

## Prevalence of exclusive breastfeeding among peri-urban mothers living with and without HIV in Lesotho

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### ABSTRACT

**Background:** Breastfeeding is lifesaving against child malnutrition, yet exclusive breastfeeding (EBF) rates remain low, particularly among mothers with HIV.

**Objective:** We compared the prevalence of EBF between mothers with and without HIV and explored factors associated with breastfeeding.

**Methods:** A cross-sectional design was used to investigate 151 mother-child dyads; mothers with HIV ( $n = 73$ ) and without HIV: ( $n = 78$ ). Structured and previously used questionnaire was used to collect sociodemographic and breastfeeding practices data of mothers of children aged 6–12 months, during routine postnatal care at selected primary healthcare facilities in Maseru.

**Results:** All mothers had similar sociodemographic characteristics, with EBF prevalence of 40.4%. Mothers with HIV had lower rates of EBF than their counterparts (28.8% vs. 51.3%,  $p = 0.005$ ), despite 98.6% achieving viral suppression. Most mothers with HIV introduced complementary feeding as early as 1–3 months (19.2% vs. 9.0%) and above half of them started giving solid foods from 4–5 months (52.1% vs. 39.7%);  $p = 0.012$ . Above a quarter of all mothers received EBF support from healthcare facility, spouse and other family members. Only 40.4% of mothers were encouraged to EBF, while 70.9% believed that breastmilk is sufficient during first six months, and a strong positive correlation was found between EBF and mothers' beliefs (mother with HIV:  $r = 0.5$ ,  $p < 0.001$ ; mothers without HIV,  $r = 0.4$ ;  $p = 0.001$ ).

**Conclusion:** Despite ongoing efforts to promote breastfeeding among mothers with HIV, EBF rates remain low, regardless suppressed viral loads. The belief in breastmilk adequacy during first six months was a key determinant of EBF, underscoring need for targeted education on breastmilk composition and sufficiency.

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### KEYWORDS

Exclusive breastfeeding; mothers with HIV; HIV care; complementary feeding; lesotho; prevalence

## Introduction

Lesotho is among the Southern African countries burdened with a high prevalence of HIV infection, with 22.7% of adults living with HIV [1]. Women (27.4%) are disproportionately affected more than men (17.8%), particularly women of childbearing age (15–49 years: 27.9% vs. 15.7%) [1]. Furthermore, in 2020, the prevalence of HIV among pregnant women was estimated at 24.0% [1]. Nevertheless, the increasing antiretroviral therapy (ART) coverage, alongside the elimination of mother-to-child transmission coverage of 84%, has contributed significantly to the remarkable progress in reducing vertical transmission of HIV [2–3]. About 97.5% of women of childbearing age who delivered in the last 12 months were reported taking ART during pregnancy, while 83.4% of women living with HIV were virally suppressed [1]. On the other hand, number of children who are HIV-exposed but uninfected is rising globally, estimated at 14.8 million in 2018 (71.0% also had *in utero* ART exposure), with 90% of them in sub-Saharan Africa [4–5]. In Southern Africa specifically, the prevalence in some countries has exceeded 15% of the child population, for example, in Eswatini (32.4%), Botswana (27.4%), South Africa (21.6%) and Lesotho (21.1%). The growing population of children who are HIV-exposed but uninfected is of critical public health concern [4–5].

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Children who are HIV-exposed but uninfected are a high-risk population for poor growth; stunting, neurodevelopment, and inadequate nutrition in the first 1000 days, potentially resulting from suboptimal feeding practices, including breastfeeding [6–8]. Breastmilk provides infants with adequate and complete nutrition necessary for growth and development, particularly in the first six months of life, when the infant's gut is not fully developed to handle foods other than liquid foods. Against the background of a high prevalence of stunting (36%) in Lesotho, which is higher than the average of the African region (30.7%) and global rates (22.3%), breastfeeding is considered a key intervention pivotal in protecting children against malnutrition and poor growth [9–10]. However, exclusive breastfeeding (EBF) rates are below the World Health Assembly (WHA) target of 50% by 2025, and the Global Breastfeeding Collective target of 70% by 2030, with global rates standing at 48% and African regions at 45% in 2023 [11].

Lesotho is one of the countries in the African region that has reported remarkable progress towards achieving the breastfeeding target, with 61% rates of EBF reported among 0–5 month old infants [10]. The success in improving breastfeeding rates may be attributed to ongoing campaigns to promote, protect, and support breastfeeding. Despite the many benefits of breastfeeding to mothers and infants, some mothers living with HIV still fear vertical transmission of HIV through breastfeeding [12], hence the breastfeeding rates among children exposed to HIV are low when compared to children who are HIV-unexposed, in South Africa [6–7]. In Lesotho, it was reported that women who were found to be living with HIV were less likely to exclusively breastfed [13].

In 2016, the HIV and infant feeding guidelines were updated and recommended similar breastfeeding practices for mothers living with and without HIV who have ART provision and adequate adherence [14]. In the HIV settings, the minimum risk of vertical HIV transmission in the era of ART is very low (0.9%) [15], including through breastfeeding [16]. In Lesotho, the rate of vertical HIV transmission has been reported to have decreased from 6.1% in 2022 to 5.1% in 2023 [17]. Limited information is available on the prevalence of EBF between mothers with HIV and those without HIV in Lesotho. Therefore, this study aimed to determine and compare the prevalence of EBF between mothers with HIV and mothers without HIV and its associated factors in the peri-urban areas of the Maseru district.

## Methods

### *Study design and setting*

A quantitative cross-sectional design was used to investigate breastfeeding practices based on maternal recall. The study was done during routine postnatal care visit at the Paki Health Centre (PHC) located in Mazenod and Likotsi Filter Clinic (LFC), located in the Ha-Thetsane, both in the outskirts of the capital city, Maseru, Lesotho; a Southern African country landlocked in South Africa. These primary health care facilities were purposively selected as they serve about 30 peri-urban communities, making them a suitable representative of Maseru district's peri-urban population. Demographically, women residing in urban (29.7%) and peri-urban (27.9%) areas are more affected by HIV than those in rural areas (25.1%) [1].

### *Study population and sample size*

As the study aimed to assess the prevalence of EBF, which occurs during the first six months of life, only children aged 6–12 months were included. This approach ensured that participants had completed the EBF period, allowing for a more accurate estimate of EBF prevalence while minimising maternal recall bias. The study population therefore comprised mothers living with HIV (mother with HIV) and mothers not living with HIV (mothers without HIV) who had children within this age range at the time of data collection and were receiving primary healthcare services at PHC and LFC. All eligible participants who agreed to participate in the study and signed an informed consent form for themselves and on behalf of their children were enrolled on the day of the study. Recruitment continued until no eligible participants were available during the data collection period. The study anticipated to investigate 200 mother-child dyads, however, about 151 mother-child dyads with available HIV care information were included in this study (PHC,  $n = 71$  and LCF,  $n = 80$ ), grouped by HIV status; mothers with HIV ( $n = 73$ ) and mothers without

HIV ( $n = 78$ ). Exclusion criteria 1) mothers with children less than 6 months of age ( $n = 19$ ), 2) without HIV care information ( $n = 8$ ) and 3) children older than 12 months of age ( $n = 13$ ), 4) those living with HIV ( $n = 1$ ) or 5) with severe medical conditions ( $n = 3$ ), and lastly 6) mothers under the age of 18 years, as they are considered minors and therefore unable to provide independent informed consent ( $n = 5$ ).

### **Data collection process**

Data was collected for three weeks in May 2023. A formal self-introduction was conducted by the two researchers, followed by a written informed consent. Data was then collected through one-to-one interviews in the local language (Sesotho) within a consultation room. Each interview lasted approximately 15–20 minutes per participant. However, the duration varied slightly across participants due to factors such as the mother's level of understanding, the need for clarification of questions, interruptions by childcare demands and variations in participants' communication pace or engagement levels. These factors were considered when standardising interview time to ensure both data quality and participant comfort. Previously used fully structured questionnaires were employed to collect data on the mothers' socio-demographic, self-reported breastfeeding practices. Data on mothers' medical history of HIV care were collected from their' clinic records and recorded on the questionnaire. The feeding practices questions were adapted from the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) questionnaire for assessing infant and young child feeding practices [18]. Data was handwritten verbatim during interview process.

### **Data processing and analysis**

The data was checked, cleaned, corrected where necessary, and entered into a Microsoft Office 2016 Excel sheet. Latest HIV viral load suppression was defined as viral load  $<1000$  copies/ml and unsuppressed if  $\leq 1000$  copies/ml in line with the national HIV guideline for routine care [19]. ART adherence was considered good at adherence levels  $\geq 95\%$  [19]. Data were processed and analysed using the Statistical Package for the Social Sciences (SPSS) version 29.0 for descriptive statistics. Normality of the data was assessed using histograms and the Shapiro-Wilk test. Categorical data were presented as frequencies and percentages. Continuous data are presented as mean and standard deviation. The comparison between mothers with HIV and mothers without HIV was performed using the chi-square test (non-normally distributed data) and an independent t-test (normally distributed data). All significance tests were performed at a significance level of 0.05. Correlations were determined using bivariate analysis (Spearman correlation coefficients) and were significant at a level of 0.05.

## **Results**

This study investigated 151 mother-child dyads: 73 of the mothers were living with HIV and 78 were not. Overall, 43.7% of the mothers in this study were aged between 18 and 25 years, 68.9% were unemployed, and 74.2% were married or cohabiting. More than half (58.9%) of the mothers attained secondary education. Regarding obstetric history, 74.2% of the mothers delivered through vaginal delivery, and 2.0% delivered at home. There were no significant differences in sociodemographic characteristics between mothers with HIV and those without HIV groups. Regarding HIV care outcomes for mothers with HIV, adherence based on pill count was at 97.3% and mothers had a low mean viral load with 98.6% achieving viral suppression (Table 1).

In this study, children with HIV-exposure were older than those without HIV exposure ( $12.4 \pm 5.1$  vs  $11.5 \pm 4.2$  months;  $p = 0.012$ ) (Table 2). More than one-third of the children in both groups were initiated to breastfeeding within one hour following birth. The percentage of EBF was lower (28.8%) in mother with HIV than in mothers without HIV (51.3%);  $p = 0.005$ . Most children with HIV exposure (52.1% vs. 39.7%;  $p = 0.012$ ) were introduced to complementary feeds from the age of 4 to 5 months. Less than a quarter

**Table 1.** Characteristics of mothers with HIV and those without HIV.

Variables		Total population <i>n</i> (%) <i>n</i> = 151	Mothers with HIV <i>n</i> (%) <i>n</i> = 73	Mothers without HIV <i>n</i> (%) <i>n</i> = 78	<i>p</i> value
Maternal age (years)	18–25	66 (43.7)	28 (38.4)	38 (48.7)	0.415
	25–34	61 (40.4)	33 (45.2)	12 (15.4)	
	35–44	24 (15.9)	12 (16.4)	12 (15.4)	
Employment status	Unemployed	104 (68.9)	53 (72.6)	51 (65.4)	0.338
	Employed	47 (31.1)	20 (37.4)	27 (17.9)	
Level of education	No schooling	3 (2.1)	3 (4.2)	0 (0)	0.167
	Any primary schooling	47 (31.1)	26 (35.6)	21 (26.9)	
	Any secondary schooling	89 (58.9)	39 (53.4)	50 (64.1)	
	Any tertiary schooling	12 (7.9)	5 (6.8)	7 (9.0)	
Marital status	Single/windowed/ divorced	39 (2.6)	19 (26.0)	20 (25.6)	0.957
	Married/cohabiting	112 (74.2)	54 (74.0)	58 (74.4)	
Mode of delivery	Vaginal delivery	112 (74.2)	53 (72.6)	59 (75.6)	0.670
	Caesarean section	39 (25.9)	20 (27.4)	19 (24.4)	
Place of delivery	Home	3 (2.0)	2 (2.7)	1 (1.3)	0.740
	Hospital	148 (98.0)	71 (97.3)	77 (98.7)	
Birth spacing between the previous and present child	Firstborn	55 (36.4)	21 (28.8)	34 (43.6)	0.145
	1–2 years	36 (23.8)	21 (28.8)	15 (19.2)	
	3–5 years	51 (33.8)	28 (38.4)	23 (29.5)	
	More than 6 years	9 (6.0)	3 (4.1)	6 (7.7)	
Type of ART regime currently in use	TDF/3TC/DTG	-	73 (100.0)	-	-
Latest ART adherence status	Good	-	71 (97.3)	-	-
	Poor	-	2 (2.7)	-	-
	Latest CD4 count (cells/mm <sup>3</sup> ), mean ± SD	-	523.3 ± 181.4	-	-
Latest viral load (copies/ml), mean ± SD	-	44.4 ± 58.9	-	-	
<i>Viral load classification</i>					
Virally suppressed: <1000copies/ml		-	72 (98.6)	-	-
Virally unsuppressed: ≥1000copies/ml		-	1 (1.4)	-	-

Abbreviations: ART: Antiretroviral Therapy; CD4: Count-Cluster of Differentiation 4 Count; TDF/3TC/DTG: Tenofovir Disoproxil Fumarate/Lamivudine/ Dolutegravir; SD: standard deviation, -: not applicable.

† ART adherence rate was based on pill count, considered good at adherence levels ≥95%.

**Table 2.** Self-reported child feeding practices based on maternal recall.

Variables		Total population <i>n</i> = 151	Children with HIV exposure <i>n</i> = 73	Children without HIV exposure <i>n</i> = 78	<i>p</i> value
Child age in months, mean ± SD		12.4 ± 4.8	12.4 ± 5.1	11.5 ± 4.2	<b>0.012</b>
Sex of the child, <i>n</i> (%)	Male	78 (51.7)	37 (50.7)	41 (52.6)	0.817
	Female	73 (48.3)	36 (49.3)	37 (47.4)	
Early initiation of breastfeeding, <i>n</i> (%)	Within 1 hour after birth	92 (60.3)	42 (57.5)	50 (64.1)	0.408
	After 1 hour following birth	59 (39.1)	31 (42.5)	28 (35.9)	
EBF during the first 6 months, <i>n</i> (%)	Yes	61 (40.4)	21 (28.8)	40 (51.3)	<b>0.005</b>
Timing for introduction of complementary foods (months), <i>n</i> (%)	1–3	21 (13.9)	14 (19.2)	7 (9.0)	<b>0.012</b>
	4–5	69 (45.7)	38 (52.1)	31 (39.7)	
	At 6	61 (40.4)	21 (28.8)	40 (51.3)	
First foods introduced within the first 6 months, <i>n</i> (%)	Water	15 (9.3)	7 (9.6)	8 (10.3)	0.131
	Formula milk	37 (24.5)	26 (35.6)	11 (14.1)	
	Thin porridge	38 (25.2)	19 (26.0)	19 (24.4)	
Reasons for early introduction of foods (before 6 months), <i>n</i> (%)	Returning to work/ school	21 (13.9)	9 (12.3)	12 (15.4)	0.125
	Fear of HIV infecting the baby	10 (6.6)	10 (13.7)	n/a	
	Maternal ill health	11 (7.3)	6 (8.2)	5 (6.4)	
	Perceived breastmilk insufficiency	43 (28.5)	26 (35.6)	17 (21.8)	
	Right time	5 (3.3)	1 (1.4)	4 (5.1)	
Believe that breastmilk is sufficient during the first 6 months of life, <i>n</i> (%)	Yes	107 (70.9)	49 (67.1)	58 (74.4)	0.328
Reasons for believing breastmilk is insufficient during the first 6 months, <i>n</i> (%)	It is too watery	5 (3.3)	4 (5.5)	1 (1.2)	0.591
	Does not satisfy the baby	10 (6.6)	9 (12.3)	1 (1.3)	
	No reason	29 (19.2)	11 (15.1)	18 (23.1)	

Abbreviations: EBF, exclusive breastfeeding; n/a, not applicable for mothers without HIV; SD, standard deviation.

(13.7%) of mothers with HIV reasoned that they feared vertical transmission of HIV. About 70.9% of the mothers in the study believed that breastmilk is sufficient as a feed during the first 6 months of life.

Table 3 presents the findings regarding self-reported breastfeeding support and encouragement. Overall, 97.4% of mothers reported that they received education on breastfeeding during the antenatal care period, in particular, on the benefits of breastfeeding (49.0%), either from a healthcare professional or a community health worker (92.1%). Approximately 21.9% and 25.6% of mothers with HIV and those without HIV, respectively, indicated a lack of family support for breastfeeding.

The determinants of EBF among mothers with HIV and those without are presented in the Table 4. The age of the mothers with HIV was negatively correlated with EBF ( $r = -0.4$ ;  $p = 0.001$ ). A positive correlation between EBF and the belief that breastmilk is sufficient during the first 6 months of life was found in mothers with HIV ( $r = 0.5$ ;  $p < 0.001$ ) and mothers without HIV ( $r = 0.5$ ;  $p = 0.001$ ).

## Discussion

In this study, we determined and compared the prevalence of EBF and its associated factors in the Maseru peri-urban areas. There were no significant differences in terms of mothers' characteristics between the groups.

Although the initiation of breastfeeding within an hour after birth was higher than the global rate of 46%, it was below the Global Breastfeeding Collective target of 70% by 2030 [11], 67% reported in the Lesotho Demographic Health Survey (2023/24) [10] and lower than previously reported rates in South African studies [20–21]. Similar lower rates were previously reported in Southern African context [6–7]. This underscores the need for nutrition-specific interventions targeting healthcare professionals to strengthen their capacity to support and encourage early initiation of breastfeeding within the first

**Table 3.** Maternal self-reported breastfeeding support and encouragement.

Variables		Total population, <i>n</i> (%) <i>n</i> = 151	Mothers with HIV, <i>n</i> (%) <i>n</i> = 73	Mothers without HIV, <i>n</i> (%) <i>n</i> = 78	<i>p</i> value
Reported receiving encouragement on EBF	From healthcare professional	40 (26.5)	16 (21.9)	24 (30.8)	0.957
	From family	21 (13.9)	5 (6.8)	16 (20.5)	
Reported receiving support on EBF	From healthcare professional	38 (25.2)	17 (23.3)	21 (26.9)	0.339
	From spouse/husband	38 (25.2)	23 (31.5)	15 (19.2)	
	From other family members	39 (25.8)	17 (23.3)	22 (28.2)	
Lack of family support for breastfeeding; Yes		36 (24.5)	16 (21.9)	20 (25.6)	0.325
Received education <sup>†</sup> on breastfeeding; Yes		147 (97.4)	71 (97.3)	76 (97.4)	0.946
Knowledge learnt from the education received	All about breastfeeding	20 (13.2)	9 (12.3)	11 (14.1)	
	Benefits breastfeeding	74 (49.0)	39 (53.4)	35 (44.9)	
	Exclusive breastfeeding	36 (23.8)	16 (21.9)	20 (25.6)	
	Baby positioning when breastfeeding	17 (11.3)	7 (9.6)	10 (12.8)	
Source of education received	Community health worker/ healthcare professional	135 (89.4)	64 (87.7)	71 (92.0)	0.654
	Family	6 (4.0)	4 (5.5)	2 (2.6)	
	Media, e.g. radio	6 (4.0)	3 (4.1)	3 (3.8)	

Abbreviation: EBF, exclusive breastfeeding.

<sup>†</sup>During antenatal care/pregnancy.

**Table 4.** Determinants of exclusive breastfeeding among mothers with and without HIV.

Variables	Mothers with HIV ( <i>n</i> = 73)		Mothers without HIV ( <i>n</i> = 78)	
	<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value
Age (years)	-0.4	<b>0.001</b>	-0.1	0.665
Employment status	0.2	0.610	-0.1	0.386
Level of education	0.0	0.850	-0.1	0.531
Marital status	0.2	0.150	0.0	0.896
Believe that breastmilk only is sufficient during the first 6 months of life	0.5	<b>&lt;0.001</b>	0.4	<b>0.001</b>
Received support on EBF	-0.1	0.349	0.2	0.169
Lack of family support for breastfeeding	-0.3	<b>0.023</b>	0.1	0.671
Received education on breastfeeding	0.1	0.369	0.7	0.145

Abbreviations: EBF, exclusive breastfeeding; *r*, correlation coefficient. Correlations were determined using Spearman correlation coefficients, and correlations were significant at the level of 0.05.

hour after delivery. It is equally important to revitalise and reinforce the Baby-Friendly Hospital Initiative (BFHI) to ensure that maternity facilities consistently promote, protect, and support optimal breastfeeding practices.

The EBF rates were lower in mothers with HIV than their counterparts, similar to other Southern African studies [7, 21–22]. The previous study done in Lesotho showed that mothers who were found to be living with HIV had lower EBF levels [13]. The rates were lower despite mothers with HIV having a good ART adherence and achieved viral suppression. Additionally, this occurs despite the country reporting a reduction in vertical HIV transmission from 6.1% in 2022 to 5.1% in 2023, thereby achieving the global target of 5.1% [17]. The risk of vertical HIV transmission remains low when infants are exclusively breastfed, without any mixed feeding, and when mothers maintain consistent adherence to ART and achieved viral suppression [14]. In this study, EBF was largely influenced by perceived breastmilk insufficiency, with a smaller number citing work or school commitments. Among mothers living with HIV, fewer than a quarter reported fear of HIV transmission as a reason. The low rates in this study may also indicate that socio-cultural and healthcare-related factors continue to hinder high EBF rates. The literature had shown that mothers with HIV face challenges in EBF despite the many documented benefits, largely due to socio-cultural and healthcare-related factors, including stigma and lack of knowledge [23–24] and perinatal depression [25], which can undermine EBF adoption. Nonetheless, in the present study, most mothers reported receiving breastfeeding support, encouragement, and education from healthcare providers. This suggests that breastfeeding promotion efforts are being implemented to some extent. However, there remains a need for greater emphasis on peer counselling and awareness, particularly among mothers with HIV, to reinforce that breastfeeding is safe and beneficial when ART is consistently adhered to. Strengthening this messaging within Lesotho's maternal and child health programmes could improve breastfeeding practices and child health outcomes. Nutrition education on the composition of breastmilk will be beneficial, as some mothers reported that they do not believe that breastmilk is sufficient during the first six months. In addition, strengthening maternal mental health support, stigma reduction, and coherent health messaging can potentially improve breastfeeding outcomes [25–26].

Early introduction of solid food (below six months) was observed among mothers with HIV, with 52.1% introducing complementary foods at 4–5 months of age, compared to 39.8% among mothers without HIV ( $p = 0.012$ ). The most commonly reported reason for early introduction was perceived breastmilk insufficiency. As discussed above, this may also explain the low rates of EBF. Similar findings have previously been reported in Maseru, however, not in the context of HIV [27]. This is a common practice in the African context, where the early introduction of solid food was reported between 40–80% [7,28]. The quality of the complementary foods introduced is less nutrient-dense [19, 29–32]. In Lesotho, only 9% of children under five receive a minimum acceptable diet [19]. The IYCF guideline is a cornerstone for appropriate feeding practices and increasing breastfeeding rates, as breastmilk is sufficient for the first six months, with more than 80% of its composition being water [33]. Water was among the first foods introduced during the first six months of life among study children.

Although most mothers with and without HIV believed that breastmilk was adequate in the first six months, breastfeeding practices were still suboptimal, in particular among mothers with HIV. Determining beliefs and attitudes towards breastfeeding is important for reaching the Global Breastfeeding Collective targets of 70% by 2030 [11]. A positive attitude from mothers is needed to increase breastfeeding rates, and education and counselling play a major role in changing behaviour and perception to increase EBF rates [34]. Nutrition professionals need to strengthen training gaps and develop visual aids for health promotion.

Breastfeeding support is important, especially in low- and middle-income countries where the secondary schooling literacy level is low. Healthcare workers are a cornerstone for educating, counselling, and encouraging mothers to breastfeed, as they provide evidence-based knowledge. Quebu et al. [35] recently reported in South Africa that breastfeeding health education and family support are critical for mothers to improve their practice, close gaps, and foster a breastfeeding-friendly environment.

To achieve Sustainable Development Goals 2 and 3: Zero hunger and Good health and well-being respectively, the IYCF should be strengthened and adhered to promote appropriate feeding practices. Undernutrition is linked to approximately 45% of deaths among children under five years of age globally

and this problem is highly prevalent in Africa, where HIV also has a high prevalence. Suboptimal feeding practices may contribute to child malnutrition in Lesotho, including a stunting prevalence of 36%. Exclusive and continued breastfeeding are life-saving and cost-effective interventions that should be promoted during antenatal care. There is a need for expanded media campaigns through radio, television, and social media, focused on the promotion, protection, and support of breastfeeding. Strengthening Code monitoring efforts is also important to reduce the influence of breastmilk substitute advertising and marketing at both national and global levels [36–37].

A strong but negative correlation was observed between EBF and maternal age among mothers with HIV, most of whom were aged between 25 and 34 years. This finding suggests that as maternal age increases, the likelihood of practicing EBF decreases among this group. Age plays an important role in breastfeeding practices, as younger mothers are more likely to follow guidance from healthcare providers, whereas older mothers tend to rely on their previous knowledge and experiences [22].

A strong positive correlation was observed between mothers with HIV and those without HIV in their belief that breastmilk is sufficient for the first six months. Family-focused interventions, including male engagement, are needed to reinforce and ensure families are aware that breastmilk alone is adequate during this period. The strength of the present study lies in using the local language, a comparable sample size, and further determining the relationships between mothers' sociodemographic factors, HIV status and EBF practices.

The study has several limitations that should be acknowledged. Given that the average age of children among mothers with HIV and mothers without HIV was 12 and 11 months, respectively, the data on EBF duration, timing of mixed feeding or solid food introduction, and reasons for discontinuing EBF relied entirely on maternal recall, which is inherently subjective and prone to recall bias. Additionally, there is a possibility of social desirability bias, as some mothers may have provided responses they believed were expected or socially acceptable, particularly regarding adherence to recommended feeding practices. Furthermore, there may be unexplored factors influencing EBF duration such as cultural beliefs, maternal workload, or household dynamics, that were not captured due to the study design and questionnaire limitations. Although data were collected over a three-week period, the short window may have introduced minor temporal influences. Lastly, the small sample size may limit the generalisability of the findings to the broader population.

## Conclusion

The low rate of EBF is a persistent public health concern among mothers living with HIV in this study, despite enormous efforts to support, promote, and encourage breastfeeding, including improvement in maternal HIV care; high rates of ART adherence and viral load suppression. This was coupled with the early introduction of complementary feeding. A key determinant of EBF identified in this study was the belief that breastmilk alone is sufficient to meet an infant's nutritional needs during the first six months of life. Strengthening awareness and education campaigns, including through mass media, is essential to further protect, promote, and support breastfeeding. Particular emphasis should be placed on improving mothers' understanding of the nutritional composition and adequacy of breastmilk.

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## Author contributions

Mothusi Nyofane designed the study. Mothusi Nyofane and Phumudzo Tshiambara performed statistical analysis, interpreted the data, and drafted the manuscript. Liekolo Makhetha and Lieketseng Moeno collected data and reviewed the manuscript. Phumudzo Tshiambara and Mothusi Nyofane revised the manuscript accordingly. All authors have approved the final version of the manuscript for submission and publication.

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## Data availability statement

Data is available from the corresponding author upon request.

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