Colostrum Avoidance Practices and Its Associated Factors among Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2020. A Community Based Cross Sectional Study

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Abstract

Background: Even though colostrum discarding hurts child health, little is known about the extent of the problem and its contributing factors in Southern Ethiopia. This study aimed to determine the prevalence of colostrum avoidance practices and associated factors among mothers of children aged less than 12 months in Jinka town, South Ethiopia.

Methods: A community-based cross-sectional study was conducted at Jinka Town from March 1 to 30, 2020. A total of 420 mothers having children less than 12 months of age were selected by systematic sampling technique. The data were collected by using pretested interviewer-administered and semi-structured questionnaires. The data was entered using EPI DATA 3.1 and exported to SPSS version 23 for analysis. Descriptive statistics, binary and multivariable logistic regression analysis were done. Adjusted odds ratio with 95% CI at a p-value < 0.05 was estimated to identify statistically significant variables with colostrum avoidance practices.

Results: The prevalence of colostrum avoidance practice was 9.8% [95% CI: (6.9–12.5)]. Delayed initiation of breastfeeding [AOR = 9.08(95% CI 4.16–19.83)], lack of breastfeeding counseling [AOR = 2.33(95% CI 1.11–4.87)], home delivery of index child [AOR = 2.48 (95% CI 1.16–5.27)] and poor knowledge on breastfeeding [AOR = 4.55(95% CI 1.95–10.63)] were factors associated with colostrum avoidance practices.

Conclusion: Colostrum avoidance practice among mothers of children aged less than 12 months in Jinka town was high. Delayed initiation of breastfeeding, lack of breastfeeding counseling, home delivery, and knowledge of breastfeeding practice were factors associated with colostrum avoidance practice.

Keywords
-colostrum avoidance, associated factors, Jinka town, ethiopia

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Background

Breastfeeding is considered a proven child survival strategy, and the World Health Organization (WHO) recommends newborns be put on the breast within an hour after birth.[1] It provides immense immunologic, psychological, social-economic, and environmental benefits.[2] It also significantly reduces a child's risk of developing obesity, type 2 diabetes mellitus, and related chronic non-communicable diseases.[3] Moreover, colostrum feeding promotes a child's intellectual development.[4] Furthermore, it promotes effective suckling, successful establishment, and maintenance of breastfeeding throughout infancy.[5] However, in different countries including Ethiopia, a significant proportion of mothers are deprived of colostrum for their newborn.[6–8]

Colostrum is the first milk that is produced in the first few hours after delivery. It is thick, sticky, and clear to yellowish in color. It comprises proteins, vitamin A and maternal antibodies vital to the newborn's nutrition till lactation is fully established.[9] It is the low-volume concentrated form of the nutrient supply system, which suits newborns with the premature digestive systems. It has a laxative effect which facilitate the passage of the baby's first stool, meconium. This helps to prevent neonatal jaundice by clearing excess amount of bilirubin, which is produced in large quantities at birth.[10,11] Colostrum feeding is associated with a reduced risk of otitis media, gastroenteritis, and respiratory illness, necrotizing entero-colitis, obesity, and hypertension.[12] Contrary to these advantages, colostrum is considered heavy, thick, dirty, toxic, and harmful to children's health, and therefore in some societies, a portion of colostrum is discarded.

Globally, colostrum avoidance is practiced in many countries; In Uttarakhand, India 92% of mothers discarded colostrum, In Nepal 16.5%, In Pakistan 27.9%, and Burkina Faso 16% of mothers deprived of colostrum for their infants.[13–16] In Ethiopia, colostrum discarding is the common nutritional malpractice. In Afar 35%, in Debre Tabor 25.6% in Raya kobo 13.5%, in Axum 6.3%, and Motta town 20.3% of mother reported that they discarded colostrum.[17–21] Factors contributing to colostrum avoidance identified by previous studies were: home delivery, failure to attend ANC, lack of post-natal care, late breastfeeding initiation, and poor knowledge of optimal breastfeeding.[19,20,22]

Globally, more than 4000 infants and young children die because they do not get colostrum within the first hour after birth.[23] Among women in developing countries who do not give colostrum feeds, most of them avoid colostrum feeding based on cultural beliefs that range from no nutritional value for infants to harmful to the infant's health.[24] Every day, 3000–4000 infants die in the developing world from diarrhea and acute respiratory infections because they were receiving inadequate amounts of breast milk in their feeding and were deprived of colostrum.[25] A study carried out in the Afambo district, Afar found that children who were colostrum avoided had 2.34 times increased likelihood of being underweight when compared to those children who were fed colostrum.[26]

A wide range of dangerous newborn feeding practices was familiar in Ethiopia even after the implementation of infant and young child feeding guidelines.[27] The Government of Ethiopia has been devising different strategies including generating of health extension program and working in collaboration with Non-Governmental Organizations (NGOs) in the areas of IYCF.[28,29] WHO and UNICEF recommend that children should initiate colostrum within the first hour of birth, However, in Ethiopia, about 27% of the infant had not started colostrum within one hour of birth.[30,31] Although colostrum avoidance harms child health, little is known about the extent of the problem and its contributing factors in Southern Ethiopia particularly in the study area. As there are diverse cultural practices among Ethiopian communities, evidence generated by this study will assist in developing context-specific interventions to halt colostrum avoidance practice and promote optimal IYCF practice. Therefore, this study aimed to assess the prevalence of colostrum avoidance practices and its associated factors among mothers of children aged less than 12 months in Jinka Town, Southern Ethiopia.

Methods and Materials

Study Setting, Design, and Period

A community-based cross-sectional study was conducted in Jinka Town, South Omo Zone from March 1 to 30, 20202 which is situated 755 Km away from Addis Ababa and 525 Km from Hawassa. The Town has an estimated population size of 31226 living in 6 kebeles (the smallest administration unit in Ethiopia). Out of the total population, 15582 are males and 15644 are females. Out of all female population, 6076 are women in the reproductive age group (15–49 yr). About 997 of the total population are accounted for by children less than one year of age. The Town has 1 hospital, 1 health center, and 6 health posts providing health services including maternal and child health care. The town also has 12 private clinics and 13 drug vendors.[32]

Source Population

All mothers of children aged less than 12 months in Jinka Town, South Omo Zone.

Study Population

All mothers of children aged less than 12 months in the selected kebeles of Jinka Town during the data collection period.

Eligibility Criteria

Inclusion criteria: All mothers/caregivers of children aged less than 12 months and mothers who had lived at least for 6 months in the study area.

Exclusion criteria: Those mothers who were seriously ill or unable to give the required information during the data collection period.

Sample Size and Sampling Technique

In this study, the sample size was determined by using the single population proportion formula. Considering the prevalence of colostrum avoidance practices of 20.3% obtained from a previous study conducted in Motta Town,[21] 95% confidence interval, the margin of error of 4%, and 10% non-response rate. The following single population formula:

$$n = (Z\alpha/2)^2 p(1-p)/d^2 = 1.96^2(0.203*0.797)/0.04^2 = 388.$$

Where, n = sample size, P = estimated prevalence based on past study, 20.3%, D = error allowed 4%, Zα/2 = critical value at 95% CI is 1.96, Non-response rate of 10%. Thus, the final sample size was n = 427 mothers.

A systematic sampling technique was employed to select the study participants. From a total of 6 kebeles of Jinka Town 4 Kebeles were selected by lottery method. To obtain the sample size from each selected kebeles proportional allocation to sample size was done. First, the numbering of all households of selected kebeles with mothers of children aged less than 12 months was conducted, and then a systematic sampling technique was applied for selection of the study participants. Finally, every $K^{th} = 2$ mother from each household of the selected Kebele was identified until the required sample size was fulfilled and the starting household was selected using a lottery method. At the time of the survey, from each household unit, one eligible mother who had a child aged less than 12 months were selected.

Study Variables

Dependent variable. Colostrum avoidance practices

Independent variables. Socio-demographic factors: age of the mother, educational status of the mother, educational status of father of index child, marital status, religion, ethnicity, occupation of the mother, household's wealth status, family size, and sex of the index child. Maternal health service utilization: ANC visit, BF counseling during ANC visit, place of delivery of index child, mode of delivery of index child, and postnatal care. Breastfeeding history: delayed initiation of BF and prelacteal feeding practices. Knowledge: mother's knowledge of BF. Maternal health-related factors: medical conditions and breast problem

Operational Definition and Terms

Colostrum avoidance: is the failure to feed infants the first, thick and yellowish milk that is produced in the first 3 days after birth. Avoiding colostrum was coded as '1', while colostrum feeding was coded as '0' for regression analysis.[19]

Prelacteal feeding: If an infant within the first three days of life feeds something other than breast milk.[30]

Delayed initiation of BF: Initiation of breastfeeding after one hour of birth.[30]

Good knowledge of breastfeeding practice: If a mother answered four questions out of seven on breastfeeding knowledge correctly.[21]

Data Collection Procedure and Data Quality Control

A structured interviewer-administered questionnaire was used to collect data from mothers of a child. The questionnaire was constructed by adapting from previous literature.[13,18–20,22] The questionnaire was initially prepared in English and then translated into the Amharic version (local language) by different a fluent speakers of both languages and then to English to check its consistency. The data were collected by four trained diploma nurses who are fluent speakers of the local language and supervised by two BSc public health professionals. A face-to-face interview technique was conducted at the study participants' houses.

The questionnaire was pretested before the actual data collection on 5% of the sample size in a nearby Town, Key Afer to check clarity and consistency of the data collection instruments. The collected data were checked for the consistency, completeness, and relevance on a daily during the entire data collection by the supervisors and principal investigator.

Data Processing and Analysis

The collected data was coded and entered by EPI DATA 3.1 and exported to the statistical package for social science (SPSS) version 23.0 for analysis. Then data cleaning, editing recoding, and management were carried out. Descriptive statistics; mean, standard deviation, and proportion were done. The wealth index of participant's households was computed by the principal component analysis (PCA). Assumptions for factor analysis were checked. Finally, household wealth status was ranked into three categories (poor, middle, and rich). Binary logistic regression analysis was employed to examine the statistical association between the colostrum avoidance practices and independent variables. Variables that have p-value < 0.25 during bivariate analysis were entered into the multivariable logistic regression to identify statistically significant variables. The model goodness of fit was tested by Hosmer-Lemeshow statistic which is not significant P-value = 0.264. Multi co-linearity test was carried out to see the correlation between all multivariate independent variables using collinearity statistics which is tolerance > 0.1 and variance inflation factor < 10. An Adjusted odds ratio (AOR) with 95% CI at a p-value < 0.05 was estimated to identify statistically significant variables. The data were presented by tables, frequencies, and graphs.

Results

Socio-Demographic Characteristics of Mothers and Children

Four hundred twenty mothers having children less than 12 months of age were interviewed in this study, with a response rate of 98.4%. The mean age of respondents was 26.86(SD ± 5.06) years. About 183 (43.6%) of the respondents had a primary level of education. A majority of the respondents; 314(74.8%) were unemployed in occupation. About 247(58.8%) of fathers of index children had a secondary level of education and above. Around half of the children, 228(54.3%) were males (Table 1).

The Prevalence of Colostrum Avoidance Practices among Mothers

The prevalence of colostrum avoidance practices in this study was 41(9.8%) (95% CI: 6.9–12.5). The main reasons for colostrum

Table 1. Socio-Demographic Characteristics of Mothers of Children Aged Less Than 12 in Jinka Town, South Ethiopia, 2018/19 (N = 420).

Variables	Category	Frequency(n)	Percentage (%)
Maternal age (year)	15–24	141	33.5
	25–34	235	56.0
	≥35	44	10.5
Marital status	Married	396	94.3
	Unmarried	24	5.7
Educational status of mother	Unable to read and write	63	15.0
	Primary education	183	43.6
	Secondary and above	174	41.4
Religion	Orthodox	259	61.7
	Protestant	139	33.1
	Muslim	19	4.5
	Others	3	0.7
Ethnicity of mother	Amhara	181	43.1
	Ari	114	27.1
	Gofa	31	7.4
	Wolayta	42	10.0
	Basketo	42	10.0
	Others	10	2.4
Maternal occupation	Unemployed	314	74.8
	Employed	106	25.2
Educational status of the father of index child	Unable to read and write	40	9.5
	Primary education	133	31.7
	Secondary and above	247	58.8
Family size	≥ 4	280	66.7
	≤ 3	140	33.3
Sex of index child	Male	228	54.3
	Female	192	45.7
Wealth index	Poor	140	33.3
	Middle	146	34.8
	Rich	134	31.9

avoidance were breast milk insufficiency 14(34.1%). Regarding of the total respondents; 53(12.6%) were practicing prelacteal feeding. A major reason for prelacteal feeding was cultural practice 19(35.8%). Three hundred twenty-four (77.1%) of mothers initiated breastfeeding within one hour (Table 2).

Maternal Health Care Service Utilization and Obstetric Characteristics

Three hundred eighty (90.5%) of mothers have utilized ANC services for their index infants. Of those mothers who have utilized ANC services 140(36.8%) visit four and above. About 268(63.8%) of respondents had got breastfeeding Counseling. Three hundred twenty-seven (77.9%) of mothers delivered their index child at a health facility. Three hundred fifty-one (83.6%) of mothers gave birth through spontaneous vaginal delivery. Two-third, (65%) of respondents utilized postnatal care. Nearly half 198(47.2%) of infants were birth order of second and third child (Table 3).

Table 2. Colostrum Avoidance Practices among Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2018/19 (N = 420).

Variable	Category	Frequency	Percentage
Colostrum avoided (420)	Yes	41	9.8
	No	379	90.2
Reason for discarding colostrum (41)	Maternal medical illness	9	22
	Colostrum is not good for child growth	7	17.1
	Breast milk insufficiency	14	34.1
	Causes abdominal discomfort	11	26.8
Pre-lacteal feeding (420)	Yes	53	12.6
	No	367	87.4
Reason for providing pre-lacteal feeding(53)	Breastfed for newborn will be thirsty	10	18.9
	Breast problem	2	3.8
	Maternal medical illness	2	3.8
	Inadequate milk secretion	5	9.4
	Infant feeding problem	4	7.5
	Child growth	3	5.7
	Cultural practice	19	35.8
	To clean infant bowel/mouth	8	15.1
Breastfeeding initiation (420)	Within one hour	324	77.1
	Greater than one hour	96	22.9

Table 3. Maternal Health Care Service Utilization among Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2018/19 (N = 420).

Variable	Category	Frequency(n)	Percentage (%)
Attending ANC (N = 420)	Yes	380	90.5
	No	40	9.5
Number of Antenatal care visit (N = 387)	1–3 visit	240	63.2
	≥4 visit	140	36.8
Breastfeeding Counseling	Yes	268	63.8
	No	152	36.2
Information from counseling (M)	Benefit of breastfeeding	154	57.0
	Positioning and attachment	40	14.9
	Exclusive breastfeeding	88	32.8
	Non-breastfeeding problem	38	14.2
	Expressed breastfeeding	19	7.1
Place of Delivery (N = 420)	Health facility	327	77.9
	At Home	93	22.1
Mode of Delivery (N = 420)	Spontaneous delivery	351	83.6
	Instrumental delivery	28	6.7
	C/S delivery	41	9.8
PNC	Yes	273	65.0
	No	147	35.0
Number of PNC visit	1	64	23.4
	2	131	48.0
	3	78	28.6
Birth order of index child	1	148	35.2
	2–3	198	47.2
	≥4	74	17.6
Birth spacing	No previous child	148	35.2
	< 24 months	64	15.3
	≥24 months	208	49.5

Table 4. Maternal Medical Condition and Breast Problem among Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2018/19 (N = 420).

Variable	Category	Frequency(n)	Percentage (%)
Any breastfeeding problem	Yes	45	10.7
	No	375	89.3
Types of problem	Abscess	8	17.8
	Mastitis	16	35.8
	Cracked/sore nipples	7	15.6
	Breast milk insufficiency	14	31.1
Any maternal illness following delivery of index child	Yes	41	9.8
	No	379	90.2

Table 5. Breastfeeding Knowledge of Mothers of Children Aged Less Than 12 Months in Jinka Town, South Ethiopia, 2018/19 (n = 420).

Knowledge questions	Response	Frequency(n)	Percentage (%)
Breastfeeding is important for infant health	Yes	400	95.2
	No	20	4.8
Breastfeeding is important for maternal health	Yes	271	64.5
	No	149	35.5
An infant should be put to breast immediately after birth	Yes	346	82.4
	No	74	17.6
The first milk/colostrum should be given to an infant	Yes	361	86.0
	No	59	14.0
Pre-lacteal feeding is not needed for an infant before starting breast milk	Yes	290	69.0
	No	130	31.0
Breast milk alone without water and other liquids is enough for an infant during the first 6 months of life	Yes	274	65.2
	No	146	34.8
Starting from 6 month an infant should start complementary feeding and continued breastfeeding up to 2 years and beyond	Yes	289	68.8

Maternal Medical Condition and Breast Problem

A majority (89.3%) of mothers did not face any breast problems following the delivery of the index child. A majority 379(90.2%) of the mothers not faced any medical illness following the delivery of the index child (Table 4).

Maternal Knowledge on Breastfeeding

Of the total respondents, 290 (69%) of mothers know about as there is no need to give prelacteal feeding to the infant and 361(86%) of mothers know about the importance of the colostrum for the infant. Three hundred fifty-two (83.8%) mothers had good knowledge regarding optimal breastfeeding practices while the remaining 68(16.2%) had poor knowledge concerning optimal breast feeding practices (Table 5).

The Factors Associated with Colostrum Avoidance Practices

In the final multivariable Logistic regression analysis, the time of initiation of breast feeding, BF counseling, place of delivery, and knowledge of breastfeeding practices were significant factors associated with colostrum avoidance practices. Mothers who delayed initiation of breastfeeding were 9.08 times more likely to discard colostrum when compared to mothers who started

Table 6. Bivariable and Multivariable Logistic Regression Analysis of Factors Associated with Colostrum Avoidance Practices among Mothers of Children Aged Less Than 12 Months in Jinka Town, 2018/19.

Variable	Categories	Colostrum avoidance practice		Crude OR with 95% CI	Adjusted OR with 95% CI	P-value
		Yes n (%)	No n (%)			
Educational status of Mother	Unable to read and write	10 (24.4)	53 (14)	2.54 (1.04–6.23)	0.56(0.16–1.88)	0.351
	Primary education	19 (46.3)	164 (43.3)	1.56(0.73–3.32)	1.02(0.42–2.45)	0.96
	Secondary and above	12 (29.3)	162 (42.7)	1	1	
Prelacteal feeding	Yes	15 (36.6)	38 (10.02)	5.17(2.52–10.62)	2.24(0.86–3.81)	0.096
	No	26 (63.4)	341(89.98)	1	1	
BF initiation	Timely	14 (34.1)	310(81.8)	1	1	
	Delayed	27(65.9)	69(18.2)	8.66(4.31–17.38)	**9.08(4.16–19.83)***	**0.001**
BF counseling	Yes	16(39.02)	252(66.49)	1	1	
	No	25(60.98)	127(33.51)	3.10(1.59–6.01)	**2.33(1.11–4.87)***	**0.024**
Place of delivery	Health facility	20(48.8)	307(81)	1	1	
	Home	21(51.22)	72(19)	4.47(2.30–8.69)	**2.48(1.16–5.29)***	**0.018**
Post-natal care	Yes	19(46.3)	254(67.02)	1	1	
	No	22(53.7)	125(32.98)	2.35(1.23–4.50)	1.81(0.86–3.81)	0.117
Knowledge on BF practice	Good	25(60.98)	327(86.28)	1	1	
	Poor	16(39.020	52(13.72)	4.02(2.01–8.04)	**4.55(1.95–10.63)***	**0.001**

Key: * = statistically significant at p < 0.05 in multivariable logistic regression; 1 = indicated the reference category.

breastfeeding timely within one hour (AOR = 9.08, 95% CI; 4.16–19.83). Mothers who didn't get breast feeding counseling were 2.33 times more likely to discard colostrum when compared to those mothers who get breastfeeding counseling (AOR = 2.33,95% CI; 1.11–4.87). Mothers who delivered the index child at home were 2.48 times more likely to discard colostrum when compared to mothers who gave birth at a health facilities (AOR = 2.48,95% CI;1.16–5.29). Furthermore, colostrum avoidance practices were 4.55 times higher among mothers with poor knowledge of breastfeeding practices when compared to their counterparts (AOR = 4.55, 95% CI; 1.95–10.63) (Table 6).

Discussion

This study aimed to assess the prevalence of colostrum avoidance practices and associated factors among mothers of children aged less than 12 months in Jinka town, South Ethiopia. In this study, the prevalence of colostrum avoidance practice was 9.8%. This result is consistent with the studies conducted in Axum town 6.3%,[20] North Wollo Zone 12%,[22] Raya Kobo District 13.5%,[19] and East Wollega Zone 8.8%.[33] However, the finding of this study was higher than the studies done in the Hula district, Sidama Region 3.9%.[34] The difference between these studies might be due to the difference in community attitude towards colostrum feeding among ethnic groups. The other possible reason for this inconsistency of the finding might be the sociodemographic differences among study participants.

The finding of this study is also lower than studies done in different developing countries. Uttarakhand, India 92%,[13] Nepal 16.5%,[14] Pakistan 27.9%,[15] Burkina Faso 16%,[16] South Sudan 38.8%[35] and Debre Tabor 25.6%.[18] This difference could be due to the difference in maternal health service utilization

between study populations. This could also be the place of residence and difference in maternal educational level. Hence, mothers who reside in the towns would have better access to maternal and child health services.

In this study, Mothers who delayed initiation of breastfeeding were about nine times more likely to practice colostrum avoidance than those who initiated breastfeeding within one hour. This result is consistent with the study done in Raya Kobo District, North Wollo zone, Pakistan, Nepal and Uttarakhand, India respectively.[13–15,19,22] This might be due to the fact that when the mother delays initiation of breastfeeding infants suckling activity decreases and which in turn affects or decreases maternal milk secretion due to decreased breast stimulation, which finally made the mother give other food to the infant and discard colostrum.[21]

This study showed that mothers who didn't get breastfeeding counseling were 2.3 times more likely to discard colostrum when compared to the mothers who get counseling regarding breastfeeding. Other studies done in Hula District, Sidama Region, and East Wollega Zone showed that breastfeeding counseling during antenatal care improves timely initiation of first breast milk.[33,34] This could be due to breastfeeding counseling during the perinatal period may increase the mother's awareness of optimal breastfeeding practices that might decrease colostrum avoidance. But study done in the Axum town revealed that there was no association between breastfeeding counseling during ANC visit and colostrum avoidance practices.[20] This could be due to variation in the utilization of maternal health services among study settings.

In this study, mothers who delivered their index infants at home were 3.48 times more likely to engage in colostrum avoiding practices when compared with those mothers who delivered in a health facility. This finding was consistent with a study done in Raya Kobo district, North Wollo Zone, Pakistan and Uttarakhand,

India.[13,19,22] This could be due to the fact that mothers, who gave birth at home, were more likely to be exposed to the traditional beliefs that favor colostrum discarding. In contrast, utilizing an institutional delivery would have an added benefit to receiving immediate obstetric care, such as early initiation of breastfeeding which reduces the likelihood of practicing colostrum avoidance.

The odds of colostrum avoidance were 4.55 times higher among mothers with poor knowledge of optimal breastfeeding practices when compared to their counterparts. This finding was supported by other studies carried out in Axum Town, Raya Kobo District, Hula District, and Uttarakhand, India.[13,19,20,34] This might be due to the awareness of mothers about breastfeeding practices and the nutritional value of colostrum decreases the likelihood of colostrum discarding.

The limitation of this study was that the information obtained from mothers having children aged less than 12 months is subject to recall bias and also it is difficult to establish a temporal relationship as the study design was cross-sectional.

Conclusion

Colostrum avoidance practice among mothers of children aged less than 12 months in Jinka town was found to be high when compared to WHO recommendations. Delayed initiation of breastfeeding, lack of breastfeeding counseling, home delivery of index child, and poor knowledge of breastfeeding practice were significant factors associated with colostrum avoidance practices of mothers. Awareness creation activities on the nutritional value of colostrum, promotion of institutional delivery, and improving breastfeeding counseling are important interventions to reduce colostrum avoidance practices in Jinka Town.

Ethics Approval and Consent to Participate

The study protocol was approved by the Institutional Review Board (IRB) of the College of Medicine and Health Science, Arba Minch University. Based on the approval, an official letter of support was written by Arba Minch University Public Health Department to the Jinka Town health office. At last, data was collected after assuring the confidentiality of responses and obtaining informed verbal consent from the study participant.

Participant Consent

Obtained

Consent for Publication

Not applicable.

Availability of Data and Material

For those who are interested; the datasets of this study could be accessed from the corresponding author up on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' Contributions

EA and FG designed the study, supervised the data collection, performed the analysis, interpretation of the data and prepared the first draft of the manuscript. GT, MG and ZJW assisted in data interpretation and reviewed the manuscript critically. All authors read and approved the final manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

1. WHO U. Global Strategy for Infant and Young Child Feeding 2003 [Available from: http://apps.who.int/iris/bitstream/handle/10665/42590/9241562218.pdf;jsessionid=FB748ED1F90AFF4AB552F026E7D0D607?sequence=1.
2. Goldman AS. Modulation of the gastrointestinal tract of infants by human milk. Interfaces and interactions. An evolutionary perspective. *J Nutr*. 2000;130(2):426S-431S.
3. Horta BL, Loret de Mola C, Victora CG. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. *Acta Paediatr*. 2015;104(467):30-37.
4. Jedrychowski W, Perera F, Jankowski J, et al. Effect of exclusive breastfeeding on the development of children's cognitive function in the Krakow prospective birth cohort study. *Eur J Pediatr*. 2012;171(1):151-158.
5. Begum K, Dewey KG. Impact of early initiation of exclusive breastfeeding on newborn deaths. 2010.
6. Khanal V, Adhikari M, Sauer K, Zhao Y. Factors associated with the introduction of prelacteal feeds in Nepal: findings from the Nepal demographic and health survey 2011. *Int Breastfeed J*. 2013;8(1):9.
7. Nguyen PH, Keithly SC, Nguyen NT, Nguyen TT, Tran LM, Hajeebhoy N. Prelacteal feeding practices in Vietnam: challenges and associated factors. *BMC Public Health*. 2013;13(1):932.
8. Legesse M, Demena M, Mesfin F, Haile D. Prelacteal feeding practices and associated factors among mothers of children aged less than 24 months in Raya kobo district, north eastern Ethiopia: a cross-sectional study. *Int Breastfeed J*. 2014;9(1):189.
9. WHO/UNICEF. Baby-friendly hospital initiative (BFHI). Revised, Updated and Expanded for Integrated Care. Section 3, Breastfeeding Promotion and Support in a Babyfriendly Hospital: A 20-h Course for Maternity Staff. 2009.

10. Abiodun O, Olu-Abiodun O, Ani F, Sotunsa O. Sexual and reproductive health knowledge and service utilization among in-school rural adolescents in Nigeria. *J AIDS Clin Res*. 2016;7(6):1-8.

11. LLLI. What is colostrum? How does it benefit my baby? 2016. 2016.

12. Bayissa ZB, Gelaw BK, Geletaw A, et al. Knowledge and practice of mothers towards exclusive breastfeeding and its associated factors in Ambo woreda West Shewa zone Oromia region Ethiopia. *Epidemiology*. 2015;5(1):1-7.

13. Mukherjee K, Venugopal PN. Colostrum avoidance and breastfeeding practices among mothers of Khos tribal community of Uttarakhand. *J Anthropol Surv India*. 2018;67(1):45-55.

14. Bhandari S, Thorne-Lyman AL, Shrestha B, et al. Determinants of infant breastfeeding practices in Nepal: a national study. *Int Breastfeed J*. 2019 Dec;14(1):1-7.

15. Sohail J, Khaliq A. Knowledge, attitude and practice of mothers regarding colostrum feeding to newborns in rural Pakistan: a cross-sectional study. *Khyber Med Univ J*. 2017;9(4):192-196. 2017.

16. Munos MK, Mullany LC, Maïga A, Baya B, Bryce J. Coverage and determinants of newborn feeding practices in rural Burkina Faso. *J Perinatol*. 2014;34(5):369.

17. Liben ML, Abuhay T, Haile Y. The role of colostrum feeding on the nutritional Status of preschool children in Afambo District, Northeast Ethiopia. *Eur J Clin Biomed Sci*. 2016;2(6):87-91. 2016 doi: 10.11648/j.ejcbs.20160206.15.

18. Abie BM, Goshu YA. Early initiation of breastfeeding and colostrum feeding among mothers of children aged less than 24 months in Debre Tabor, Northwest Ethiopia. *BMC Res Notes*. 2019 Dec;12(1):1-6.

19. Legesse M, Demena M, Mesfin F, Haile D. Factors associated with colostrum avoidance among mothers of children aged less than 24 months in Raya Kobo district, North-eastern Ethiopia: community-based cross-sectional study. *J Trop Pediatr*. 2015;61(5):357-363.

20. Weldesamuel GT, Atalay HT, Zemichael TM, et al. Colostrum avoidance and associated factors among mothers having children less than 2 years of age in Aksum town, Tigray, Ethiopia. 2018. *BMC Res Notes*. 2018 Dec;11(1):1-7.

21. Tewabe T. Prelacteal feeding practices among mothers in Motta Town, Northwest Ethiopia: a cross-sectional study. *Ethiop J Health Sci*. 2018 Jul;28(4):393-402.

22. Yimer NB, Liben ML. Effects of home delivery on colostrum avoidance practices in north wollo zone, an urban setting, Ethiopia: a cross sectional study. *J Health Popul Nutr*. 2018 Dec;37(1):1-7.

23. Agrawal DKA, Khare BB. Study on the current status of infant and childhood feeding practice. Indian pediatrics. *Indian Pediatr*. 2013 Sep 1;22(9):716-716.

24. Gunnlaugsson G, Einarsdottir J. Colostrum and ideas about bad milk: a case study from Guinea-Bissau. *Soc Sci Med*. 2013;36(3):283-288. 2013.

25. Singh B. Knowledge, attitude and practice of breastfeeding–A case study. *Eur J Sci Res*. 2010;40(3):404-422.

26. Liben ML, Abuhay T, Haile Y. Determinants of child malnutrition among agro pastorals in Afambo district Northeastern Ethiopia. *Health Sci J*. 2016;10(4):15.

27. Federal Ministry of Health FHD. National strategy for infant and young child feeding Ethiopia 2004 [Available from: https://motherchildnutrition.org/nutrition-protection-promotion/pdf/mcn-national-strategy-for-infant-and-young-child-feeding-ethiopia.pdf.

28. Fetene N, Linnander E, Fekadu B, et al. The Ethiopian health extension program and variation in health systems performance: what matters? *PloS one*. 2016;11(5):e0156438.

29. Kim SS, Rawat R, Mwangi EM, et al. Exposure to large-scale social and behavior change communication interventions is associated with improvements in infant and young child feeding practices in Ethiopia. *PloS one*. 2016;11(10):e0164800.

30. Central Statistical Agency and ICF Macro. Ethiopia Demographic and Health Survey 2016 Maryland, USA 2016.

31. WHO U. Capture the moment: Erly initiation of breast feeding;the best start of every new born Newyork 2018 [Availablefrom: https://www.unicef.org/publications/files/UNICEF_WHO_Capture_the_moment_EIBF_2018.pdf.

32. office JTh. Town health office plan, 2018 2018.

33. Hailemariam TW, Adeba E, Sufa A. Predictors of early breastfeeding initiation among mothers of children under 24 months of age in rural part of West Ethiopia. *BMC Public Health*. 2015;15(1):1076.

34. Shibru Hoche BM, Wakgari N. Suboptimal breast feeding and its associated factors in rural communities of Hula district, Southern Ethiopia: a cross-sectional study. *Ethiop J Health Sci*. 2017;28(1):49.

35. Tongun JB, Sebit MB, Ndeezi G, Mukunya D, Tylleskar T, Tumwine JK. Prevalence and determinants of pre-lacteal feeding in South Sudan: a community-based survey. *Glob Health Action*. 2018;11(1):1523304.

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Abbreviations

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statistical Agency
EBF	Exclusive Breast Feeding
EDHS	Ethiopian Demographic and Health Survey
IYCF	Infant and Young Feeding Practice
PLF	Prelacteal Feeding
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations children's emergency fund
WHO	World Health Organization.

Appendix

Face to Face Interview Questionnaire (English Version)

Part 1: Socio-demographic variables of Mother and child

S. no	Question	answer	Skip
101	How old are you?	----------------------	
102	What is your current marital status?	1. Single 2. Married 3. Divorced 4. Widowed	
103	What is your level of education?	1. Unable to read and write 2. Primary education 3. Secondary education and above	
104	What is your religion?	1. Orthodox 2. Protestant 3. Muslim 4. Other (specify)-----	
105	Which ethnic group do you belong to?	1. Amhara 2. Ari 3. Gofa 4. Wolayta 5. Basketo 6. Others (specify)----	
106	What is your current occupation?	1. Student 2. Private employee 3. Civil servant 4. Daily laborer 5. Trader 6. Farmer 7. House wife 8. Other (Specify)-----	
107	What is the educational status of father of index child?	1. Unable to read and write 2. Primary education 3. Secondary education and above	
108	Family size	----------------------	
109	Sex of your (the index) child?	1. Male 2. Female	
110	Do you have your own home?	1 yes 2 no	
	Does your household have the following properties?		
	A radio	1 Yes 2 no	
	A television	1 yes 2 no	
	A watch?	1 Yes 2. No	
	A non-mobile phone	1 yes 2 no	
	A table	1 yes 2no	
	A chair	1 yes 2 no	

(continued)

Part 2: Infant feeding practices

S no	question	Answer	Skip
201	Did you feed colostrum (the first yellow milk) for this index during the first five days after birth?	1. Yes 2. No	
202	If question 205 is no, why you avoid colostrum for your child?	1. Maternal medical Illness 2. For the child growth 3. My breast has no milk 4. Cause Abdominal discomfort and diarrhea 5. Other (specify)-------	
203	Did you give anything to drink and/or eat other than breast milk within 3 days of delivery for your child?	1, yes 2, no	ques 205
204	Why did you give anything to drink and/or eat before breast milk after delivery?	1. Breastfed for newborns will be thirsty 2. Breast problem 3. Maternal medical illness 4. Inadequate milk secretion 5. Infant feeding problem 6. For child growth 7. Cultural practice 8. To clean infant's bowel/throat/mouth 9. Other (specify)	
205	When did you initiate breast feeding (name of the index child) after birth?	-----------------in days	

Part 3: Maternal health services related and obstetric factors

S no	questions	answers	Skip
301	Did you attend the ANC clinic during your last pregnancy?	1. Yes 2. No	If no jump to quest no 303
302	If Yes, how many times did you attend ANC clinic during the last pregnancy?	------------------in Number	
303	Did you get breastfeeding counseling for the index child?	1. Yes 2. No	If no jump to quest no 305
304	If yes, what were you told about breast feeding?	1. Benefits of breastfeeding 2. Positioning of the baby 3. Exclusive breastfeeding 4. Management of breast problem 5. Expression of breast milk	
305	Where did you give your last birth?	1. Health facility 2. At home 3. TBA's place 4. Other (specify) -------------	
306	What was the mode of delivery?	1. Normal spontaneous delivery 2. Instrumental delivery 3. CS delivery 4. Other specify-------------	
307	Who delivered you?	1. Health professionals 2. Traditional birth attendant 3. Others specify-------------	
308	Did you receive PNC following delivery of your index child?	1 yes 2 no	
309	How many times did you attended PNC visits?	_____in Number	
310	Birth order of the index child	-----------------	
311	Birth spacing with the previous child	------------------	
312	Did you experience any Breastfeeding problems?	1 yes 2 no	If no jump to quest no 312
313	If yes, what was the problem	1) Abscess 2) Mastitis 3) Sore/cracked nipples 4) Others(mention)	
314	Did you experience any medical illness following delivery of the index child?	1 yes 2 no	

Part 5: knowledge on breast feeding

401	Breastfeeding is important for infant health?	1 yes 2 no	Skip
	Breastfeeding is important for maternal health?	1 yes 2 no	
	An infant should be put to breast immediately after birth?	1 yes 2 no	
	The first milk/colostrum should be given to an infant? 1 yes 2 no	1 yes 2 no	
	Breast milk alone without water and other liquids is enough for an infant during the first 6 months of life?	1 yes 2 no	
	Starting from 6 month an infant should start complementary feeding and continued breastfeeding up to 2 years and beyond?		