history of HIV testing", "sexual activity", "number of sex partners in the past six months" and "knowledge about HIVST." Results of logistic regression analyses are depicted in Table 1. The acceptability of unsupervised HIVST was higher in the group of young students as compared with older students (crude OR: 3.4 [95% CI: 2.6-4.6]; adjusted OR: 3.6 [95% CI: 2.4-5.4]; P < 0.0001); the acceptability of unsupervised HIV self-testing was significantly associated with prior knowledge on HIVST (crude OR: 2.9 [95% CI: 2.2-4.0]; adjusted OR: 2.8 [95% CI: 2.0-3.8]; P < 0.0001). Finally, partnership and civil status and past-history of HIV testing were associated with acceptability of unsupervised HIVST with logistic regression.

Discussion

We herein evaluated the acceptability of HIVST in students in Bunia, Democratic Republic of Congo. Our observations show that the unsupervised HIVST approach is much more acceptable (81%) among young students (age ≤ 24 years) and that the acceptability of unsupervised HIV self-testing is associated with prior knowledge on HIVST. These findings are reminiscent to previous studies in South Africa on the acceptability of HIVST among young and adolescents reporting high rates of acceptability, generally greater than 80% [10]. The understanding of supervised and unsupervised self-testing strategies was previously evaluated by Pant Pai and colleagues in

order to guide effective implementation of HIVST in high-income and resource constrained settings [3]. Those authors evaluated the feasibility to implement unsupervised oral fluid-based self-testing strategy which appears effective despite variable accuracy estimates obtained by self-testers [3]. Nonetheless, our previous observations indicate a good practicability and performance of finger-stick whole-blood HIVST among highly educated people, demonstrating the potential of using an unsupervised HIVST [5, 11]. Thus, the implementation of unsupervised finger-stick whole blood-based self-testing strategy appears effective in young students because of the higher acceptability as demonstrated by our finding. Finally, the majority (77.9%) of the study's young students reported that post-test counselling should be essential for use of HIV self-testing. These observations confirm that post-test counselling should be accessible to people who conduct HIVST even in sub-Saharan Africa [3, 10, 11].

Conclusion

In conclusion, our study demonstrates high acceptability of unsupervised HIVST among young students in association with prior knowledge of HIVST and possibility of post-test counselling. Adapted communication about HIVST appears likely essential to increase the supply and use of HIVST among students in DRC.

What is known about this topic

- HIV self-testing (HIVST) is a novel strategy that can enable early HIV testing, prevention interventions and care in key populations at high risk of HIV infection, such as young people aged 15-24 years;
- In the Democratic Republic of Congo (DRC), HIVST is being currently progressively implemented;
- The supervised and unsupervised HIVST are the two approaches of self-test kits distribution as proposed by World Health Organization (WHO) in 2013 to implement HIV self-testing.

What this study adds

- This study demonstrates high acceptability of unsupervised HIVST rather than supervised HIVST among people aged 18-24 years in association with prior knowledge of HIVST and possibility of post-test counselling;

- Adapted communication about HIVST appears likely essential to increase the supply and use of HIVST among students in DRC.

Competing interests

The authors declare no competing interests.

Authors' contributions

Serge Tonen-Wolyec, Salomon Batina-Agasa, Ginette Claude Mireille Kalla, Jérémie Muwonga, Francois-Xavier Mbopi-Kéou and Laurent Bélec have conceived and designed the research; Serge Tonen-Wolyec were involved in participant's recruitment; Serge Tonen-Wolyec supervised the survey; Serge Tonen-Wolyec and Ralph-Sydney Mboumba Bouassa performed statistical analyses; Michel Noubom critically reviewed the paper, Serge Tonen-Wolyec, Francois-Xavier Mbopi-Kéou and Laurent Bélec analyzed the results and drafted the manuscript. All the authors have read and agreed to the final manuscript.

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Table

Table 1: factors associated with the acceptability of supervised and unsupervised self-testing in 1,012 students from three major higher education institutions in the city of Bunia, Democratic Republic of the Congo

References

1. UNAIDS. Get on the Fast-Track, The life-cycle approach to HIV, Finding solutions for everyone at every stage of life (2016). Geneva: United Nations Program on HIV/AIDS (UNAIDS).
2. World Health Organization. Report on the first international symposium on self-testing for HIV: the legal, ethical, gender, human rights and public health implications of self-testing scale-up. Meeting report-Geneva, Switzerland. 8-9 April 2013. Geneva, 2013.
3. Pant Pai N, Sharma J, Shivkumar S, Pillay S, Vadnais C, Joseph L *et al.* Supervised and unsupervised self-testing for HIV in high- and low-risk populations: a systematic review. *PLoS Med.* 2013; 10(4): e1001414. [PubMed](#) | [Google Scholar](#)
4. World Health Organization & Unitaids. Market and Technology Landscape. HIV rapid diagnostic tests for self-testing, 3rd Edition. July 2017. Accessed 18 September 2017.
5. Tonen Wolyec S, Batina Agasa S, Muwonga S, Fwamba N'kulu F, Mboumba Bouassa RS, Bélec L. Evaluation of the practicability and virological performance of finger-stick whole-blood HIV self-testing in French-speaking sub-Saharan Africa. *PLoS ONE.* 2018; 13(1): e0189475. [PubMed](#) | [Google Scholar](#)
6. PEPFAR. Democratic Republic of Congo, Country Operational Plan (COP) 2017, Strategic Direction Summary. Accessed 18 September 2017.
7. Lee VJ, Tan SC, Earnest A, Seong PS, Tan HH, Leo YS. User acceptability and feasibility of self-testing with HIV rapid tests. *J Acquir Immune Defic Syndr.* 2007; 45(4): 449-53. [PubMed](#) | [Google Scholar](#)
8. Madiba S, Mokgatle M. Students want HIV testing in schools: a formative evaluation of the acceptability of HIV testing and counselling at schools in Gauteng and North West provinces in South Africa. *BMC public health.* 2015; 15: 1. [PubMed](#) | [Google Scholar](#)

9. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *BMJ*. 2007; 335(7624): 806-8. **PubMed | Google Scholar**
10. Mokgatle MM, Madiba S. High acceptability of HIV self-testing among technical vocational education and training college students in Gauteng and North West Province: what are the implications for the scale up in South Africa. *PLoS One*. 2017; 12(1): e0169765. **PubMed | Google Scholar**
11. Longo JDD, Saint-Calvaire Diemer H, Tonen-Wolyec S, Mboumba Bouassa R-S, Tepka G, Grésenguet G *et al*. HIV self-testing in Central Africa: stakes and challenges. *Health Sci Dis*. 2018; 19(2): 1-8. **Google Scholar**

Table 1: factors associated with the acceptability of supervised and unsupervised self-testing in 1,012 students from three major higher education institutions in the city of Bunia, Democratic Republic of the Congo

Characteristic	Acceptability of supervised HIV self-testing					Acceptability of unsupervised HIV self-testing					Total <i>n</i> =1,012
	<i>n</i> (%)	cOR [95% CI]	<i>p</i> *	aOR [95% CI]	<i>p</i> **	<i>n</i> (%)	cOR [95% CI]	<i>p</i> *	aOR [95% CI]	<i>p</i> **	
Sex											
Male	298 (58.8)	0.9 [0.7–1.3]	0.991	0.8 [0.6–1.0]	0.061	353 (69.6)	0.7 [0.5–0.9]	0.006	0.8 [0.6–1.2]	0.269	507
Female	297 (58.8)	Reference		Reference		390 (77.2)	Reference		Reference		505
Age group											
Younger ≤ 24	383 (53.6)	0.5 [0.3–0.6]	< 0.0001	0.7 [0.5–1.0]	0.077	579 (81.0)	3.4 [2.6–4.6]	< 0.0001	3.6 [2.4–5.4]	< 0.0001	715
Older > 24	212 (71.4)	Reference		Reference		164 (55.2)	Reference		Reference		297
Partnership and civil status											
Single	461 (54.2)	0.1 [0.01–0.5]	< 0.0001	0.1 [0.01–0.6]	0.013	641 (75.4)	7.8 [2.1–13.6]	< 0.0001	5.7 [1.6–20.8]	0.008	850
Married/partnered	114 (80.9)	Reference		Reference		84 (59.6)	Reference		Reference		141
Other	20 (95.2)	6.2 [1.3–0.3]		4.7 [0.6–36.6]	0.143	18 (85.7)	8.1 [2.6–24.2]		5.9 [1.6–21.5]	0.008	21
Educational level											
Undergraduate	380 (54.3)	Reference	< 0.0001	Reference		548 (78.3)	Reference	< 0.0001	Reference		700
Graduate degree	215 (68.9)	1.9 [1.4–2.5]		1.3 [0.9–1.8]	0.157	195 (62.5)	0.5 [0.3–0.6]		1.0 [0.7–1.5]	0.930	312
Ever tested for HIV											
Yes	295 (54.3)	Reference	0.002	Reference		400 (73.7)	Reference	0.849	Reference		543
Non	300 (64.0)	0.7 [0.5–0.9]		0.7 [0.5–1.1]	0.084	343 (73.1)	1.0 [0.8–1.4]		1.8 [1.0–3.1]	0.05	469
Sexually active											
Yes	538 (59.8)	1.4 [0.9–2.1]	0.056	1.1 [0.7–1.7]	0.728	655 (72.9)	0.8 [0.5–1.2]	0.225	0.7 [0.4–1.3]	0.286	899
No	57 (50.4)	Reference		Reference		88 (77.9)	Reference		Reference		113
Number of sex partners in past six months											
None	219 (52.3)	2.0 [1.0–2.9]	0.001	1.2 [0.7–2.0]	0.591	310 (74.0)	1.3 [0.7–2.3]	0.073	1.5 [0.8–2.8]	0.256	306
One partner	279 (65.6)	0.6 [0.4–0.9]		0.8 [0.5–1.4]	0.449	316 (74.4)	1.1 [0.6–1.9]		0.9 [0.5–1.7]	0.786	425
Two partners	49 (54.4)	2.1 [0.8–3.2]		1.4 [0.7–2.7]	0.292	56 (62.2)	0.5 [0.3–4.5]		0.6 [0.7–3.3]	0.238	90
More than two partners	48 (61.5)	Reference		Reference		61 (78.2)	Reference		Reference		78
Knowledge about HIV self-testing											
Yes	280 (60.9)	1.2 [0.9–1.5]	0.221	[0.9–1.7]	0.55	387 (84.1)	2.9 [2.2–4.0]	< 0.0001	2.8 [2.0–3.8]	< 0.0001	460
No	315 (57.1)	Reference		Reference		356 (64.5)	Reference		Reference		552

* *P*-value calculated using Pearson's χ^2 test or Fisher's exact test;

** *P*-value calculated using regression analysis;

aOR: adjusted Odds ratios; cOR: crude Odds ratios; CI: confidence interval; *P*: *P*-value