



Colostrum Avoidance Practices and Associated Factors among Mothers Having Children Less than Six Months of Age in Chiro District, Oromia Region, Eastern Ethiopia

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Abstract

Background: Colostrum is full of essential nutrients and bioactive compounds that are vital for the health and growth of neonate. While colostrum is indeed crucial for the health and immunity of newborns, the statement that avoiding feeding colostrum is the leading cause of respiratory and diarrhoeal diseases during infancy period. To the best of our literature review, most of these studies were conducted in a small sample size and there is no study on a similar title in the Chiro Woreda. Therefore, the objective of this study is colostrum avoidance practices and associated factors among mothers having children less than six months of age in Chiro District, Oromia Region, Eastern Ethiopia.

Methods: A community-based cross-sectional study including 850 mothers having children under six months old in the Chiro District was carried out between September 1 and September 30, 2023. A pretested, semi-structured, and interviewer-administered tool was used to gather data. A multistage sampling technique was used to recruit the final study participants. Data were entered into Epi data version 3.1 software and then exported to Stata version 17 for data analysis. Poisson regression analysis was utilized to determine the variables linked to colostrum avoidance practices. To declare a statistically significant, the adjusted prevalence ratio with its 95% confidence interval and a p-value less than 0.05 were taken into consideration.

Results: The prevalence of colostrum avoidance practices was 14.1% (95% CI: 11.9-16.6). Home delivery (APR = 1.8; 95% CI: 1.1, 2.3), hadn't postnatal care utilization (APR = 2.1; 95% CI: 1.4, 2.7), breastfeeding initiation after one hour (APR = 1.6; 95% CI: 1.1, 2.2), and poor knowledge about colostrum (APR = 2.2; 95% CI: 1.1, 2.9) were factors significantly associated with colostrum avoidance practices.

Conclusions: This study revealed that mothers of children aged less than six months almost one out of seven mothers practice colostrum avoidance. Home delivery hadn't post-natal care services utilization, breastfeeding initiation after one hour, and poor knowledge about colostrum feedings were factors significantly associated with colostrum avoidance practices. Therefore, healthcare workers should promote institutional delivery, encourage post-natal care utilization, encourage breastfeeding initiation within one hour, and enhance maternal knowledge about the benefit of colostrum feeding.

Keywords: Colostrum Avoidance; Practices; Children Less Than Six Months; Eastern Ethiopia

Introduction

The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) strongly advocate colostrum feeding for newborns as soon as possible after birth [1]. Colostrum is recognized as the first and most beneficial form of milk that the mammary glands secrete after giving birth [1,2]. Adequate nutrition during infancy and early childhood is paramount to guarantee the overall well-being of children. Their growth, health, and development are predicted by their early life nutritional status and immunity [2]. Colostrum has all the important nutrients to meet the infant's nutritional demand in the first 6 months of life [1].

Colostrum, the first milk but yellow in appearance, is produced in the first two to three days of delivery [3]. Colostrum is full of essential nutrients and bioactive compounds that are vital for the health and growth of the neonate [4]. Promoting and supporting colostrum feeding practices is a public health intervention to improve infant and child health outcomes [5]. While colostrum is indeed crucial for the health and immunity of newborns, the statement that avoiding feeding colostrum is the leading cause of respiratory and diarrhoeal diseases during infancy period [6].

A study conducted in Pakistan with over 17,000 children indicated that low breastfeeding practices were associated with neonatal and infant mortality [7]. Sub-Saharan Africa accounted for the lowest breastfeeding rate and the highest under-five mortality rate in which sub-optimal breastfeeding was significantly associated with child mortality. A three-fold risk of under-five death was related to delayed breastfeeding initiation [8]. A result of a systematic review and meta-analysis reported that the pooled prevalence of colostrum avoidance practices in Ethiopia was 19.07%. Moreover, cross-sectional studies reported that the magnitude of colostrum avoidance practice ranged from (6.8%) in Aksum town, Tigray [9] to a magnitude of 22.1% in Bure District, Amhara region of Ethiopia [10].

Even though colostrum feeding has numerous roles in health and against illness, the evidence indicated that colostrum avoidance practice is prevalent among different cultural backgrounds and it's a custom among developing countries like Ethiopia [11-13]. Colostrum avoidance includes late initiation breast feedings and avoiding the first milk [14,15]. Mothers in developing countries avoid feeding colostrums for various traditional and cultural bases [12,13,16]. A study conducted in Indian society indicated that a concept of ritual pollution, which considers the yellowish

color of the colostrum as impure, influenced the practice of colostrum avoidance [17]. Another study indicated that believing that colostrum had no nutritional value and assuming colostrum could infect and endanger their children's well-being negatively affected the practice [18].

Studies conducted in the different cultural settings of Ethiopia found that socio-demographic, knowledge, attitude, health-seeking behavior, counseling, and obstetric-related factors were found to be significantly associated with colostrum avoidance practice [9,10,15,19,20]. To the best of our literature review, most of these studies were conducted in a small sample size and there is no study on colostrum avoidance and its associated factors in the study area. Therefore, the objective of this study is colostrum avoidance practices and associated factors among mothers having children less than six months of age in Chiro District, Oromia Region, Eastern Ethiopia.

Methods and Materials

Study Setting

The study was carried out in the Chiro district, West Hararghe Zone, Eastern Ethiopia. The area lies 326 kilometers from Ethiopia's capital city, Addis Ababa. The district comprises 39 rural and 3 urban kebeles. Based on the 2007 census, the total population of the Chiro town was projected to be 272,340 of which 133,656 are females in 2023. Around 45,043 of the total population are urban inhabitants. According to data from Chiro Woreda Administration has one public hospital, one health facility, three health posts, and nine private clinics. The Chiro woreda has five private clinics, 39 health posts, and 7 health centers. The number of mothers having children less than six during the study period was 2,108.

Study design and population

A community-based cross-sectional study was conducted from September 1 to September 30, 2023. All mothers in the Chiro district who had children less than six months were served as the source population. Mothers who had children less than six months and lived more than six months in the Chiro district were included in this study. During the time of data collection, mothers who were critically ill and unable to answer for the interviewer were excluded from this study.

Sampling and sampling procedure

The sample size was calculated using a formula for the estimation of a single population. The following assumptions were made: the prevalence of colostrum avoidance practices among mothers

who had children aged less than six months in Bure District was 44.4% [10], with a 95% confidence interval, 3% margin of error ($d = 0.03$), design effect of 1.5, and a non-response rate of 10%, the total sample size was =875. A multistage sampling technique was applied to select study unity from the community. Firstly, Chiro Woreda has 42 Kebeles (39 rural and 3 urban Kebeles). From 42 kebeles (six rural and one urban Kebeles) were selected using simple random sampling. Secondly, in each selected kebele households with mothers having children less than six months were labeled through house-to-house visits by data collectors and community health extension workers (CHEW). Then, the calculated sample size (875) was proportionally allocated to each kebele. Finally, study participants were selected by using systematic random sampling of every K value (2). $K = N/n$, $2108/875$ with $k = 2.4 \approx 2$. The first study participant was selected by the lottery method.

Study variables and measurements

The dependent variable in this study was colostrum avoidance practices and the independent variables were socio-demographic, maternal obstetric and medical-related characteristics, and breastfeeding-related characteristics.

Operational definitions

- **Colostrum avoidance:** Avoiding or discarding colostrum at least once within the first three days after delivery of the newborn [21].
- **Knowledge about colostrum:** Respondents who scored equal to mean and above on the colostrum feeding knowledge questions were considered as good knowledge about the colostrum unless otherwise poor knowledge [22].
- **Attitudes toward the colostrum feedings:** Participants who scored above or equal to the mean score of attitude toward colostrum feedings questions were considered to have a favorable attitude toward the colostrum feedings unless otherwise unfavorable attitude [22].
- **Prelacteal feeding:** Mothers who gave fluid or food to neonates except for drugs, vitamins, minerals, and vaccines before breastfeeding initiation or within the first few days of life after delivery [23].

Data collection tool and procedures

Data were collected by using a pretested, semi-structured, and interviewer-administered tool adapted from different literature [10,22,24]. The tool was originally prepared in English and then translated into the national languages (Afan Oromo and Amharic), and back-translated into English by another person to check for

uniformity. For data collection, the Afan Oromo and Amharic version questionnaire was used. The tool includes socio-demographic, maternal health services and obstetric-related characteristics, and breastfeeding-related characteristics. For data collection eight BSc midwifery professionals who had experience in the community data collection were recruited and supervised by four master's holder nurse professionals.

Data quality control

The data collectors and supervisors were trained for two days by a principal investigator on the aims of the study and ways of data collection. A pretest was conducted among 5% [44] of the sample size at Gelemso town that was not included in the actual study. Continuous follow-up and supervision were done by the supervisors throughout the data collection period.

Data analysis

Data were coded, cleaned, and entered into Epi data version 3.1 software. The data were exported to Stata version 17 for data analysis. The descriptive results of the study were reported in the form of a frequency, percent, mean, and standardized deviation. The association between independent factors was investigated by the Poisson regression analysis model with robust variance estimation. The Poisson regression with robust variance does not experience any convergence issues while applying binomial data. When the dependent variable is frequent, often with a prevalence of more than 10 %, the prevalence ratio can be overrated by the odds ratio. The presence of multicollinearity between explanatory variables was determined using the variance inflation factor (VIFs), the correlation matrix for the regression coefficients and there is no collinearity between variables. Based on Akaike's and Bayesian information criteria, the final model was determined. Pearson Chi-square and the Hosmer-Lemeshow goodness-of-fit were tested to evaluate the model's fitness. Results were reported using APRs with a 95 % CI. P -value < 0.05 were considered to declare a statistically significant association.

Results

Socio-demographic characteristics of participants

A total of 850 mothers having children less than 6 months of age were interviewed with a response rate of 97.1%. In this study, 374 respondents were found to age range between 23 to 29 and the mean age of the mothers was 29.4 with a standard deviation of 7.41 ($sd \pm 7.41$) and ranging from 16 to 49 years. About 284 (33.4%) mothers attended secondary school and 463 (54.5%) rural residents (Table 1).

Variables	Frequency	Percent (%)
Age of participant (years)		
<23	94	11.0
23-29	374	44.0
30-38	276	32.5
≥39	106	12.5
Maternal educational level		
No formal education	139	16.4
Primary	268	31.5
Secondary	284	33.4
Diploma and above	159	18.7
Maternal household head		
Yes	333	39.2
No	517	60.8
Maternal occupation		
Unemployed	190	22.4
Employed	660	77.6
Infant sex		
Male	398	46.8
Female	452	53.2
Religion		
Muslim	266	31.3
Orthodox	333	39.2
Protestant	177	20.8
*Others	74	8.7
Residence of participant		
Rural	463	54.5
Urban	387	45.5

Table 1: Socio-demographic characteristics of mothers having children less than six months in Chiro District, Eastern Ethiopia, 2023 (n = 850).

*Indicates that (Adventist, Wakefata, and Catholic).

Obstetric and medical-related characteristics

In this study, 617 (72.6%) participants were multiparous women, and 786 (92.5) mothers had at least one antenatal care contact for their current pregnancy. About 663 (78.0%) mothers delivered the index child at health institutions. Among study participants, 778 (91.5%) mothers gave birth spontaneous vaginal delivery, and about 687 (80.8%) mothers had a history of post-natal care utilization. About 108 (12.7%) mothers who participated in this study had chronic disease and 97 (11.4%) experienced neonatal illness (Table 2).

Variables	Frequency	Percent (%)
Parity		
Primi-paraous	233	27.4
Multiparous	617	72.6
Anti-natal care visit for current pregnancy		
Yes	786	92.5
No	64	7.5
Anti-natal care visit times (n=786)		
1	21	2.7
2	53	6.7
3	166	21.1
≥4	546	69.5
Place of delivery for current birth		
Health Institution	663	78.0
Home	187	22.0
Mode of delivery		
Vaginal	778	91.5
C/S	72	8.5
PNC service utilization		
Yes	687	80.8
No	163	19.2
Neonatal illness		
No	753	88.6
Yes	97	11.4
Maternal chronic disease		
No	742	87.3
Yes	108	12.7

Table 2: Obstetric and medical-related characteristics of mothers having children less than six months in Chiro District, Eastern Ethiopia, 2023 (n = 850).

Breastfeeding related characteristics

From the study respondents, 548 (64.5%) mothers of children aged less than 6 months were counseled about breastfeeding at least one time by healthcare providers during the current pregnancy or delivery. In this study, 672 (79.1%) participants initiated breastfeeding within one hour of delivery, and 688 (80.9%) mothers did not practice pre-lacteal feeding for the current birth. Among study participants, 724 (85.2%) mothers had good knowledge about colostrum feedings (Table 3).

Variables	Frequency	Percent (%)
Counseled on breastfeeding for current birth		
Yes	548	64.5
No	302	35.5
Breastfeeding initiation time		
Within one hour	672	79.1
After one hour	178	20.9
Pre-lacteal feeding		
No	688	80.9
Yes	162	19.1
Type of pre-lacteal feedings (n=162)		
Plain water	44	27.2
Fresh butter	29	17.9
Cow milk	67	41.4
Honey	12	7.4
Tea	10	6.1
Reason for pre-lacteal feeding (n=162)		
Delayed initiation	22	13.6
Cultural practices	49	30.2
Inadequate breast secretion	49	30.2
Maternal illness	42	26.0
Cultural support of colostrum feeding		
Yes	743	87.4
No	107	12.6
Husband support of colostrum avoidance		
No	619	72.8
Yes	231	27.2
Knowledge of colostrum		
Good	724	85.2
Poor	126	14.8
An attitude of colostrum feeding		
Favorable	438	51.5
Unfavorable	412	48.5

Table 3: Breastfeeding-related characteristics of mothers having children less than six months in Chiro District, Eastern Ethiopia, 2023 (n = 850).

Prevalence of colostrum avoidance

The reported prevalence of colostrum avoidance practices was 14.1% (120/850) with (95% CI: 11.8% – 16.6%) among mothers having children less than six months in Chiro District, Oromia Region, Eastern Ethiopia.

Factors associated with Colostrum avoidance

Bivariate Poisson regression analysis identified that age less than 23, mother not a head of household, hadn't ANC contact, multiparous, home delivery, hadn't postnatal care services utilization, neonatal illness, breastfeeding initiation after one hour, pre-lacteal feeding, poor knowledge about colostrum feedings, and husband support for colostrum avoidance were significantly associated with colostrum avoidance practices among mothers have children less than six months.

After adjusting for confounding variables, the prevalence of colostrum avoidance practices was 1.8 higher (APR= 1.8; 95% CI: 1.1, 2.3) among mothers who gave birth at home compared to mothers who gave birth in the health facility. Similarly, the prevalence of colostrum avoidance practices was 2.1 higher (APR= 2.1; 95% CI: 1.4, 2.7) among mothers who hadn't post-natal care services utilization compared to those who had post-natal care services utilization. The mothers who initiated breastfeeding after one hour were 1.6 times more likely to practice colostrum feeding avoidance than those mothers who initiated breastfeeding within one hour (APR= 1.6; 95% CI: 1.1, 2.2). Mothers who had poor knowledge about colostrum feeding were 2.2 times more likely to practice colostrum avoidance than those mothers who had good knowledge about colostrum feeding (APR= 2.2; 95% CI: 1.1, 2.9).

Discussion

Colostrum avoidance is still a frequent practice in Ethiopia even though colostrum is vital for the child's survival [25]. This study revealed that 14.1% (95% CI: 11.9-16.6) of mothers practiced colostrum avoidance. This implies the need for behavioral modification programs of colostrum feeding practices among newly delivered mothers. The finding of this study was comparable with the studies conducted in Nepal (16.5%) [26], Amhara region, Ethiopia (14.5%) [10], Gozamen district, Ethiopia (16.6%) [27], and lower than studies conducted in India (92%) [28], Amhara region, Ethiopia (32.8%) [29], and Northeast Ethiopia (39.5%) [30]. However, higher than the studies done in Jinka town, southern Ethiopia (9.8%) [31], Sodo zuria district, Southern Ethiopia (8.5%) [32]. This difference might be due to socio-cultural practices, beliefs, and taboos across the communities that have a lion's share in the avoidance of colostrum. Also might be the difference due to maternal health service access (access to PNC, institutional delivery, and counseling about breastfeeding), and geographical location.

Variables	Crude PR with (95% CI)	Model I APR (95% CI)	Model II APR (95% CI)	Model-III APR (95%CI)	Model IV APR (95% CI)	p-value
Age						
Below 23	-1.3 (-2.3, -0.3)	-1.3 (-2.3, 0.3)			-0.1 (-1.2, 0.9)	
23-29	1	1			1	
30-38	-0.1 (- 0.4, 0.3)	-0.1 (- 0.4, 0.3)			-0.1 (-0.5, 0.3)	
≥ 39	-0.2 (-0.8, 0.4)	-0.2 (-0.8, 0.4)			-0.3 (-0.9, 0.4)	
Maternal household head						
Yes	1	1			1	
No	0.3 (-0.1, 0.7)	0.3 (-0.1, 0.7)			0.2 (-0.2, 0.6)	
Antenatal care contact						
Yes	1		1		1	
No	2.0 (1.7, 2.4)		0.7 (0.3, 1.1)		0.5 (0.0, 0.9)	
Parity						
Primi-parous	1		1		1	
Multiparous	0.3 (-0.1, 0.7)		0.5 (0.0, 0.9)		0.0 (-0.5, 0.5)	
Place of delivery						
Health institution	1		1		1	
Home	3.0 (2.5, 3.5)		2.5 (1.9, 3.0)		1.8 (1.1, 2.3)	0.001**
PNC service utilization						
Yes	1		1		1	
No	2.3 (1.7, 2.9)		2.2 (1.0, 2.8)		2.1 (1.4, 2.7)	0.001*
Neonatal illness						
No	1		1		1	
Yes	-0.7(-1, -0.2)		-0.2 (-0.7, 0.3)		-0.1 (-0.6, 0.5)	
Breastfeeding initiation time						
Within 1 hour	1			1	1	
After 1 hour	3 (2.5, 3.5)			1.8 (1.2, 2.3)	1.6 (1.1, 2.2)	0.001*
Pre-lacteal feeding						
No	1			1	1	
Yes	2.1 (1.7, 2.4)			0.6 (0.1, 1.0)	0.3 (-0.2, 0.7)	
Knowledge of colostrum						
Good	1			1	1	
Poor	3.1 (2.6, 3.5)			2.8 (1.3, 3.2)	2.2 (1.1, 2.9)	0.001*
Husband support for colostrum avoidance						
No	1			1	1	
Yes	1.3 (0.9, 1.6)			0.5 (0.1, 0.8)	0.3 (-0.1, 0.7)	

Table 4: Factors associated with colostrum avoidance among mothers having children less than six months in Chiro District, Eastern Ethiopia, 2023 (n = 850).

*indicates that those factors with p-value 0.05-0.001, **Indicates that those factors with p-value < 0.001.

This study also reported that home delivery was significantly associated with colostrum avoidance practices. This finding is in line with studies done in India [33], Bure district [10], Gozamen district [27], and Aksum town [34]. The possible justification might be giving birth at home could foster several sociocultural malpractices like colostrum avoidance practice. In addition, mothers who gave birth in health facilities can receive advice from healthcare providers regarding the benefits of colostrum feeding which decreases their risk of avoiding colostrum.

Post-natal care service utilization had a significant association with colostrum avoidance practices. This finding is consistent with studies conducted in Aksum town [34], Chenchä Zuria district, Southern Ethiopia [35]. This might be during post-care health care providers counsel mothers about importance of the colostrum feeding, and thereby more likely to practice colostrum feeding to newborns.

Late initiation of breastfeeding was another variable that had an association with colostrum avoidance practices. Compared with mothers who started breastfeeding within an hour, mothers who started breastfeeding after one hour were 1.6 times more likely to discard colostrum. This finding is in line with studies done in Gozamen district [27], Raya Kobo district [36], and Kombolcha town [37]. This could be explained by the possibility that newborn colostrum avoidance practices higher probability of occurring as the period gap between delivery and breastfeeding initiation rises.

The current study's findings demonstrated that mother's knowledge about breastfeeding was found to be associated with colostrum avoidance practices, which are consistent with Aksum town [34], Bure district [10], and Raya Kobo district [36]. This could be because mothers who are unaware of the value of colostrum feeding to their newborns choose to avoid colostrum. To raise the level of maternal knowledge, it is crucial to raise awareness of the benefits of colostrum feeding through health extension workers.

Strengths and limitations of the study

This study used a higher sample size which improved the study participant's representation and the generalizability of findings. The study has also some limitations since the information was obtained by self-reporting (interview response) and might be subjected to recall bias. Lack of support with qualitative data is also another limitation. The study also shares the limitations of the cross-sectional study design.

Conclusion

This study revealed that mothers having children aged less than six months almost one out of seven mothers practice colostrum avoidance. Home delivery hadn't post-natal care services utilization, breastfeeding initiation after one hour, and poor knowledge about colostrum feedings were factors significantly associated with colostrum avoidance practices. Therefore, healthcare workers in Woreda should encourage institutional delivery, advise post-natal care utilization, encourage breastfeeding initiation within one hour, and enhance maternal knowledge about the benefit of colostrum feeding.

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Competing Interests

The authors declare that they have no competing interests.

Consent for Publication

Not applicable.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University College of Health and Medical Sciences on May 26 with Ref. NO.IHRERC/132/2023. Then support letter was written to the Chiro Woreda Administration. Informed, voluntary, written, and signed consent was obtained from the participants after explanations about the aims, objectives, benefits, and harms of the study was provided. Confidentiality was maintained at all levels of the study through anonymous data collection.

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