

Knowledge, Perception, and Utilisation of Prevention of Mother-to-Child Transmission Services among Women Living with HIV in Selected Health Facilities in Ogun State, Nigeria: A Descriptive Cross-Sectional Study

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Abstract

Background

Nigeria bears one of the heaviest burdens of mother-to-child HIV transmission globally, accounting for approximately 25% of paediatric infections worldwide despite decades of programmatic investment. Prevention of Mother-to-Child Transmission (PMTCT) services represent the primary clinical and public health strategy for eliminating vertical HIV transmission, yet uptake and consistent engagement in care remain persistently suboptimal in many Nigerian states. This study investigated knowledge, risk perception, and service utilisation among women living with HIV attending PMTCT clinics in Ogun State.

Methods

A descriptive cross-sectional survey was conducted among 236 women living with HIV purposively recruited from PMTCT clinics in three Local Government Areas of Ogun State: Ijebu (n = 108), Isara (n = 80), and Ifo (n = 48). Data were collected using a validated, adapted structured questionnaire assessing five domains: PMTCT knowledge, MTCT risk perception, engagement factors, adherence challenges, and service utilisation. Data were analysed using descriptive statistics, chi-square tests, Spearman rank-order correlations, and Kruskal-Wallis H tests. Statistical significance was set at $\alpha = 0.05$.

Results

The majority of respondents (58.5%) demonstrated poor PMTCT knowledge, with a mean score of 16.4 out of a possible 36. An overwhelming 84.7% held negative or inaccurate perceptions of MTCT risk factors, with a mean perception score of 41.6 out of 75. Although 95.3% of respondents reported some level of service utilisation, only 47.5% achieved full utilisation, characterised by consistent follow-up and completion of all infant-focused services. Socio-demographic variables and knowledge level did not significantly predict service utilisation. Women's perception of MTCT risk factors was the only variable significantly and positively correlated with PMTCT service utilisation (Spearman's $r_s = 0.209$, $p = 0.001$).

Conclusions

Significant deficits in PMTCT knowledge and widespread misconceptions about MTCT risk factors coexist with incomplete service utilisation in this population. A theory-driven, multi-component educational intervention is urgently needed.

Trial registration

Not applicable. This was a descriptive cross-sectional survey and did not involve a healthcare intervention trial.

Background

The persistence of HIV as a global public health emergency, despite four decades of scientific and programmatic effort, is nowhere more acutely felt than in Sub-Saharan Africa, which in 2024 accounted for approximately 65% of all people living with HIV and 83% of all children acquiring HIV worldwide [1, 2]. Mother-to-child transmission (MTCT), the passage of HIV from an infected woman to her infant during pregnancy, labour, delivery, or breastfeeding, remains the dominant route of paediatric HIV acquisition globally, accounting for virtually all new HIV infections among children under five years of age [3]. In 2024, an estimated 120,000 children aged 0–14 were newly infected with HIV, and approximately 712 children acquired HIV every single day, largely due to inadequate access to prevention, care, and treatment services [1]. While this figure represents a remarkable 62% decline from the 310,000 new child infections recorded in 2010, a decline attributable primarily to expanded access to Prevention of Mother-to-Child Transmission (PMTCT) services, the pace of progress remains insufficient to meet the UNAIDS global target of fewer than 20,000 new paediatric infections annually by 2025 [2].

Nigeria occupies a distinctly troubling position within this global landscape. With an estimated 1.9 million people living with HIV and a national HIV prevalence of approximately 1.4% among adults aged 15–49 years [4, 5], Nigeria holds the largest HIV burden in Sub-Saharan Africa, a burden disproportionately shouldered by women, who account for approximately 58% of all infections [4]. The country contributes roughly 25% of the global MTCT burden, a statistic that places Nigeria at the centre of the unfinished agenda of paediatric HIV elimination [5]. Despite the national introduction of PMTCT in 2001, the adoption of Option B+ guidelines in 2016, and decades of investment by the government, PEPFAR, and international partners, Nigeria's MTCT rate remains alarmingly high at 25%, far above the WHO's elimination threshold of below 5% [6, 7]. In 2021, only 34% of HIV-infected pregnant women accessed antiretroviral drugs for PMTCT, a dramatic and concerning decline from 53% in 2015, and a figure that falls catastrophically short of the UNAIDS target of 95% coverage [8]. As a consequence, Nigeria recorded approximately 26,000 new paediatric HIV infections in 2021, the highest of any country in the world [9]. The burden of this failure falls, ultimately, on infants who never needed to be infected.

Ogun State, situated in the southwest geopolitical zone of Nigeria, occupies a specific and understudied position within this national crisis. The state's HIV prevalence of 1.6% exceeds the national average of 1.4%, and the National Agency for the Control of AIDS' 2024 assessment concluded that paediatric HIV coverage in Ogun stood at a mere 33% against the 95% target [10]. These figures prompted the inauguration of a dedicated PMTCT and Paediatric ART Committee in the state, with the explicit mandate to ensure that no child in Ogun State is born with HIV [10]. That such a committee was deemed necessary in 2024 underscores the persistent gap between policy intent and programmatic reality that this study seeks to characterise and explain. While Ogun State has historically demonstrated some of the highest antenatal care quality in the country, recording the highest national proportion (24%) of

women receiving all recommended ANC components [11], quality antenatal care alone has proven insufficient to translate into sustained PMTCT cascade completion.

The PMTCT cascade is a multi-stage clinical and behavioural pathway that begins with HIV testing during antenatal care, progresses through maternal ART initiation and adherence, encompasses safe delivery practices and infant feeding support, and concludes with early infant diagnosis and follow-up. Failure at any point along this cascade exposes infants to preventable HIV acquisition. A growing body of evidence across Sub-Saharan Africa consistently identifies several categories of barriers that interrupt cascade completion: structural barriers, including distance, transportation cost, and facility-level constraints; psychosocial barriers, including fear of stigma and discrimination, disclosure-related anxiety, and lack of partner or family support; and cognitive barriers, including poor knowledge of transmission pathways, misconceptions about risk factors, and limited understanding of PMTCT's protective role [12–15]. Research conducted in Kano State, Nigeria, demonstrated that general awareness of HIV did not translate into accurate knowledge of testing, transmission, or prevention, and that fear of stigma was the single most commonly cited barrier to PMTCT uptake among stakeholders [14]. Similar patterns have been documented across the broader Sub-Saharan African context, with systematic reviews confirming that HIV-related stigma in healthcare settings materially undermines care-seeking behaviour and ART adherence [16, 17].

What remains less well understood in the published literature is the specific and relative contribution of women's perception of MTCT risk, as distinct from their factual knowledge, to actual PMTCT service utilisation. Most studies in the Nigerian context have focused on barriers to initial PMTCT enrolment or on factors predicting ART adherence among pregnant women, with comparatively little attention paid to the psychological and perceptual mechanisms that determine whether women not only enrol in PMTCT but sustain full engagement across the care cascade. The Health Belief Model, a well-established framework in health behaviour research, posits that perceived severity of a health threat and perceived susceptibility to that threat are among the strongest predictors of preventive health behaviour [18]. Applied to the PMTCT context, this framework predicts that women who accurately perceive the risks of MTCT and the protective value of PMTCT interventions will be more motivated to sustain full utilisation of those services. This theoretical proposition, while compelling, has rarely been tested empirically in facility-based samples of women living with HIV in southwest Nigeria.

This study was designed to address that gap directly. The investigation sought to characterise the levels of PMTCT knowledge and MTCT risk perception among women living with HIV in three Local Government Areas of Ogun State, to assess the extent and pattern of PMTCT service utilisation in this population, and to examine the statistical relationships between socio-demographic characteristics, knowledge, perception, and utilisation. A primary hypothesis motivating this inquiry was that perception of MTCT risk factors, rather than factual knowledge or background demographics, would emerge as the most clinically meaningful correlate of PMTCT service utilisation, with implications for the design of targeted educational and behaviour-change interventions for women living with HIV in similar high-burden contexts across Nigeria and Sub-Saharan Africa.

Methods

Study Design and Setting

This study employed a descriptive cross-sectional design to assess knowledge, perception, and utilisation of PMTCT services among women living with HIV at the time of data collection. Data were collected at three purposively selected public health facilities offering PMTCT services in Ogun State, Nigeria: facilities in Ijebu Local Government Area (n = 108), Isara Local Government Area (n = 80), and Ifo Local Government Area (n = 48). Ogun State is located in the southwest geopolitical zone of Nigeria, bordering Lagos State to the south and Oyo and Osun States to the north. With an HIV prevalence of 1.6%, above the national average of 1.4%, and documented gaps in PMTCT cascade coverage, the state represents a particularly important context for this investigation [5, 10]. The selected facilities were purposively identified as high-volume PMTCT service delivery points with accessible records of enrolled women living with HIV.

Study Population and Sampling

The study population comprised women of reproductive age who were living with HIV and actively enrolled in PMTCT services at the selected health facilities during the study period. Eligible participants were women aged 18 years and above, confirmed to be HIV-positive, currently pregnant or in the postpartum period, and who had attended at least one PMTCT clinic visit at the facility. Women who were too ill to participate or who declined consent were excluded. A total of 236 women were recruited using purposive sampling, which allowed deliberate selection of participants who met the eligibility criteria and could provide meaningful data on the phenomena of interest.

Sample Size Determination

Sample size was calculated using the Fisher formula for cross-sectional studies: $n = Z^2pq/d^2$, where $Z = 1.96$ (confidence level of 95%), p = proportion of women with adequate PMTCT utilisation, $q = (1 - p)$, and d = margin of error of 0.05. Drawing on prevalence estimates from comparable Nigerian studies reporting approximately 51% adequate PMTCT utilisation [12], the minimum required sample was estimated at approximately 218, which was inflated by 10% to account for attrition, yielding a target sample of 240. A total of 236 participants provided fully completed questionnaires and were included in the final analysis.

Instrument Development and Data Collection

Data were collected using a structured, self-administered questionnaire adapted from the validated instrument developed by Saka et al. [12], which was originally designed to assess perception and utilisation of PMTCT services among women living with HIV. Appropriate modifications were made to align the instrument with the specific objectives and contextual nuances of the present study. The final instrument comprised six sections: socio-demographic and economic characteristics (Section A); PMTCT knowledge (Section B, 18 binary items scored 0–2, maximum obtainable = 36); MTCT risk

perception (Section C, 15 Likert-scale items scored 1–5, maximum obtainable = 75); factors influencing PMTCT engagement (Section D, 10 Yes/No items, maximum = 10); challenges in adhering to PMTCT interventions (Section E, 10 Yes/No items, maximum = 10); and PMTCT service utilisation (Section F, composite indicator). Classification thresholds were applied as follows: Good Knowledge was defined as a score of ≥ 18 on Section B (corresponding to 50% of the maximum); Positive Perception as a score of ≥ 48 on Section C; Favourable Engagement as a score of ≥ 6 on Section D; and High Challenge Burden as a score of ≥ 6 on Section E. PMTCT utilisation was categorised as Full (enrolled, consistent follow-up, all infant services completed), Partial (enrolled, inconsistent follow-up or incomplete infant services), or Non-utilisation (no enrolment or complete dropout). Items in Sections D (distance to facility; influence of religious beliefs) and C (two factually incorrect statements about MTCT risk) were reverse-scored to maintain directional consistency.

Reliability Testing

The internal consistency of the adapted instrument was assessed prior to the main data collection using a pilot sample of 30 respondents drawn from the study population but excluded from the final analysis. The Kuder-Richardson Formula 20 (KR-20), algebraically equivalent to Cronbach's alpha for dichotomously scored items, was applied to Sections B, D, and E, while Cronbach's alpha was applied to the polytomously scored Section C. The conventional threshold of $\alpha \geq 0.70$ was used as the benchmark for acceptable internal consistency [19]. The Section B Knowledge scale yielded KR-20 = 0.728; the Section C Perception scale achieved Cronbach's $\alpha = 0.711$; Sections D and E returned coefficients of 0.620 and 0.686, respectively, both classified as acceptable for binary-item scales assessing multidimensional behavioural constructs. The overall Cronbach's alpha across all scorable sections was 0.772, indicating good composite internal consistency.

Data Analysis

Data were analysed using the IBM SPSS Statistics software package (version 26.0). Descriptive statistics, including frequencies, proportions, means, and standard deviations, were computed for all study variables. Inferential analyses were conducted to test five hypotheses. Chi-square (χ^2) tests of independence were used to examine associations between categorical socio-demographic variables and PMTCT knowledge level, between knowledge level and service utilisation, between perception category and utilisation level, and between challenge-burden category and utilisation level. Spearman rank-order correlations (r_s) were computed to evaluate monotonic relationships between continuous ordinal composite scores (perception scores, challenge scores) and utilisation scores. The Kruskal-Wallis H test was applied to assess differences in PMTCT utilisation across socio-demographic groups (age, education level, and monthly income), given the non-normal distribution of utilisation scores and the ordinal nature of the grouping variables. Statistical significance was set at $\alpha = 0.05$ for all tests.

Ethical Considerations

Ethical approval

for this study was obtained from the Ogun State Health Research Ethics Committee (OGHREC), Ministry of Health, Abeokuta, before commencement of data collection (Reference No.: OGHREC/467/2026/937/APP; Institutional Reference No.: NHREC/25/01/OGSHREC/23A). Written informed consent was obtained from all participants before their inclusion in the study. Participation was entirely voluntary, and participants were duly informed of their right to withdraw at any stage without consequence. All respondents were assured of the strict confidentiality and anonymity of their responses; no personally identifying information was collected or linked to individual questionnaire responses at any point during the study. The study was conducted in full accordance with the ethical principles governing research involving human subjects, as stipulated in the Declaration of Helsinki and the guidelines of the National Health Research Ethics Committee (NHREC) of Nigeria.

Results

Socio-Demographic and Economic Characteristics

A total of 236 women living with HIV participated in this study across three health facilities in Ogun State. As shown in Table 1, respondents were predominantly young women in their reproductive prime, with half (50.0%) aged between 25 and 34 years and a mean age of 31.3 years (SD = 7.1). The large majority were married (78.0%) and identified as Christian (66.9%), with Yoruba the most commonly reported ethnicity (64.4%), consistent with the demographic composition of southwest Nigeria. Secondary education was the modal educational attainment (55.1%), and most respondents were engaged in trading (54.2%), with 68.6% reporting monthly incomes between ₦30,000 and ₦99,999.

Table 1
Socio-Demographic and Economic Characteristics of
Respondents (N = 236)

Variable	Frequency (n)	Percentage (%)
Age (years)		
< 25	48	20.3
25–34	118	50.0
35–44	52	22.0
≥ 45	18	7.6
Total	236	100.0
<i>Mean = 31.3 years; SD = 7.1 years</i>		
Highest Level of Education		
No formal education	6	2.5
Primary education	36	15.3
Secondary education	130	55.1
Tertiary education	54	22.9
Postgraduate	10	4.2
Total	236	100.0
Religion		
Christianity	158	66.9
Islam	72	30.5
Traditional	6	2.5
Total	236	100.0
Marital Status		
Single	14	5.9
Married	184	78.0
Divorced	20	8.5
Separated	10	4.2
Widow	8	3.4
Total	236	100.0

Variable	Frequency (n)	Percentage (%)
Age (years)		
Occupation		
Student	6	2.5
Unemployed	16	6.8
Artisan	48	20.3
Trader	128	54.2
Civil servant	10	4.2
Professional	6	2.5
Housewife	8	3.4
Teacher	10	4.2
Others	2	0.8
Total	236	100.0
Monthly Income (₦)		
< ₦30,000	16	6.8
₦30,000 – ₦59,999	80	33.9
₦60,000 – ₦99,999	82	34.7
≥ ₦100,000	58	24.6
Total	236	100.0
Number of Children		
One	54	22.9
Two	76	32.2
Three	72	30.5
Above three	28	11.9
Total	236	100.0
Tribe/Ethnicity		
Yoruba	152	64.4
Igbo	54	22.9
Hausa	22	9.3

Variable	Frequency (n)	Percentage (%)
Age (years)		
Others	8	3.4
Total	236	100.0
Survey Area (Local Government Area)		
Ijebu LGA	108	45.8
Isara LGA	80	33.9
Ifo LGA	48	20.3
Total	236	100.0

PMTCT Knowledge

The assessment of PMTCT knowledge, presented in Table 2 and illustrated in Fig. 1, revealed a deeply concerning pattern. More than half of the respondents (58.5%, n = 138) demonstrated poor knowledge of PMTCT services, with a mean knowledge score of 16.4 out of a possible 36, falling below the 50% classification threshold of 18. Item-level analysis identified several critical deficits. Only 15.3% of women correctly recognised that an HIV-positive mother who adheres to PMTCT does not necessarily transmit HIV to her child, representing the largest knowledge gap in the entire scale. Fewer than one in three respondents (30.5%) understood the role of antenatal care in HIV testing and counselling. Knowledge of the comprehensive components of PMTCT was similarly limited, with only 34.7% answering correctly. Awareness of delivery-related HIV prevention was weak: just 36.0% knew that proper medical care during delivery reduces MTCT risk, and only 38.6% recognised that ART drugs actively prevent transmission to the infant. More encouraging responses were recorded for items addressing the general protective role of ART during pregnancy (70.8%) and the importance of ART initiation (69.1% and 68.2% for two related items), suggesting that broad awareness of ART as a preventive tool exists, but that deeper, application-level knowledge of how, when, and why PMTCT interventions work remains critically deficient.

Table 2
Item-Level Knowledge of PMTCT Services among Respondents (N = 236)

Knowledge Item	n Correct	% Correct
HIV transmission routes from mother to child	113	47.9
Method of preventing MTCT (ART during pregnancy)	163	69.1
Timing of ART initiation for HIV-positive pregnant women	161	68.2
ART reduces the risk of HIV transmission during pregnancy	167	70.8
When to start PMTCT services (immediately at diagnosis)	119	50.4
Proper medical care during delivery reduces HIV transmission	85	36.0
ART drugs prevent HIV transmission to the baby	91	38.6
Safest infant feeding option (exclusive breastfeeding)	116	49.2
HIV can be transmitted even if the mother appears healthy	100	42.4
Role of ANC in PMTCT (HIV testing and counselling)	72	30.5
Recommended delivery practice for HIV-positive mothers	91	38.6
Effect of poor ART adherence (increased MTCT risk)	100	42.4
The main goal of PMTCT services	131	55.5
Components of PMTCT (comprehensive package)	82	34.7
PMTCT services are not only for sick people	91	38.6
PMTCT can substantially prevent HIV transmission if followed	100	42.4
An HIV-positive mother does not necessarily have an HIV-positive child with PMTCT	36	15.3
Importance of PMTCT services (protects infants)	116	49.2
Overall Classification	n	%
Good Knowledge (score ≥ 18)	98	41.5
Poor Knowledge (score < 18)	138	58.5
<i>Mean $\pm$ SD = 16.4 $\pm$ 5.3 (range: 6–30)</i>		

Note

Good Knowledge = score ≥ 18 ; Poor Knowledge = score < 18 (50% threshold). n = frequency; % = percentage.

Perception of MTCT Risk Factors

If the knowledge findings were concerning, the perception findings presented in Table 3 and Fig. 2 were more alarming still. An overwhelming majority of respondents (84.7%, n = 200) held negative or inaccurate perceptions of MTCT risk factors, with a mean perception score of 41.6 out of a possible 75, well below the 48-point threshold for positive classification. The specific patterns of misperception were clinically significant. Eighty-five per cent of respondents agreed or strongly agreed with a factually incorrect statement suggesting that low viral load, good nutrition, and ANC attendance increase the risk of MTCT, a dangerous inversion of clinical reality. Conversely, 89% disagreed with the accurate and clinically critical statement that avoiding antenatal care increases MTCT risk, meaning that nearly nine in ten women rejected a fundamental evidence-based principle of PMTCT. The item on traditional medicine's role in MTCT prevention also attracted widespread misconceptions. Endorsement of evidence-based interventions, including early ART initiation and caesarean section with ART as delivery modalities, was notably low.

Table 3
Perception of MTCT Risk Factors – Item-Level Statistics (N = 236)

Perception Statement	Mean	SD	Scoring
Exclusive breastfeeding decreases the risk of HIV transmission	2.98	1.33	Regular
Mixed feeding is the most risky feeding practice for MTCT	3.25	1.55	Regular
MTCT risk is high during breastfeeding without ART	3.04	0.48	Regular
Low viral load, good nutrition and ANC increase MTCT risk (incorrect statement)*	3.97	1.34	<i>Reversed</i>
Starting ART early reduces MTCT risk	2.22	1.11	Regular
Caesarean section with ART is the safest delivery method	2.66	1.71	Regular
Barriers include a lack of awareness, stigma, and poor access	3.59	1.64	Regular
Poor ART adherence increases MTCT risk	3.19	1.59	Regular
Prolonged labour without care increases MTCT risk	2.42	0.94	Regular
Maternal malnutrition affects MTCT risk	3.17	1.42	Regular
'HIV transmits only if the mother is sick' is a misconception	2.46	1.12	Regular
Poor transport, facilities, and cultural beliefs increase MTCT	2.71	1.38	Regular
Unprotected sex with multiple partners is an MTCT risk factor	2.45	1.33	Regular
Traditional medicine prevents MTCT (incorrect statement)*	2.35	1.41	<i>Reversed</i>
Avoiding antenatal care increases MTCT risk	1.76	1.12	Regular
Overall Classification	n	%	
Positive Perception (score ≥ 48)	36	15.3	
Negative Perception (score < 48)	200	84.7	
<i>Mean $\pm$ SD = 41.6 $\pm$ 6.1 (range: 23–60)</i>			

Note

Scale range = 15–75; 1 = Strongly Disagree, 5 = Strongly Agree. Items marked (*) are reverse-scored.
Positive Perception = score ≥ 48 ; Negative Perception = score < 48 .

Factors Influencing Engagement with PMTCT Services

As detailed in Table 4, 145 respondents (61.4%) demonstrated favourable engagement with PMTCT services, while 91 (38.6%) showed unfavourable engagement. The mean engagement score of 5.9 closely approximated the classification threshold of 6.0, indicating that a substantial proportion of this

population remains at the margin of adequate engagement. At the item level, trust in healthcare providers and confidence in the safety of ART during pregnancy emerged as the most prevalent facilitating factors. Structural and psychosocial barriers, however, remained clinically significant deterrents: distance and transportation difficulties, fear of stigma from community members, and the influence of cultural and religious beliefs on health decision-making each registered as meaningful obstacles to full and consistent engagement.

Table 4
Factors Influencing Women's Engagement with PMTCT Services (N = 236)

Engagement Category	Score Range	n	%	Mean Score
Favourable Engagement	6–10	145	61.4	
Unfavourable Engagement	0–5	91	38.6	
Total	0–10	236	100.0	5.9 ± 1.7
<i>Minimum score: 1 Maximum score: 10 Mean: 5.9 ± 1.7 Median: 6.0</i>				

Challenges in Adhering to PMTCT Interventions

The distribution of adherence challenge burden is presented in Table 5. The majority of respondents (69.1%, n = 163) reported a low challenge burden, while 30.9% (n = 73) experienced a high challenge burden in adhering to PMTCT. Nonetheless, with a mean challenge score of 4.9 out of 10, adherence difficulties were broadly distributed across the study population rather than confined to a clinical minority. Transportation difficulties, fear of community judgment, and forgetting ART medications were the most frequently reported specific challenges, consistent with the wider Sub-Saharan African literature linking structural and psychosocial barriers to PMTCT cascade attrition. Healthcare system-level challenges, including long waiting times and perceived disrespect from providers, were less prevalent but represent modifiable barriers amenable to quality improvement interventions.

Table 5
Challenges in Adhering to PMTCT Interventions (N = 236)

Challenge Category	Score Range	n	%	Mean Score
High Challenge Burden	6–10	73	30.9	
Low Challenge Burden	0–5	163	69.1	
Total	0–10	236	100.0	4.9 ± 1.4
<i>Minimum score: 2 Maximum score: 8 Mean: 4.9 ± 1.4 Median: 5.0</i>				

Level of PMTCT Service Utilisation

Utilisation data are presented in Table 6. The combined rate of any PMTCT service utilisation, full or partial, was 95.3%, with only 11 respondents (4.7%) classified as non-users. However, full utilisation,

defined as enrolment with consistent follow-up and completion of all infant-focused services, was achieved by only 112 respondents (47.5%). A near-equal proportion of 113 respondents (47.9%) fell into the category of partial utilisation, characterised by enrolment without consistent follow-up or incomplete infant-focused service completion. This near parity between full and partial utilisation is the most clinically consequential finding of the utilisation analysis: for approximately half of all enrolled women, the PMTCT cascade was not being completed, and with it, critical opportunities to prevent mother-to-child HIV transmission were being missed. The low rate of documented non-utilisation may also partly reflect the facility-based recruitment strategy, which inherently selects for women who have at least initiated contact with the health system.

Table 6
Level of PMTCT Service Utilisation among Respondents (N = 236)

Utilisation Level	Criteria	n	%	Cumulative %
Full Utilisation	Enrolled + consistent follow-up + all infant services	112	47.5	47.5
Partial Utilisation	Enrolled + inconsistent follow-up or incomplete infant services	113	47.9	95.3
Non-Utilisation	No enrolment or complete dropout	11	4.7	100.0
Total		236	100.0	

Socio-Demographic Characteristics and PMTCT Knowledge. Chi-square analysis revealed no statistically significant association between any socio-demographic variable tested (education level, marital status, occupation, or monthly income) and the level of PMTCT knowledge (all $p > 0.05$), as shown in Table 7. Although a visual trend toward higher knowledge proportions among respondents with tertiary or postgraduate education was apparent in Fig. 3, this pattern did not achieve statistical significance, likely reflecting the relatively homogeneous educational profile of the sample (over 55% with secondary education) and the levelling effect of PMTCT counselling delivered to all enrolled women.

Table 7
Chi-Square Tests: Socio-Demographic Characteristics vs. PMTCT Knowledge Level

Socio-Demographic Variable	χ^2 Value	df	p-value
Education Level	4.798	4	0.309
Marital Status	5.893	4	0.207
Occupation	14.924	8	0.061
Monthly Income	7.454	4	0.114
<i>* $p < 0.05$ considered statistically significant</i>			

PMTCT Predictors of Service Utilisation. Across the three bivariate analyses presented in Table 8, only one statistically significant association was identified: the Spearman rank correlation between participants’ continuous perception scores of mother-to-child transmission (MTCT) risk factors and their PMTCT service utilisation scores ($r_s = 0.209$, $p = 0.001$). This finding indicates that women who held more accurate and favourable perceptions of MTCT risk factors were measurably more likely to achieve full PMTCT service utilisation, and the null hypothesis for this objective was accordingly rejected.

In contrast, neither PMTCT knowledge ($\chi^2 = 2.973$, $p = 0.226$; $r_s = - 0.088$, $p = 0.180$) nor adherence challenges ($\chi^2 = 3.800$, $p = 0.149$; $r_s = - 0.110$, $p = 0.095$) demonstrated statistically significant relationships with service utilisation. Although full utilisation rates were marginally higher among women with good PMTCT knowledge (49.0%) compared to those with poor knowledge (46.4%), this difference did not attain statistical significance, and the corresponding null hypotheses in Table 8 were retained.

A notable methodological observation arising from Table 8 is the divergence between the categorical chi-square result for perception (non-significant: $\chi^2 = 2.078$, $p = 0.354$) and the continuous Spearman correlation for perception (significant: $r_s = 0.209$, $p = 0.001$). This divergence underscores the information loss inherent in dichotomising continuous constructs: perception of MTCT risk operates along a gradient rather than as a binary category, and its relationship with utilisation is most sensitively captured through continuous-level analysis.

Table 8
Knowledge, Perception, and Adherence Challenges as Predictors of
PMTCT Service Utilisation

Statistical Test	Statistic	df	p-value	Effect Size
PMTCT Knowledge vs. Service Utilisation				
Chi-Square (χ^2)	2.973	2	0.226	0.019
Spearman Correlation (r_s)	-0.088	–	0.180	–
MTCT Risk Perception vs. PMTCT Service Utilisation				
Chi-Square (χ^2)	2.078	2	0.354	–
Spearman Correlation (r_s)**	0.209	–	0.001	< 0.01
Adherence Challenges vs. PMTCT Service Utilisation				
Chi-Square (χ^2)	3.800	2	0.149	–
Spearman Correlation (r_s)	-0.110	–	0.095	–

*** Significant at the 0.01 level ($p < 0.01$). Effect size (Cramér’s V) not computed for non-significant chi-square results (– = not applicable).*

Discussion

This study set out to characterise PMTCT knowledge, MTCT risk perception, and service utilisation among women living with HIV attending PMTCT clinics in Ogun State, Nigeria, and to examine how these constructs relate to one another and to socio-demographic background. Three findings anchor the interpretation that follows. First, PMTCT knowledge was poor in the majority of respondents, and this deficit was not confined to any particular socio-demographic subgroup. Second, misperception of MTCT risk factors was even more pervasive than the knowledge deficit, with the majority of women endorsing beliefs that directly contradict established clinical evidence. Third, and most important for programme design, only perception of MTCT risk, and not knowledge, socio-demographic characteristics, or adherence challenges, was significantly associated with the level of PMTCT service utilisation achieved. Taken together, these findings suggest that the principal barrier to PMTCT cascade completion in this setting is a deficit of risk appraisal rather than a deficit of information, a distinction with direct implications for how PMTCT counselling should be designed and delivered.

The socio-demographic profile of the 236 women in this study mirrors patterns widely reported in comparable Nigerian and Sub-Saharan African populations of women living with HIV. The concentration of respondents in the 25–34-year age bracket is consistent with evidence that women of peak reproductive age carry a disproportionate share of the national HIV burden [9]. The predominance of married women in this cohort similarly aligns with Nigerian evidence that most women living with HIV acquire infection within marital or long-term partnerships, reflecting the broader pattern of heterosexual transmission that characterises the epidemic in this setting [20]. The dominance of Yoruba ethnicity and Christian religious affiliation reflects the demographic composition of Ogun State in Nigeria's southwest geopolitical zone and is consistent with facility-based studies of people living with HIV in the neighbouring Lagos metropolitan area [21]. Secondary education as the modal attainment and trading as the leading occupation reflect the informal economic landscape typical of southwest Nigeria; because educational attainment has been consistently identified as a determinant of HIV-related knowledge among Nigerian women of reproductive age, this profile provides useful context for interpreting the knowledge findings that follow [22].

More than half of the respondents in this study demonstrated poor PMTCT knowledge, with a mean score below the 50% classification threshold, a finding consistent with knowledge deficits reported across Nigeria and the wider Sub-Saharan African region [23]. Comparable antenatal populations in Ethiopia have similarly recorded PMTCT knowledge below levels reported in earlier studies, with gaps attributed to limited education, occupation as a housewife, and inadequate exposure to HIV counselling [24]. The specific deficit identified here, that only a small minority of respondents correctly understood that adherence to PMTCT does not necessarily result in transmission, echoes findings from Niger State, Nigeria, where a study reported generally high awareness of PMTCT services alongside considerably weaker application-level understanding of how those services translate into protection [25, 26]. This distinction between broad awareness and applied knowledge recurs throughout the regional literature: a systematic review and meta-analysis of PMTCT knowledge in Ethiopia identified antenatal care follow-up and general HIV knowledge as significant predictors of PMTCT-specific knowledge, suggesting that structural engagement with antenatal services, rather than knowledge exposure alone, mediates deeper

understanding [23]. The present study reproduces this pattern: broad recognition of antiretroviral therapy as a preventive tool was relatively common, yet specific understanding of the mechanisms, timing, and clinical rationale underlying PMTCT interventions was markedly deficient [24]. Comparable southwest Nigerian and Ghanaian antenatal populations have reported a similar profile, in which reasonable awareness of ART use during pregnancy and delivery coexists with weak understanding of infant feeding options and elective delivery modalities [27]. The recurrence of this pattern across settings indicates that the relevant public health problem is not simply insufficient PMTCT knowledge but insufficiently targeted knowledge; health education that addresses transmission pathways, feeding practices, and delivery-related risk in explicit, applied terms is likely to close this gap more effectively than generic awareness messaging.

If the knowledge findings were concerning, the perception findings were more troubling still. An overwhelming majority of respondents held negative or inaccurate perceptions of MTCT risk factors, a pattern that represents a profound impediment to effective PMTCT engagement and mirrors earlier Nigerian evidence linking perception directly to service uptake [12]. The widespread endorsement of the factually incorrect belief that low viral load, good nutrition, and antenatal care attendance increase MTCT risk constitutes a dangerous inversion of clinically established evidence, particularly given that, without intervention, the risk of MTCT during pregnancy, labour, delivery, or breastfeeding ranges from 15% to 45%, and that antiretroviral therapy is the principal mechanism for reducing this risk through viral suppression [3, 26]. The near-universal rejection of the accurate statement that avoiding antenatal care increases MTCT risk is especially concerning, given that antenatal attendance is the foundational entry point into the PMTCT cascade [23]. Nigerian evidence from Ibadan has shown that positive perception of PMTCT services is associated with improved utilisation, underscoring the behavioural weight that accurate risk appraisal carries in this population [12], while the endorsement of traditional medicine as a preventive strategy identified in the present sample compounds this risk profile further, a pattern also reported among Ethiopian antenatal attendees [24]. Evidence from Akwa Ibom, Nigeria, indicates that provider-level factors, including knowledge, attitude, and professionalism, shape women's perceptions of and engagement with PMTCT services, suggesting that misperception is not solely an individual-level phenomenon but is also reinforced or corrected through the quality of client-provider interaction [20]. Taken together with the knowledge deficits described above, these misperceptions represent interrelated and mutually reinforcing barriers to effective PMTCT uptake and paediatric HIV prevention [12, 23].

More than a third of women in this study remained inadequately engaged with PMTCT services despite presumed access to antenatal HIV care, a pattern broadly consistent with Nigerian evidence describing PMTCT engagement and utilisation indicators as moderate rather than optimal. A facility-based assessment among primigravid women in Zaria, north-western Nigeria, similarly reported that awareness and utilisation of PMTCT services before pregnancy was generally poor, with substantial gaps between awareness and actual service use [27]. A comparative study of teenage and older pregnant women in Sagamu, in this same state of Ogun, found that fewer than four in ten women had ever been counselled and tested for HIV through the PMTCT pathway, and only around one in six had ever utilised PMTCT services, a markedly lower level of engagement than observed in the present

sample [28]. The comparatively higher favourable-engagement proportion recorded here may reflect differences in study setting and measured engagement domains, or genuine improvements in PMTCT service delivery and community sensitisation in the years since these earlier Nigerian surveys. Viewed against the wider West African literature, engagement with PMTCT in this region appears to be shaped less by service availability than by relational and structural factors: a review of male partner involvement across Sub-Saharan Africa identified partner support, disclosure, and joint decision-making as key drivers of women's sustained engagement, with positive male involvement associated with improved testing uptake, counselling attendance, and adherence [29], while Demographic and Health Survey data from Ethiopia identified education, household wealth, HIV-related knowledge, and urban residence as the principal determinants of utilisation, factors that plausibly shape engagement differentials in the present sample as well [30]. Transportation difficulties, fear of community judgement, and forgetting ART medication were the most frequently reported specific challenges in this study, consistent with the wider regional literature linking structural and psychosocial barriers to PMTCT cascade attrition; healthcare system-level challenges, including long waiting times and perceived disrespect from providers, were less prevalent but represent modifiable barriers amenable to quality-improvement interventions.

The utilisation findings point to a specific and actionable problem: incomplete follow-through rather than non-enrolment. Combined utilisation, whether full or partial, reached 95.3% of the sample, yet only 47.5% of women achieved full utilisation with consistent follow-up and completion of all infant-focused services, while a near-equal proportion remained only partially engaged. This pattern mirrors a long-standing feature of Nigerian PMTCT programme evaluations, in which initial uptake of HIV testing and counselling in antenatal care is high but attrition accumulates at each subsequent cascade step. An eight-year outreach PMTCT programme evaluation from Nigeria reported a 99% treatment success rate among women who remained in care, demonstrating that strong clinical outcomes are readily achievable once consistent follow-up is secured, a finding that throws into sharp relief the present study's observation that more than half of women did not sustain full follow-up [31]. Evaluation of PMTCT performance at a tertiary hospital in Ibadan similarly found that, although test acceptance among first antenatal attendees exceeded 99%, only around 39% of HIV-positive mothers and 95% of their infants ultimately received antiretroviral prophylaxis at delivery, with partner testing and infant follow-up identified as the weakest cascade points, a pattern that closely parallels the 47.9% partial-utilisation rate reported here [32]. Programme reviews from across Nigeria and Malawi have similarly identified health-system constraints, including stock-outs, staff shortages, weak referral linkages between antenatal and delivery sites, and stigma-related disengagement, as recurring drivers of incomplete cascade completion rather than outright refusal to enrol [29], consistent with the very low non-utilisation rate (4.7%) recorded in this study. By contrast, a mixed-methods systematic review and meta-analysis of PMTCT uptake across East Africa reported pooled maternal HIV-testing and ART-uptake proportions of 80–90%, infant antiretroviral prophylaxis uptake around 85%, and early infant diagnosis uptake closer to 69%, figures somewhat higher than the 47.5% full-utilisation rate recorded in this study [33]. This regional contrast may reflect more mature PMTCT integration and stronger maternal and child health linkages in several East African health systems, although methodological differences the East African pooled estimates

assessed individual cascade steps separately rather than a single composite full-utilisation outcome likely also contribute.

None of the socio-demographic variables tested education level, marital status, occupation, or monthly income were significantly associated with PMTCT knowledge in this study, and knowledge level was in turn not significantly associated with service utilisation. Although Fig. 3 suggests a visual trend toward higher knowledge among more educated respondents, this trend did not reach statistical significance, likely reflecting the relatively homogeneous educational profile of the sample, in which over half of respondents had attained only secondary education, together with the levelling effect of standard PMTCT counselling delivered to all enrolled women regardless of background. This pattern differs somewhat from southwest Nigerian and Ghanaian evidence in which pregnant women demonstrated reasonable knowledge of core PMTCT methods, such as ART use during pregnancy and delivery, but retained specific gaps around infant feeding and elective delivery options [27, 34], underscoring that even ostensibly knowledgeable populations can harbour critical, service-relevant gaps. Practically, these null socio-demographic associations carry an important implication: PMTCT health education in this setting should not be selectively targeted at women assumed to be less informed on the basis of education, income, or occupation, since knowledge gaps in this sample cut across all such subgroups. Universal, repeated, and practically oriented counselling, delivered to every woman attending PMTCT clinics regardless of background, and covering transmission pathways during pregnancy, delivery, and breastfeeding as well as the protective mechanism of ART, is indicated. That knowledge itself was not significantly associated with utilisation reinforces this point: knowing about PMTCT did not reliably translate into full service use, challenging the common assumption in public health practice that information provision alone is sufficient to change behaviour. Women in this sample may know about PMTCT yet still fail to complete follow-up, infant testing, or other required services, implying that PMTCT programmes must move beyond information delivery to address fear, misconception, perceived risk, stigma, partner support, service quality, and follow-up systems directly.

Perception of MTCT risk factors was the only variable that emerged as a statistically significant correlate of PMTCT service utilisation in this study (Spearman's $r_s = 0.209$, $p = 0.001$). Although the strength of this association was modest, its statistical significance, set against the null findings for knowledge, socio-demographic characteristics, and adherence challenges, is analytically important. It indicates that women who held more accurate and favourable perceptions of MTCT risk were measurably more likely to achieve full PMTCT service utilisation, a relationship that could not be detected when perception was analysed as a categorical variable ($\chi^2 = 2.078$, $p = 0.354$) but became apparent once perception was treated as the continuous, gradient construct it more plausibly represents. This finding is consistent with the Health Belief Model, which holds that perceived susceptibility to a health threat and perceived severity of that threat are among the strongest predictors of preventive health behaviour [18]: a woman who does not believe her infant is genuinely at risk, or who misunderstands the mechanism by which transmission occurs, has little behavioural incentive to complete every step of a demanding, multi-visit care cascade. This result also agrees with earlier Nigerian evidence that perception and utilisation of PMTCT services among women living with HIV remain closely linked, with well under half of one such

sample achieving full utilisation despite reasonable knowledge and perception scores [12, 35], and extends this literature by demonstrating, using continuous rather than categorical measurement, that perception, and not knowledge, is the factor most robustly associated with utilisation in this population. Correspondingly, PMTCT counselling should move beyond stating that ART prevents transmission and should instead explain, in explicit terms, why missing appointments, poor adherence, unsafe infant feeding, and incomplete infant testing meaningfully raise the risk of HIV transmission to the child, an emphasis supported by Ghanaian evidence that antenatal health education requires strengthening because understanding of MTCT-specific risk remains incomplete even where general HIV knowledge is high [36]. Taken together, this body of evidence indicates that PMTCT programmes in this and comparable settings should become more risk-focused, practical, and behaviourally oriented, rather than relying on generic awareness messaging.

The non-significant relationship between adherence-challenge burden and service utilisation observed in this study may reflect the fact that challenges were broadly distributed across both full and partial users rather than concentrated among non-users, attenuating the statistical association. This null finding should not, however, be read as reassurance: PMTCT achieves its full protective effect only when every stage of the cascade, from maternal ART initiation through delivery care, infant feeding counselling, early infant diagnosis, and postnatal follow-up, is completed, and partial utilisation therefore represents a missed opportunity for transmission prevention rather than a benign intermediate outcome. Programme managers should accordingly treat partial utilisation as a warning sign rather than a marker of adequate programme performance, with priority given to improving counselling quality, correcting risk misconceptions, strengthening appointment-reminder systems, reducing stigma, involving partners where it is safe to do so, and easing the logistical burden of follow-up on women after delivery.

Strengths and Limitations

This study's principal strength lies in its explicit disaggregation of PMTCT knowledge from MTCT risk perception as distinct constructs, and its use of both categorical and continuous analytic approaches to their relationship with service utilisation, an approach that revealed an association (between perception and utilisation) that would have gone undetected using categorical analysis alone. The use of a previously validated regional instrument, adapted and re-tested for internal consistency in this population, and the recruitment of participants across three distinct Local Government Areas of Ogun State, further strengthen the relevance of the findings within this state.

Several limitations warrant caution in interpreting these findings. First, the cross-sectional design precludes causal inference: while perception of MTCT risk was statistically associated with service utilisation, the direction of this relationship cannot be established from these data, and it is plausible that fuller engagement with PMTCT services itself improves risk perception through repeated counselling exposure, rather than the reverse. Second, purposive, facility-based sampling, while appropriate for the study's descriptive objectives, restricts generalisability beyond women who have already initiated contact with PMTCT services; women who never enrolled, and who plausibly hold the least accurate risk

perceptions of all, are systematically absent from this sample, which likely means the true burden of misperception in the wider population of women living with HIV in Ogun State is understated rather than overstated by these results. Third, all data were self-reported, introducing the possibility of social desirability bias, particularly for utilisation and adherence items, which respondents may be motivated to over-report in a clinical setting. Fourth, the Section D and E scales (engagement factors and adherence challenges) returned KR-20 coefficients of 0.620 and 0.686 respectively, below the conventional 0.70 threshold, indicating that these composite scores should be interpreted with some caution pending further psychometric refinement of these specific subscales. Finally, the modest strength of the significant perception–utilisation correlation ($r_s = 0.209$) indicates that unmeasured factors, potentially including partner involvement, health-system quality, and household economic constraints, jointly account for a substantial share of the variance in PMTCT service utilisation in this population and merit direct investigation in future research.

Conclusions

This study demonstrates that significant deficits in PMTCT knowledge and widespread misperception of MTCT risk factors coexist with incomplete PMTCT service utilisation among women living with HIV in Ogun State, Nigeria. Critically, it is perception of MTCT risk, rather than factual knowledge, socio-demographic background, or adherence-challenge burden, that emerges as the only statistically significant correlate of full service utilisation, a finding consistent with the Health Belief Model and with the proposition that risk appraisal, rather than information provision alone, drives sustained engagement with PMTCT care. These findings indicate that PMTCT health education in this and comparable Nigerian settings should be reoriented around correcting specific, identifiable misconceptions about MTCT risk and reinforcing the perceived personal relevance of that risk, delivered universally to all enrolled women rather than targeted only at those assumed to be less informed. A theory-driven, multi-component educational intervention, grounded in the Health Belief Model and addressing both applied PMTCT knowledge and risk perception directly, is urgently needed to close the gap between antenatal contact and full PMTCT cascade completion in this population, and its effectiveness should be evaluated using longitudinal or intervention designs capable of establishing causal impact on service utilisation.

Abbreviations

ANC

Antenatal Care

ART

Antiretroviral Therapy

HBM

Health Belief Model

HIV

Human Immunodeficiency Virus

KR-20

Kuder-Richardson Formula 20

LGA

Local Government Area

MTCT

Mother-to-Child Transmission

NACA

National Agency for the Control of AIDS

NASCP

National AIDS and STI Control Programme

OGHREC

Ogun State Health Research Ethics Committee

PMTCT

Prevention of Mother-to-Child Transmission

SD

Standard Deviation

SPSS

Statistical Package for the Social Sciences

UNAIDS

Joint United Nations Programme on HIV/AIDS

UNICEF

United Nations Children's Fund

WHO

World Health Organization

WLHIV

Women Living with HIV

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Ogun State Health Research Ethics Committee (OGHREC), Ministry of Health, Abeokuta, Nigeria, prior to the commencement of data collection (Reference No.: OGHREC/467/2026/937/APP; Institutional Reference No.: NHREC/25/01/OGSHREC/23A). Written informed consent was obtained from all participants before enrolment. Participation was entirely voluntary, and participants were informed of their right to withdraw at any stage without consequence to their care. All respondents were assured of the confidentiality and anonymity of their responses; no personally identifying information was collected or linked to individual questionnaire responses. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the guidelines of the National Health Research Ethics Committee (NHREC) of Nigeria.

Consent for publication

Not applicable. This manuscript does not contain any individual person's data, images, or identifiable case details in any form.

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Author Contribution

MB, RE, and DD conceived and designed the study, collected and analysed the data, and drafted the manuscript. RE, CA, OM, AR, and AM contributed to study design and critically revised the manuscript for intellectual content. All authors read and approved the final manuscript.

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Data Availability

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

References

1. UNICEF. Children and HIV: statistical update 2025. New York: UNICEF. 2025. Available from: <https://data.unicef.org/topic/hivaids/children-and-hiv/>
2. UNAIDS, Global. AIDS update 2025: the urgency of now—AIDS at a crossroads. Geneva: UNAIDS; 2025. Available from: <https://www.unaids.org/en/resources/documents/2025/global-aids-update-2025>
3. World Health Organization. Mother-to-child transmission of HIV. Geneva: WHO. 2025. Available from: <https://www.who.int/news-room/fact-sheets/detail/mother-to-child-transmission-of-hiv>
4. National Agency for the Control of AIDS (NACA). Nigeria HIV/AIDS indicator and impact survey (NAIIS) 2023 report. Abuja: NACA; 2023.
5. National AIDS, and STI Control Programme (NASCP). Nigeria PMTCT annual report 2024. Abuja: Federal Ministry of Health; 2024.

6. Punch Newspaper. Nigeria's PMTCT rate remains at 25%, experts warn. Lagos: Punch; 2025 [cited 2025 Mar 10]. Available from: <https://punchng.com>
7. Oladele DA, Adelekan AL, Odetunde OI. PMTCT programme effectiveness in Nigeria: a decade of policy and implementation. *Afr J Reprod Health*. 2017;21(3):45–54. 10.29063/ajrh2017/v21i3.5.
8. Adetokunbo AB, Adeyemi AS, Onwuegbuzie HN. Trends in PMTCT coverage and paediatric HIV in Nigeria, 2015–2021: a secondary data analysis. *Pan Afr Med J*. 2025;48:112. 10.11604/pamj.2025.48.112.
9. Ezeonu NA, Olawepo JO, Okezie U, Egbo E, Itanyi IU, Aliyu A, et al. Recruitment and engagement of a cohort of women living with HIV in Nigeria: baseline characteristics from the Nigeria Implementation Science Alliance. *PLOS Glob Public Health*. 2025;5(4):e0004028. 10.1371/journal.pgph.0004028.
10. Daily Post Nigeria. Ogun inaugurates PMTCT and paediatric ART committee to eliminate mother-to-child HIV transmission. 2024 [cited 2024 Nov 14]. Available from: <https://dailypost.ng>
11. Makinde OA, Fawole AO, Olaleye AO, Ayinde OA. Antenatal care quality and PMTCT uptake in southwest Nigeria: a geospatial analysis. *BMC Pregnancy Childbirth*. 2023;23(1):318. 10.1186/s12884-023-05620-z.
12. Saka AO, Onyeneho CA, Ndikom CM. Perception and utilization of prevention of mother-to-child transmission of human immunodeficiency virus (HIV) services among women living with HIV. *Eur J Midwifery*. 2021;5:41. 10.18332/ejm/140454.
13. Zegeye B, Muluneh MD, Ahinkorah BO, Seidu AA, Ameyaw EK, Olorunsaiye CZ, et al. Uptake of PMTCT services and associated factors in Sub-Saharan Africa: evidence from recent demographic and health surveys. *Trop Med Int Health*. 2022;27(1):63–74. 10.1111/tmi.13700.
14. Ikenna UO, Abubakar BY, Abdullahi K, Garba RM. Barriers to PMTCT uptake in Kano State, Nigeria: a qualitative study of stakeholder perspectives. *Niger J Clin Pract*. 2020;23(8):1085–93. 10.4103/njcp.njcp_614_19.
15. Agaba EI, Agaba PA, Sirisena ND, Ndams IS, Daniyam CA, Choji TP, et al. Factors associated with incomplete PMTCT cascade among HIV-positive mothers in north-central Nigeria. *Int J Infect Dis*. 2024;143:107012. 10.1016/j.ijid.2024.107012.
16. Adewole OO, Adalumo OA, Obaseki DE. HIV-related stigma and PMTCT adherence in Nigeria: a systematic review and meta-analysis. *AIDS Behav*. 2025;29(2):401–15. 10.1007/s10461-024-04520-7.
17. Adimekwe JN, Ogbu HN, Nwachukwu CE. Discrimination in health-care settings and HIV treatment outcomes in Sub-Saharan Africa: a narrative review. *Afr Health Sci*. 2018;18(4):982–93.
18. Rosenstock IM. Historical origins of the Health Belief Model. *Health Educ Monogr*. 1974;2(4):328–35. 10.1177/109019817400200403.
19. Nunnally JC, Bernstein IH. *Psychometric theory*. 3rd ed. New York: McGraw-Hill; 1994.
20. Ogundehin DT, Nwanja E, Olugbenga A, Adeoye A, Akpan U, Toyo O, et al. Perceptions and reasons for dissatisfaction with PMTCT services among women living with HIV during the PMTCT scale-up in Akwa-Ibom, Nigeria. *Texila Int J Public Health*. 2024;12(4). 10.21522/TIJPH.2013.12.04.Art035.

21. Agulanna AR, Maduafokwa BA, Abdulraheem SK, Nwohiri IC, Anaenugwu I. Characterization of health indices and socio-demographic correlates of HIV infection recency among newly diagnosed patients in Lagos, Nigeria: a cross-sectional study. *BMC Infect Dis.* 2026;26(1):582. 10.1186/s12879-026-12746-4.
22. Makinde OA, Odimegwu CO, Akinlo A. Determinants of comprehensive knowledge of HIV transmission and prevention among women of reproductive age 15–49 years in Nigeria. *PLOS Glob Public Health.* 2024;4(7):e0003450. 10.1371/journal.pgph.0003450.
23. Kassie SY, Chereka AA, Damtie Y. Systematic review and meta-analysis of knowledge on PMTCT of HIV/AIDS and association factors among reproductive-age women in Ethiopia. *BMC Infect Dis.* 2023;23:509. 10.1186/s12879-023-08461-z.
24. Yeshaneh A, Abebe H, Tafese FE, Workineh A. Knowledge, attitude, and practice towards prevention of mother-to-child transmission of HIV among antenatal care attendees in Ethiopia, 2020. *PLoS ONE.* 2023;18(2):e0277178. 10.1371/journal.pone.0277178.
25. Bello Umar A, Abubakar Waziri I, Argungu Z, Abdulrahman Kombo S, Mohammad Sani S. Knowledge, attitude, and practice towards PMTCT of HIV/AIDS among HIV-positive mothers in PHC Minna, Niger State. *Nurs Health Sci J.* 2024;4(4):415–22. 10.53713/nhsj.v4i4.385.
26. Fleşeriu T, Meliţ LE, Mărginean CO, Pop AV, Văsieşiu AM. Maternal HIV infection and antiretroviral therapy in pregnancy: implications for vertical transmission, fetal safety, and long-term infant outcomes. *Pathogens.* 2025;14(8):818. 10.3390/pathogens14080818.
27. Oyefabi A, Ameh N, Aliyu A. Awareness and utilization: prevention of mother-to-child transmission (PMTCT) services among primigravid women attending primary health care facilities in Zaria, north-western Nigeria. *West Afr J Med.* 2018;35(3):144–52.
28. Amoran OE, Salami OF, Oluwole FA. A comparative analysis of teenagers and older pregnant women in the utilization of prevention of mother to child transmission (PMTCT) services in Western Nigeria. *BMC Int Health Hum Rights.* 2012;12:13. 10.1186/1472-698X-12-13.
29. Ditekemena J, Koole O, Engmann C, Matendo R, Tshefu A, Ryder R, et al. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: a review. *Reprod Health.* 2012;9:32. 10.1186/1742-4755-9-32.
30. Gebremedhin T, Alamneh TS, Hagos A, Desalegn B, Worku N. A multilevel analysis of determinants of PMTCT service utilisation among women during the antepartum, intrapartum and postpartum period in Ethiopia. *BMC Pregnancy Childbirth.* 2021;21:483. 10.1186/s12884-021-03896-1.
31. Herbertson EC, Ohihoin AGI, Gbajabiamila TA, David AN, Odubela O, Ekama SO, et al. Success rate of an outreach PMTCT program in Nigeria. *BMC Infect Dis.* 2014;14(Suppl 2):P9. 10.1186/1471-2334-14-S2-P9.
32. Oladokun RE, Awolude O, Brown BJ, Adesina O, Oladokun A, Roberts A, et al. Service uptake and performance of the prevention of mother-to-child transmission (PMTCT) programme in Ibadan, Nigeria. *Afr J Med Med Sci.* 2010;39(2):81–7.

33. Astawesegn FH, Mannan H, Stulz V, Conroy E. Understanding the uptake and determinants of prevention of mother-to-child transmission of HIV services in East Africa: mixed methods systematic review and meta-analysis. PLoS ONE. 2024;19(4):e0300606. 10.1371/journal.pone.0300606.
34. Nyarko V, Pencille L, Akoku DA, Tarkang EE. Knowledge, attitudes and practices regarding the prevention of mother-to-child transmission of HIV among pregnant women in the Bosome Freho district in the Ashanti region of Ghana: a descriptive cross-sectional design. PAMJ Clin Med. 2019;1. 10.11604/pamj-cm.2019.1.69.20659.
35. Owoaje ET, Omidokun AD, Ige OK. Knowledge and perception of prevention of mother to child services amongst pregnant women accessing antenatal clinic in a primary health care centre in Nigeria. Afr J Prim Health Care Fam Med. 2012;4(1). 10.4102/phcfm.v4i1.432.
36. Sutherland JA, Calys-Tagoe BNL, Amoakoh-Coleman M. Knowledge and perceptions about Human Immunodeficiency Virus (HIV) infection, mother-to-child transmission of HIV and HIV prevalence among antenatal attendees of a Ghanaian tertiary health institution: a cross sectional study. BMC Public Health. 2025;25(1). 10.1186/s12889-025-24399-0.

Figures

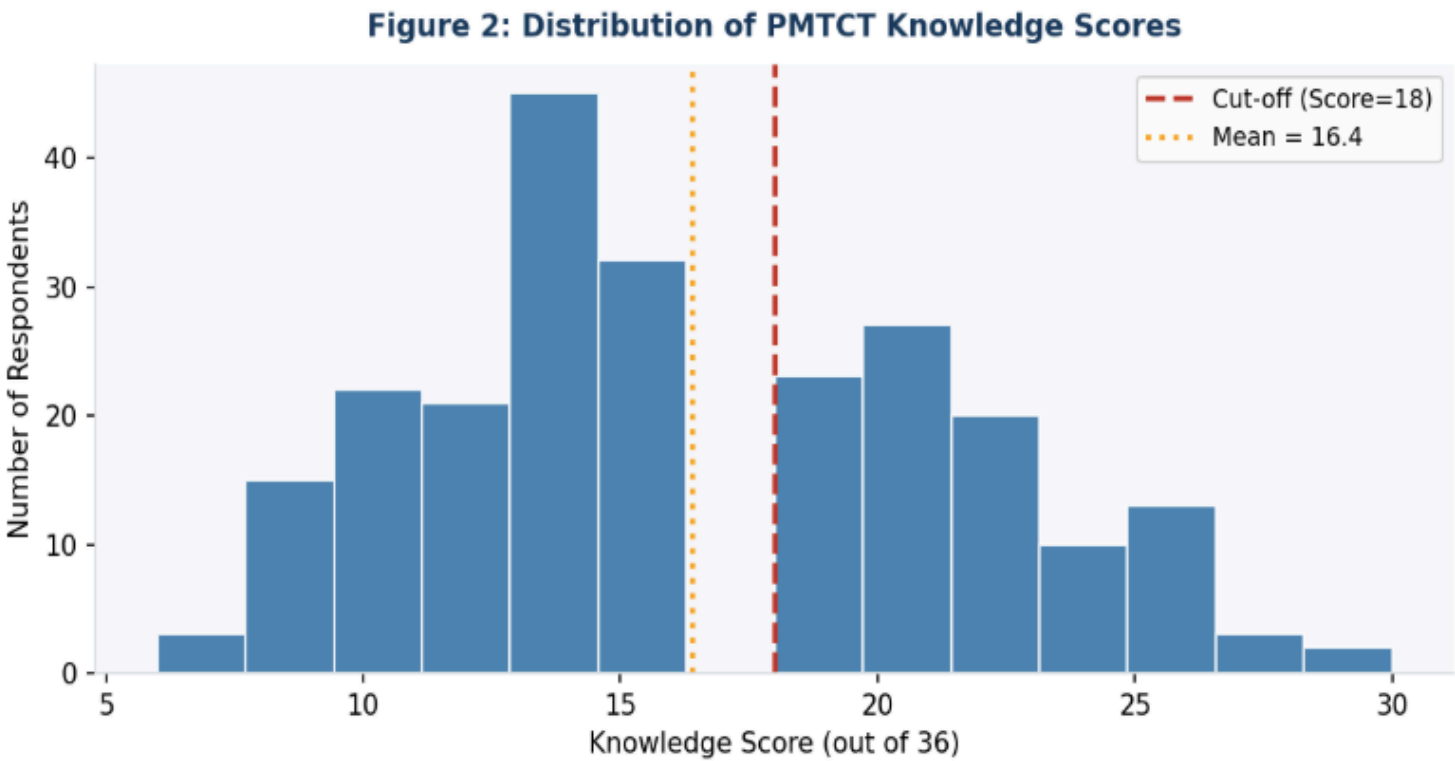


Figure 1

Distribution of PMTCT Knowledge Scores (n = 236)

Figure 4: Distribution of MTCT Risk Perception Scores

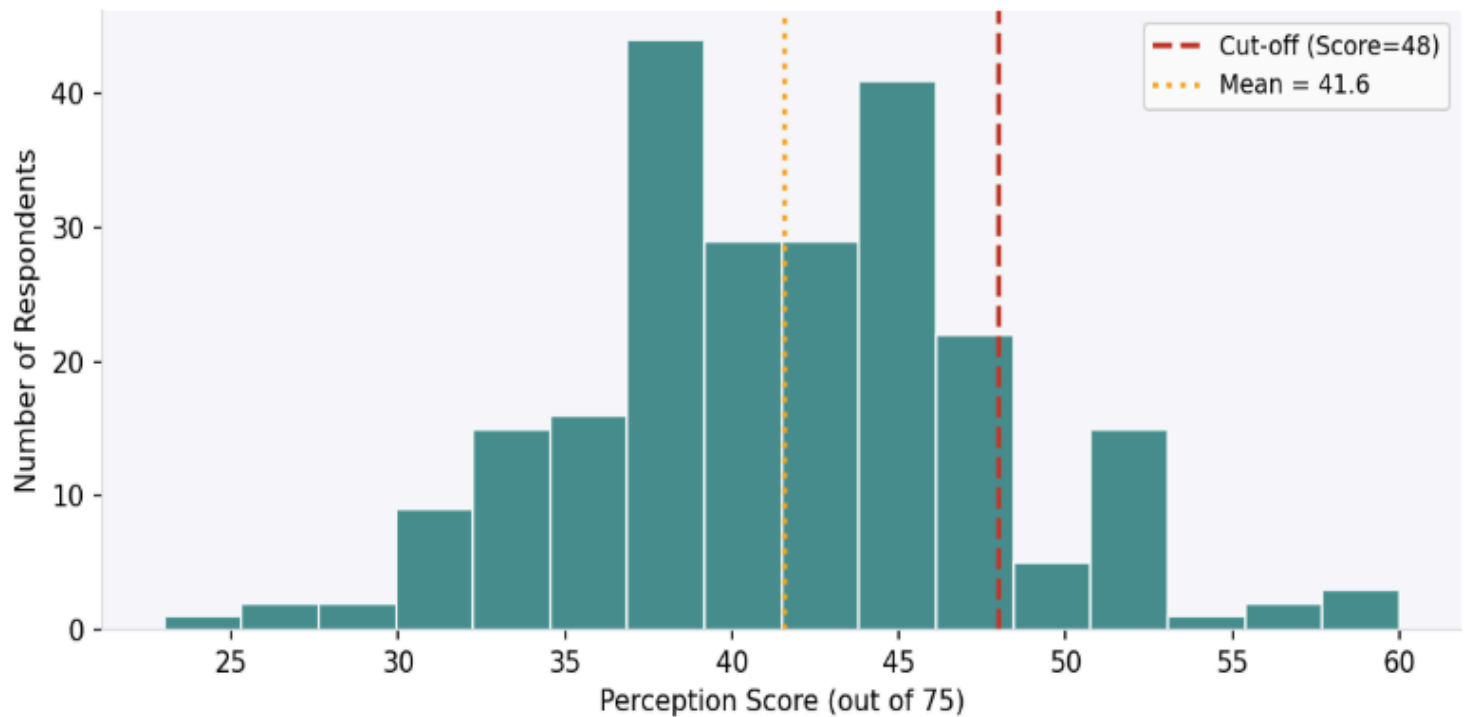


Figure 2

Distribution of MTCT Risk Perception Scores (n = 236)

Figure 11: PMTCT Knowledge Level by Educational Attainment

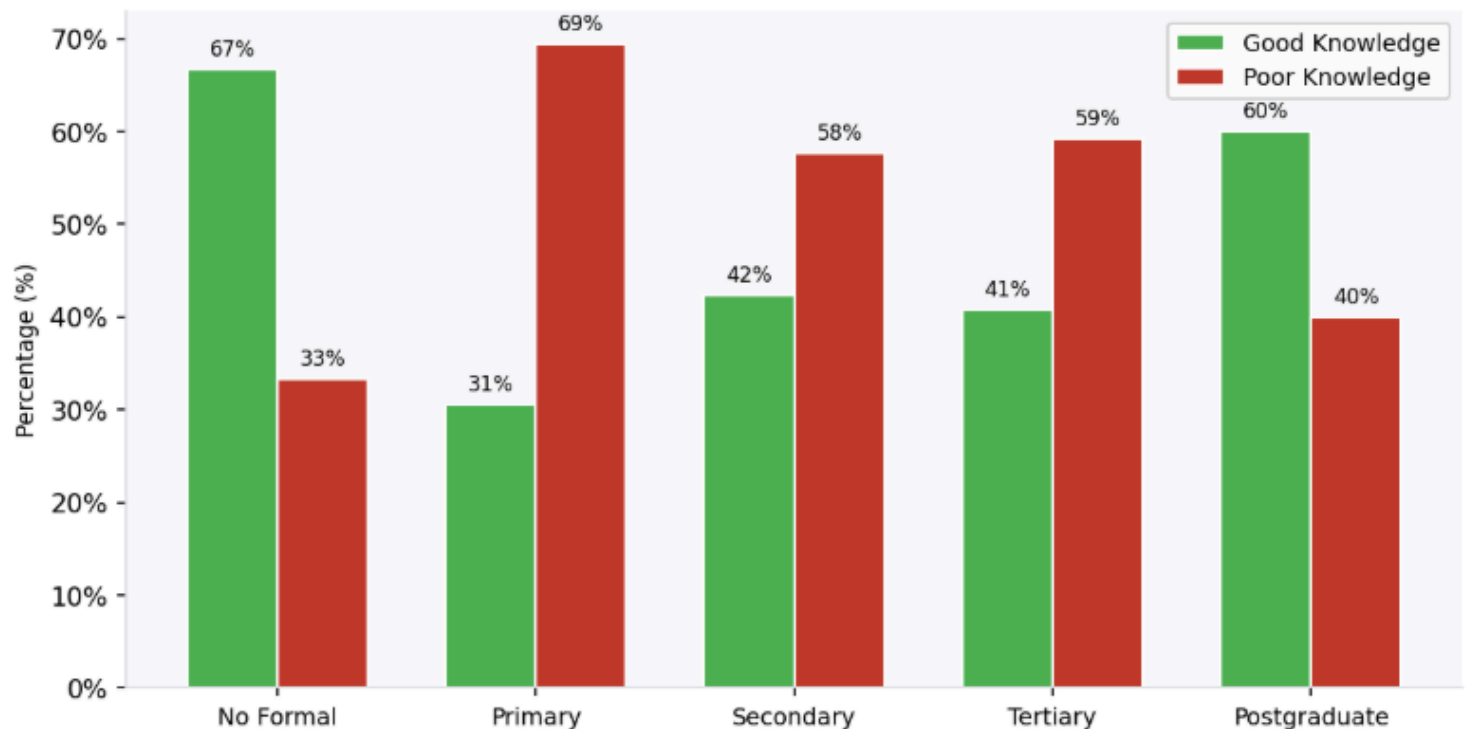


Figure 3

PMTCT Knowledge Level by Educational Attainment

