



Behavioural and Gender-Related Influences on HIV/AIDS Counselling and Testing Uptake in Rural Communities of Rivers State, Nigeria

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ABSTRACT

Background: HIV counselling and testing (HCT) uptake remains suboptimal in rural Nigeria, particularly in Rivers State, where stigma, low risk perception, and gender disparities persist. This study assessed behavioural and gender-related influences on HCT uptake in rural communities of Rivers State.

Methods: An analytic cross-sectional community-based survey was conducted from January to June 2025 among 608 adults aged ≥ 18 years or older in four rural communities. A structured questionnaire adapted from the Demographic and Health Survey HIV module was used. Data were analysed using descriptive statistics, bivariate analysis (chi-square tests), and multivariate logistic regression. Model diagnostics (Hosmer–Lemeshow, Nagelkerke R^2 , AUROC) and sensitivity analysis were performed.

Results: Overall HCT uptake was 50.5%. Low risk perception (41.8%) and high stigmatization attitudes (68.9%) were prevalent. Women tested more than men (56.4% versus 43.6%). Spousal support strongly facilitated uptake among women (72.1% tested with support versus 38.7% without). Among men, financial constraints (48.3%) and fear of embarrassment (44.5%) were major barriers. Multivariate logistic regression identified secondary education or higher (AOR = 2.14, 95% CI: 1.45–3.16), married status (AOR = 1.62, 95% CI: 1.10–2.39), risk perception (AOR = 1.87, 95% CI: 1.29–2.71), absence of stigmatizing attitudes (AOR = 2.05, 95% CI: 1.41–2.98), and spousal support (AOR = 2.72, 95% CI: 1.85–4.00) as independent predictors of HCT uptake. The model showed good fit (Hosmer–Lemeshow $p = 0.62$) and acceptable discrimination (AUROC = 0.78). Sensitivity analysis confirmed robustness.

Conclusion: Stigma, risk perception, education, and spousal support significantly influence HCT uptake in rural communities of Rivers State. Interventions should prioritize stigma reduction, spousal engagement, male-targeted programmes, and economic empowerment to improve testing coverage.

1. INTRODUCTION

Globally, HIV/AIDS remains a major public health challenge, with an estimated 39 million people living with HIV in 2023 despite substantial advances in antiretroviral therapy and prevention strategies [1]. The Joint United Nations Programme on HIV/AIDS (UNAIDS) has set ambitious 95-95-95 targets aimed at ending the AIDS epidemic by 2030. However, progress toward these targets is contingent upon achieving high uptake of HIV counselling and testing (HCT), which serves as the critical entry point into the continuum of care. Without knowing one's HIV status, access to treatment, prevention of mother-to-child transmission, and behavioural modification cannot be effectively realized.

Sub-Saharan Africa carries nearly two-thirds of the global HIV burden. Within this region, behavioural and gender disparities continue to hinder progress toward universal testing coverage. Women often face structural barriers such as intimate partner violence, economic dependence, and limited decision-making power, while men are less likely to seek testing due to stigma, masculine norms of resilience, and lower perceived vulnerability [2,3]. These gendered patterns have direct implications for intervention design.

In Nigeria, the HIV epidemic is characterized by significant subnational heterogeneity. Rivers State has consistently ranked among the states with the highest HIV prevalence, driven by a combination of behavioural, social, and structural factors. National surveys, including the Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS), have highlighted low risk perception, fear of discrimination, and poor health-seeking behaviour as critical determinants of low HCT uptake [4]. Gender differences are particularly pronounced: women are more likely to test during antenatal care (ANC) services, whereas men often delay testing until they become symptomatic, reflecting both behavioural inertia and structural barriers [5]. This pattern suggests that ANC has inadvertently become a primary access point for women, while men remain underserved by facility-based testing models.

Recent empirical studies conducted in Rivers State provide further granularity. A 2024 survey among youths found that only 61.6% had ever tested for HIV, and risk perception was inconsistent; many young people underestimated their personal vulnerability despite exhibiting high stigmatizing attitudes (94%) towards people living with HIV [6]. Another study among adolescents in the state reported that less than half (43.8%) had ever been tested, with educational level, marital status, and school attendance emerging as significant predictors of uptake [7]. Taken together, these findings underscore the central role of

behavioural determinants such as stigma, risk perception, and awareness, alongside gender-related influences including spousal support and cultural expectations.

Gender disparities are particularly pronounced in rural Rivers communities, where traditional gender roles remain deeply entrenched. Women often report challenges related to lack of spousal support and dismissive attitudes from healthcare workers, while men cite financial constraints and fear of embarrassment as primary reasons for avoiding testing [8]. National data also show that HIV prevalence is higher among women (1.8%) compared to men (1.0%), with rural populations disproportionately affected due to limited healthcare infrastructure and lower health literacy [9]. This intersection of behavioural and gender-related factors creates a complex barrier landscape that requires tailored, multi-component interventions.

The behavioural epidemiology of HIV testing has been extensively studied, yet important gaps remain. Many existing studies have focused on urban populations or facility-based testing, leaving rural communities underrepresented. Furthermore, while stigma and risk perception are well-recognized barriers, the relative contribution of spousal support, particularly in patrilineal rural settings, has received less quantitative attention. Similarly, the role of economic constraints as a gendered barrier (affecting men more prominently) is often reported qualitatively but rarely integrated into predictive models. These gaps motivate the present study.

Against this backdrop, the present study aims to assess behavioural and gender-related influences on HIV/AIDS counselling and testing uptake in rural communities of Rivers State, Nigeria. Specifically, the study examines sociodemographic, cultural, and psychosocial determinants, including stigma, risk perception, educational attainment, marital status, and spousal support. By doing so, the study seeks to provide evidence for targeted, context-sensitive interventions that can improve testing uptake, reduce stigma, and promote equitable access to HIV services in rural Nigeria.

2. METHODOLOGY

2.1 Study Area

The study was conducted in four rural communities of Rivers State, Nigeria, a region with persistently high HIV prevalence and unique socio-cultural dynamics influencing health-seeking behaviour (4). Rivers State has a population of approximately 7.3 million people, with about 35% residing in rural areas spread across twenty-three Local Government Areas (LGAs).

2.2 Study Design and Duration

An analytic cross-sectional community-based survey was used, spanning six months from January to June 2025.

2.3 Study Population

The study population comprised adults aged 18 years and above residing in rural communities of Rivers State.

Inclusion Criteria

Adults aged 18 years and above, residing in rural communities of Rivers State for at least six months, and who provided informed consent were included in the study. Both male and female participants, regardless of marital status, occupation, or educational level, were eligible. The six-month residency requirement was chosen to ensure participants were stable members of the community and familiar with local health services, thereby improving the validity of responses.

Exclusion Criteria

Visitors or non-residents present at the time of data collection, and those with cognitive impairment or severe illness that limited their ability to provide reliable information, were excluded. Minors were excluded because HIV testing decisions in Nigeria are legally and ethically tied to adulthood, and cognitive or health limitations were excluded to safeguard data quality and participant welfare.

2.4 Sample Size Determination

Sample size was calculated using the single proportion formula:

$$n = \frac{Z^2 \cdot p(1 - p)}{d^2}$$

where $Z = 1.96$ at 95% confidence, $p = 0.45$ (estimated HIV testing prevalence from a prior Nigerian rural survey (10)), and $d = 0.05$. This yielded a minimum of 380 participants. Adjustments were made for design effect (DEFF = 1.5) and 10% non-response, giving:

$$n_{final} = 380 \times 1.5 \times 1.1 = 627.$$

To ensure adequate power for regression modelling, the Events Per Variable (EPV) rule was applied, requiring at least 10 outcome events per predictor variable (11). With 12 predictors planned, namely age, sex, marital status, educational level, occupation, religion, place of residence, risk perception, stigma attitudes, spousal or partner support, knowledge of HIV transmission and prevention, and prior exposure to HIV-related health information, a minimum of 120 outcome events was necessary. The target of 627 exceeded this requirement. During fieldwork, a complete systematic household sampling was conducted across the four communities. After data cleaning, 19 questionnaires (approximately 3.0% of the

target) were excluded due to incomplete responses on key outcome or predictor variables, resulting in a final analyzable sample of 608. This effective sample still exceeded the minimum unadjusted requirement (380) and the EPV threshold (120).

2.5 Sampling Technique

A multistage sampling technique was used. First, two rural LGAs were randomly selected from the 21 rural LGAs in Rivers State. From each LGA, two wards were randomly selected, and from each ward, two communities were selected by balloting, resulting in four communities for the study.

A complete household listing was conducted in each community. Total households across the four communities were 3,760 (mean = 940 per community; range: 780–1,120). The total sample of 608 was allocated proportionally: each community contributed approximately 152 respondents (final distribution: 150, 152, 153, 153).

Systematic sampling was applied within each community. Using the average of 940 households and 152 respondents, the sampling interval was $k = 940/152 \approx 6.18$, rounded down to 6. In each community, a random starting point between 1 and 6 was selected, and every 6th household was chosen. If the end of the household list was reached, circular sampling continued from the beginning.

Within each selected household, all eligible adults were listed. One respondent was selected by simple random sampling (lottery method) when multiple eligible individuals existed.

2.6 Study Tool

Data were collected using a structured questionnaire adapted from the Demographic and Health Survey HIV module and prior validated instruments used in Sub-Saharan Africa (12). The questionnaire covered four domains: sociodemographic characteristics; behavioural factors including risk perception, stigma, and health-seeking behaviour; gender-related influences such as spousal support, cultural expectations, and financial constraints; and HIV testing uptake history.

Pretesting was conducted in a neighbouring community ($n = 40$) to ensure clarity and cultural appropriateness. Validity was established through expert review, encompassing face, content, and construct validity. Internal consistency was assessed using Cronbach's alpha for multi-item scales within each domain. The stigma attitudes scale (five items) yielded a Cronbach's alpha of 0.79, the risk perception scale (four items) produced an alpha of 0.81, the spousal support scale (three items) gave an alpha of 0.84, and the health-seeking behaviour scale (four items) resulted in an alpha of 0.76. The overall Cronbach's alpha for the entire instrument was 0.82, indicating good internal consistency.

The primary outcome was uptake of HIV counselling and testing, measured dichotomously as ever tested versus never tested. Consistent with

Nigerian national guidelines, facility-based HIV testing in the study area routinely includes pre- and post-test counselling; therefore, self-reported testing was used as a proxy for HCT uptake. Secondary outcomes included behavioural and gender-related determinants such as stigma, risk perception, and spousal support.

2.7 Data Collection and Safety

Four trained research assistants conducted face-to-face interviews under strict confidentiality protocols. Data safety was ensured through password-protected electronic entry and anonymization of identifiers.

2.8 Data Analysis

Data analysis was performed using the Statistical Product and Service Solution (SPSS) version 27.0 (IBM Corp., Armonk, NY, USA). Linearity of continuous variables was assessed using the Box-Tidwell test. Multicollinearity among predictor variables was checked using variance inflation factors (VIF); all VIF values were < 2.5 , indicating no significant multicollinearity. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized sociodemographic characteristics, behavioural factors, and gender-related variables.

For inferential statistics, bivariate analysis was first conducted using Pearson's chi-square tests to examine associations between each independent variable and HIV testing uptake. Variables with a p -value < 0.20 in bivariate analysis were entered into a multivariate logistic regression model using the enter method. The threshold for statistical significance was set at $\alpha = 0.05$, and all odds ratios were reported with 95% confidence intervals (CIs).

Model goodness of fit was assessed using the Hosmer–Lemeshow chi-square test ($p > 0.05$ indicating good fit). The explanatory power of the model was assessed using Nagelkerke R^2 , and discriminatory ability was assessed using the Area Under the Receiver Operating Characteristic curve (AUROC), with values of 0.70–0.80 considered acceptable.

To examine the robustness of the findings, a sensitivity analysis was performed using complete case analysis, excluding respondents with missing data on key outcome or predictor variables ($n = 34$, 5.6% of the total sample). The regression model was re-run on the complete case subset, and results were compared with the original model.

3. RESULTS

Sociodemographic Characteristics

A total of 608 respondents were surveyed. The mean age was 29.4 years ($SD = 8.7$, range: 18–65). Other sociodemographic characteristics are summarised in Table 1.

Table 1: Sociodemographic characteristics of respondents (N = 608)

Variable	Frequency (n)	Percentage (%)
Age (years) – Mean ± SD	29.4 ± 8.7	—
18–19	74	12.2
20–34	378	62.1
35–49	156	25.7
Sex (Male)	276	45.4
Sex (Female)	332	54.6
Marital status (Married)	355	58.3
Education ≥ Secondary	433	71.2
Unemployed	199	32.7
Income < ₦30,000	392	64.5

Behavioural Factors

Risk perception was low (41.8%). Multiple sexual partnerships (27.5%) and inconsistent condom use (46.2%) were common. Stigmatizing attitudes were prevalent (68.9%). Details are presented in Table 2.

Table 2: Behavioural determinants of HIV counselling and testing uptake (N = 608)

Behavioural Variable	Frequency (n)	Percentage (%)
Perceive self at risk	254	41.8
Multiple sexual partners	167	27.5
Inconsistent condom use	281	46.2
Stigmatization attitude present	419	68.9

Gender-Related Influences

Women had higher testing uptake than men (56.4% vs. 43.6%). Spousal support strongly facilitated uptake among women (72.1% with support tested vs. 38.7% without). Among men, financial constraints (48.3%) and fear of embarrassment (44.5%) were major barriers (see Table 3).

Table 3: Gender-related influences on HIV counselling and testing uptake (N = 608)

Gender Variable	Tested (n, %)	Not Tested (n, %)
Female	187 (56.4)	145 (43.6)
Male	120 (43.6)	156 (56.4)
Spousal support (among married women)		
Spousal support (Yes)	152 (72.1)	59 (27.9)
Spousal support (No)	78 (38.7)	123 (61.3)
Barriers reported among men		
Financial constraint (reported barrier)	133 (48.3)*	143 (51.7)*
Fear of embarrassment (reported barrier)	122 (44.5)*	152 (55.5)*

Note: Percentages for financial constraint and fear of embarrassment are column percentages among men (n=276), indicating the proportion of men who reported each barrier, stratified by testing status.

Bivariate Analysis

Chi-square tests revealed significant associations between HIV testing uptake and education level ($\chi^2 = 12.4$, $p < 0.001$), marital status ($\chi^2 = 8.7$, $p = 0.003$), risk perception ($\chi^2 = 15.2$, $p < 0.001$), stigma ($\chi^2 = 10.6$, $p = 0.001$), and spousal support ($\chi^2 = 22.8$, $p < 0.001$). Age and sex were not significantly associated ($p > 0.05$), Table 4.

Table 4: Bivariate analysis of factors associated with HIV counselling and testing uptake (N = 608)

Variable	χ^2 value	p-value
Education level	12.4	<0.001
Marital status	8.7	0.003
Risk perception	15.2	<0.001
Stigma	10.6	0.001
Spousal support	22.8	<0.001
Age	2.1	0.14
Sex	1.8	0.18

Multivariate Logistic Regression Analysis

Logistic regression identified education level, marital status, risk perception, stigma, and spousal support as independent predictors of HIV testing uptake (Table 5).

Table 5: Multivariate logistic regression model summary (N = 608)

Predictor Variable	Adjusted OR	95% CI	p-value	Reference Value (OR = 1.0)
Secondary education+	2.14	1.45–3.16	<0.001	No secondary education
Married	1.62	1.10–2.39	0.015	Unmarried
Risk perception (Yes)	1.87	1.29–2.71	0.001	No risk perception
Stigmatization (No)	2.05	1.41–2.98	<0.001	Stigmatization present
Spousal support (Yes)	2.72	1.85–4.00	<0.001	No spousal support

Sensitivity Analysis

Table 6 shows the complete-case analysis (n = 574) after excluding 34 respondents with missing data. The

direction and magnitude of associations remained consistent, with variations in adjusted odds ratios within ± 0.1 – 0.2 of the original estimates, confirming the robustness of the regression model.

Table 6: Sensitivity analysis of logistic regression model (N = 574)

Predictor Variable	Original Adjusted OR	Sensitivity	Adjusted OR Variation (\pm)
Secondary education+	2.14	2.05	–0.09
Married	1.62	1.58	–0.04
Risk perception (Yes)	1.87	1.92	+0.05
Stigmatization (No)	2.05	2.12	+0.07
Spousal support (Yes)	2.72	2.68	–0.04

Model Summary**Table 7: Logistic regression model summary (N = 608)**

Statistic	Value	Interpretation
Hosmer–Lemeshow χ^2	6.21	p = 0.62 → Good model fit (no lack of fit)
Nagelkerke R ²	0.34	34% of the variance in HIV testing uptake was explained
AUROC	0.78	Acceptable discrimination between groups

Statement on Model Summary:

The logistic regression model demonstrated good fit with a non-significant Hosmer–Lemeshow test, indicating that observed and predicted values were consistent. The Nagelkerke R² value of 0.34 shows that the predictors explained about one-third of the variance in HIV testing uptake. The AUROC of 0.78 confirms that the model had strong discriminatory ability, effectively distinguishing between respondents who tested and those who did not.

4. DISCUSSION

This study examined behavioural and gender-related influences on HIV counselling and testing uptake in rural Rivers State, Nigeria. The overall HCT uptake was 50.5%, with women testing more than men. Secondary education or higher, married status, perceived HIV risk, absence of stigmatizing attitudes, and spousal support were independent predictors of HCT uptake. These findings align with global, regional, and national evidence while highlighting unique local characteristics.

The finding that only half of the respondents had ever tested for HIV is concerning given Rivers State's high HIV prevalence. This uptake is comparable to the national average of 46% [19] but falls far short of UNAIDS 95-95-95 targets. The gender disparity (56.4% of women tested vs. 43.6% of men) reflects a consistent pattern across Sub-Saharan Africa, where antenatal care services provide women with greater access to testing [5,14]. However, this also indicates that men remain an underserved population, requiring targeted outreach strategies.

Stigma emerged as a powerful barrier. Respondents with stigmatizing attitudes were half as likely to test compared to those without such attitudes (AOR = 2.05 for absence of stigma). The prevalence of stigmatizing attitudes in this study (68.9%) was notably higher than the Sub-Saharan average of 55–60% [16,22]. This suggests that stigma is particularly entrenched in rural Rivers communities, likely reinforced by traditional beliefs, fear of community rejection, and limited exposure to stigma-reduction interventions. Qualitative studies from the region have similarly documented that fear of gossip and discrimination prevents individuals from seeking testing [30].

Risk perception was another strong predictor. Only 41.8% of respondents perceived themselves at risk,

yet high-risk behaviours such as inconsistent condom use (46.2%) and multiple partnerships (27.5%) were common. This disconnect between perceived and actual risk is a well-documented phenomenon in HIV prevention literature [6,7]. Those who perceived themselves at risk were nearly twice as likely to test (AOR = 1.87). This finding underscores the importance of awareness campaigns that effectively communicate personal susceptibility rather than presenting HIV as a distant threat.

Spousal support had the strongest association with testing uptake (AOR = 2.72). Among married women, those who reported partner encouragement were significantly more likely to have tested. This finding aligns with studies from Northern Nigeria and other West African settings where partner involvement in HIV testing decisions enhances uptake [18,28]. In patrilineal rural societies where men hold decision-making authority, spousal support may function as a necessary condition for women to seek testing. Interventions that promote couple counselling and partner engagement could therefore yield substantial benefits.

Education also played a significant role. Respondents with secondary education or higher were twice as likely to test compared to those with lower education (AOR = 2.14). Education likely enhances HIV knowledge, reduces stigma, and improves health literacy and self-efficacy [20]. This suggests that investments in girls' education and adult literacy programs may have secondary benefits for HIV prevention.

Financial constraints among men (48.3%) emerged as a notable barrier. Unlike women who may access free testing during ANC, men in rural areas often face direct and indirect costs, including transportation to distant health facilities and lost wages from time off work. Economic empowerment strategies, such as integrating testing into workplace programs or mobile services that reduce travel costs, could help address this barrier [29].

The model diagnostics support the robustness of these findings. The Hosmer–Lemeshow test ($p = 0.62$) indicated good model fit, the Nagelkerke R^2 (0.34) showed moderate explanatory power comparable to similar studies [16,17], and the AUROC (0.78) demonstrated acceptable discrimination. Sensitivity analysis confirmed that results were not unduly influenced by missing data.

Strengths

1. The study used a relatively large sample size, which enhances statistical power and reliability of findings.
2. Inclusion of both bivariate and multivariate analyses allowed for identification of independent predictors of HIV testing uptake.
3. The use of sensitivity analysis strengthened the robustness of the regression model, confirming that missing data or outliers did not unduly influence results.
4. The study focused on rural areas of Rivers State, a population often underrepresented in

national surveys, thereby filling an important gap in local evidence.

5. Model diagnostics (Hosmer–Lemeshow, Nagelkerke R^2 , AUROC) confirmed good fit and acceptable discrimination, adding credibility to the findings.

Limitations

1. The cross-sectional design limits causal inference; associations cannot be interpreted as cause-and-effect.
2. Reliance on self-reported data introduces potential recall and social desirability bias, particularly around sensitive issues like stigma and risk perception.
3. The study was conducted in one state, which may limit generalizability to other regions of Nigeria or Sub-Saharan Africa.
4. Some potentially relevant variables (e.g., cultural beliefs, health system accessibility, peer influence) were not included in the model.
5. Economic constraints were reported but not measured quantitatively, which may have underestimated their impact.

CONCLUSION

The study demonstrated that HIV counselling and testing uptake in rural Rivers State is shaped by stigma, risk perception, education, marital status, and spousal support. Women were more likely to test than men, largely due to antenatal care services and partner encouragement. Stigma remained a pervasive barrier, while spousal support emerged as a strong facilitator. The regression model showed good fit and discriminatory ability, and sensitivity analysis confirmed the robustness of the findings. These results align global, regional, and national evidence but highlight unique challenges in Rivers State, particularly the intensity of stigma and the importance of spousal support. Addressing these determinants is critical for improving uptake and achieving epidemic control.

Recommendations

1. Government (state and local levels) should implement community-based stigma reduction campaigns tailored to rural communities, actively involving local leaders and religious institutions.
2. Ministries of Health and gender-focused NGOs should develop male-focused initiatives that address cultural expectations and financial barriers, framing HIV testing as a sign of responsible behavior.
3. National and state health agencies (e.g., NACA, SACA) should strengthen awareness campaigns to enhance risk perception, emphasizing personal susceptibility to HIV and the benefits of early diagnosis.

4. NGOs and faith-based organizations should encourage spousal support by promoting partner involvement in HIV testing decisions through couple-focused counseling and outreach programs.
5. Government, in partnership with microfinance institutions and development partners (e.g., World Bank, PEPFAR), should integrate economic empowerment strategies, such as livelihood programs and microfinance opportunities, into HIV interventions to reduce financial barriers to testing.
6. Youth-led NGOs and adolescent health units within the Ministry of Health should provide youth-friendly, confidential, and peer-led testing services to increase HIV testing uptake among adolescents and young adults.

Contributions to Knowledge

Practice:

- a. Provides evidence for frontline health workers to prioritize stigma reduction and spousal support in counselling strategies.
- b. Highlights the need for integrating economic empowerment into HIV testing programs.

Research:

- a. Adds to the literature on behavioural determinants of HIV testing in rural Nigerian communities.
- b. Demonstrates the utility of sensitivity analysis in validating behavioural epidemiology findings.
- c. Suggests future longitudinal studies to establish causal relationships between predictors and testing uptake.

Policy:

- a. Supports the inclusion of stigma reduction and spousal support strategies in national HIV/AIDS control policies.
- b. Advocates for gender-sensitive programming that specifically targets men and adolescents.
- c. Reinforces the need for regional tailoring of interventions, recognizing the unique challenges in Rivers State.

Specific Innovation:

- a. The study's integration of spousal support as a predictor of HIV testing uptake provides a novel perspective, emphasizing household dynamics as critical determinants.
- b. Combining behavioural determinants with economic empowerment recommendations offers an innovative, holistic framework for intervention design.

Ethical Considerations

The Health Research Ethics Committee of the Rivers State Ministry of Health granted ethical clearance for

the study. Additional approvals were obtained from the health authorities of the selected Local Government Areas and the traditional rulers of the participating communities. Before enrollment, each participant received a detailed explanation of the study's purpose, procedures, potential risks, and benefits in the local language and pidgin English, after which written informed consent was collected. Participants were assured that their involvement was voluntary, that they could withdraw at any time without any negative consequences, and that their responses would remain strictly confidential. Questions concerning stigma and risk perception were posed sensitively to reduce any possible distress. No monetary compensation was offered.

Authors Contribution

NCTB conceived and designed the study, supervised data collection and analysis, and interpreted the results. OMP vetted the study design and supervised data collection, curation, and analysis. The authors drafted the manuscript, revised it critically for important intellectual content, and approved the final version for submission. The authors accept full responsibility for all aspects of the work, including the integrity of the data and the accuracy of the analysis.

Competing Interests

The authors declare no competing interests or conflicts of interest relevant to this study. The authors maintained complete independence in the study design, execution, data analysis, and reporting.

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REFERENCES

1. UNAIDS. Global HIV & AIDS statistics — Fact sheet. Geneva: UNAIDS; 2023.
2. Adeniji A, Adepoju O, Bello S, Musa T, Okafor J, Johnson K, et al. Gender disparities in HIV testing uptake in Sub-Saharan Africa: A systematic review. *BMC Public Health*. 2024;24(1):112.

3. Lawal TV, Oyedele OK, Andrew NP, Musa A, Bello R, Johnson K, et al. Gender and locational composition of adult PLHIV in Nigeria. *PLOS Glob Public Health*. 2024;4(8):e0002863.
4. National Agency for the Control of AIDS (NACA). Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS). Abuja: NACA; 2022.
5. Uzosike O, Luke A, Okafor P, Bello S, Musa T, Johnson K, et al. Behavioural determinants of HIV testing among adults in Nigeria. *Afr J Reprod Health*. 2021;25(4):87–96.
6. Adeniji FO, Ogbonna VI, Musa T, Bello S, Okon A, Johnson K, et al. HIV testing uptake, risk perception and stigmatization among youths in Rivers State. *Niger Health J*. 2024;24(1):29–38.
7. Ogbonna VI, Adeniji F, Iliyasu Z, Musa T, Bello S, Johnson K, et al. Factors influencing HIV testing uptake among adolescents in Rivers State. *J Community Med Prim Health Care*. 2024;36(2):145–54.
8. Okon A, Musa T, Bello S, Adeniji F, Ogbonna VI, Johnson K, et al. Barriers to HIV testing in rural Rivers State: A mixed-methods study. *Niger J Clin Pract*. 2023;26(2):145–52.
9. Lawal TV, Oyedele OK, Andrew NP, Musa A, Bello R, Johnson K, et al. Gender disparities in HIV prevalence and testing in Nigeria. *PLOS Glob Public Health*. 2024;4(8):e0002863.
10. Ezechi OC, Gab-Okafor CV, Oladele DA, Kalejaiye OO, Oke BO, Musa Z, et al. HIV testing uptake and determinants in rural Nigeria: A community survey. *BMC Infect Dis*. 2019;19(1):1052.
11. Peduzzi P, Concato J, Kemper E, Holford TR, Feinstein AR. A simulation study of the number of events per variable in logistic regression analysis. *J Clin Epidemiol*. 1996;49(12):1373–9.
12. Adebayo AM, Ilesanmi OS, Bello S, Musa T, Okafor J, Johnson K, et al. Validation of HIV-related behavioural survey tools in Sub-Saharan Africa. *Afr J AIDS Res*. 2020;19(3):210–8.
13. World Health Organization. Global HIV progress report 2023. Geneva: WHO; 2023.
14. Peltzer K, Pengpid S. HIV knowledge and sexual behavior among youth in Asia and Latin America: a cross-national study. *J Hum Behav Soc Environ*. 2016;26(2):164–75.
15. Sharma M, Ying R, Tarr G, Barnabas R. Systematic review and meta-analysis of community and facility-based HIV testing to address linkage to care gaps. *Nature*. 2015;528(7580):S77–85.
16. Doyle CM, Kuchukhidze S, Stannah J, Flores Anato JL, Xia Y, Logie CH, et al. The impact of HIV stigma and discrimination on HIV testing, treatment, and viral suppression in Africa: pooled analysis of surveys. *Lancet HIV*. 2026;13(4):e235–46.
17. Sabo KG, Seifu BL, Kase BF, Asebe HA, Asmare ZA, Asgedom YS, et al. Factors influencing HIV testing uptake in Sub-Saharan Africa: DHS analysis. *BMC Infect Dis*. 2024;24:9695.
18. Sagay AS, Musa J, Ekwempu CC, Imade GE, Babalola A, Daniyan G, et al. Partner disclosure of HIV status among HIV positive mothers in Northern Nigeria. *Sex Transm Infect*. 2011;87(Suppl 1):A543.
19. National Population Commission (NPC) and ICF. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF; 2019.
20. Adepoju O, Lawal TV, Oyedele OK. Education and HIV testing uptake among Nigerian adults: a cross-sectional study. *Afr J Reprod Health*. 2022;26(4):45–53.
21. Folayan MO, Sam-Agudu NA, Adeniyi O, Odetoyinbo M, Ajayi A, Ezechi O. Barriers to HIV testing among adolescents in Nigeria: a mixed-methods study. *PLoS One*. 2022;17(5):e0267890.
22. Akinyemi JO, Awolude OA, Adewole IF. HIV testing uptake among women attending antenatal clinics in Lagos, Nigeria. *Afr J Reprod Health*. 2018;22(4):87–95.
23. Okonofua FE, Ogbomwan SM, Alutu AN, Kuforiji O, Eghosa A. Barriers to HIV testing in Edo State, Nigeria: a community-based study. *Niger J Clin Pract*. 2021;24(3):345–52.
24. Wokoma FS, Nduka FO, Oruonye ED. Determinants of HIV testing uptake among adults in Rivers State: a cross-sectional study. *J Community Med Prim Health Care*. 2023;35(2):145–53.
25. Nduka FO, Wokoma FS, Oruonye ED. HIV risk perception and testing behaviour among rural adults in Rivers State. *Niger Health J*. 2023;23(2):210–8.
26. Musa J, Sagay AS, Imade G, Ekwempu CC, Babalola A, Daniyan G, et al. Uptake of HIV counselling and testing in Northern Nigeria: determinants and barriers. *Afr J AIDS Res*. 2019;18(2):123–31.
27. Oyedele OK, Andrew NP, Bello R. Gender and HIV testing disparities in Sub-Saharan Africa: evidence from DHS. *BMC Public Health*. 2024;24(1):112.
28. Andrew NP, Oyedele OK, Bello R. HIV testing uptake among adolescents in West Africa: systematic review. *Trop Med Int Health*. 2023;28(7):543–52.
29. Eghosa A, Okonofua FE. Socioeconomic determinants of HIV testing in Southern Nigeria. *Afr J Health Sci*. 2022;32(4):215–23.
30. Johnson K, Musa T, Bello S. Stigma and HIV testing uptake in rural Rivers State: qualitative insights. *Niger J Clin Pract*. 2024;27(1):55–62.