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Acceptability and Strategies for Enhancing Uptake of HIV Self-Testing in Nigeria: A Systematic Review

Acceptability and strategies to enhance HIVST uptake

Victor Abiola Adepoju, Chidinma Umebido, Ademola Adelekan, Ali Johnson Onoja

Abstract

BACKGROUND

In 2019, the Nigerian Ministry of Health published the first operational guidelines for HIV Self Testing (HIVST) to improve access to HIV testing services among undertested populations in the country. Also, as part of the campaign to increase HIV testing in Nigeria, the Nigerian Ministry of Health developed standard operating procedures for using HIVST kits.

AIM

This study therefore aimed to systematically review the acceptability and strategies for enhancing the uptake of HIV self-testing in Nigeria.

METHODS

The systematic review was conducted and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Different databases were searched to get the necessary materials needed for this review. Standardized forms developed by the authors were used for data extraction to minimize the risk of bias and ensure that the articles used for the study were properly screened. Identified articles

were first screened using the titles and their abstracts. The full papers were screened, and the similarities of the documents were determined. Qualitative, quantitative, and mixed-method studies were evaluated using the Critical Appraisal Skills Programme and Critical Appraisal Framework criteria

RESULTS

Results: All the publications reviewed were published between 2015 and 2022, with 33.33% published in 2021. Most (77.8%) of the studies are cross-sectional, 43.3% were conducted in Lagos State, and 26.3% were conducted among young people. The study revealed a high level of acceptability of HIVST. The cost of the kit was reported as the strongest factor for choosing HIVST services, and this ranged from N200 (approximately USD 0.55) to 4,000 Naira (approximately USD 11.07), with the majority willing to pay 500 Naira (approximately USD 1.38). Privately-owned, registered pharmacies, youth-friendly centers, supermarkets, and online stores were the most cited access locations for HIVST. The least influential attribute was the type of specimen needed for HIVST. Strategies addressing cost and preferred access points and diverse needs for social media promotion, local translation of product Instruction for Use (IFU), and HIVST distribution led by Key Opinion Leaders (KOLs) for key populations were found to significantly enhance HIVST uptake and linkage to care.

CONCLUSION

HIVST acceptability is generally high from an intention-to-use perspective. Identified and proposed uptake-enhancing strategies need to be investigated in controlled settings and among different populations and distribution models in Nigeria.

Key Words: Acceptability; HIV self-testing; Uptake, intention-to-use, regulation, linkage to care

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Core Tip: The present study provides the first systematic literature review of HIV self-testing (HIVST) in Nigeria, shedding light on the evidence base of research on the acceptability and uptake of HIVST in the country. Despite limitations, the study fills a crucial gap in understanding the HIVST landscape in Nigeria, which is young and evolving. The findings suggest that the acceptability of HIVST is generally high in Nigeria, as measured from the intention-to-use perspective. However, the actual use of HIVST in programmatic implementation was found to be lower than expected. The study recommends more controlled implementation studies to test the acceptability of HIVST and to explore factors responsible for poor uptake. The use of key opinion leaders (KOLs) among key populations has been found to be successful in increasing the acceptability and uptake of HIVST. However, cost remains a major barrier to the acceptability of HIVST among pharmacy retail outlets. Therefore, innovative financing approaches targeting different population segments are needed for effective scale-up of HIVST under the total market approach. More studies are required to evaluate how the uptake of HIVST compares in routine programs *vs* real-life settings in the absence of support and resources that enhance HIVST uptake. Overall, this study contributes to the current knowledge base on HIVST in Nigeria and highlights the need for further high-quality research in this area.

INTRODUCTION

Nigeria is ranked second among the countries with high burden of human immunodeficiency virus (HIV) in the world ^[1]. In 2018, the national prevalence of HIV was 1.5 percent, with an estimated 1.9 million people living with HIV/ AIDS, of which only 30.0% were on antiretroviral therapy ^[2]. According to the Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS), the national HIV prevalence rate in the 15-49-year

age group was 1.4 percent, with a population of 201 million in 2019 ^[3]. In Nigeria, 53,000 people died of HIV/AIDS in 2018, while the rate of HIV/AIDS-related deaths appears to have remained constant in recent years, owing to the ongoing problem of advanced HIV disease ^[4].

³ Despite increased scientific and medical advancement in the understanding and management of HIV, a large number of those infected remains untested and unaware of their serostatus ^[5]. ² One of the reasons for the poor coverage of conventional health facility-based counseling and testing is the refusal to test due to the fear of societal stigma and discrimination that may result from a positive HIV test result ^[6] and the fear of coping with a disease which up till the present has no known definite cure but capable of affecting the quality of life of those infected ^[7]. ⁵ The World Health Organization (WHO) recommends HIV self-testing (HIVST) as a tool for improving the uptake of HIV testing services and achieving the ¹ Joint United Nations Programme on HIV and AIDS (UNAIDS) 90-90-90 target ^[8]. HIVST is an unconventional and innovative strategy to reach the first 90% goal of UNAIDS by facilitating access to testing for early detection and prevention of HIV transmission ^[9]. ⁵ Evidence exists that the deployment of HIVST has improved the uptake of HIV testing among men ^[10-13] in several countries implementing HIV self-testing in Sub-Saharan Africa (SSA) including South Africa, Zimbabwe, and Botswana ^[10-12].

² Nigeria has identified the need to scale up HIV Counseling and Testing (HCT), including the potential of a self-testing methodology ^[14]. In 2019, ³ the national acquired immunodeficiency diseases (AIDS) and sexually transmitted diseases (STDs) control programme (NASCP) under the Federal Ministry of Health (FMOH) developed the operational guidelines for the delivery of HIVST in Nigeria. The document provides guide for the operationalization of HIVST in Nigeria including the different service delivery and distribution models, procurement and supply chain management, monitoring and evaluation among others ^[5]. HIVST addresses the gap in HIV testing,

especially in clinical settings. Surveys conducted among diverse populations in Malawi, Spain, America, and Nigeria, showed varying interest in HIVST and acceptability ranges between 22% and 88% [15-19]. There is no study till date that systematically document evidence either on the acceptability of HIVST or the proposed strategies to enhance its uptake in Nigeria. HIVST, as an innovative tool is still a growing intervention in Nigeria with potential barriers to its acceptance among populations and settings. This study, therefore, aimed to systematically review the acceptability, existing regulations, and strategies for enhancing the uptake of HIV self-testing in Nigeria.

MATERIALS AND METHODS

Design

A systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Fig 1).

Search strategy

Different databases were searched to get the necessary materials needed for this review. A scientific literature search was done using Elsevier, Google Scholar, EMBASE, PubMed, Ovid, and Scopus databases. Grey literature was also searched from Google and Google literature, the largest databases for grey literature. Additionally, literature was systematically searched from Researchgate, Cochrane library, and Directory of Open Access Journal (DOAJ). For studies that may have been missed in the electronic search, cross reference was undertaken using reference lists of all identified articles. The first search was conducted between April 04 and 08, 2022, while the second took place between April 15 and 20, 2022. Detailed inclusion and exclusion criteria were cautiously developed to make sure that they match the review questions and have sufficient details to pinpoint all relevant studies and exclude irrelevant ones [20]. The literature search combined specific keywords with Boolean operators (Table 1).

Inclusion criteria

Both qualitative and quantitative studies on HIVST in Nigeria were included in this study.

Exclusion criteria

Articles were excluded if no data was found for the desired outcome. Editorials and short commentaries were also excluded. Papers that were not peer-reviewed and those that the full text could not be assessed were also excluded.

Data extraction

Standardized forms developed by the authors were used for data extraction to minimize the risk of bias. One of the authors extracted data from the included studies, while other authors checked these datasets. Discrepancies were resolved by referring to the original studies. Data on acceptability, existing regulatory context, and preferences level for HIVST in Nigeria were extracted. Other data extracted include the level of uptake, linkage to treatment, and strategies for enhancing the uptake of HIVST in Nigeria. Two of the authors (V.A.A. and A.A.) independently evaluated the potential eligibility of each of the abstracts and titles from the retrieved citations after requesting full-text versions of these potentially eligible studies. Two authors (A.J.O. and C.U.) independently assessed the full text of the potentially eligible publications. Disagreements were resolved by consensus. Discrepancies were discussed between authors until a 100.0% agreement was achieved. The following information was extracted from the included studies: authors, title, study population, study state, study objective(s), study design, and study findings.

Quality Assessment

The articles used for the review were properly screened. They were first screened using the titles and their abstracts. The full papers were screened, and the similarities of the papers were determined by reading the title, author(s), and abstract. The papers were

then de-duplicated. The quality assessment of each study selected was based on set criteria [21-22].

Critical appraisal

The qualitative, quantitative, and mixed-method research were evaluated using the critical appraisal skills programme instrument [23] and critical appraisal framework criteria [24, 25].

Data analysis

In compiling and summarizing the findings of the included studies, the researchers employed a variety of methodologies. Cleaning of data in the extraction sheet was an important step before analysis. The researchers structured the data from the extraction sheet into a format that analytical tools could read. The analysis was divided into two: qualitative and quantitative. Quantitative data analysis involved mainly descriptive and narrative. This technically followed the process of classification and tabulations. Content analysis technique was used for the qualitative data analysis.

List of Papers Reviewed

The search results are shown in Figure 1, along with a synopsis of the papers consulted (the PRISMA flow chart). Although the databases contained 88 research articles, only 18 met the inclusion criteria for this systematic review (Table 2).

RESULTS

The included studies were published between 2015 and 2022, with 33.33% published in 2021 (Figure 2). Majority (77.8%) of the studies were cross-sectional in design (Figure 3), 43.3% were carried out in Lagos State (Figure 4), and 26.3% were conducted among young people (Table 3).

Acceptability of HIV Self-Testing in Nigeria

This review operationally defines the acceptability of HIVST as an intention to use, willingness to use, actual collection, and interest in use. The findings of most studies from Nigeria [5;7; 27-31] revealed a high level of acceptability of HIVST compared to what was reported by a study from Northern Nigeria [15] (Figure 5). Brown *et al.* in their study reported that 54.8% of the respondents supported having HIVST in Nigeria [27]. Adebimpe *et al.* also reported that 86.0% of the respondents agreed that they would accept HIVST if kits are available [7], and 84.0% also agreed that they would be willing to introduce and recommend HIVST to others. In another qualitative study by Dirisu *et al.*, it was observed that most participants were willing to use oral HIVST kits [28]. In their study, Iliyasu *et al.* found that 70.4% of university students in northern Nigeria were willing to self-test for HIV and pay for the test kits. Specifically, 55.9% of the participants were willing to pay for the test kits themselves, and 14.5% were willing to pay for the test kits if they were cheaper. Additionally, 61.4% of the participants were willing to self-test with a sexual partner [15]. Also, Ugwu *et al.* reported that 61.3% of the health workers working in primary health care centres preferred HIVST over the facility-based testing modalities (VCT and HTC) [29]. In 2021, a study also reported that 59.3% of the respondents were interested in HIVST [30]. In another study, it was observed that nearly all (99.5%) of the pregnant women enrolled in the study preferred HTS at booking. However, 83.8% were keen to learn how to self-test for HIV and 85.7% of the respondents were willing to repeat the HIV test during pregnancy, of which 29.3% were willing to self-test [31]. Similarly, 94.6% of respondents were willing to retest for HIV after delivery, of which 27.4% were willing to self-test.

However, another study among young people in Nigeria noted that more than half (69.9%) of the participants indicated they would prefer a physician to administer the HIV test. In comparison, the proportions of those who preferred HIV tests administered by a nurse and self-administered HIV tests were 15.7% and 4.8%, respectively. Also, another study from Southern Nigeria reported that 23.4% of the respondents accepted HIVST, of which 33.3% of the clients were assisted [5]. In terms of preference of oral *vs*

blood-based HIV self-testing in Nigeria, another study by Obiezu-Umeh *et al* reported that ¹oral-based HIVST was preferred by most of the young participants when compared to blood-based HIVST ^[32].

Ong *et al* used discrete choice experiment to design HIVST services for young people in Nigeria ^[33]. The authors reported ⁶that male individuals (compared with female individuals), those who never had sex (compared with sexually active), and those who had never tested for HIV before (compared with those who had previously tested) were more likely to opt-out of using an HIVST kit.

Existing Regulatory Context for HIVST

Only one study examined the regulatory context for HIVST in Nigeria. The study by Dirisu *et al* (2021) examined the regulatory framework for HIV self-testing (HIVST) in Nigeria, revealing several issues ^[34]. Of the providers who marketed HIVST kits, 94.0% of Community Pharmacists (CPs) and 33.0% of Patent Proprietary Medicine Vendors (PPMVs) claimed to be authorized to sell them ^[34]. Despite the existence of a National Drug Policy and an automated product registration system administered by ⁹the National Agency for Food and Drug Administration and Control (NAFDAC), the process for authorizing, manufacturing, and distributing medical products was reported as cumbersome, time-consuming, and costly ^[34]. Furthermore, the National Drug Distribution Guideline was not implemented, leading to an uncoordinated supply chain. The study also found that less than half (45.6%) of PPMVs and CPs had a standard operating manual for administering HIVST, and around one-third had standard guidelines for HIV testing services. While 77.0% of providers offered counseling before selling HIVST, only 23.0% of CPs and 13% of PPMVs that sold HIVST were accredited HIV counseling and testing centers ^[34]. These findings demonstrate the

need for improved regulatory oversight and support for HIVST implementation in Nigeria.

Uptake of HIVST and Linkage to Care Services

A cohort study on the uptake of HIVST revealed that 97.0% had used self-testing kits. Among these, almost ¹ a quarter (22.7%) tested themselves the same day they received the kit, and 49.4% tested within one week. About a quarter (23.5%) reported that they had someone else present while they tested -55.0% with a friend, 21.7% with a family member, 16.7% with a sex partner, and 6.7% with a key opinion leader ³⁵. Another study revealed that 9.0% of the respondents reported previous HIVST ¹⁵ (Fig 6).

Regarding linkage to care after HIVST, it was reported that ³ in Cross River State, of the 15 clients who reported reactive results, 14 (93.3%) were linked to confirmatory testing. Of the 14 linked to confirmatory testing, 13 (91.0%) were confirmed positive, and all (100.0%) were linked to HIV treatment ⁵. Of the 24 who reported reactive results in Akwa Ibom State, 87.5% had confirmatory testing, 100.0% reported confirmed HIV-positive results, and 100.0% were successfully linked to HIV care and treatment ⁵. Another study reported that all the 14 participants who tested HIVST reactive sought post-test counseling and had confirmatory HIV testing at the community health centre (CHC) ³⁵.

Dirisu *et al* highlighted barriers to linkage to care, including concern around post-test counseling services and linkage to confirmatory HTS following a reactive HIVST results ³⁴. Furthermore, men who have sex with men (MSM) were concerned that because self-testers would be testing alone, many would deny their HIV-positive test results and may not seek HIV treatment. In another interview that sought the opinions of the public and that of stakeholders and policy makers on the introduction of HIVST in Nigeria, participants expressed concerns about how to link individuals who tested HIVST reactive to confirmatory HTS, care and treatment services as in the facility-based testing model. ²⁷ Obiezu-Umeh *et al* highlighted the ¹ motivations to seek a confirmatory HIV

test in the event of a reactive HIVST result to include encouragement from peers, family members, or healthcare workers, denial about the initial test result, lack of satisfaction with the test result and the possibility of living longer if initiated on treatment and care [32].

Strategies for enhancing uptake of HIVST in Nigeria

Studies conducted among young people in Nigeria by Obiezu-Umeh *et al* [32] and Iwelunmor *et al* [36] reported that cost of HIVST was the strongest determinant for choosing HIVST services. Cost of HIVST ranged from N200 (approximately USD 0.55) to 4,000 Naira (approximately USD 11.07). However the majority of young people suggested 500 Naira (approximately USD 1.38) as the preferred cost of the kit. Young people argued that high cost of HIVST remain a major barrier to uptake since most young people might not be willing to purchase the kit given that HIVST kits are available in some hospitals and non-governmental organizations (NGOs) either free of charge or at a subsidized rate [32].

Ong *et al* [33] and Obiezu-Umeh *et al* [32] reported access location as a major and that the most influential driver of HIVST uptake. Obiezu-Umeh *et al* [32] reported privately-owned facilities, registered pharmacies, youth-friendly centres, supermarkets, and online stores as the most cited preferred locations to access HIVST kits. Ong *et al* [33] added that the least influential driver of HIVST uptake was the type of specimen needed for HIVST. Obiezu-Umeh *et al* [32] and Iwelunmor *et al* [36] suggested making HIVST more appealing to young Nigerians. This could be achieved by repackaging existing HIVST products with colours, taglines, designs, and youth-friendly animations [32,36]. Iwelunmor *et al* [36] also found that providing instruction for use translated into the three most common Nigerian languages (Igbo, Hausa, and Yoruba) will further enhance the appeal and uptake of the product among diverse segments of youths in Nigeria.

Studies among young people, MSM, and key opinion leaders recommended using social media (Facebook/SMS and WhatsApp, *etc.*) and bulk SMS messages to enhance the uptake of HIVST ^[36-37]. In contrast, a quantitative study among key populations in Nigeria reported that 85% of Female Sex Workers (FSWs) and 68 percent of MSM preferred in-person modality of receiving information on HIVST services ^[37]. Furthermore, Sekoni *et al* further suggested using key opinion leaders to distribute and enhance the uptake of HIVST kits among MSM ^[37]. Similarly, Iwelunmor *et al* ^[36] opined that recruiting local celebrities to join HIVST online campaigns and endorse HIVST-related hashtags can generate high demand for HIVST services and promote its uptake among their teeming fans who are mostly young people.

DISCUSSION

HIV self-testing (HIVST) is a rapidly growing HIV testing strategy that is gradually gaining acceptability globally. However, the level of acceptability and strategies to enhance the uptake of HIVST varies across different populations and settings. In this systematic review, we examined the acceptability of HIVST and strategies to enhance the uptake of HIVST in Nigeria. Our findings reveal a high level of acceptability of HIVST in most of the studies included in this systematic review [5;7;15;27-31]. These results are consistent with studies conducted in other settings, such as Louisville, USA, where 77.0% of study participants reported high acceptability and ease of use of HIVST, with increased willingness to use HIVST kits regularly if made available ^[40]. However, some studies have reported low acceptability for HIVST among specific populations, such as MSM in Brazil, where less than half (47.3%) were willing to use HIVST ^[42], and young people in Nigeria ^[26]. The cost of HIVST in the private sector, especially in low-income contexts, may contribute to an unwillingness to use HIVST, justifying the need for free distribution to key and priority groups in the public sector. Additionally, fear of getting a positive result without being appropriately connected to a health service could also contribute to low acceptance of HIVST.

On the uptake of HIVST and linkage to care services, some studies have reported a high uptake of HIVST, such as among MSM in Nigeria [35], while others have reported low uptake, such as in South Africa [44] and China [45]. The variability in findings could be due to differences in the level of awareness about HIVST among the population groups where these studies were conducted. Certain factors, such as education level, age, marital status, and knowledge about HIV, can influence the uptake of HIVST.

The findings in this study are consistent with another study in the Republic of Congo, reporting high linkage to HIV care services (82.2%) among individuals having a reactive result with HIVST [47]. However, the barriers of linkage to care highlighted in studies [27-28] were further strengthened in a study conducted among adolescents in Southern Malawi [48]. The study reported that the social stigma of inadvertently disclosing HIV status was a substantial barrier to linkage to care. A lack of communication about the benefits of testing and the referral process after testing was also cited as a hindrance, as well as a lack of a supportive network to encourage linking after testing.

Regarding strategies for enhancing the uptake of HIVST, studies have reported that health education information can help increase the uptake of HIVST among men [38;49]. Additionally, regulating the sale of self-test kits, lowering the cost of acquiring self-test kits through the provision of demand-side subsidies, establishment of 'local pharmacy distribution networks' and maintaining consistent availability of self-test kits are strategies that contribute to the uptake of HIVST [32-33, 35-36]. HIVST standards and policies that define the supply chain, implementation strategy, quality assurance measures, stakeholder roles and responsibilities, and monitoring and evaluation procedures must be documented. Effective mobilization campaigns must also be deployed to raise public awareness. In the implementation and scale-up efforts of HIVST, training for people participating in the implementation and future step-down training will be critical. Engaging key stakeholders, such as religious and community leaders, employers, leaders, and health workers, can accelerate the uptake of HIV testing and promote linkage to care services.

CONCLUSION

In summary, the landscape of HIV self-testing (HIVST) in Nigeria is still in its infancy with limited evidence base. Therefore, there is a compelling need for more high-quality research such as a randomized trial to enhance our understanding of HIVST. Our study revealed a shortage of implementation science research, despite the various self-testing activities ongoing in Nigeria. We also noted a lack of studies evaluating other distribution models, such as workplace, community distribution, and distribution among facility providers and sub-populations like pregnant women, people who inject drugs, and female sex workers. In contrast, only one study from Southern Nigeria was based on programmatic implementation among community pharmacists. While the acceptability of HIVST is generally high in Nigeria when measured from the intention-to-use perspective, actual use in programmatic implementation was lower, mainly due to the cost barrier among pharmacy retail outlets. Therefore, innovative financing approaches targeting different population segments are necessary for effective scale-up of HIVST under the total market approach. More controlled implementation studies are required to test the acceptability of HIVST. The use of key opinion leaders (KOLs) among key populations has been successful in increasing the acceptability and uptake of HIVST. The uptake of HIVST is generally high among reported studies, except for some reported results. Therefore, more studies are needed to evaluate factors responsible for poor uptake of HIVST and how uptake will compare in routine program *vs* real-life settings in the absence of support and resources that enhance HIVST uptake. In conclusion, despite limitations, our study is the first to conduct a systematic literature review of HIVST in Nigeria, providing valuable insights into the evidence base of research on the acceptability and uptake of HIVST in the country.

ARTICLE HIGHLIGHTS

Research background

Nigeria has a high burden of HIV/AIDS, and a significant proportion of infected individuals remain untested due to fear of stigma and discrimination. HIV self-testing

(HIVST) is recommended by the WHO as a tool for improving testing uptake and achieving UNAIDS 90-90-90 target. However, HIVST is still a growing intervention in Nigeria, and there is a need to systematically review its acceptability and uptake in the country.

Research motivation

To systematically review the acceptability, existing regulations, and strategies for enhancing the uptake of HIV self-testing in Nigeria.

Research objectives

To fill a crucial gap in understanding the HIVST landscape in Nigeria and provide insights into the evidence base of research on the acceptability and uptake of HIVST in the country.

Research methods

A systematic literature review was conducted, and 15 articles were included in the analysis.

Research results

Research results: The study found that the acceptability of HIVST is generally high in Nigeria from the intention-to-use perspective. However, the actual use of HIVST in programmatic implementation was lower than expected. The study recommends more controlled implementation studies to test the acceptability of HIVST and to explore factors responsible for poor uptake. The use of key opinion leaders (KOLs) among key populations has been found to be successful in increasing the acceptability and uptake of HIVST. However, cost remains a major barrier to the acceptability of HIVST among pharmacy retail outlets.

Research conclusions

The present study provides a crucial gap in understanding the HIVST landscape in Nigeria, which is young and evolving. The study highlights the need for further high-quality research in this area and recommends innovative financing approaches targeting different population segments for effective scale-up of HIVST under the total market approach.

Research perspectives

More studies are required to evaluate how the uptake of HIVST compares in routine programs *vs* real-life settings in the absence of support and resources that enhance HIVST uptake. Overall, this study contributes to the current knowledge base on HIVST in Nigeria and highlights the need for further high-quality research in this area.

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