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Assessment of Antenatal Care Enrollment and Uptake of Prevention of Mother-to-Child Transmission (PMTCT) of HIV Services at ESUTH Parklane, Enugu, South-East Nigeria

Ikeuba Divine (MD)[1], Inyiama Anita(MD)[1], Maduemem Chikaodili(MD)[1], Nnadozie John-Miracle(MD)[1], Chijindu Godspeed Chimbo (MD)[1], Omeke Amarachi Precious (MD)[1], Okonkwo Precious Nnenna (MD)[1], Amalu Akuoma Chelsea (MD)[1], Ekpendu Clinton Chukwudi (MD)[1], Udeh Amarachukwu Favour(MD)[1], Achikanu Peter Chukwuemerie (MD)[1], Nnamdi Divine-favour Nmesoma (MD)[1], Achunike Ogochukwu Emmanuel (MD)[1], Onah Nzube Johnmartin (MD)[1], Nsude Vincent Onyedikachukwu (MD)[1], Obumkelu-Chinedu Miracle Chukwuemezugo (MD)[1]

[1]Enugu State University Science and Technology College of Medicine, Nigeria

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*Corresponding Author: Nnadozie John-Miracle Email: 50johnmiracle@gmail.com

Abstract: **Background:** Mother-to-child transmission (MTCT) of HIV remains a major public health issue in Nigeria, which has one of the highest HIV burdens globally. Without intervention, transmission risk during pregnancy, delivery, or breastfeeding ranges from 15% to 45%. The Prevention of Mother-to-Child Transmission (PMTCT) program aims to reduce this through routine testing, antiretroviral therapy (ART), and infant prophylaxis. Despite national implementation, service uptake and outcomes vary across health facilities. **Objective:** To assess antenatal care enrollment and uptake of Prevention of Mother-to-Child Transmission (PMTCT) of HIV services among pregnant women living with HIV at ESUTH Parklane, Enugu State, South-East Nigeria. **Methods:** A four-year retrospective descriptive study was conducted using records of 115 pregnant women living with HIV who received care at the Antenatal Care (ANC) and Anti-Retroviral Therapy (ART) Clinics of ESUTH Parklane between 2021 and 2024. Data were obtained from clinic records and analyzed descriptively using frequencies and percentages. **Results:** Participants had a mean age of 32.79 years. Most (86.1%) were aged 20–40 years, all were married and Christians, and the majority were Igbo (96.5%) with post-secondary education (68.7%). Nearly half (42.6%) were unemployed, while most (61.7%) had a parity of two. ANC enrolment was highest in 2021 (38.3%), declined to 13.9% in 2023, and increased to 26.1% in 2024. Uptake of PMTCT services among enrolled women was highest in 2021 and 2024 (41.7% each), with markedly lower uptake in 2022 and 2023. **Conclusion:** The uptake of PMTCT services among pregnant women living with HIV at ESUTH Parklane is encouraging, with notable progress in antenatal care enrollment and PMTCT service utilization. Strengthening follow-up systems, enhancing community awareness, and improving service integration are essential to sustain and improve PMTCT service uptake.

Keywords: PMTCT, HIV, Antenatal Care, Uptake, Pregnant Women, ESUTH Parklane.

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INTRODUCTION

Mother-to-child transmission (MTCT) of HIV occurs when the virus is passed from an HIV-positive mother to her infant during pregnancy, childbirth, or through breastfeeding [1–7]. While HIV-1 is more commonly transmitted from mother to child, HIV-2 is rarely transmitted through this route [8,9]. Since the emergence of HIV/AIDS in the early 1980s, over 79 million people have been infected globally, with nearly 39 million lives lost to the disease. In 2020, over 1.5 million individuals were newly infected with the virus. HIV has been reported in over 164 countries worldwide [10,11]. The majority of affected individuals are from Africa, Asia, Europe, and South America [10,11]. Nigeria has the largest HIV burden in Sub-Saharan Africa, with over 1.9 million people currently living with HIV [12]. AIDS-related deaths in Nigeria were estimated to be about 49,000 across all age groups in 2020 [12]. Worldwide, HIV is recognized to have two major types, HIV-1 and HIV-2, with various subtypes. HIV-1 is the major cause of the HIV epidemic in Nigeria, with subtypes A and G predominating in Southern and Northern Nigeria, respectively [12].

Each year, about 1.3 million women and girls living with HIV become pregnant worldwide [13]. Without intervention, the risk of HIV transmission from a mother living with HIV to her child during pregnancy, labour, delivery, or

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breastfeeding ranges from 15% to 45% [13]. However, with access to antiretroviral therapy (ART), this risk is significantly reduced. In 2019, 85% of HIV-positive pregnant women received ART globally [13].

As of recent data, out of the estimated 1.9 million people living with HIV in Nigeria, about 1.7 million have been placed on life-saving ART [12]. This represents approximately 90% of identified people living with HIV receiving treatment [12]. Data from the National Agency for the Control of AIDS (NACA) indicate that Nigeria has the highest number of new HIV infections among children globally. One out of every seven children born with HIV worldwide is born in Nigeria [12]. In 2016, Nigeria accounted for 37,000 of the 160,000 global paediatric HIV infections recorded among newborns [12].

HIV is transmitted through the exchange of infected body fluids such as blood, breast milk, semen, vaginal secretions, and saliva. It can also be transmitted from a mother to her child during pregnancy and delivery. Individuals who are adherent to ART and achieve viral suppression do not transmit HIV. Early access to ART and continued treatment are therefore critical for improving maternal health and preventing HIV transmission [10]. Maternal HIV infection not only worsens maternal outcomes but is also associated with an increased risk of mother-to-child transmission [14]. Factors that increase HIV transmission include blood transfusion, sharing of sharp objects, and unsafe sexual practices [15]. Viral infection during pregnancy is associated with adverse fetal outcomes such as fetal growth restriction and low birth weight. The risk of vertical transmission depends largely on maternal viral load, emphasizing the importance of strengthening Prevention of Mother-to-Child Transmission (PMTCT) services [15].

The World Health Organization (WHO) launched the Triple Elimination Initiative to reduce the incidence, morbidity, and mortality associated with HIV, syphilis, and hepatitis B while strengthening disease surveillance systems [16].

In alignment with this initiative, Nigeria implemented comprehensive PMTCT guidelines to reduce HIV transmission from mother to child. The guidelines follow a provider-initiated approach and include routine HIV testing and counselling for all pregnant women attending antenatal clinics, lifelong ART for all HIV-positive pregnant and lactating women irrespective of CD4 count or clinical stage, infant antiretroviral prophylaxis after birth, and early infant diagnosis through virological testing at six weeks of age [16].

The Prevention of Mother-to-Child Transmission (PMTCT) programme was introduced in Nigeria in July 2002 to reduce mother-to-child transmission of HIV [15]. According to WHO and UNICEF, PMTCT consists of four components: primary prevention of HIV among women of childbearing age and their partners, prevention of unintended pregnancies among women living with HIV, prevention of HIV transmission from women living with HIV to their infants, and provision of appropriate treatment, care, and support for women living with HIV and their children and families [13]. This study focuses primarily on the uptake of PMTCT services among pregnant women living with HIV attending ESUTH Parklane.

The impact of PMTCT in reducing the burden of HIV cannot be overemphasized. This study assessed the uptake of PMTCT services over a four-year period at Enugu State University Teaching Hospital (ESUTH), Parklane, as an index for evaluating the effectiveness of PMTCT services in the hospital.

Mother-to-child transmission remains the predominant route of HIV infection among children [17–20]. Poor health-seeking behaviour, delayed presentation to healthcare facilities, inadequate antenatal care attendance, and home deliveries continue to contribute to HIV transmission among pregnant women. In many instances, women present to health facilities only after complications arise, resulting in delayed HIV diagnosis and missed opportunities for PMTCT interventions.

Stigma associated with HIV infection also discourages some pregnant women from disclosing their HIV status or accessing PMTCT services, leading to poor utilization of available services and loss to follow-up. In addition, poor adherence to antiretroviral therapy remains a significant challenge and increases the risk of mother-to-child transmission.

Prevention of Mother-to-Child Transmission of HIV remains a vital public health programme that has contributed significantly to reducing HIV transmission and improving maternal and child health outcomes. Effective PMTCT improves the health of women living with HIV and increases the likelihood of delivering HIV-free infants.

ESUTH Parklane is a tertiary health institution with a multidisciplinary approach to HIV care. The hospital operates an Antiretroviral Therapy (ART) Clinic that provides comprehensive HIV services in collaboration with the Antenatal Care (ANC) Clinic, where PMTCT services are integrated for pregnant women living with HIV. This integrated model is not commonly available at the primary healthcare level, making ESUTH Parklane an appropriate setting for this study.

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The hospital also maintains an effective medical records unit, allowing access to reliable secondary data from ANC and ART clinics. A retrospective assessment of PMTCT services at ESUTH Parklane provides insight into antenatal care enrolment among pregnant women living with HIV and the uptake of PMTCT services using routine clinical records.

Objective of the Study

To assess antenatal care enrollment and uptake of Prevention of Mother-to-Child Transmission (PMTCT) of HIV services at ESUTH Parklane, Enugu State, South-East Nigeria.

METHODOLOGY

STUDY AREA

The study was conducted at the Enugu State University Teaching Hospital (ESUTH), Parklane, a state-owned tertiary health institution located in the Government Reserved Area (GRA), Enugu North Local Government Area of Enugu State, Nigeria. As a tertiary facility, ESUTH Parklane provides research, training, and specialized clinical services, including the management of people living with HIV (PLWHIV). The hospital's Antiretroviral Therapy (ART) Clinic works in collaboration with the Obstetrics Clinic to deliver integrated Prevention of Mother-to-Child Transmission (PMTCT) services within antenatal care (ANC) for pregnant women living with HIV (LWHIV).

Established in October 2008, the PMTCT program at ESUTH Parklane offers a comprehensive range of services, including HIV counselling and testing, initiation of antiretroviral therapy (ART), and pediatric HIV care.

Enugu State, where the hospital is located, is one of the 36 states of Nigeria, situated in the South-East region. The state has an estimated population of 4,690,100, according to the 2022 Nigerian Population Projection, and lies between latitudes 6°53′64″N and 7°43′56″N north of the equator and east of the Greenwich Meridian. The majority of the working population are business oriented and civil servants.

STUDY DESIGN

The study design was a four-year retrospective descriptive study that assessed antenatal care (ANC) enrollment and uptake of Prevention of Mother-to-Child Transmission (PMTCT) of HIV services at ESUTH, Enugu, Nigeria, from January 2021 to December 2024.

STUDY POPULATION

The study population included records of all HIV-positive pregnant women who presented at the Antenatal Care (ANC) Clinic of Enugu State University Teaching Hospital (ESUTH), Parklane, over a four-year period from January 1, 2021 to December 31, 2024.

INCLUSION CRITERIA

All records of HIV-positive mothers within the study period accessible at the medical records unit of the Antenatal Care Clinic of the hospital.

EXCLUSION CRITERIA

Records with incomplete or missing variables.

SAMPLE SIZE DETERMINATION

No formal sample size calculation was performed, as the study employed a census approach. All client records that met the inclusion criteria within the study period (January 2021 to December 2024) were retrieved for data collection.

SAMPLING TECHNIQUE

A census of all eligible records was used to select clients' folders at the medical records unit of the Antenatal Care Clinic of the hospital.

STUDY INSTRUMENT

Relevant information was obtained using a self-designed proforma containing the socio-demographic variables and structured to obtain data according to the specific objectives.

DATA COLLECTION METHOD

Secondary data were collected from clients' folders. The folders were identified and tracked through the booking registers in the Antenatal Care (ANC) and Anti-Retroviral Therapy (ART) Clinics of ESUTH Parklane. Relevant information, as outlined in the study proforma, was extracted from each folder.

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Data collection was carried out by the research team that had been trained prior to the commencement of the exercise. The entire data collection process lasted for a period of three weeks.

DATA MANAGEMENT

MEASUREMENT OF VARIABLES

A. Socio-demographic Characteristics

The socio-demographic characteristics of the participants were recorded as independent variables. These included age, marital status, religion, tribe, educational level, employment status, and parity. Each variable was analyzed individually to determine its distribution among participants. The results were summarized using descriptive statistics and presented in frequencies and percentages to show the pattern of socio-demographic characteristics among the study population.

B. Enrollment of Pregnant Women Living with HIV (LWHIV) for Antenatal Care (ANC)

This variable assessed the proportion of pregnant women living with HIV who enrolled for antenatal care (ANC) services at ESUTH Parklane between 2021 and 2024. Data were obtained from the HIV enrollment register for the specified period. The total number of HIV-positive pregnant women enrolled was presented using frequencies and percentages to show yearly trends.

C. Uptake of PMTCT Services Among Enrolled Clients

This variable measured the uptake of Prevention of Mother-to-Child Transmission (PMTCT) services among HIV-positive pregnant women enrolled for ANC at ESUTH Parklane between 2021 and 2024. Data were extracted from clients' records at the ART and ANC clinics. Uptake levels were analyzed using frequencies and percentages to illustrate service utilization patterns within the study period.

STATISTICAL ANALYSIS

Data were entered and analyzed using the Statistical Product and Service Solutions (SPSS) version 27. Descriptive statistics were employed to summarize the data. Frequencies and percentages were computed for categorical variables such as ANC enrolment and PMTCT uptake. Percentages were calculated using the total number of records with available data for each variable as the denominator.

Data corresponding to the study objectives were presented as annual frequencies and percentages and visualized using line charts to illustrate yearly distribution trends.

ETHICAL CONSIDERATION

Ethical clearance was obtained from the Health Research Ethics Committee of Enugu State University Teaching Hospital, Parklane, Enugu State.

Permission to collect data was obtained from the Head of Department of Obstetrics and Gynecology, Deputy Director of Nursing Services (DDNS), and Head of the Medical Records Unit of the hospital.

The confidentiality of the information collected from the registers and records was maintained as patients' personal information were replaced with their registration/hospital numbers.

LIMITATION

Incomplete data entries in the register and loss to follow-up on clients were major limitations in this study.

RESULTS

A total of 115 client records were retrieved from the Antenatal Care (ANC) enrollment register for analysis. All data were collected through patient registers and analyzed using Statistical Product and Service Solutions (SPSS) version 27. This chapter presents the findings according to the study objectives, namely the socio-demographic characteristics of participants, antenatal care (ANC) enrollment among pregnant women living with HIV (LWHIV), and uptake of Prevention of Mother-to-Child Transmission (PMTCT) services.

Socio-demographic Characteristics of Participants

Table 1: Socio-demographic characteristics of participants (n = 115)

Variables	Frequency	Percentage (%)
Age (years)		
≤20	1	0.9
20–40	99	86.1

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≥40	15	13.0
Mean Age ± S.D	**32.79 ± 5.71**	
Marital status		
Married	115	100.0
Religion		
Christianity	115	100.0
Tribe		
Igbo	111	96.5
Yoruba	2	1.7
Tiv	1	0.9
Kalabari	1	0.9
Education		
Secondary	36	31.3
Post-secondary	79	68.7
Employment Status		
Unemployed	49	42.6
Self-employed	44	38.3
Employed	22	19.1
Parity		
1	31	27.0
2	71	61.7
3	7	6.1
4	1	0.9
5	4	3.5
6	1	0.9

As presented in **Table 1**, the socio-demographic characteristics of the 115 participants showed that the majority (86.1%) were aged 20–40 years, with a mean age of 32.79 ± 5.71 years. All participants were married (100%) and Christians (100%). The predominant tribe was Igbo (96.5%). Regarding educational attainment, 68.7% had post-secondary education. For employment status, 42.6% were unemployed. The highest proportion of participants (61.7%) had a parity of two.

Enrollment of Pregnant Women Living with HIV (LWHIV) for Antenatal Care (ANC)

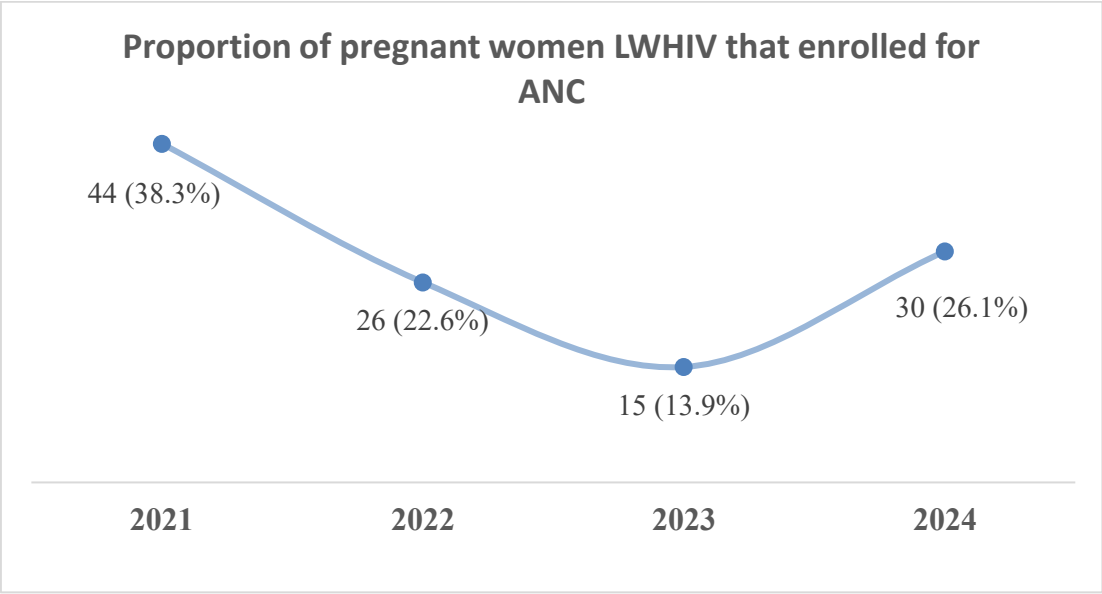


Figure 1: Proportion of pregnant women LWHIV that enrolled for ANC at ESUTH Parklane between 2021 and 2024.

As illustrated in **Figure 1**, the trend in the proportion of pregnant women living with HIV (LWHIV) who enrolled for antenatal care (ANC) services at ESUTH Parklane between 2021 and 2024. Out of the 115 pregnant women living with

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HIV who enrolled for ANC services during the four-year period, 44 (38.3%) enrolled in 2021, 26 (22.6%) in 2022, 15 (13.9%) in 2023, and 30 (26.1%) in 2024. The trend demonstrates a progressive decline in enrolment from 2021 to 2023, followed by a slight increase in 2024.

Table 2: Proportion of pregnant women LWHIV that enrolled for ANC at ESUTH Parklane between 2021 and 2024

Months	2021 N (%)	2022 N (%)	2023 N (%)	2024 N (%)
January	3 (42.9)	0 (0.0)	1 (14.3)	3 (42.9)
February	6 (50.0)	1 (8.3)	1 (8.3)	4 (33.3)
March	4 (28.6)	3 (21.4)	4 (28.6)	3 (21.4)
April	4 (33.3)	4 (33.3)	1 (8.3)	3 (25.0)
May	6 (60.0)	2 (20.0)	1 (10.0)	1 (10.0)
June	3 (42.9)	1 (14.3)	0 (0.0)	3 (42.9)
July	5 (38.5)	4 (30.8)	1 (7.7)	3 (23.1)
August	2 (22.2)	4 (44.4)	1 (11.1)	2 (22.2)
September	4 (36.4)	3 (27.3)	1 (9.1)	3 (27.3)
October	4 (57.1)	0 (0.0)	1 (14.3)	3 (42.9)
November	3 (33.3)	3 (33.3)	2 (22.2)	1 (11.1)
December	0 (0.0)	1 (20.0)	2 (40.0)	2 (40.0)

As presented in **Table 2**, the monthly distribution of pregnant women living with HIV (LWHIV) who enrolled for antenatal care (ANC) services at ESUTH Parklane from 2021 to 2024. The highest proportions of enrolment were observed in May 2021 (60.0%), October 2021 (57.1%), and February 2021 (50.0%).

Uptake of Prevention of Mother-to-Child Transmission (PMTCT) Services Among Enrolled Pregnant Women

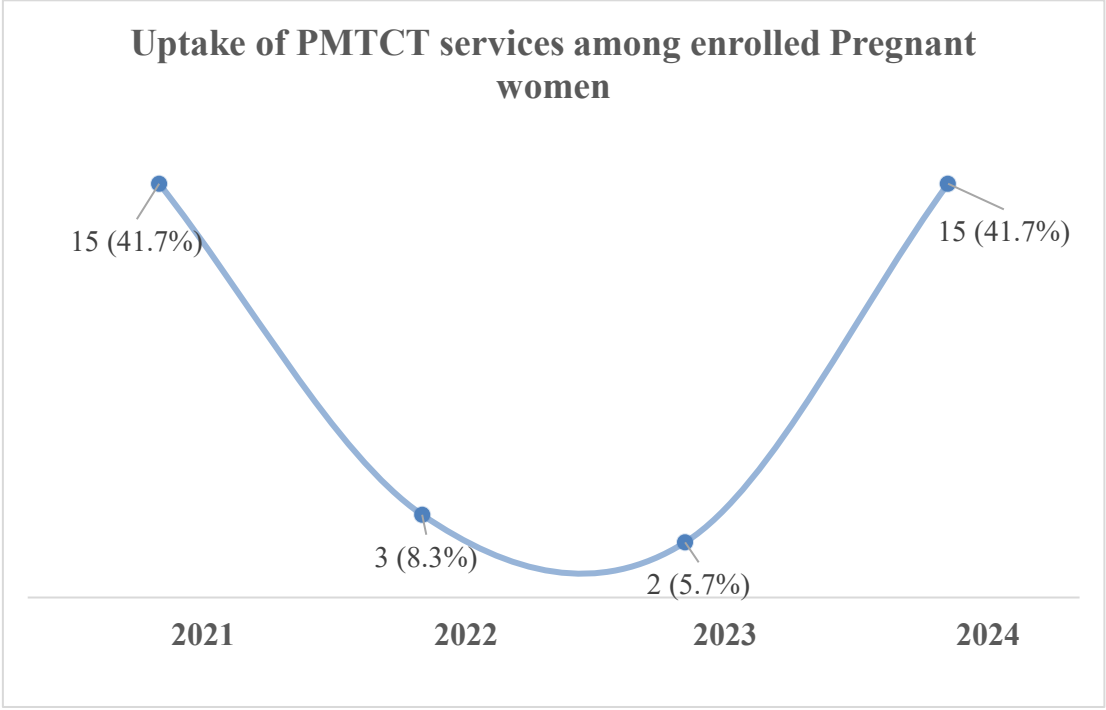


Figure 2: Uptake of PMTCT Services Among Enrolled Pregnant Women at ESUTH Parklane between 2021 and 2024.

As illustrated in **Figure 2**, the trend in the uptake of Prevention of Mother-to-Child Transmission (PMTCT) services among pregnant women living with HIV (LWHIV) enrolled for antenatal care (ANC) at ESUTH Parklane from 2021 to 2024. Out of 115 pregnant women living with HIV who enrolled for ANC services at ESUTH between 2021 and 2024, 35 (30.4%) accessed PMTCT services. The uptake of PMTCT services was highest in 2021 and 2024 (41.7% each), but was significantly lower in 2022 (8.3%) and 2023 (5.7%).

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Table 3: Monthly distribution of Uptake of PMTCT Services Among Enrolled Pregnant Women at ESUTH Parklane between 2021 and 2024

Months	2021 N (%)	2022 N (%)	2023 N (%)	2024 N (%)
January	1 (33.3)	0 (0.0)	0 (0.0)	2 (66.7)
February	3 (50.0)	0 (0.0)	0 (0.0)	3 (50.0)
March	3 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)
April	0 (0.0)	0 (0.0)	0 (0.0)	2 (100.0)
May	3 (75.0)	1 (25.0)	0 (0.0)	0 (0.0)
June	2 (50.0)	1 (25.0)	0 (0.0)	1 (25.0)
July	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)
August	0 (0.0)	0 (0.0)	0 (0.0)	2 (100.0)
September	1 (25.0)	1 (25.0)	1 (25.0)	1 (25.0)
October	1 (50.0)	0 (0.0)	0 (0.0)	1 (50.0)
November	1 (50.0)	0 (0.0)	0 (0.0)	1 (50.0)
December	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)

As presented in **Table 3**, the monthly distribution of uptake of PMTCT services among enrolled pregnant women at ESUTH Parklane between 2021 and 2024. The highest uptake was recorded in February 2021 and 2024, with three (3) women each, followed by March 2021 with three (3) women and May 2021 with three (3) women. Moderate uptake was observed in June 2021, June 2022, June 2024, and September 2021–2024, each with one (1) woman.

DISCUSSION

This study assessed antenatal care (ANC) enrollment and uptake of Prevention of Mother-to-Child Transmission (PMTCT) of HIV services at Enugu State University Teaching Hospital (ESUTH), Parklane, Enugu State, South-East Nigeria, between 2021 and 2024. The socio-demographic profile of the 115 participants showed that the majority were aged 20–40 years, with a mean age of 32.79 years. All participants were married and Christians. Most belonged to the Igbo ethnic group and had post-secondary education. The highest proportion of participants (61.7%) had a parity of two. This overall profile, particularly the age range of the women, closely aligns with regional patterns in Southeast Nigeria, where a high HIV prevalence is noted among women aged 18–31 years, corresponding to their peak reproductive years [14]. However, the finding that 42.6% of the participants were unemployed contrasts with a study in Anambra State, where a lower HIV prevalence of 9.5% was reported among unemployed women [21], suggesting that unemployment may not be directly correlated with HIV prevalence but rather reflects broader socioeconomic vulnerabilities. The higher proportion of unemployed participants in this study could be attributed to the fact that unemployed women, including students and housewives, may have more flexible schedules to attend antenatal clinic appointments and are therefore more likely to be captured in facility-based studies.

The findings of this study revealed that the proportion of pregnant women living with HIV (LWHIV) enrolled in antenatal care (ANC) at ESUTH Parklane was highest in 2021 at 38.3%. This observation aligns partially with a study in Mozambique, where HIV prevalence among pregnant women peaked at 42% in 2016 before declining to 27% in 2021, a trend attributed to the expansion of antiretroviral therapy (ART) and strengthened PMTCT services [22]. The relatively high enrollment observed in 2021 from this study may similarly reflect improved HIV testing, linkage to care, and early implementation of PMTCT interventions during that period. However, this finding contrasts with data from West Africa, such as Côte d'Ivoire, where only 65% of HIV-positive pregnant women accessed ANC and just 45% completed the recommended four visits, largely due to stigma, late booking, and poor follow-up systems [23]. The higher ANC enrollment in this study could therefore indicate better community sensitization and institutional support for HIV-positive pregnant women in Enugu.

Furthermore, findings from a systematic review and meta-analysis in Nigeria estimated a pooled HIV prevalence of 7.22% among pregnant women attending ANC services, which is considerably lower than the proportion observed in this study. When disaggregated by geopolitical zones, the review revealed marked regional disparities, with the South-East zone showing a much higher prevalence rate of 17.04% compared to 6.84% in the North-Central and 6.27% in the South-West [24]. This regional variation supports the present study's finding, as Enugu, being part of the South-East zone, falls within the region identified as having a higher HIV burden among pregnant women. The elevated ANC enrollment among LWHIV in ESUTH Parklane may thus reflect both the region's concentrated HIV prevalence and the role of the facility as a key referral center for PMTCT services in the South-East.

The uptake of PMTCT services at ESUTH Parklane was notably high, with 41.7% of enrolled pregnant women accessing Highly Active Antiretroviral Therapy (HAART) in both 2021 and 2024. However, when compared to findings from other regions, this rate appears relatively lower. A meta-analysis in East Africa reported maternal ART uptake at 88.3%,

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indicating significantly higher coverage in that region [25]. In Malawi, although 90% of pregnant women attending under-5 clinics received HIV counselling, only 66% initiated ART during pregnancy, highlighting barriers to treatment initiation despite high service availability [26]. Similarly, in Ghana, while institutional ANC coverage among HIV-positive pregnant women exceeded 80%, actual utilization of PMTCT services remained below 50%, suggesting that access alone does not ensure service use [27].

Within Nigeria, a national review showed a steady increase in ART uptake from 70% in 2015 to approximately 88% in 2020, reflecting strengthened PMTCT programs and improved service delivery [28]. Regionally, a study by the University of Nigeria, Enugu Campus, in collaboration with ESUTH Parklane, found that 93.8% of HIV-positive pregnant women accessed ART as part of PMTCT services, indicating strong program performance within the same institution [29]. The 41.7% uptake observed in the present study is therefore considerably lower than rates reported in East Africa, across Nigeria, and even within the same facility in earlier studies. This discrepancy may be due to contextual challenges such as irregular clinic attendance, inadequate follow-up, stigma, or financial constraints that limit consistent ART adherence and service utilization during the study period.

CONCLUSION

Based on the findings of this study, it is evident that the Prevention of Mother-to-Child Transmission (PMTCT) program at ESUTH Parklane has achieved considerable progress in promoting antenatal care enrollment and PMTCT service uptake among pregnant women living with HIV (LWHIV). The relatively high ANC attendance and uptake of PMTCT services observed in this study reflect improved awareness, accessibility, and institutional support for PMTCT services within the facility. However, variations in service uptake across the study period indicate the need for sustained interventions to improve continuity of care and maximize utilization of available PMTCT services. Strengthening follow-up mechanisms, enhancing community sensitization, and improving service integration are essential to sustain and further improve PMTCT service uptake among pregnant women living with HIV.

RECOMMENDATIONS

From the study findings, the following recommendations were made:

To the Enugu State Ministry of Health: Intensify community sensitization and HIV awareness campaigns to promote consistent ANC enrollment among pregnant women living with HIV (LWHIV). The high enrollment observed in 2021 suggests that outreach efforts and early testing initiatives are effective. Sustaining these interventions can enhance early identification and linkage to PMTCT services.

To ESUTH Parklane Management: Strengthen patient follow-up and retention strategies to improve PMTCT service uptake. The observed decline in uptake compared to earlier studies indicates a need for improved tracking systems, enhanced counseling services, and patient-centered interventions to minimize defaulting and loss to follow-up.

To Healthcare Providers: Continue promoting early antenatal booking, routine HIV testing, and timely initiation of PMTCT services through comprehensive health education and counseling for pregnant women.

To Researchers and Academic Institutions: Undertake further studies to explore the socio-economic, behavioral, and health system factors contributing to variations in ANC enrollment and PMTCT service uptake among pregnant women living with HIV. Such evidence will guide the development of context-specific interventions to strengthen PMTCT program outcomes in Enugu and similar settings.

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