A RETROSPECTIVE ANALYSIS OF MATERNAL AND PREGNANCY OUTCOMES FOLLOWING PMTCT MATERNAL COHORT REGISTRATION IN A DISPLACED SETTING

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ABSTRACT

BACKGROUND/AIM: This study assessed maternal and pregnancy outcomes following the Prevention of Mother-to-Child Transmission (PMTCT) cohort registration in a displaced setting.

Methods: A retrospective analysis of HIV-positive pregnant women's outcomes following enrollment in the maternal PMTCT register between January 2019 and December 2021 in FSP Daudu. Using a checklist, data was collected from the folders and PMTCT maternal register. Measures of interest included sociodemographic characteristics maternal outcomes and pregnancy outcomes.

RESULTS: Of 223 HIV-positive pregnant women, 201 were enrolled in the program. However, only 189 maternal records met the inclusion criteria. Registration for the PMTCT program occurred primarily during the prenatal period, between the ages of 26 and 30, with a mean gestational age of 15.2 weeks. Only 5.95 reported facility delivery, and up to 70% had over 4 PMTCT follow-up visits before delivery ($\chi 2 = 6.825$, $P = 0.03$). The retention rate among the cohort was 98.4%, with 62 % of the women being active throughout the program and over 86% having a live birth. Most miscarriages occurred during the first trimester. Bivariate analysis suggested that aside from maternal age, similar factors affected maternal and pregnancy outcomes. These factors include maternal prior PMTCT experience, total number of visits, and the place of delivery.

CONCLUSIONS: Active follow-up and documentation constitute an effective strategy to improve PMTCT maternal retention in care and improve patient outcomes. Ensuring that women are active in PMTCT care by engaging community health workers in service delivery will create positive outcomes in the program.

KEYWORDS: PMTCT, HIV, Maternal health, Pregnancy.

(The Ethiopian Journal of Reproductive Health; 2024; 16; 32-42)

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INTRODUCTION

The Prevention of Mother-to-Child Transmission (PMTCT) of the Human Immunodeficiency Virus (HIV) follow-up program for pregnant women program focuses on Prongs 3 and 4 of the PMTCT, which are: to prevent HIV transmission from a woman living with HIV to her infant (prong 3); and to provide appropriate treatment, care, and support to women living with HIV and their children and families (prong 4)[1]. In most facilities that run the PMTCT program, health providers Integrate information about HIV and Acquired immunodeficiency syndrome (AIDS) as well as education on PMTCT care options to empower women/men about the need to be retained in care during pregnancy. In most countries, Nigeria inclusive, the Option B+ approach has been implemented in the PMTCT care[2,3]. Option B+ is a vertical transmission prevention strategy in which pregnant HIV-positive women are offered lifelong medication regardless of their CD4 status. This strategy offers benefits such as protection for the partner(s) and (unborn) kid, as well as health benefits for the woman[4]. However, there exist numerous challenges with implementing the PMTCT program and the Option B+ approach. In a study in Nigeria and Malawi, findings suggested that challenges in PMTCT program implementation centered around economic and sociocultural factors, limited male involvement, the organization of PMTCT service delivery, as well as factors centered around health workers' inefficiency[5,6]. These same factors affect sexual and reproductive health and rights (SRHR) services including PMTCT in displaced settings[7,8]. In a study by Wut et al., (2017), that examined the outcomes of women in a PMTCT cohort it was highlighted that there was a low mother-to-child transmission rate but high loss-to-follow-up of mother-infant pairs[9]. This same finding has been discovered in other places like Ethiopia, where pregnant women on lifelong antiretroviral therapy (ART) had improved health outcomes than those on short term prophylaxis[10]. Although there are many studies evaluating the PMTCT program, there is little literature on maternal outcomes following PMTCT registration. Most studies have focused on, retention, LTFU and infant outcomes[10,11]. The exposure to sexual and reproductive health and right (SRHR) challenges and risk of LTFU in care due to migration by women in this area is a major public health concern. However , there are limited studies that examine or evaluate the outcomes of maternal PMTCT follow-up in displaced settings. Maternal PMTCT outcomes as prescribed by the Federal ministry of Health (FMoH) include: active in PMTCT, transferred out, transferred to another PMTCT, transition to an ART clinic, LTFU, and death[12]. According to Resnik, (2019), one major outcome of every pregnancy that needs to be examined is the proportion of life births, still births and miscarriages amongst others[13]. Based on this background, this study examines pregnancy and maternal outcomes following PMTCT cohort registration in a displaced setting in Nigeria.

Background of PMTCT services at the Family Support program (FSP) Clinic Daudu

The FSP Daudu clinic is located in the Guma local government area (LGA) of Benue state. It provides SRHR care, pediatric and general medical care in the community. The facility provides PMTCT care as part of its ART clinic. When a pregnant HIV positive woman presents at the facility, she is enrolled into the PMTCT program and is registered in the PMTCT maternal cohort register. She is then encouraged to seek ANC care alongside PMTCT care. ANC and PMTCT services are integrated however, records are kept separately. The woman is then scheduled for follow-up visits with the facility. During each visit, she is clinically assessed, and records are kept in her folder and in the PMTCT maternal cohort register. To aid follow-up and improve attendance, trained community health workers, including mentor mothers and traditional birth attendants function, as adhoc staff who assist with PMTCT activities. This practice has been recommended to improve program performance[14].

These volunteers assist with maternal follow-up, drug pickup, health education, tracking of LTFU and other activities aimed at improving maternal health and having a positive PMTCT experience. The facility also runs a mother-to-mother support group activity, in which women in the PMTCT program come together to share experience on how to live healthy with HIV and bring forth healthy HIV-negative babies. All HIV services including PMTCT services are offered free.

MATERIAL AND METHODS

This was a retrospective analysis of PMTCT pregnancy outcomes of HIV women's outcomes who enrolled in the PMTCT maternal cohort register between January 2019 and December 2021 in FSP Daudu. Since 2018, the people of Benue and the Fulani have been in a clash over farming and grazing land and this clash has caused the displacement of over one million people (IDMC & NRC, 2019). These displaced persons are faced with SRHR issues, including HIV and AIDS. According to the Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS) report, the state has an HIV prevalence of 4.3%[15].

Both patient folders and the PMTCT maternal cohort register of those who enrolled in the PMTCT maternal cohort register were reviewed. Figure 1 shows the flow chart of studies included in the study. A checklist which was developed following a review of literature and indicators listed in the PMTCT register was used. The checklist was pilot tested on 18 records of women who used the PMTCT maternal service in 2018. The Cronbach's Alpha test was used to test for reliability and the instrument was found reliable at 0.927, (P value =0.000). The checklist was inputted into the Kobo toolbox to collect the data. Four research assistants were trained in data collection. Permission was sort form the State ministry of Health and head of the facilities clinic to assess the records.

Source of data and measures

Each mother's demographic and clinical data was captured in her folder and in the register during each visit. These included, age, date of enrollment in the ART, gestational age (GA) of registration and point of entry (Antenatal, intra-natal or post-natal). Each time a mother or mother/infant pair reported to the clinic for follow-up , the outcome measures were evaluated.

Measures of interest included sociodemographic characteristics, maternal outcomes as prescribed by the maternal cohort register and pregnancy outcomes. Maternal outcomes included: active in maternal PMTCT, transfer to an ART clinic (positive outcomes), transfer to another maternal PMTCT ,loss to follow-up (LTFU), death of the woman(negative outcomes), while pregnancy outcomes included miscarriage/still-birth (negative outcomes) or life birth (positive outcomes) . Active in PMTCT was defined as having over 4 PMTCT visits while out of facility delivery included delivery out of a hospital setting.

Data Analysis

Data were imported into SPSS 23, cleaned, and analyzed. The data was represented in charts and tables. Bivariate analysis of chi-square/Fisher's exact test was used to associate the sociodemographic characteristics of respondents to maternal outcomes and pregnancy outcomes. Outcomes were classified as good or poor by scoring participants' responses. Negative maternal outcomes were assigned a -1 and positive outcomes were assigned a +1. After summations, outcomes with a negative sum were classified poor. Retention in care was defined as mothers who stayed in care till the end of her pregnancy. Maximum score of maternal and pregnancy out comes was 2 and 1 respectively.

RESULTS

A total of 223 women were pregnant during the study period, however, only 201 women were registered in the PMTCT maternal cohort register, of this,189 records met the inclusion criteria. However only 186 were examined (figure 1)

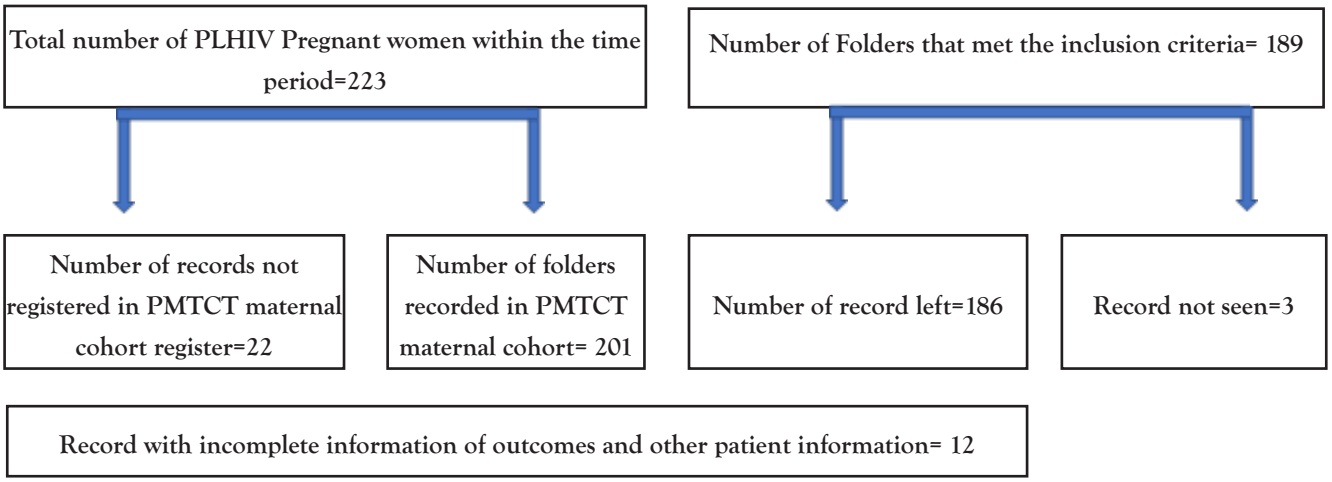

Fig. 1: Flow chart of records included in the study

Sociodemographic characteristics of respondents

Table 1 shows that about one-third of the respondents 68(36.6%) were between 26-30 years of age, with a mean age of 28.8 ±5.6 years. The major point of entry was during the antenatal care total of 99% of the respondents were on a first-line regimen. Most women were enrolled into the PMTCT program in their first trimester (64.5%) and the mean gestational age at PMTCT registration was 15.2weeks. Up to 64% of the respondents started PMTCT after 1 year of enrollment in ART, while 58.1% had prior PMTCT experience. Most participants 116 (62.4%) had a minimum of four a PMTCT visits however, majority 175(94.1%) of the women gave birth out of the facility.

Pregnancy/maternal outcomes of women who received maternal PMTCT services

In Figure 2, of the 186 respondents, 116 (62.4%) were active throughout the PMTCT visit. 171(91.9%), transferred to an ART clinic after PMTCT while 12(6.5%) transferred from PMTCT to another PMTCT program. Only 2 (1.1%) women were LTFU while 1 maternal dead was recorded (giving a retention rate of 98.4%) and 163(87.6%) had a live birth

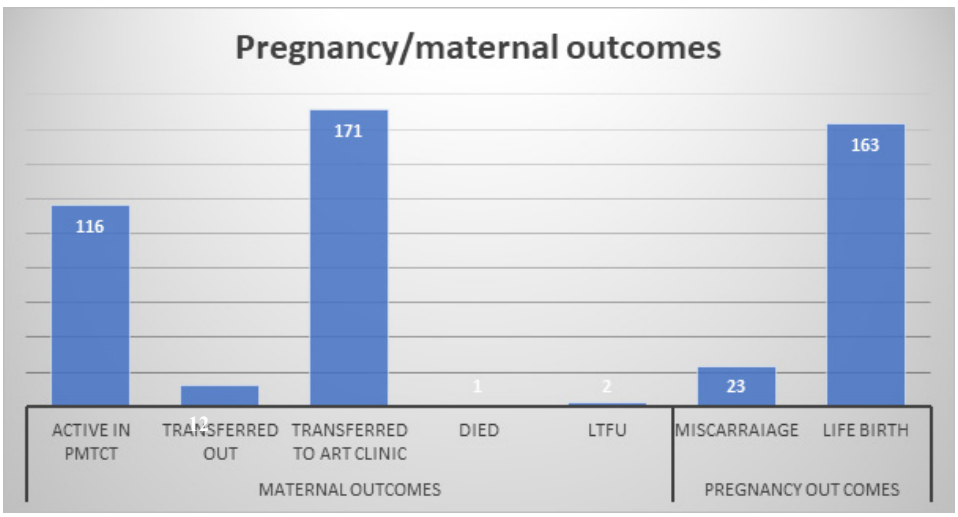

Figure 2: Pregnancy/PMTCT maternal outcome

***Active in PMTCT means a total of 4 or more PMTCT visits. Sociodemographic characteristics of respondents**

Table 1: Sociodemographic characteristics

Age		**Mean** 28.8 ±5.6	**N (%)**
age range	20 and bellow	14 (7.5)	153(82.3)
	21-25	45 (24.2)	17(17.6)
	26-30	68(36.6)	
	31-35	37 (19.9)	
	36 and above	22 (11.8)	
point of entry	Antenatal		185(99.5)
	Post-natal		1(0.5)
ARV Regimen	1st line		184(99)
	2nd line		2(1)
GA in weeks		15.2weeks	
G A range (weeks)	0-12 weeks		120(64.5)
	13-26 weeks		63(33.9)
	27-40 weeks		3(1.6)
Art Start	within 1 year of ART enrolment		67(36.0)
	after 1 year of ART enrollment		119(64.0)
prior PMTCT experience	Yes		108(58.1)
	No		78(41.9)
Place of delivery	Facility		11(5.9)
	Out of facility		175(94.1)
total visit	≤3		70(37.6)
	4 and above		116(62.4)

Relationship between number of visits and place of delivery

The total number of visits significantly affected a woman's place of delivery. Over 70% of those who gave birth at the facility had more than four visits. This was statistically significant at $X^2 = 43.5$, $p = 0.00$.

Distribution of miscarriages per trimester

Most miscarriages 15/23 (65%) occurred during the 1st trimester(see Figure 3).

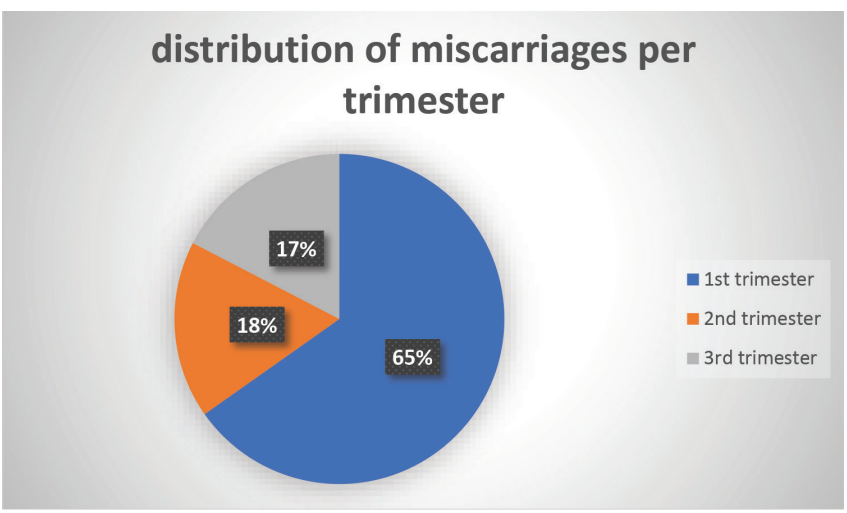

Figure 3: distribution of Miscarriages per trimester

Outcomes of PMTCT women who registered in the Maternal cohort.

After assigning scores to maternal and pregnancy outcome variables, over 80% of the women had a good outcome as seen in figure 4.

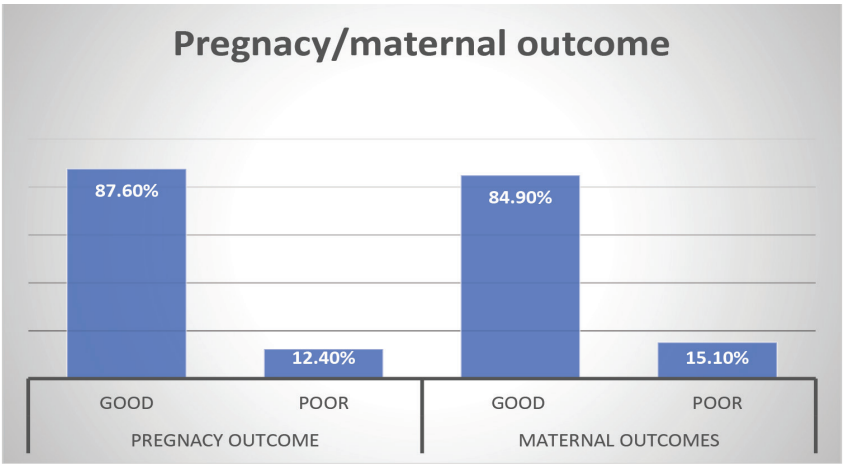

Figure 4: proportion of women with good/poor outcomes

While 87.6% had good pregnancy outcomes, 84.9% had good maternal PMTCT outcomes.

Association between sociodemographic characteristics and pregnancy /maternal outcome

In table 3, aside the age of the respondents, same factors that affected maternal PMTCT outcomes affected pregnancy outcomes. A woman on ART Prior to PMTCT experience, maternal age and total number of visits significantly affected maternal outcome. Most women with good outcome had prior PMTCT experience. This was statistically significant ($\chi 2$ = 14.8.; p = 0.00 and $\chi 2$ = 11.02; p = 0.001) for maternal and pregnancy outcomes respectively. Most women with facility delivery had a good outcomes ($\chi 2$ = 148.43; p = 0.00 and $\chi 2$ = 151.59; p = 0.00 for maternal and pregnancy outcomes respectively) . also women with over 4 PMTCT visits had good outcomes($\chi 2$ = 32.47; p = 0.00 and $\chi 2$ = 32.21; p = 0.00 for maternal and pregnancy outcomes respectively) . the age of the respondent significantly affected only maternal outcome $\chi 2$ = 11.46, p = 0.022.

Table 2: Relationship between number of visits and place of delivery

		Place of delivering Facility	chi-square Out of facility	P value
total visit	≤3visits	3(27.3)	67(38.2)	43.5.000
	4 and above	8(72.7)	103(61.8)	
Total	11(100)	175(100)		

*The Chi-square statistic is significant at the .05 level.

Table 3: Bivariate association between sociodemographic characteristics and pregnancy /maternal outcome

Outcome		Maternal Outcome		Pregnancy	
		Test statistic	P value	Test statistic	P value
Age range	20 and bellow 21-25 26-30 31-35 36 and above	11.46**	.022*	6.44**	.169
Regime	1st line 2nd line	.358**	.55	.29**	.593
Art start	within 1 year of PMTCT enrolment after 1 year of PMTCT enrolment	2.795	.095	1.59	.208
G A range (weeks)	0-13 weeks 14-26 weeks 27-40 weeks	.69**	.73	.62**	.734
Place of delivery	Facility Out of facility	148.43**	.000*	151.59**	.000*
prior PMTCT experience	yes No	14.80	.000*	11.02	.001*
total visit	less than 4 visits 4 and above	32.47**	.000*	32.21**	.000*

*. The test statistic is significant at the .05 level..
**. Fishers exact test

DISCUSSIONS

The goal of enrolling women in the PMTCT cohort registry and following them up throughout their pregnancies until 18 months after delivery is to prevent HIV transmission from the HIV-infected woman to her infant. The National Guidelines for HIV Care and Treatment recommend this as the third and fourth component of PMTCT care[16]. However, according to USAID, preventing vertical transmission, though crucial for the health of both the mother and her child, is faced with numerous challenges in Africa, especially in displaced communities. This challenge stems from among other things; gaps in program data reporting, inadequacies in service delivery, and low service uptake[17]

In this study,Only 83% of HIV-positive pregnant women were registered in the PMTCT-mother cohort during the study years, . It has been reported that in displaced communities, the number of health care practitioners available are often inadequate to serve the population in need[18]. In a review by Beek, Dawson and Whelan, (2017), while assessing factors that affect the transfer of sexual and reproductive health training skills into practice in humanitarian settings of low and lower-middle income country, it was highlighted that inadequacy in the health workforce was a major factor that affected delivery of services[19]. These same factors has been highlighted as reasons for substandard SRHR care in humanitarian settings[20]

The majority of the women in our study were between 26 and 30 years old. These findings are similar to those of other studies, which confirm that the majority of women who seek antenatal care in Nigeria are between the ages of 20 and 39[21].

Although most of the women in our study registered in their first trimester, the mean gestational age of PMTCT-maternal cohort registration was 15.2 weeks, with about three-fifths having a total of 4–8 PMTCT visits. The WHO recommends that women begin antenatal care within the first 14 weeks of gestation and take part in at least four-sessions to mitigate the risk of high-risk pregnancy[22]. For women with high-risk conditions, including HIV, more visits are required. However, studies in Nigeria have shown that most women begin ANC late[21,23]. In our setting, the reason for late registration may include poverty, inaccessibility to services, and limited knowledge about service benefits, which are common reasons that affect SRHR service provision in displaced settings[24]. Our findings were similar to those of Adebangbe and Mturi (2021), which showed that the majority of women in displaced settings in Northern Nigeria began ANC care during the second trimester[25]. In a retrospective study in Lesotho that assessed HIV status and antenatal care attendance among pregnant women in a rural setting, findings suggested that though the number of visits and GA at the first visit did not differ between HIV-positive and HIV-negative women, HIV-positive women who knew their status before ANC were more likely to present early than all other women[26]. However, these findings seemed to differ from that in our study, which focused on PMTCT visits.

About two-thirds 62.4% of the women had over 4 PMTCT visits. Other studies on number of ANC visitation are generally low, especially among internally displaced women[25,27]. The question that follows is whether HIV infection increases a woman's care-seeking behavior. Previous research reported that Nigerian women were making insufficient progress towards the WHO's goal of at least four ANC visits in the absence of complications[28].

The majority of the women in the study gave birth outside of the facility; however, the total number of visits significantly affected a woman's place of delivery. Over 70% of women who gave birth at the facility had more than four ANC visits. In many displaced settings, women have been reported to delivery at home or in the hands of traditional Birth attendants (TBA)[29,30]. A study by Ohihoin et al., (2021) among displaced women in Nigeria highlighted that more than 50percent of pregnancies occurred during displacement however only 20% of the women sought ANC while majority birthed at home[29]. According to the USAID, if a woman has not received at least one antenatal care visit, she is less likely to give birth in a health facility. Hence, the use of community workers including TBAs is essential to linking pregnant women to antenatal care and encouraging the use of a health facility for safe delivery[31].

The retention rate among the participants in our study was about 98%, with 87% of the women having a good PMTCT or pregnancy outcome. This can be attributed to the fact that the study assessed only women who were registered in the PMTCT maternal cohort. Studies among internally displace women highlighted poor maternal and neonatal outcomes[25,32]. Adebangbe and Mturi, (2021) echoed that these outcomes are poorer than that in non-humanitarian settings[25]. However, this was majorly because most of the women failed to seek care or are not properly followed up by a health care practitioner during the antenatal or postnatal period[25,32]. Also, Prior PMTCT experience, maternal age and total number of visits had a significant impact on maternal outcome. According to UNICEF, in a 2019 report concerning sub-Saharan Africa, it was noted that only 70% of HIV positive women were placed on ART, and 64% of HIV-exposed infants (HEIs) were tested for HIV at six weeks, however, only 55% of these infants received a definitive diagnosis at 18 months[33]. Following analysis of data from the INSPIRE project in Malawi, Nigeria, and Zimbabwe, retention-in-care rates among 5107 women ranged from 30% to 76%(6). our findings thus demonstrates that PMTCT maternal follow-up is an effective quality improvement intervention for increasing retention in programs aimed at preventing mother-to-child

HIV transmission. Thus, HIV programmers must continuer to place a greater emphasis on PMTCT follow-up in order to ensure high quality of care for pregnant women living with HIV.

CONCLUSION

This study analyzed the data of 186 women who had enrolled in the PMTCT program in displaced setting. Findings suggested that following up pregnant women living with HIV during pregnancy has the possibility of improving maternal outcomes. The study also note a very high rate of out-of-facility delivery by HIV-positive women in the displace setting. However, women who participate in PMTCT are more likely to give birth in the facility. Also, maternal prior PMTCT experience, total number of visits, and place of delivery significantly affected the maternal and pregnancy outcomes of the women. Hence, we can conclude that the active involvement (visitation as scheduled and retention throughout pregnancy) of an HIV-positive pregnant woman in care can improve their health outcomes in times of displacement. We thus suggest that health care programmers should include lay community health workers, TBAs , and mentor mothers in PMTCT care programs to improve patient follow-up and linkage to a health facility for birthing. Leveraging mother-to-mother support group activities to improve awareness of the importance of PMTCT care and follow-up can improve program outcomes. In addition, it is also necessary for PMTCT providers to increase efforts to ensure women have appropriate PMTCT follow-up visits at the facilities. This will go a long way toward improving the quality of life of pregnant HIV-positive women in displaced settings.

LIMITATION

Our study was limited to women enrolled in the PMTCT cohort register; hence, data on women who were not registered in the program were un available. The study employed a retrospective approach, hence only data available in the record was used for the study. Cases of missing data were noted in some folders and in the registers while ANC uptake was not recorded along PMTCT service uptake, although having more information about ANC services uptake by the women would have been useful for this study, however, there was no unified record system whereby women's data could be traced and linked at the facility.

Conflict of Interest: The authors declare no conflict of interest.

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