

# Knowledge, Attitudes and Practices of HIV Positive Breastfeeding Mothers in Prevention of Mother to Child Transmission of HIV in Ouagadougou (Burkina Faso) and Associated Factors

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## Abstract

World Health Organization (WHO) places strong emphasis on exclusive breastfeeding of HIV exposed infants during the first 6 months, combined to antiretroviral treatment for mothers and prophylaxis for infants. However, adherence to safe breastfeeding among HIV infected mothers is still a major challenge in Burkina Faso.

We conducted a cross sectional study in four hospitals in Ouagadougou, Burkina Faso in order to explore knowledge, attitudes and practices of HIV infected breastfeeding mothers attending selected clinics for Prevention of Mother to Child Transmission of HIV (PMTCT).

Two hundred and one HIV infected mothers attended the clinics for their children's routine medical visit, among them 162 (81%) had chosen breastfeeding. The majority of women (95%) were familiar with PMTCT measures required during pregnancy and childbirth, whereas prevention measures required during breastfeeding period were less mentioned: mothers strict adherence to antiretroviral treatment (48.1%), safe sexual practices (1.85%), cessation of breastfeeding in case of breast infection (6.2%), avoiding traditional enema (36.4%) and stopping breastfeeding at the age of 12 months after 6 months of exclusive breastfeeding along with the introduction of other foods and fluids (43.2%). Moreover, 52.2% of women did not practice exclusive breastfeeding during the first six months. Factors associated with poor breastfeeding practices were: infant feeding option decided solely by the mother, living in well serviced areas and having a low score ( $\leq 3$ ) of knowledge on how to prevent HIV transmission during breastfeeding.

There is a need for urgent interventions in support of safe breastfeeding in HIV exposed infants in Ouagadougou.

**Keywords:** Breastfeeding; HIV; KAP (Knowledge, Attitudes and Practices); Ouagadougou

**Abbreviations:** PMTC: Prevention of Mother to Child HIV Transmission; WHO: World Health Organization; HIV: Human Immunodeficiency Virus; KAP: Knowledge Attitudes Practices; ART: Antiretroviral Treatment; CHU-YO: Centre Hospitalier Universitaire Yalgado Ouédraogo

## Introduction

More than 260,000 new Human Immunodeficiency Virus (HIV) infections were recorded in children worldwide in 2012, of which 90% in Sub-Saharan Africa. The majority of these children were infected vertically during childbirth and breastfeeding [1]. The latter accounts for more than one third of paediatric HIV infections in Africa [2]. However, HIV transmission through breastfeeding can be reduced and even avoided through either artificial feeding or optimal Antiretroviral treatment (ART) during breastfeeding [3]. Although mother to child

transmission of HIV has been eliminated in some low-income countries, it still remains a major public issue in most countries. Persistence of high paediatric HIV infection is associated with such factors as: low HIV screening and poor ART coverage among pregnant women, poor adherence to ARV during pregnancy and unsafe infant feeding practices [4].

In 2010, World Health organization (WHO) developed specific recommendations on feeding practices for infants born from HIV infected mothers [5]. In Burkina Faso, knowledge, attitudes and practices regarding safe breastfeeding and challenges faced by breastfeeding mothers living with HIV, remain unknown. Implementation of these recommendations will require breastfeeding women to have good knowledge and to adopt right attitudes and practices regarding safe breastfeeding. The aim of this study is to describe knowledge, attitudes and practices of HIV infected mothers who opted for breastfeeding in Ouagadougou and identify factors associated with poor breastfeeding practices.

## Methods

### Design and setting of the study

From 1<sup>st</sup> September 2014 to 15<sup>th</sup> January 2015, we conducted a cross sectional study based on a questionnaire in four largest PMTCT clinics in Ouagadougou, Burkina Faso (Yalgado Ouédraogo Teaching Hospital and district hospital of Bogodogo, Boulmigou and Nongr-massom). These clinics offered maternal and paediatric HIV care. Data collection was approved by the hospitals' administration board and an informed consent was obtained from the participants before the interview.

### Participants description

During the study period, mothers who attended the clinics for routine medical visits for their HIV exposed children were proposed to participate in the study. We included consenting mothers who had been on ART before 14 weeks of pregnancy and who had a child followed up at one of the PMTCT clinics mentioned above. A structured questionnaire was administered to the mothers, in a single face to face interview, by a trained health worker who did not work in the clinics.

The collected variables included: the child's and mother's age at the time of the interview, educational status, marital status, level of knowledge on PMTCT measures (mothers were asked to name PMTCT interventions required during pregnancy, childbirth and breastfeeding). Breastfeeding practices were considered good if mothers adhered to all of the following measures and bad if they did not adhere to any one of these measures: strict adherence to maternal ARV therapy and infant prophylaxis, exclusive breastfeeding during the first six months of infant's life, breastfeeding cessation before 12 months of age if feasible, avoiding traditional enema and finally bringing the child regularly to the clinic throughout the PMTCT period.

We allotted one point for each correct answer in order to evaluate mothers' knowledge as regards to PMTCT measures depending on the period (pregnancy, childbirth and breastfeeding). Thus, maximum score for knowledge on PMTCT measures during pregnancy was 4 points, 3 points for childbirth period and 7 points for the breastfeeding period; we calculated the median for each score and women were ranked in two or three groups depending on their score in relation with the median.

### Statistical analysis

The population characteristics were described using median and interquartile range (IQR) for quantitative variables. Qualitative variables were described using absolute numbers and percentages; groups were compared using the Chi 2 test or the Fisher's test when applicable.

We used a multivariable logistic regression model to determine the correlates of breastfeeding practices. All independent statistically significant variables with a threshold of 25% in a univariate analyse were introduced in the multivariate analyses.

We conducted a stepwise descendant analysis. Variables were retained in the final model if significantly associated with breastfeeding practices ( $p < 0.05$ ). Final results were adjusted for mothers' past history of PMTCT interventions.

## Results

We interviewed 201 HIV positive mothers among them 46.7% were from Yalgado Ouédraogo Teaching Hospital (CHU-YO). Overall 162 mothers (81%, 95% Confidence Interval [CI 95%]: 75.6–86.4) opted for breastfeeding; all of them accepted to participate in the study (Table 1).

Health facility	HIV infected mothers received with their infants during the study period	Breastfeeding HIV infected mothers enrolled
	N	N (%)
CHU YO	94	74 (78.7)
Boulmiougou	52	46 (88.5)
Nongr-Massom	32	23 (71.9)
Bogodogo	23	19 (82.6)
Total	201	162 (80.6)

**Table 1:** Distribution per clinic of HIV infected mothers received in the selected clinics and those enrolled (Ouagadougou Burkina Faso, September 2014-January 2015).

Children's biological parents were living together in 95.0% of cases. Mother's HIV status had been disclosed to the father in 75.3% (116/162) cases and 93.1 (108/116) fathers participated in their children's care. In term of ART, 129 (79.6%) mothers were on ART and 69 (42.6%) infants had received ART for prophylaxis. The infants' median age was 5.7 months (IQR: 2.6-9.7); 30.2% (49/162) mothers had a past history of PMTCT interventions (Table 2).

Characteristics	Number (%)
Median age of mothers, (EIQ)	32 (28-35)
(18-24)	14 (8.6)
(25-35)	108 (66.7)
>35	40 (24.7)
<b>Marital status of couples</b>	
Polygamous union	29 (17.90)
monogamous union	125 (77.2)
Single mother living alone	8 (4.9)
<b>Mother's educational status</b>	
No education	65 (40.1)
Primary education	55 (34.0)
Secondary or higher education	42 (25.9)
<b>Mother's current employment</b>	
Housewife	89 (54.9)
Student	9 (5.6)
Trader/Public or private sector worker	64 (39.5)
<b>Mother's residence</b>	

Serviced zone	116 (71.6)
Non-serviced zone	46 (28.4)
<b>Availability of tape water at home</b>	
Tape water available	146 (90.1)
No tape water	16 (9.9)
<b>Partner's educational status (N=154')</b>	
No education	59 (38.3)
Primary education	34 (22.1)
Secondary or higher education	61 (39.6)
<b>Partner's current employment (N=154')</b>	
Jobless	6 (3.9)
Student	10 (6.5)
Trader/Public or private sector worker	138 (89.6)
<b>Partner's Serostatus</b>	
HIV+	56 (34.6)
HIV-	43 (26.5)
Unknown	63 (38.9)

**Table 2:** Socio demographic characteristics of the 162 participants and their partners (Ouagadougou, Burkina Faso, September 2014-January 2015).

### Knowledge, attitudes, practices on PMTCT during breastfeeding

Mother to child HIV transmission was possible during breastfeeding according to 99.5% of mothers. However, more than half (52.5%) declared incapable of adhering to exclusive breastfeeding during the infant's first six months of life and one third (37%) declared practicing traditional enema using herbs. Mothers were familiar with most PMTCT measures required during pregnancy and childbirth. However, the median score of knowledge on PMTCT measures required during breastfeeding was below 4 for 123 (75.9%) of mothers (Table 3). The proportion of good breastfeeding practices was 34% (55/162).

Variables	Number (%)
<b>Have you missed at least one dose of your antiretroviral treatment the last 7 days? (N=129')</b>	
Yes	5 (3.9)
No	124 (96.1)
<b>Have you missed at least one dose of baby's antiretroviral prophylaxis the last 7 days? (N=71')</b>	
Yes	17 (23.9)
No	54 (76.1)
Median duration of breastfeeding in months (EIQ)	11.13 (7.76-12)

≤ 12	27 (71.1)
>12	8 (28.9)
<b>Have you or would you choose exclusive breastfeeding the first six months of your infant's life?</b>	
Yes	77 (47.5)
No	85 (52.5)
<b>Have or would you stop breastfeeding at 12 months of infant's life if feasible?</b>	
Yes	150 (92.6)
No	12 (7.4)
<b>Have or are you practicing enema?</b>	
Yes	60 (37.0)
No	102 (63.096)
<b>Good breastfeeding practices</b>	
Yes	55 (34.0)
No	107 (66.0)
<b>Measures required for PMTCT during pregnancy</b>	
Attend prenatal consultations	161 (99.4)
Mother's strict adherence to antiretroviral treatment	155 (95.7)
Safe sex or abstinence	26 (16.0)
Consult at any sign of danger	6 (3.7)
Median score on knowledge of measures required for PMTCT during pregnancy (EIQ)	2 [2-2]
≤ 2	132 (81.5)
>2	30 (18.5)
<b>Measures required for PMTCT during delivery</b>	
Delivery in a health center	161 (99.4)
Strict adherence to ARV treatment	157 (96.9)
Administering Nevirapine to the baby at birth	157 (96.9)
Median score of knowledge on measures required for PMTCT during delivery (EIQ)	3 (3-3)
<3	8 (4.9)
≥ 3	154 (95.1)
<b>Measures required for PMTCT during breastfeeding</b>	
Administering Nevirapine to the child once a day for 6 weeks	159 (98.1)
Exclusive breastfeeding during the first 6 months	107 (66.1)
Stop breastfeeding at 12 months if feasible	70 (43.2)

Avoid traditional enema using local herbs	59 (36.4)
Mother's strict adherence to ARV treatment	78 (48.1)
Avoid breastfeeding in case of cracks or infection of the breasts	10 (6.2)
Safe sex or abstinence	3 (1.9)
Median score of knowledge on measures required for PMTCT during breastfeeding (EIQ)	3 (2-4)
<2	34 (21.0)
[2-4]	89 (54.9)
>4	39 (24.1)

**Table 3:** Attitudes, practices and knowledge on safe breastfeeding among the 162 participants (Ouagadougou, Burkina Faso, September 2014-January 2015).

### Factors associated with breastfeeding practices

Table 4 presents factors associated with best breastfeeding practices in a univariate model. Mothers who had chosen to breastfeed in agreement with the father had better breastfeeding practices compared to those who had made the choice without the agreement from their partners ( $p=0.03$ ). Women living in poor resource areas had better breastfeeding practices compared to those living in well serviced areas ( $p=0.02$ ). Similarly, mothers with a median score  $>3$  of knowledge on prevention measures required during breastfeeding had better breastfeeding practices compared to those with a score  $\leq 3$  ( $p=0.01$ ). There was no association between best breastfeeding practices and a past history of PMTCT interventions.

In a multivariate model adjusted for a past history of PMTCT interventions, decision on feeding option made in consultation with the partner, [adjusted odds ratio (ORa: 3.27, CI 95%: 1.21-8.85), residence in a poor resource area (ORa: 2.49, CI 95% 1.17-5.27), and having a score  $>3$  of knowledge for PMTCT measures required during breastfeeding (ORa: 2.32, CI 95% 1.15-4.69), increased chances of having best breastfeeding practices (Table 5).

	Good breastfeeding practices			p
	Total	Yes	No	
	N=162	N=55 (%)	N=107 (%)	
How the feeding option was decided				
Mother alone	142	44 (31.0)	98 (69.0)	0.03
In agreement with the father	20	11 (55.0)	9 (45.0)	
Age				
[19-24]	14	6 (42.9)	8 (57.1)	0.67
[25-35]	108	37 (34.3)	71 (65.7)	
>35	40	12 (30.0)	28 (70.0)	
Marital status				

Polygamous union	29	12 (41.4)	17 (58.6)	0.61
Monogamous union	125	40 (32.0)	85 (68.0)	
Mother living alone	8	3 (37.5)	5 (62.5)	
Education status				
No education	65	25 (38.5)	40 (61.5)	0.26
Primary education	55	14 (25.5)	41 (74.5)	
Secondary or higher education	42	16 (38.1)	26 (61.9)	
Current employment				
Housewife	89	25 (28.1)	64 (71.9)	0.13
Student	9	5 (55.6)	4 (44.4)	
Trader / Public or private sector worker	64	25 (39.1)	39 (60.9)	
Residence				
Well serviced areas	116	33 (28.4)	83 (71.6)	0.02
Poorly serviced zone	46	22 (47.8)	24 (52.17)	
Water source at home				
Tape water	146	50 (34.3)	96 (65.7)	0.81
No tape water	16	5 (31.3)	11 (68.7)	
Partner's educational status (N=154 <sup>†</sup> )				
No education	59	18 (30.5)	41 (69.5)	0.69
Primary education	34	11 (32.4)	23 (67.6)	
Secondary or higher education	61	23 (37.7)	38 (62.3)	
Partner's current employment (N=154 <sup>†</sup> )				
Jobless	6	0 (0.0)	6 (100.0)	0.1
Student	138	47 (34.1)	91 (65.9)	
Trader/Public or private sector worker	10	5 (50.0)	5 (50.0)	
Partner's serostatus (N=154 <sup>†</sup> )				
HIV+	56	17 (30.3)	39 (69.7)	0.41
HIV-	43	18 (41.9)	25 (58.1)	
Unknown	55	17 (30.9)	38 (69.1)	
Mother's disclosure of serostatus to the partner (N=154 <sup>†</sup> )				
Yes	116	42 (36.2)	74 (63.8)	0.26

No	38	10 (26.3)	28 (73.7)	
Partner's participation in child's care (N=116**)				
Yes	108	39 (36.1)	69 (63.9)	0.93
No	8	3 (37.5)	5 (62.5)	
Median score on knowledge of measures required for PMTCT during pregnancy (IIQ)				
0	132	47 (35.6)	85 (64.4)	0.35
≥ 1	30	8 (26.7)	22 (73.3)	
Median score on knowledge of measures required for PMTCT during delivery (EIQ)				
≤ 2	8	4 (50.0)	4 (50.0)	0.32
>2	154	51 (33.1)	103 (66.9)	

Median score on knowledge of measures required for PMTCT during breastfeeding (EIQ)				
≤ 3	104	28 (26.9)	76 (73.1)	0.01
>3	58	27 (46.6)	31 (53.4)	
Median number of children other than this one, who had received PMTCT interventions				
0	113	36 (31.9)	77 (68.1)	0.39
≥ 1	49	19 (38.8)	30 (61.2)	

**Table 4:** Factors associated with safe breastfeeding practices among the 162 participants, univariate analysis (Ouagadougou, Burkina Faso, September 2014- January 2015).

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	Full model	p	Final model	p
	ORa (IC 95%)		ORa (IC 95%)	
How the feeding option was decided				
By mother alone	1	0.03	1	0.02
In agreement with the father	3.01 (1.09-8.31)		3.27 (1.21-8.85)	
Mother's current employment				
Housewife	1	0.12	-	
Student	4.06 (0.91-18.07)			
Trader/Public or private sector worker	1.60 (0.78-3.31)			
Residence				
Well serviced areas	1	0.01	1	0.01
Poorly serviced areas	2.70 (1.26-5.78)		2.49 (1.17-5.27)	
Median score on knowledge of measures required for PMTCT during breastfeeding (EIQ)				
≤ 3	1	0.07	1	0.02
>3	1.64 (0.95-2.81)		2.32 (1.15-4.69)	
Median number of children other than this one, who had received PMTCT interventions				
0	1	0.14	1	0.18
≥ 1	1.75 (0.82-3.74)		1.65 (0.78-3.49)	
ORa: Adjusted odds ratio; IC 95%: Interval of confidence at 95%				

**Table 5:** Factors associated with safe breastfeeding practices among the 162 participants, multivariate analysis (Ouagadougou, Burkina Faso, September 2014- January 2015).

## Discussion

In 2014, most HIV positive women breastfed their children (81%) and the majority of women (95%) lived with their partners in the three hospitals visited. Moreover, 2/3 of mothers was on ART and had disclosed their HIV status to their partner. The majority (95%) of women were familiar with PMTCT measures required during pregnancy and childbirth, whereas prevention measures required

during breastfeeding period were less mentioned. Factors associated with poor breastfeeding practices were: infant feeding option decided solely by the mother, living in well serviced areas and having a low score (≤ 3) of knowledge on how to prevent HIV transmission during breastfeeding.

Indeed, the rate of breastfeeding among HIV positive mothers was even higher in these health facilities as compared to national rate



estimated at 75% in 2010 [6]. Undoubtedly, this is related to the new revised national policy in favour of breastfeeding for HIV exposed infants when all the conditions (acceptable, feasible, affordable, sustainable and safe) were not fulfilled for artificial feeding. However, our rate is lower than that reported in Tanzania in 2008 in four urban health facilities including two hospitals, where among 196 HIV positive mothers, 187 (95.4%) opted for breastfeeding [7]. Thus, thanks to new revised national policies which strongly promote breastfeeding, it is the preferred option for the majority of HIV positive mothers in Sub-Saharan Africa.

On the other hand, despite recent progress in HIV treatment, disclosure of HIV status to partners is still a challenge in PMTCT programs in Ouagadougou as it has been confirmed in this study. Non-disclosure of HIV status to the partner has implications in all the stages of PMTCT cascade and particularly during breastfeeding [8]. A prospective study on 280 women in Kenya indicated a close link between non-disclosure of HIV status to the partner and practice of mixed feeding. Women who disclosed their HIV status to their partner, had three times more chances of practicing exclusive breastfeeding, compared to those who did not share their status with their partners [9].

Furthermore, demographic characteristics of the population like educational status, current employment and place of residence, reflect the general profile of the majority of women in African urban areas marked by lack of education and precariousness. The issue of safe feeding practices for HIV exposed infants in this context of poverty and lack of education continue to be at the centre of much debate in Africa [10].

Breastfeeding practices were considered poor in the majority of women. Among harmful practices we noted; non-adherence to ART and failure to practice exclusive breastfeeding during the first six months of infant's life. In fact, very few women were aware of prevention measures required for PMTCT during breastfeeding in the visited health centres. In a similar study carried out in Togo in 2010, 66% of women affirmed that there were no prevention measures against HIV transmission during breastfeeding [10]. Indeed, before the period preceding the first trials which showed significant decrease in transmission when ART was administered throughout breastfeeding period, PMTCT sensitization messages focused mainly on prevention measures during pregnancy and delivery. However, we noted that some of the women although well aware of the advantages of exclusive breastfeeding, considered this practice inapplicable in a hot tropical climate.

Thus, mixed feeding is widespread in Africa among HIV positive and negative women. Hurdles to exclusive breastfeeding include: lack of support from the community, beliefs that exclusive breastfeeding is inappropriate, and that maternal milk is insufficient for the child's optimal growth [7]. Yet, early introduction of supplementary food and decrease of maternal milk intake could increase the risk of HIV transmission due to possible lesions of digestive mucous which is still immature in infants below six months of age. Diarrhea and malnutrition are also more common in these children. Thus, greater emphasis needs to be placed to increase the rate of exclusive breastfeeding among HIV infected mothers [11]. Finally, there is a need to assess health workers' knowledge on the recently revised national PMTCT guidelines to ensure that messages disseminated by these health workers are correct and clear [12].

Best breastfeeding practices were statistically significantly associated with the fact that feeding option was decided in agreement with the father, residence in poor resource areas and having a high score of knowledge on prevention measures required during breastfeeding. Indeed, when feeding option is decided in agreement with the father, the latter is expected to fully play his role in support of the mother during breastfeeding period. This can include helping the mother to avoid harmful practices which may favour HIV transmission such as mixed feeding, voluntary interruption of ART, abrupt cessation of breastfeeding or extended breastfeeding beyond 12-18 months unnecessarily. Though, it is interesting to note that despite the fact that more than 80% of fathers were aware of their partner's HIV status, only 20% were involved in the decision to breastfeed. In most societies in Africa, new-borns' and infants' upbringing is in the sole hands of mothers and grandmothers. Thus, grandmothers play a key role in providing care to the new-borns [1,13]. In this survey, we did not include questions regarding grandmothers' involvement in breastfeeding practices. However, it is a well-known fact that they are usually the guardians of widespread socio-cultural practices such as traditional enema using local herbs for treatment of constipation or early introduction of other fluids in the baby's diet [1,14-16]. It is important that nutrition advices in the context of PMTCT are addressed not only to both parents, but also to grandmothers. To achieve this target, community health workers could be good channels for sensitization. Furthermore, women living in poor resource areas had significantly better breastfeeding practices compared to their counterparts. In theory, women living in well serviced areas, are well-off and more educated, therefore they would be expected to be more frequently away from their children for professional reasons. Therefore, they tend to leave their children with babysitters with risks of mixed feeding, early weaning and non-adherence to ART prophylaxis for their children. All in all, the key issue in safe breastfeeding practices in the context of HIV is insufficient knowledge of PMTCT measures required during breastfeeding among HIV infected mothers. In fact, reviewing guidelines alone might not be sufficient to change breastfeeding practices, it would be necessary to address social, structural and contextual factors which might jeopardize the success of the program [17].

The small sample size (201 HIV positive mothers of whom 162 were breastfeeding) might have constituted a limit for this study. In addition, the fact that we were not able to interview breastfeeding HIV positive mothers who did not attend the clinics, might have introduced a potential bias. These mothers might be the ones who had the worst feeding practices. However, to minimize this bias, all HIV infected mothers who brought their HIV exposed children to the PMTCT clinics during the study period and who met the inclusion criteria were recruited. Also, the fact that the investigator was a health worker might have exposed to social desirability bias. However, mothers were interviewed face to face and only once which made it possible to assess their actual knowledge. Otherwise, they could have sought the information which they did not have. Lastly, the study design made it impossible to follow up the children over a period of time in order to determine their HIV and nutritional status. In addition, the survey covered only mothers whose children were followed in hospitals of Ouagadougou; they might not represent the Burkina Faso population of HIV infected mothers.

## Conclusion

Safe breastfeeding for HIV exposed infants in hospitals of Ouagadougou is still a challenge. In order to achieve the goal of HIV free survival in children, the factors associated with poor breastfeeding practices must be identified and addressed. Focus must be laid on education of HIV positive women during pregnancy and throughout breastfeeding period.

## Declarations

### Ethics approval and consent to participate

Ethics approval was not applicable in this study design as this study was based on a questionnaire. Written consent to participate was obtained for all participants included in the study.

### Availability of data and materials

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

### Competing interests

The authors declare that they have no competing interests.

### Authors' Contributions

LK conducted the overall study coordination. CY, AK, GN, FB, AV, BC conducted the study on the field. DD performed the analysis. DY, FO, CZ, AK, FK corrected the manuscript. All the authors reviewed, edited and approved the manuscript.

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