

Early Initiation of Breastfeeding and Its Association in Rural Areas of Burkina Faso

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Abstract

Background: The global recommendations of the WHO and UNICEF are that all infants should start breastfeeding within one hour of birth. It is low-cost and has substantial potential to reduce neonatal and early infant morbidity. The objectives of the study were to investigate rate of early initiation of breastfeeding and to identify potential associated factors. **Methods:** A community based cross-sectional study design was conducted in three districts of Burkina Faso. Cluster sampling was used. The data were collected by using a structured and pretested interview questionnaire. The associations between early initiation and independent variables were tested using the Chi-square test. Crude Odds ratios (COR) with 95% confidence intervals were used. **Results:** Percentage of children who were put to the breast within one hour of birth was fair (41%). Having more than 2 antenatal care visits was found to be 1.43 times more likely to initiate breastfeeding early, COR: 1.4, 95% CI: [1.14 - 1.81], $p < 0.001$. Receiving advices, during pregnancy, on early initiation of breastfeeding, child feeding and child growth, were found to be more likely to initiate breastfeeding early, respectively COR: 1.52, 95% CI: [1.25 - 1.80]; 1.39, 95% CI: [1.15 - 1.67] and 1.39, 95% CI: [1.15 - 1.67], with $p < 0.001$. Mothers having skilled delivery were found to be more likely to initiate breastfeeding early, COR: 1.47, 95% CI: [1.20 - 1.79], $p < 0.001$. **Conclusions:** This study demonstrates that delayed initiation of breastfeeding continues to be a problem in rural areas of Burkina Faso, as only four in 10 newborn infants received breast milk within the first hour of birth. The results show that receiving advices on early initiation of breastfeeding, child growth and feeding and skilled delivery were found to be more likely to initiate breastfeeding within one hour of delivery. Therefore improving the skills of health providers and, mother individual counselling and strengthening community-based support, are critical to improve timely initiation of breastfeeding.

Keywords

Prevalence, Early Initiation, Breastfeeding, Rural Areas, Burkina Faso

1. Background

The global recommendations of the WHO and UNICEF are that all infants should start breastfeeding within one hour of birth (early initiation of breastfeeding) and be exclusively breastfed (only breast milk, no other liquids or solids, not even water, with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines) up to 6 months of age [1] [2]. Providing appropriate breastfeeding in the first day of life is crucial to the health of the newborn infant and to breastfeeding success [3] [4]. Progress to improve early initiation of breastfeeding rates has been slow over the past 10 years. Still less than half of all newborns are put to the breast within an hour of birth globally [5]. Early initiation of breastfeeding, is important for both the mother and the child, as suckling stimulates the release of hormones which help produce milk, and also stimulates the contraction of the uterus after childbirth, thus decreasing the likelihood of postpartum hemorrhage. “Colostrum” (milk produced from the breast in the first three days after delivery) is rich in natural antibodies that will help protect the newborn against infections [6]. Early initiation of breastfeeding could save millions lives each year by reducing deaths mainly due to diarrheal and lower respiratory tract infections in children [7]. Early initiation of breastfeeding is low-cost and has substantial potential to reduce neonatal and early infant morbidity and mortality [8]-[15].

Despite these benefits, less than 40% of infants in resource limited settings are breastfed within an hour of birth [16]. Identifying predictors to early initiation of breastfeeding is important in order to develop feasible and sustainable strategies by which to improve this key public health interventions.

The objectives of the study were to investigate rates of early initiation of breastfeeding and to identify potential factors associated with initiation of breastfeeding among Burkina Faso rural settings mothers.

2. Methods

2.1. Study Design, Setting and Participants

A Community based cross-sectional study design was conducted in three districts of East region (Manni and Gayéri) and center-north region (Boulsa) from November to December 2011. Manni and Gayéri are two of the six districts of the East region. Boulsa is one of the three districts of the center-north region. The three districts was the setting for a new project.

All rural mothers who have children less than 24 months were considered as source population.

2.2. Sample Size

The procedures for determining survey sample size described above are designed to take into account the requirements for a follow-up survey round of a program evaluation as initial round in the concerned districts.

Two steps are involved in determining survey sample size, calculating the number of mother-infant pairs required to satisfy the measurement requirements for child feeding and calculating how many households would have to be contacted in order to find the number of elements needed in the first step.

As the survey was for implementing feeding intervention, we used the percentage of infants who were stunted as the indicator for calculating the sample size in each district.

The following basic equation has been used to calculate the required sample size for each district.

$$n = D * \left[(Z\alpha + Z\beta)^2 * (P1 * (1 - P1) + P2 * (1 - P2)) / (P2 - P1)^2 \right]$$

n = required minimum sample size per survey round; D = design effect (assumed to be 2); $P1$ = the estimated level of percentage of infants who were stunted ($P1$ Manni = 31.6%; Boulssa = 32%; Gayérie = 31.2%);

$P2$ = the expected level of percentage of infants who were stunted for the project area such that the quantity ($P2$ Manni = 22.6%; Boulssa = 23%; Gayérie = 22.22%)

$(P2 - P1)$ is the size of the magnitude of change it is desired to be able to detect;

$Z\alpha = 1.28$, the Z-score corresponding to the degree of confidence with which it is desired to be able to conclude that an observed change of size $(P2 - P1)$ would not have occurred by chance (α —the level of statistical significance); $Z\beta = 0.84$, the z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size $(P2 - P1)$ if one actually occurred ($\beta = 0.80$ —statistical power).

Sample size was (including non-responses rate) 611 infants for Manni; 611 infants for Boulsa and 610 infants for Gayeri, with a total of 1832 infants.

2.3. Sampling

Cluster sampling, as probability sampling methods was used. In each district, villages were the clusters. Size of each cluster was available from the last population census to sample selection. Probability-proportional-to-size (PPS) selection procedures were used. Sampling frames was lists of villages from the last population census. Two-stage cluster design is one in which 1) clusters are selected with probability-proportional-to-size (PPS) at the first stage of sample selection and 2) a constant number of households is chosen from each cluster at the second stage. In each district, PPS selection procedures are: 1) prepare a list of first stage sampling units (*i.e.*, clusters = villages) with a corresponding measure of size for each; 2) starting at the top of the list, calculate the cumulative measure of size

and enter these figures in a column next to the measure of size for each unit; 3) calculate the sampling interval (SI) by dividing the total cumulative measure of size (M) by the planned number of units to be selected a — that is, $SI = M/a$; 4) Select a random number (random start) between 1 and (SI). Compare this number with the cumulative measure of size column. The unit within whose cumulative measure of size the number (RS) falls is the first sample unit; 5) subsequent units are chosen by adding the sampling interval (SI) to the number identified in step (4); that is $RS + SI$, $RS + SI * 2$, $RS + SI * 3$, etc; 6) This procedure is followed until the list has been exhausted. The resulting number of units should be approximately equal to the target number of clusters.

2.4. Sampling Household

We used random-walk method for selecting sample households. The random-walk method is used in EPI (expanded program of immunization) cluster surveys and thus is relatively widely known. The method entails 1) randomly choosing a starting point and a direction of travel within a sample cluster, 2) conducting an interview in the nearest household, and 3) continuously choosing the next nearest household for an interview until the target number of interviews has been obtained. Selecting the starting point using the EPI method for EPI surveys. It is assumed that no map of the cluster exists and that field staff will choose a starting location. To do so, they will follow instructions that call for 1) going to a central location in the cluster and selecting a travel direction at random by spinning a bottle, 2) moving in a straight line in that direction and counting all of the households until the edge of the cluster is reached, and 3) randomly choosing a number between 1 and the number of households counted as the starting point for the survey.

2.5. Procedure for Selecting Individual Survey Subjects

All eligible subjects (children within age ranges) found within sample households are to be included in the sample (e.g., all children 0 - 24 months of age).

2.6. Data Collection

The data were collected by using a structured and pretested interview questionnaire. The questionnaire was initially prepared in French and then has been translated into the local language. Trained health workers who speak local languages were employed in the data collection process. Training was given to the data collectors and supervisors for two consecutive days on the objectives of the study, the contents of the questionnaire, particularly on issues related to the confidentiality of the responses and the rights of respondents. Before the data collection, a pre-test was conducted. Additional modifications were made to the questionnaire in terms of terminologies and formatting based on the pretest findings. Every day, all collected data were checked for their completeness, clarity and consistency by supervisor and principal investigator. Any unclear and

ambiguous data were corrected at that time by the supervisor and principal investigator.

2.7. Definition of Variables

In this study, mothers were asked about whether they had initiated breastfeeding and how long after giving birth. The outcome variable (timely initiation of breastfeeding) was expressed as the proportion of infants who first suckled within 1 hour of birth. The main outcome variable.

The study used one major questionnaire with socio-demographic factors, maternal factors, child related factors and characteristics of child feeding practices were included in the survey.

2.8. Data Analysis

The data were entered in double, cleaned and checked for missing values and outliers, and analyzed using IBMSPSS statistics for windows, version 20.0. Simple descriptive analyses were used to describe the initiation of breastfeeding practices and characteristics of the study population. The rate of early initiation was reported using frequency distribution. The associations between early initiation and independent variables were tested using the Chi-square test. Unadjusted Odds ratios (OR) with 95% confidence intervals (95% CI) was used to investigate the factors independently associated with early initiation of breastfeeding. All of the results were considered statistically significant at $P < 0.05$.

2.9. Ethical Considerations

Ethical clearance was obtained from Burkina Faso ethical committee for health research. At the time of data collection, a verbal and written consent was taken from the participants to confirm whether they are willing to participate or to obtain oral consent. Information was collected after securing consent from study participants. Data obtained from each study participant were kept confidential.

3. Results

3.1. Socio-Demographic Characteristics of the Participants

The majority (53.5%) of mothers were in the age group 21 - 30 years. The mean age of mothers was 25.96 years SD = 6.3y).

The highest proportion of mothers (91%) had not attended primary school. All of mothers were housewives. The mean number of living children by mother was 3.04.

The average number of pregnancies per woman was 3.73. More than 80 % of mothers had more than one pregnancy (**Table 1**).

The mean age of infants was 10.87 mo (SD = 6.8 mo), 52.3% were boys and 47.7% girls.

The majority (74.3%) of children had health care carte showing that they have contact with health facilities for care.

Table 1. Characteristics of the participants.

	n	%
Mothers age (years)		
15 - 20	457	24.9
21 - 30	981	53.5
≥31	394	21.5
Formal school education of mothers		
Yes	164	9.0
No	1668	91.0
Living children number by mother		
1	448	24.5
2 - 3	752	41.0
4 - 5	530	28.9
≥6	102	5.6
Number of pregnancies by mother		
1	346	18.9
2 - 5	1235	67.4
≥6	251	13.7

3.2. Advices Received during Pregnancy

The majority (78.5%) of mothers received antenatal care. During pregnancy, 59.8% of mothers have received advices on early breastfeeding initiation; 49.1% received advice on child growth and 59.8% on child feeding.

Out of participants, 63.3% of mothers have been delivered on health facilities by skilled care providers (Table 2).

3.3. Prevalence of Early Breastfeeding Initiation

Table 3 shows the indicators on early breastfeeding. Proportion of children born in last 23.9 months who were put to the breast within one hour of birth was 41%.

The average time of initiation of breastfeeding for all babies was 10.81 h and the median time of initiation of breastfeeding for all babies was 4 h with minimum 0.7 h and maximum 72 h.

3.4. Predictors of Early Initiation of Breastfeeding

Table 4 shows the results of bivariate analyses. Antenatal cares, advices on early initiation of breastfeeding, advices on child feeding, and on child growth received during pregnancy, and delivery by skilled care providers, were associated with early initiation of breastfeeding.

Having more than 2 antenatal care contact was found to be 1.43 times more likely to initiate breastfeeding within one hour of delivery, compared to mothers having less than 2 antenatal care contacts, COR: 1.43, 95% CI: [1.14 - 1.81], $p < 0.001$.

Receiving advices, during pregnancy, on early initiation of breastfeeding, child feeding and child growth, were found to be more likely to initiate early initiation of breastfeeding within one hour of birth, respectively COR: 1.52, 95% CI: [1.25 - 1.80]; 1.39, [1.15 - 1.67] and 1.39, [1.15 - 1.67], with $p < 0.001$.

Table 2. Care and advices during the pregnancy period.

	n	%
Number of antennal care contact		
0	413	22.5
1 - 2	203	11.1
3 - 4	1216	66.4
Advices on early breastfeeding initiation		
Yes	1096	59.8
No	736	40.2
Advices on child growth		
Yes	900	49.1
No	932	50.9
Advices on child feeding		
Yes	1096	59.8
No	736	40.2
Skilled birth		
Yes	1159	63.3
No	673	36.7

Table 3. Early breastfeeding initiation indicators.

	n	%
Proportion of children born in last 23.9 months who were put to the breast within one hour of birth	1832	41.0
Proportion of children born in last 11.9 months who were put to the breast within one hour of birth	1061	42.0
Proportion of children born between 12 and 23.9 months who were put to the breast within one hour of birth	771	39.7

Skilled delivery was found to be more likely to initiate breastfeeding within one hour of delivery than non-skilled deliveries, COR: 1.47, 95% CI: [1.20 - 1.79], $p < 0.001$.

4. Discussion

This study has some limits given the design of the observational study which does not allow to build a causal relationship between outcome and independent variables. Another possible bias is that the indicator of early initiation of breastfeeding is based on historic recall.

In Burkina Faso, rural women are characterized by poverty income, limited access to health facility, social and economic vulnerability, uneducated status. Early breastfeeding initiation is so impaired by poverty.

The study aimed to determine the prevalence and associated factors of early initiation of breastfeeding. Early initiation of breastfeeding is important for both the mother and the child [15]. Early suckling stimulates the release of prolactin, which helps in the production of milk and oxytocin, which is responsible for the ejection of milk and stimulates the contraction of the uterus after childbirth [17].

Table 4. Univariate analysis showing association of factors with early breastfeeding initiation among mothers in rural areas of Burkina Faso.

	n	% of EBI*	COR[95%CI]	p
Mothers age (years)				
15 - 20	457	38.5	1.0	
21 - 30	981	41.3	1.12 [0.89 - 1.40]	0.34
≥ 31	394	43.4	1.5 [0.9 - 1.7]	
Formal school education of mothers				
Yes	164	44.5	1.16 [0.84 - 1.61]	
No	1668	40.7	1.0	0.34
Sex of children				
Male	874	42.9	1.15 [0.96 - 1.39]	
Female	958	39.4	1.0	0.12
Number of antennal care visits				
0	413	36.3	1.0	
1 - 2	203	26.6	0.63 [0.43 - 0.92]	
≥3	1216	45.1	1.43 [1.14 - 1.81]	<0.001
Advices on EBI*				
Yes	1096	45.1	1.52 [1.25 - 1.80]	
No	736	35.1	1.0	<0.001
Advices on child growth				
Yes	900	45.1	1.39 [1.15 - 1.67]	
No	932	37.1	1.0	<0.001
Advices on infant feeding				
Yes	900	45.1	1.39 [1.15 - 1.67]	
No	932	37.1	1.0	<0.001
Skilled delivery				
Yes	1159	44.4	1.47 [1.20 - 1.79]	
No	673	35.2	1.0	<0.001
Number of pregnancies by mother				
1	346	40.2	1.0	
2 - 6	1235	41.1	1.03 [0.81 - 1.32]	
≥ 6	251	42.2	1.08 [0.78 - 1.51]	0.88
Living children number by mother				
1	448	39.7	1.0	
2 - 3	752	41.6	10.8 [0.85 - 1.32]	
4 - 6	530	40.4	1.02 [0.79 - 1.33]	
≥6	102	46.1	1.29 [0.84 - 1.99]	0.66

*early breastfeeding initiation.

The WHO guidelines recommends that the baby should be placed “skin-to-skin” with the mother within the first half-hour following delivery [18]. Optimally, the baby should be breastfed before any routine procedure (such as weighing, umbilical cord care, and administration of medications) is performed. Early breastfeeding enhances bonding, increases chances of breastfeeding success, and generally lengthens the duration of breastfeeding.

For early initiation of breastfeeding rating, guidelines indicate, poor for percentage of infants breastfed within one hour of birth is between 0% - 29%; fair

between 30% - 49%; good between 50% - 80% and very good between 90% - 100% [18]. This study reported that only 41% of babies breastfed within one hour of birth. Therefore, the finding of this study showed that the prevalence of timely initiation of breastfeeding was fair despite to strategies to improve early initiation of breastfeeding.

The prevalence of early initiation of breastfeeding for West Africa, East Africa, Central Africa and Southern Africa was 46.94% (95% CI 39.37 to 54.50), 61.82% (95% CI 46.22 to 77.41), 37.84% (95% CI 24.62 to 51.05) and 69.31% (95% CI 67.65 to 70.97), respectively. Countries with the lowest prevalence of early initiation of breastfeeding were Guinea (16.54%) in West Africa, Kenya (30.38%) in East Africa, Congo Brazzaville (24.10%) in Central Africa and Lesotho (66.24%) in Southern Africa [19].

We compared the prevalence of early initiation of breastfeeding (41%) reported in this study with many results in many studies from many countries [20]-[30]. Our reported prevalence was higher than that reported in Pakistan (29%), lower than prevalence reported from some countries Ethiopia (52%), North Jordan (86.6%), Saudi Arabia, Arbaminch area (South Ethiopia), Nepal, Nepal (72.2%); Tanzania (52%), Bangladesh (47%). But the finding of this study was similar than other sub-Saharan countries (Ghana), Nigeria, and similar than India (41%). Nigeria (45%), and Ghana (41%).

The possible explanation for observed difference of prevalence of early initiation of breastfeeding between studies could be due to the fact that methodological difference, variation in infant and maternal socio-demographic characteristics, economical and health status. Moreover, this variation might be resulting from due to lack of knowledge on the right time of breastfeeding initiation [31].

Immediate newborn care, including early breastfeeding initiation and exclusive breastfeeding are some of the proven interventions that reduce neonatal mortality [8] [32] [33]. Delayed breastfeeding initiation increase the risk of neonatal mortality [15].

Increasing the rate of early initiation of breastfeeding from the current rate of 41% to universal practice (near 100%), therefore, is likely to contribute significantly to reducing neonatal mortality in Burkina Faso.

Our findings showed that receiving advices on feeding during prenatal care visits, and being assisted by skilled attendants during childbirth increased the likelihood of a woman initiating breastfeeding within one hour of childbirth. Similar with this study previous studies showed that advice received/knowledge on early initiation of breastfeeding [34] [35]. Our results are also consistent with the skilled attendants' training. Health workers are trained to become skilled birth attendants, as in 'supporting successful breastfeeding' that includes 'education', and 'skill' components on supporting mothers to breastfeed as part of immediate newborn care.

Previous findings [22] [28] [36] have reported that the mothers who had their childbirth in a health facility, attended by health workers, were more likely to initiate breastfeeding within the first hour of birth. This could be due to the effect

of postpartum counseling on the importance of timely breastfeeding initiation for women who delivered at health facility. The other possible explanation could be due to mothers who gave birth at home have cultural factor delaying early initiation of breastfeeding.

Improving the skills of health providers in first level health facilities is critical to give adequate feeding support to the mothers during prenatal care visits (advices) and after delivery. Additionally, mother individual counselling and strengthening community-based support (including husbands, grande-mothers) for early nutrition is a key intervention.

A special emphasis should be given for rural women and women who gave birth at home to increase timely initiation of breastfeeding.

5. Conclusions

This study demonstrates that delayed initiation of breastfeeding continues to be a problem in rural areas of Burkina Faso, as only four in 10 newborn infants received breast milk within the first hour of birth. Given the protective association of early breastfeeding and neonatal mortality, promoting early initiation of breastfeeding is critical for newborn survival. The results show that receiving advices on early initiation of breastfeeding, child growth and feeding and skilled delivery were found to be more likely to initiate breastfeeding within one hour of delivery.

Breastfeeding promotion program is essential to encourage the practice of timely initiation of breastfeeding. Therefore improving the skills of health providers in first level health facilities is critical to give adequate feeding support to the mothers during prenatal care visits (advices) and after delivery. Additionally, mother individual counselling and strengthening community-based support for early nutrition is a key intervention. A special emphasis should be given for rural women and women who gave birth at home to increase timely initiation of breastfeeding.

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Author Contributions

All authors contributed to study design, literature review, data collection, data analysis and interpretation, and writing. All authors revised and agreed on the views expressed in the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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