Journal of Midwifery & Reproductive Health

JMRH.mums.ac.ir

Trends and Factors Influencing Uptake of the HIV-exposed Infants' Continuum of Care in a Humanitarian Setting: A Retrospective Analysis

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ARTICLE INFO

Article type:
Original article

Article History:
Received: 24-Oct-2023
Accepted: 30-Jul-2024

Key words:
HIV
Mother to Child Transmission
Program Evaluation
Pregnant Women
Pediatric HIV

ABSTRACT

Background & aim: Effective follow-up of mother-infant care is key to achieving the prevention of mother-to-child transmission (PMTCT) goals, yet service uptake gaps persist, risking HIV transmission to infants. This study aimed to assess the trends and factors influencing the uptake of the HIV-exposed infants' continuum of care in a clinic based in a humanitarian setting.

Methods: A retrospective census analysis was conducted using all available records of 163 HIV-exposed infants seen between February 2019 and February 2021 at the Family Support Clinic in Daudu, Benue State, Nigeria. Maternal and exposed infant characteristics, service uptake, and outcomes were assessed using a checklist informed by literature and guideline reviews. Child follow-up outcomes were further divided into those discharged or not discharged from the PMTCT program. Data was analyzed using chi-square statistics and logistic regression with SPSS version 26.

Results: Most mothers (71.2%) were aged 30 years or below, 62.6% had prior PMTCT experience, with only 6.7% reporting facility-based delivery. Service use decreased as infants matured, and PCR tests were performed on 66.6% of the infants before they reached 2 months of age. Only 1.2% were reported to be dead. Before maternal experience with PMTCT, significantly influencing the infants' outcomes, whereas maternal age between 26 and 30 years, early initiation of Cotrimoxazole, and the number of follow-up visits influenced infant discharge from care.

Conclusion: We recommend further studies investigating the decreasing use of PMTCT-exposed infant services as the infants mature. Interventions targeted at increasing the number of follow-up visits can help to increase PMTCT service uptake.

► *Please cite this Paper as*:
Ngwibete A, Oluwatobi Popoola V, Oluwasola S. Trends and Factors Influencing Uptake of the HIV-exposed Infants' Continuum of Care in a Humanitarian Setting: A Retrospective Analysis. Journal of Midwifery and ReProductive Health. 2026; 14(1): 1-11. DOI: 10.22038/jmrh.2025.75815.2233

Introduction

Nigeria has been ranked among the countries with the highest prevalence of mother-to-child HIV (Human Immunodeficiency Virus) transmission rate (1). HIV exposure is associated with increased morbidity and mortality(1,2). For this reason, a package of care has been recommended by the World Health Organization (WHO) to decrease the rate of morbidity and mortality among HIV-exposed infants (HEI) (2-3). The HIV-exposed infant services constitute a package of care to prevent mother-to-child transmission between an HIV-positive mothers to her baby. As outlined by the World Health Organization (WHO) and the National Guidelines for HIV Prevention, Care, and Treatment in Nigeria, infants and young children exposed to HIV must receive the following services as part of a comprehensive package: maternal Anti-retro viral (ART), maternal/HEI (HIV exposed Infants)

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care, adherence counselling, and monitoring; infant diagnostic services; ARV prophylaxis; co-trimoxazole prophylaxis; postnatal care and infant feeding in the context of HIV; and promotion of nurturing care (3-4).

Studies in Africa have highlighted significant attrition to care along the prevention of mother-to-child transmission (PMTCT) follow-up continuum (3). In Africa, 49 percent of women living with HIV are lost-to-follow-up (LTFU) between registration for antenatal care and delivery, 34 percent of infants exposed to HIV are LTFU by three months, and 45 percent of infants exposed to HIV are LTFU after their first HIV PCR test and before a definitive diagnosis (5). In Nigeria, lost to follow-up along this continuum has been reported to range from 40% 50%(3,5,6). Lack of support from husbands or family members; long distance to health facilities; poverty; community-level stigma, and the mother's age have been reported as reasons for LTFU (3,7-9). This is of significant public health concern, given that mother-to-child transmission could occur without appropriate interventions (3,7,8).

While studies in Nigeria have examined PMTCT service uptake and infant outcomes (3,7), evidence remains scarce in humanitarian settings, where risks may differ. MTCT rates have been documented to range between 2.8–3.6 % (3,7). In this study, maternal and health system factors were reported to affect uptake of HIV exposed infant services. These include rural residence, lack of maternal ART, mixed feeding, and low birth weight, which increased transmission risk(3). Young maternal age, long travel distance, non-use of family planning, and facility barriers contributed to high loss to follow-up(7). Also, no study in Nigeria has shown the trend and uptake of the HIV-exposed infant service component. This study aimed to investigate the trends in HIV–exposed infant service uptake and outcomes, as well as the factors that affect service delivery among this cohort in the Family Support Program Clinic (FSP) Duadu, located in the Guma Local Government Area (LGA) of Benue State.

Materials and Methods

The study assessed child follow-up data in the Family Support program Clinic (FSP) Daudu. FSP Daudu provides health services for displaced persons in the Daudu community, located in Benue State of Nigeria. The state has an HIV prevalence rate of 4.8%, which is the second highest when compared to other states in Nigeria (10). The facility is centrally located within the community and provides HIV/PMTCT care services along with other sexual and reproductive health and rights services to the displaced populace. A retrospective study design was used, with a written protocol guiding all steps to minimize variation during the review process for the study. The record sources were first mapped to confirm the availability of needed information, and the time frame was fixed to reduce selection error.

Exposed infants were first identified in the child follow-up register for the period from February 2019 and February 2021. The following eligibility criteria were applied: infants recorded as HIV exposed, enrolled in the register within the study period, had a linked maternal record, and had at least one documented follow-up visit. Infants were excluded if they were not recorded as HIV exposed, registered outside the study period, had no matching maternal folder, or had records with missing information that prevented the extraction of key variables. After eligibility screening, the folders of the mothers of the eligible infants were traced and reviewed.

A data abstraction manual with variable definitions and coding rules was used to strengthen consistency. The manual included details on how dates were to be entered, timing classification for prophylaxis, PCR results status, and outcomes. Discrepancies between the register and the folder were resolved by using the maternal folder as the primary source and the register as secondary.

Between February 2019 and February 2021, a total of 174 infants were due for discharge from the PMTCT care program at the facility. Of these, 163 folders had complete information about mother-infant characteristics of interest in the patient folders and register, which were reviewed for the study. Data, including maternal age, prior PMTCT experience, place of delivery, year of birth, and infant gender, timing of ARV prophylaxis, cotrimoxazole initiation, infant PCR sample collection as well as results, and infant outcomes were collected. Outcomes measured included: lost to follow-up (LTFU), died, HIV status, linked to

pediatric ART, and transferred out. Overall, the outcome in the program was further categorized into discharged or not discharged from the PMTCT program. A discharged infant was defined as an infant who had gone through the child follow-up program and was tested using HIV antibody testing strip after the complete cessation of breastfeeding at about one year and continued follow-up till about 18months of age. Infants whose HIV status was unknown were considered not discharged. The number of follow-up visits for each child was also noted.

All datasets were collected using a 12-point item checklist developed after a review of the national guidelines and literature. This checklist was inputted into Kobo Collect version 2021.2.4, which was used for data collection. The instrument underwent validation by a PMTCT focal person and a researcher, and its reliability was assessed on 20 mother-infants per record of children discharged in 2023 at a different facility using the Cronbach Alpha test, yielding a result of 0.87.

The study used existing facility records, and strict measures protected patient data and anonymity. No names or personal identifiers were entered into the dataset, as only information needed for the analysis was extracted. Each infant's folder was assigned a study code, and the list was stored in the researcher's encrypted laptop. We maintained hospital policy limiting access to the folders to the reviewers who were also staff at the facility. Data were entered on a password-protected device kept in a restricted office, and the final dataset contained no identifiers. All findings were reported in grouped form to prevent recognition of any mother or infant, and access to records was granted by facility management in line with local data protection procedures. As this study involved the retrospective review of existing medical records and did not involve any direct contact with patients, it did not require ethical clearance.

Data cleaning and analysis were done using SPSS version 23.0(IBM, Chicago). Mother-infant characteristics were crossed against the total number of infant visits. Bivariate analysis of Chi-squared statistics and Fisher's exact test was used to associate the timing of ARV prophylaxis, initiation of cotrimoxazole prophylaxis, and infant outcome with socio-demographic data. Multivariate Logistic regression was used to identify what factors significantly affect infants discharged from the PMTCT-child follow-up program. Graphs were used to demonstrate the timing of PCR testing uptake and results. Statistical tests used a significance level of 0.05.

Results

A total of 163 exposed infant records were evaluated. The majority of the records included in the study n: 91 (55.83%), were from 2020. Most of the mothers n= 63(38.7%), were between the ages of 26 and 30 years, with n=102(62.6%) having a prior PMTCT experience.

Table 1. Characteristics of respondents

Maternal characteristics	Frequency (%)
Maternal age range	
20 and below	12 (7.4)
21-25	41 (25.2)
26-30	63 (38.7)
31-35	26 (16.0)
36 and above	21 (12.9)
Prior PMTCT experience	
yes	102 (62.6)
No	61 (37.4)
Child characteristics	
Year	
2019	57 (35.0)
2020	91 (55.8)
2021	15 (9.2)
Place of delivery	
Facility delivery	11 (6.7)
Out-of-facility delivery	152 (93.3)
Gender	
Male	80 (49.1)
Female	83 (50.9)
Number of child follow-up visits	
6 visits and below	130 (79.8)
Greater than 6 visits	33 (20.2)

Up to 130(79.8%) of the infants enrolled in the program had 6 visits or below. Facility delivery was reported only in 6.7% of the records assessed (Table 1).

Association between mother and infant characteristics with the timing of ARV

All infants received ARV prophylaxis, with a majority (n = 153, 93.8%) receiving it within 72 hours of delivery. Maternal and infant characteristics did not significantly affect the timing of ARV prophylaxis (Table 2).

Table 2. Association between mother/ infant characteristics and timing of ARV prophylaxis

Maternal characteristics	Timing of ARV prophylaxis		Chi-square Test	P-Value
	within 72 hours of birthing	after 72 hours of birthing		
	Frequency (%)	frequency (%)		
Maternal age range				
20 and below	12 (7.8)	0 (0.0)	3.81	0.36
21-25	36 (23.5)	5 (50.0)		
26-30	60 (39.2)	3 (30.0)		
31-35	24 (15.7)	2 (20.0)		
36 and above	21 (13.7)	0 (0.0)		
Prior PMTCT experience				
yes	93 (60.8)	9 (90.0)	0.64**	0.58
No	60 (39.2)	1 (10.0)		
Infants' characteristics				
Year				
2019	55 (35.9)	2 (20.0)	2.27	0.39
2020	85 (55.6)	6 (60.0)		
2021	13 (8.5)	2 (20.0)		
Place of delivery				
Facility delivery	11 (7.2)	0 (0.0)	0.38**	0.48
Out-of-facility delivery	142 (92.8)	10 (100.0)		
Gender				
Male	74 (48.4)	6 (60.0)	0.51	0.35
Female	79 (51.6)	4 (40.0)		
Number of child follow-up visits				
6 visits and below	121 (79.1)	9 (90.0)	0.41**	0.36
Greater than 6 visits	32 (20.9)	1 (10.0)		

** Fisher's exact test

Association between age of cotrimoxazole initiation and mother-child characteristics

Up to n=102(62.6%) of infants received cotrimoxazole prophylaxis at less than 2 months after birth. Maternal prior PMTCT experience and the infant's Gender significantly affected the age of cotrimoxazole initiation. The majority of the infants enrolled in the program, n=76 (74.5%), whose parents had a prior PMTCT experience, initiated cotrimoxazole within 2 months after delivery. This was statistically significant at chi-square =16.57, P= 0.00. Up to n=61(59.7%) female babies also initiated cotrimoxazole at less than 2 months of age. This was statistically significant at chi-square 8.61, P=0.003 (Table 3).

PCR service uptake.

In Figure 1 bellow, out of the 163 infants, 108 (66.3%) had done a PCR test before 2 months of age, while 53(32.5%) did so at 2 months or older. 1% of the infants had no record PCR test. As seen in Figure 1, up to 56% of the infants had received a PCR result, which was all negative. The majority of the results were recorded in 2020 among 56 (34.4%) of the respondents.

The age of exposed infants reporting for a rapid test ranged from 18- 29 months, with a mean age of 19.3± 1.9. Only 73 (45%) of the infants had a rapid antibody diagnostic test, which turned out negative, and were not linked to ART. Two (1.2%) died, 81(49.7%) had stopped breastfeeding but were yet to report for testing, and 7(4.3%) were still breastfeeding and yet to be tested. There was no report of MTCT in the setting. Maternal Prior PMTCT experience, infant year of birth, Place of delivery, and timing of Cotrimoxazole initiation significantly affected infant outcome.

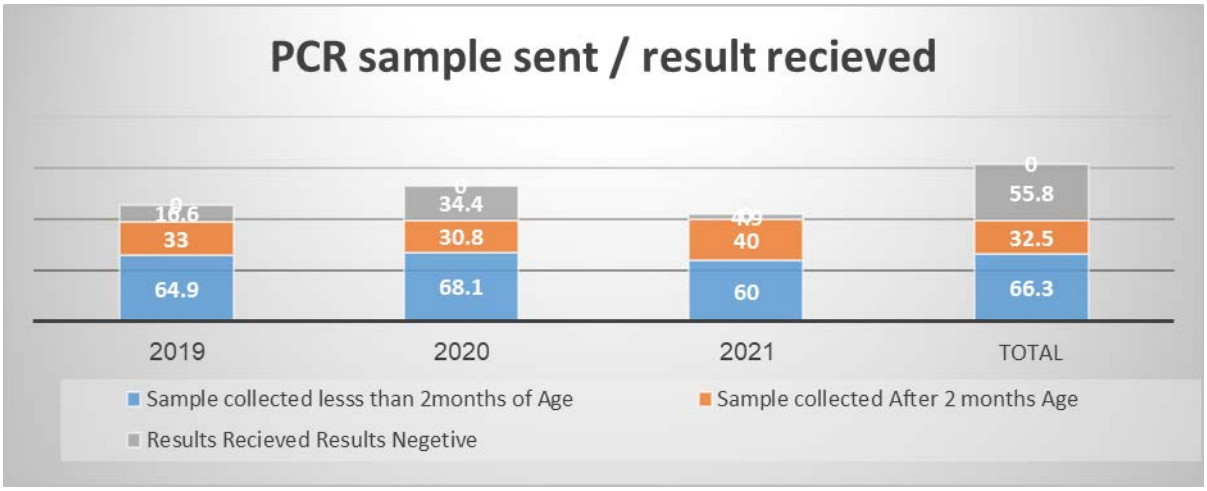

Figure 1. Distribution of timing of infant PCR sample sent / results received against year of enrollment
Association between Maternal and Infant characteristics and follow-up outcomes

Table 3. Association between age of Cotrimoxazole initiation and mother-infant characteristics

Maternal characteristics	CTX initiation		chi-square test	P-Value
	Less than 2 months after birth	more than 2 months after birth		
	Frequency (%)	Frequency (%)		
Maternal age range				
20 and below	9 (8.8)	3 (4.9)	5.32**	0.25
21-25	25 (24.5)	16 (26.2)		
26-30	40 (39.2)	23 (37.7)		
31-35	19 (18.6)	7 (11.5)		
36 and above	9 (8.8)	12 (19.7)		
Prior PMTCT experience				
yes	76 (74.5)	26 (42.6)	16.57	<0.001*
No	26 (25.5)	35 (57.4)		
Infants' characteristics				
Year				
2019	37 (36.3)	20 (32.8)	1.84	0.41
2020	58 (56.9)	33 (54.1)		
2021	7 (6.9)	8 (13.1)		
Place of delivery				
Facility delivery	8 (7.8)	3 (4.9)	5.52**	0.47
Out-of-facility delivery	94 (92.2)	58 (95.1)		
Gender				
Male	41 (40.2)	39 (63.9)	8.61	0.003*
Female	61 (59.8)	22 (36.1)		
Number of child follow-up visits				
6 visits and below	80 (78.4)	50 (82.0)	.296	0.59
Greater than 6 visits	22 (21.6)	11 (18.0)		

** Fisher's exact test

Up to 43(58.9%) of infants who were tested for HIV status after the program were of mothers with a prior PMTCT experience (chi-square=15.165, P=0.002). Slightly above half 40(54.79%) of those tested entered the program in 2020 (chi-square=34.774, P=0.000). A total of 72(98.63%) of those tested gave birth out of the facility (chi-square=4.029, P=0.02). The majority,

38(52%) of those who initiated cotrimoxazole prophylaxis before 2 months of age were tested (chi-square=11.858, P= 0.008). All infants who died had fewer than 6 child follow-up visits (Table 4).

Table 4. Association between Maternal/infant characteristics and Infant child-follow-up outcome

Maternal characteristics	Infant Outcome				chi-square	P-Value
	RVST negative, not linked to ART	Died	Stopped breastfeeding, yet to be tested	still breastfeeding		
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)		
Maternal age range						
20 and below	9 (12.3)	0 (0.0)	2 (2.3)	1 (14.3)	10.03	0.61
21-25	10 (13.7)	0 (0.0)	33 (37.9)	2 (28.6)		
26-30	29 (39.7)	2 (100.0)	32 (36.8)	2 (28.6)		
31-35	10 (13.7)	0 (0.0)	15 (17.2)	1 (14.3)		
36 and above	15 (20.5)	0 (0.0)	5 (5.8)	1 (14.3)		
Prior PMTCT experience						
Yes	43 (58.9)	1 (50.0)	54 (62.1)	4 (57.1)	*15.165*	*.002**
No	30 (41.1)	1 (50.0)	27 (31.0)	3 (42.9)		
Year						
2019	25	1 (50.0)	29 (33.3)	2 (28.6)	*34.774*	*<0.001**
2020	40	1 (50.0)	45 (51.7)	5 (71.4)		
2021	8	0 (0 .0)	7 (8.1)	0 (0.0)		
Place of delivery						
Facility delivery	1	1 (50.0)	9 (10.3)	0 (0.0)	4.029	.029*
Out-of-facility delivery	72	1 (50.0)	72 (82.8)	7 (100.0)		
Gender						
Male	38	0 (0.0)	41 (47.1)	1 (14.3)	*3.27*	0.35
Female	35	2 (100.0)	40 (46.0)	6 (85.7)		
Timing of ARV prophylaxis						
within 72 hours of birthing	69	0 (0.0)	81 (93.1)	3 (42.7)	1.56	0.67
after 72 hours of birthing	4	2 (100.0)	2 (2.3)	4 (57.1)		
CTX initiation						
Less than 2 months after birth	38	1 (50.0)	58 (66.7)	5 (71.4)	*11.86*	*.008**
more than 2 months after birth	35	1 (50.0)	23 (26.4)	2 (28.6)		
Child follow-up visits						
6 visits and below	66	2 (100.0)	58 (66.6)	4 (57.1)		
Greater than 6 visits	7	0 (0.0)	23 (26.4)	3 (42.9)	11.133	0.084

Multivariate analysis of maternal and infant characteristics and infant discharge status

Figure 2 illustrates the trends in HIV exposed infant service uptake at the facility from delivery to discharge. Only 73 (45%) of infants had been discharged from the child follow-up program. A multivariate logistic regression analysis revealed that maternal age, timing of cotrimoxazole initiation, and the number of follow-up visits for children were significant factors in determining whether an infant would be discharged from the PMTCT program. The majority of women who discharged their infants were between 26-30 years old. These women were 5.8 times more likely to have a discharge than women 20 years and below. This was statistically significant at P= 0.01, 95%CI (1.52-22.0). Most children, 38 (52%), who were discharged, had received cotrimoxazole prophylaxis before 2 months of

age. These children were 2.9 times more likely to be discharged from the program than those who took it much later, p = 0.02, 95% CI (1.20-7.21**)**. This was statistically significant a p=0.02. Additionally, the odds of a baby being discharged from care were 3.83 times higher for every additional child follow-up visit. This was statistically significant (p = 0.004, CI = 1.55, 9.45) (Table 5).

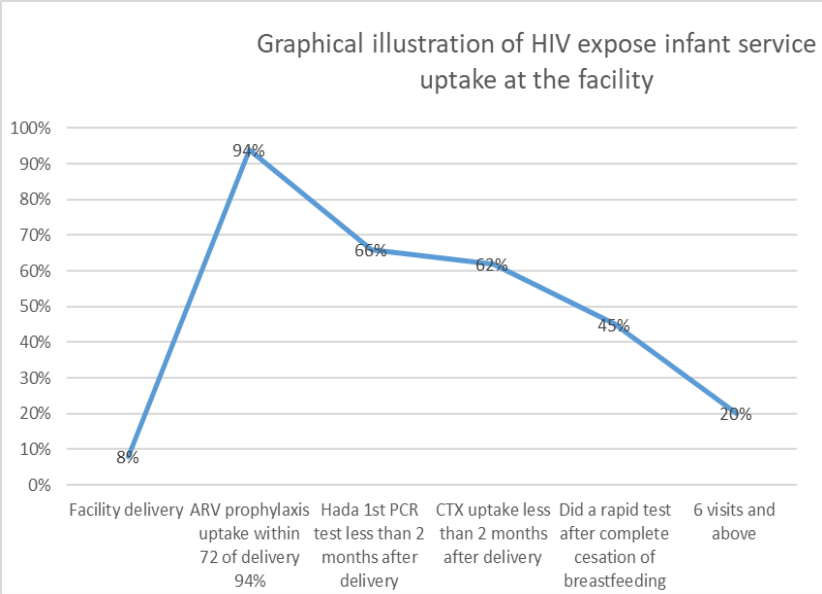

Figure 2. Graphical illustration of trends in HIV exposed infant service uptake at the facility

Table 5. Association between infant discharge status and maternal /infant characteristics

Maternal characteristics	PMTCT status		P-Value	AOR (95% CI)
	Discharged from the PMTCT program	Not discharged PMTCT program		
	Frequency (%)	Frequency (%)		
Maternal characteristic				
Maternal age range			REF	
20 and below	9 (12.3)	3 (3.3)	.276	
21-25	10 (13.7)	31 (34.4)	.010*	0.337(.048-2.38)
26-30	29 (39.7)	34 (37.8)	.115	5.773(1.52-22.0)
31-35	10 (13.7)	16 (17.8)	.073	2.611(.792-8.60)
and above 36	15 (20.5)	6 (6.7)	REF	3.442(.89-13.3)
Prior PMTCT experience			0.83	
Yes	43 (25.9)	59 (65.6)	REF	
No	30 (41.1)	31 (34.4)	.276	0.911(0.39-2.13)
Exposed infants' characteristics				
Year				
2019	25 (34.2)	32 (35.6)	REF	
2020	40 (54.8)	51 (56.7)	0.501	.64(.17-2.37)
2021	8 (11.0)	7 (7.8)	0.709	1.26(.38-4.14)
Place of delivery			REF	
Facility Delivery	1 (1. 4)	10 (11.1)	0.09	6.7(0.76-59.2)
Out-of-Facility delivery	72 (98.6)	80 (88.9)	REF	.64(.17-2.37)
Exposed infants'				

Maternal characteristics	PMTCT status			
	Discharged from the PMTCT program	Not discharged PMTCT program	P-Value	AOR (95% CI)
	Frequency (%)	Frequency (%)		
characteristic				
Gender				
Male	38 (52.1)	42 (46.7)	REF	
Female	35 (47.9)	48 (53.3)	0.83	1.08 (.52-2.25)
Timing of ARV prophylaxis			REF	
"72 Hours after delivery"	69 (94.5)	84 (93.3)	.44	.53(.109-2.60)
more than 72hrs after delivery	4 (5.5)	6 (6.7)	REF	
CTX initiation			0.02*	2.96(1.20-7.21)
Less than 2 months after birth	38 (52.1)	64 (71.1)	0.004*	3.83(1.55-9.45)
more than 2 months after birth	35 (47.9)	26 (28.9)	REF	1.08 (.52-2.25)
Number of child follow-up visits	73 (44.8)	80 (55.2)	0.83	

•Discharge implies an infant who had stopped breastfeeding was physically and clinically evaluated, and a rapid HIV test was done at 18 or later to determine the outcome of the child's PMTCT program

Discussion

We evaluated outcomes of women following PMTCT cohort registration in a displaced setting. The study revealed that while there were no new infections following in the cohort, most women do not give birth in a facility, and more than 93% of infants got ARV prophylaxis within 72 hours of birth. 62% of the children started taking cotrimoxazole within 2 months following delivery. This was significantly linked to the mother's previous experience with PMTCT and the gender of the newborn. While the majority of infants underwent a PCR test, only 45% actually showed up for discharge.

Within the broader concept of child health care intervention, HIV-exposed children need to receive comprehensive care, which comprises several follow-up visits, prophylactic treatment, and testing to prevent or detect HIV infection at an earlier stage (11-12). This is only effective if mothers can comply with the directives of care to ensure appropriate management (3,11).

Our findings show that the majority of the infants had fewer than 6 visits, with the majority of the mothers being between the ages of 26 and 30 years. More than half (62%) of the women had a prior PMTCT experience. However, only 8% of the infants were born in a health care facility. Apart from the three initial postnatal visits recommended by the WHO for all women and infant pairs following birth (12). This was contrary to our findings. The reason behind this may be due to the fact that the study was in a humanitarian setting where migration in search of security, food, and shelter is likely. However, generally, the uptake of postnatal services in Africa, especially among low-income and displaced settings, is relatively low (13–15). Aside from the fact that displaced persons tend to migrate, other challenges such as inadequacy in physical resources, cultural issues, health provider-related issues, poor communication between caregiver and receiver, and inadequacy in monitoring and evaluation systems(6,4) have been postulated as reasons for low uptake of postnatal services in these settings. These challenges, along with the issue of stigma, affect the reception of postnatal care among HIV-positive women (16). These same reasons have also been implicated as reasons behind the low uptake of facility-based delivery in low-resource and displaced settings (13,18). Although reports show that HIV-positive women in Nigeria give birth at health facilities, the majority of displaced women continue to give birth at home (15).

Our findings showed that the uptake of ARV prophylaxis was high; however, it was not significantly affected by maternal or infant

characteristics. This may be because in this setting, women are given ARV prophylaxis prior to delivery. This is to avert the danger of the child not receiving his/her prophylaxis due to the uncertainties that come along with displacement. For this reason, the women are trained on the method of administration and dosage prior to delivery. However, our study contradicts studies in Zimbabwe and Kenya, where the use of ARV prophylaxis was lower (slightly above 50%). Other studies have shown that the number of follow-up visits, facility delivery, disclosure, and urban residence were factors that affected the uptake of ARV prophylaxis (17,18). These studies, however, focused on non-humanitarian settings where uncertainties that affect health uptake are low. Hence strategy of giving women ARV before delivery may not be in place since these women are expected to report to the facility for ARV prophylaxis following delivery.

The major findings of our study showed that the PMTCT service most exposed infants received included uptake of ARV prophylaxis, 1st PCR test, and cotrimoxazole preventive therapy before 2 months of age. In our study, we observed a 20% decline in service utilization by the time infants received their first PCR test or Cotrimoxazole (CTX) preventive therapy, with only 45% of infants undergoing HIV rapid testing. In practice, women-infant pairs are encouraged to report for PCR testing 6-8weeks post-delivery. At this point, CTX is initiated to be continued throughout the breastfeeding period until the infant's discharge from the program (11). However, drug and testing kits stockouts have been reported as a primary concern in health care delivery in times of displacement (6,22). This may be the reason behind the low uptake of services post-partum in our study. A facility assessment of PMTCT service delivery in the setting could be conducted to determine if such shortages exist.

Facility delivery was the least used service. In a study in Nigeria, it was reported that the greatest LTFU in PMTCT care occurs before delivery, and only 66% of children complete the program (20). The same finding has been reported in rural Kenya(22). This shows that a significant number of the HIV-positive women give birth at home despite the risk associated with this practice. Although our findings showed similar results, the number of discharged children was lower (45%). This may be because of factors related to the displacement. A study in an IDP camp in Nigeria revealed poor optimization of PMTCT services, with uptake rates as low as 50% (6). This was linked to the lack of availability of services and resources, as well as factors related to displacement. Logistic regression analysis revealed that women aged 26-25, CTX initiation, and the number of children have a significant effect on the uptake of the rapid testing service. This indicates that younger women are likely to make a conscious effort to prevent MTCT. Constant health education on daily CTX use, along with the benefits of decreased risk of HIV-associated opportunistic infection that comes with CTX uptake in exposed infants, prompts women to use CTX. However, because of drug stockouts, CTX uptake may be delayed. In our study, for every additional child follow-up visit, there was a 3.83 chance of an infant being discharged. This confirms that regular use of a service that exposes women to more information about the uptake and benefits of services provided could improve service uptake.

One major limitation of the study is its retrospective design, which resulted in incomplete data that affected the completeness of the analysis. Additionally, the study was limited to a single setting with a relatively small sample size, which limited the generalizability of the results. However, the major strength lies in the use of data that includes both maternal and infant characteristics that are related to the continuum of care. Also, the study focuses on a pertinent reproductive health issue in humanitarian settings, highlighting the need for tailored intervention and program improvement to eliminate mother-to-child transmission of HIV.

Conclusion

Our study revealed that PMTCT child service delivery is not fully optimized in the displaced setting, as indicated by the declining utilization of child follow-up services. However, the facility reported no incidence of child HIV acquisition during the program. Factors such as maternal age, prior PMTCT experience, timing of cotrimoxazole initiation, and number of child follow-up visits significantly influenced infant outcomes and discharge from the PMTCT program, highlighting the need for targeted

interventions to improve access and utilization of services. The study highlights the importance of strengthening child follow-up through community health education, increased resources, and culturally sensitive interventions to enhance PMTCT uptake. It also highlights the importance of robust monitoring and evaluation to track program implementation and outcomes, reducing the risk of new infections in vulnerable populations. Further research is, however, needed to explore the specific factors influencing the decline in child follow-up services along the continuum of PMTCT care.

Declerations

Acknowledgments

We acknowledge the institutions and facility staff who provided the data and facilitated data collection

Conflicts of interest

The authors declared no conflicts of interest.

Ethical considerations

This study utilized secondary data, with no new data being collected directly from participants. We maintain strict confidentiality with all records used.

Code of Ethics

The research adhered to established ethical principles for the use of secondary data, including respect for privacy, integrity in reporting, and compliance with institutional and national guidelines.

Use of Artificial Intelligence (AI)

AI (Grammarly) was used for grammar checks and refinement of the manuscript

Funding

This article received no funding.

Authors' contribution

AN development of proposal, data extraction, coordination, data analysis, and manuscript drafting and editing

VOP data collection checklist design and refinement, supported manuscript review,

SO literature review, contextual interpretation of findings, and manuscript structuring and final editing.

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