

Research Article

Prelacteal Feeding and Associated Factors Among Mothers of Children Aged Less Than Six Months in Gozamen District, 2019: A Community Based Cross Sectional Study

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Abstract

Background: Prelacteal feeding (PLF) is administration of any food or fluid other than breast milk before initiation of breast feeding. Optimal breastfeeding including discouraging prelacteal feeding could save 823,000 lives per year among children ages five years old and younger. Despite of this mothers give prelacteal feeding to their child in different part of Ethiopia. However, there is a paucity of information on prevalence of prelacteal feeding and associated factors in the study area. Thus, the current study aimed at determining of the prevalence of prelacteal feeding and associated factors among mothers of children aged less than six months in Gozamen district, East Gojjam zone, North West Ethiopia, 2020. **Methods:** A community based cross-sectional study was conducted among seven hundred forty-one (741) mothers of children aged less than six months in Gozamen district from August 1 to September 12 /2019. Stratified cluster sampling technique was used to select study participants. Data were collected by face to face interviewer-administered, pretested and semi-structured questionnaire. Descriptive analysis, bi-variable and multivariable logistic regression model were employed. Adjusted odds ratio with 95% confidence interval was used to identify factors associated with prelacteal feeding. **Results:** In this study the prevalence of prelacteal feeding was found to be 17.1% with 95%CI [14.3, 20]. Mothers who had no ANC follow up [AOR: 7.53, CI; 3.32, 17.05], those mothers who did not discard colostrum [AOR: 0.12, CI; 0.07, 0.12] time of breast feeding initiation [AOR: 3.53, CI; 2.05, 6.11] and mothers who had single ANC visit [AOR: 2.98, CI; 1.52, 5.85] were significant independent factors associated with prelacteal feeding. **Conclusion:** This study concluded that prelacteal feeding was high in the study area. Therefore, in order to tackle this problem strengthening antenatal follow up, timely initiation of breastfeeding, health education and awareness creation of the communities are recommended interventions.

Keywords

Prelacteal Feeding, Associated Factors, Children Aged Less Than Six Months, Ethiopia

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1. Background

Breastfeeding (BF) and human milk are the normative standards for infant feeding and nutrition [1]. BF is uniquely suited to the human infant, both in its nutritional composition and in the nonnutritive bioactive factors that promote survival and healthy development [1, 2]. World Health Organization (WHO) United Nation Child Emergency Fund (UNICEF) and discourages the practice of Prolactal feeding (PLF) and recommends to continue breast feeding up to 2 years and beyond [3, 4]. Despite of this recommendations, in many parts of the globe including Ethiopian mothers give prolactal foods to their child [5-8].

PLF is any food or fluid except mothers breast milk or medicine given to newborn infants before breast feeding initiation within three days after delivery [9, 10]. The most common pre-lactal foods given to infants in many developing countries could be categorized into three: water only, water-based (rice water, herbal mixture, juice), and milk-based (animal milk, infant formula) [11]. Water is hazardous pre-lactal feed in terms of the detrimental effect on the nutritional aspect and makes the neonate more prone for early risk of severe gastrointestinal infections [12].

Suboptimal breastfeeding, including PLF has been linked with numerous adverse child health outcomes including increased incidence of diarrhea and pneumonia [2] and it interferes with the establishment of any breastfeeding and a healthy gut microbiome [13]. PLF may also delay the initiation of breastfeeding [14] and reduce the benefits of colostrum [15, 16]. Globally sub optimal BF responsible for 45% neonatal infectious death, 30% diarrheal death, 18% acute respiratory death in children [17]. Optimal breastfeeding including discouraging PLF could save 823,000 lives per year among children ages five years old and younger [18].

Different studies showed that different factors hindered the practice of prolactal feeding are like place of delivery, time of initiation of breast feeding, colostrums discarding, awareness on risks of prolactal feeding, ANC follow up and number of ANC visit [6, 16, 19-21]. Multiple interventions have been designed to decrease mortality and disability in children and to achieve Sustainability Development Goal (SDG). Among these, breastfeeding is the most cost-effective intervention for protecting children against diarrhea and all causes of mortality [2]. Prolactal feeding is one of the main components to assess optimal breastfeeding practices [22]. Ethiopia adopted the Infant and Young Child feeding (IYCF) guide line in 2004 that discourage prolactal feeding [23] but, after implementation of this guide line still prolactal feeding is practiced in different parts of Ethiopia. Therefore, this study was aimed to determine prolactal feeding practices and associated factors among mothers of children aged less than six months in Gozamen district, east Gojjam zone, northwest, Ethiopia. Findings of this study will be fundamental for health service providers and program managers to design strategic plan that will decrease

prolactal feeding practices in Gozamen district.

2. Methods

2.1. Study Design and Setting

A community-based cross-sectional study was done from August 1 up to September 12/2019 in Gozamen district. Gozamen district is one of the 18 districts in East Gojjam zone. The zonal capital is Debre Markos town. It is located 300 Km far northwest from Addis Ababa, capital city of the country and 260 from Bahir Dar the capital city of Amhara regional state. The district is divided into 30 kebel administratively (the smallest administration unit next to the district in Ethiopia) of those 5 are urban and 25 are rural kebel. According to the district administrative report, the population size of the district estimated at 164,816 among the total population, about 82,573 are women of those, 2536 are mothers who gave birth in the last six months and 82,224 are males. The district has 6 health centers and 26 health posts and they are all providing maternal and child health care (MCH) services.

2.2. Population

All mothers of children aged less than six months in Gozamen district were the source population and all mothers of children aged less than six months in the selected kebeles/clusters were the study population of the study. All mothers who lived in the area for at least 6 months were included in the study.

2.3. Sample Size Determination and Sampling Procedure

The sample size was calculated for the first objective and second objective. Finally, the largest sample size was taken. Single population proportion was used to determine the sample size for the first objective by assuming prevalence of prolactal feeding in Debre markos town 19.1% [10] with a 95% confidence level and 5 % marginal error and 10% non response rate. Based on these assumptions, the total sample size was calculated using the following formula:

$$n = \frac{(z\alpha/2)^2 p (1-p)}{d^2}$$

$$n = \frac{(1.96)^2 19.1 (1-0.191)}{0.05^2} = 237$$

Where n = required sample size, Z = critical value for normal distribution at 95 % confidence level (1.96) P =prevalence of prolactal feeding in Debre markos town d =

0.05(5% margin of error), by considering 10% non-response rate of = 24 and $D = 2$ (design effect) was used due to cluster sampling method, the sample size was found to be 522. For the second objective the sample size was calculated using Epi info 7.2 (double population proportion) information obtained from the previous study by taking significant factors in previous studies and the sample size was greater in the first objective than the second one, then final sample size was 746 but since it is cluster sampling method the sample size was 741. Stratified cluster sampling technique was used to recruit study participants. First the population was stratified by residence as urban and rural Kebeles. The residential stratification gives 25 rural and 5 urban kebeles. Out of those, two urban and 7 rural kebeles were selected randomly by using lottery method. Finally, all the selected kebeles were used as clusters. Household having two mothers having children less than six months age by lottery method one mother was selected. Households closed during the data collection period were proceed to the next eligible house and returned back for the second time.

2.4. Data Collection Tool and Procedures

The data were collected by using a pretested, semi structured and an interviewer- administered questionnaire. The questionnaire was developed by reviewing related literatures and some modification was done accordingly. It was first prepared in English and translated into local language Amharic for data collection and then translated back to English to check consistency by both language experts. The questionnaire had socio-demographic variables, health service utilization variables, obstetrics related variables, and maternal behavior related questions, breast feeding related variables and wealth index related variables. Data were collected by six (Health Extension Workers) HEW under the supervision of the investigators and supervisors.

2.5. Data Quality Control

Data collectors and supervisors were given for one day training. The data were checked daily manually for completeness and accuracy by principal investigator and supervisors. Pretest was conducted on (5%) of the sample size in the non selected kebeles of the district to ensure the validity, reliability, and clarity of the data collection instrument. Based on the pretest done some modifications were done on questionnaire.

2.6. Data Analysis

Data were cleaned and entered into computer using Epi data 4.4.1 software and exported to Statistical Package for Social Science (SPSS) version 20 for data analysis. Before data analysis, the missing value and outliers were checked and managed appropriately.

Data were analyzed using SPSS version 20. Descriptive analysis was employed for categorical variables using frequency, percentage, tables, and charts. For quantitative variables, summary values like median and Intra quartile range was used. PCA was performed to classify the household wealth index into low, middle and high.

Binary logistic regression (bivariable and multivariable logistic regression analysis) was fitted to identify factors associated with colostrum avoidance. Variables having p-value of <0.2 in the bivariable analysis were entered into multivariable analysis. To estimate the strength of the association adjusted Odds ratio (AOR) with their 95% Confidence Interval (CI) was determined. Finally, variables with a p-value of ≤ 0.05 were considered statistically significant. Model fitness was checked by using Hosmer Lemeshow Goodness- of -fit and declared good fitted at p-value of >0.05 .

3. Results

3.1. Socio-demographic Characteristics of Respondents

A total of 741 mothers-child pairs were interviewed and giving a response rate of 100% Majority (643) of the respondantes were from rural area and the rest were from urban. The median age of the respondents was 30 years ± 10 IQR and the median age of their child was 3 months ± 3 IQR. Majority (93.1%) of respondents were married out of them 566(82%) of their husband's occupation were farmers and 289(41.9%) of their husband's educational status were unable to read and write. Three hundred seventy eight (51%) of mothers were unable to read and write. About 643(86.8%) of study participants residences were rural. From 741 study participants 487 (65.7%) of the Mothers occupation were farmer. Only 57(7.7%) of respondents were household heads. Almost all respondents (99.5%) were orthodox religious followers and 738(99.6%) Amhara were by ethnicity (Table 1).

Table 1. Socio-demographic characteristics of mothers children aged less than six months in Gozamen district, East Gojjam zone, North West Ethiopia, 2020 (n=741).

Variables	Category	Frequency (n)	Percent (%)
Residence	urban	98	13.2
	Rural	643	86.8
Sex of child	Male	343	46.3
	Female	398	53.7
Age of respondent	15-25	162	21.9
	26-35	375	50.6
	36-45	204	27.5
Age of child	0-1 month	165	22.3
	2-3 month	290	39.1
	4-6 month	286	38.6
Family size	≤3	182	24.6
	≥4	559	75.4
Number of children	≤3	565	76.2
	≥4	176	23.8
Marital status of the mothers	Single	26	3.5
	Married	690	93.1
	Widowed	9	1.2
	Separated	3	0.4
Educational status of husband (n=690)	Divorced	13	1.8
	Unable to write and read	289	41.9
	Able to write and read	206	29.8
	Primary school	129	18.7
	Secondary school	51	7.4
Occupational status of husband (n=690)	Collage and above	15	2.2
	Farmer	566	82
	Merchant	43	6.2
	Governmental Private and employee	63	9.1
	Daily laborer	18	2.7
Occupational status of mother	Housewife	175	23.6
	Merchant	22	3
	Private and Governmental employee	31	4.2
	Farmer	487	65.7
	Daily labour	19	2.6
	Student	7	0.9
	Unable to read and write	378	51.0
Educational status of mother	Able to write and read	176	23.8
	Primary school (1-8)	127	17.1

Variables	Category	Frequency (n)	Percent (%)
	Secondary school (9-12)	44	5.9
	Collage and above	16	2.2
	Yes	417	56.3
Access to radio	No	324	43.7
	Yes	60	8.1
Access to television	No	681	91.9
	Yes	57	7.7
Household head	No	684	92.3
	Low	256	34.5
Wealth index of family	Medium	238	32.2
	High	247	33.3

3.2. Obstetrics and Maternal Behavioral Related Characteristics of Respondents

Around three-fourth (75.4%) of the study participants were multiparous and more than half (58%) of them spaced their birth more than 24 months. About 508 (68.4%) of mothers had good knowledge and more than two-third of respondents (72.2%) had favorable attitude (Table 2).

Table 2. Obstetrics and maternal behavioral related characteristics of mothers of children aged less than six months in Gozamen district, East Gojjam zone, North West Ethiopia, 2020 (n=741).

Variable	Category	Frequency (n)	Percent (%)
Parity of mother	Primparious	182	24.6
	Multi parious	559	75.4
	No previous birth	182	24.6
Birth space	<24 months	129	17.4
	≥ 24 months	430	58.0

Table 3. Health care service utilization of mothers of children aged less than six months in Gozamen district, East Gojjam zone, North West Ethiopia, 2020 (n=741).

Variable	Category	Frequency (n)	Percent (%)
ANC visit (n=741)	Yes	660	89.1
	No	81	10.9
Number of ANC visit (n=660)	<4	444	67.3
	≥ 4	216	32.7

Variable	Category	Frequency (n)	Percent (%)
Knowledge	Poor knowledge	234	31.6
	Good knowledge	507	68.4
Attitude	Unfavorable	169	22.8
	Favorable	572	77.2

3.3. Health Care Service Utilization of Study Participants

Concerning health care service utilizations of mothers, about 660 (89.1%) of respondents had ANC follow up during their pregnancy out of them, 444 (67.3%) were less than four visits. Three hundred thirteen 313 (47.4%) were counseled about breastfeeding of those 121 (38.7%) were counseled about exclusive breastfeeding. More than three-fourth of the study participant (88.9%) were gave their birth in health facilities (hospital and health centers). Majority of respondents (88.7%) their labor was assisted by a health professional. Out of the total respondents, 419 (56.6%) of mothers were participated in pregnant woman form (Table 3).

Variable	Category	Frequency (n)	Percent (%)
BF counseling at ANC (n=660)	Yes	313	47.4
	No	347	52.6
what did you counseled about	Benefit of breastfeeding	52	16.6
	Position during BF	22	7.0
	EBF	121	38.7
	Management of BF problem	13	4.1
	Expression of breast milk	18	5.8
	Colostrum benefit and should not discard	61	19.5
	Others*	26	8.3
Place of delivery (n=741)	Health facility	666	89.9
	Home	75	10.1
	Caesarian delivery	67	9
Mode of delivery (n=741)	Spontaneous vaginal delivery	659	88.9
	Instrumental delivery	15	2.1
	Health professional	657	88.7
The person assisted you during delivery (n=741)	Traditional birth attendant	15	2.0
	Family (mother, husband)	56	7.6
	Others**	13	1.7
PNC visit (n=741)	Yes	567	76.5
	No	174	23.5
BF counseling at PNC (n=567)	Yes	263	46.4
	No	304	53.6
Participation in pregnant woman form	Yes	419	56.5
	No	322	43.5

3.4. Breast Feeding-Related Characteristics

Regarding infant breast-feeding practices out of the total 127(17.1%) of respondents gave prelacteal feeding to their child within three days after delivery before initiation of

breast feeding and the main reason was 44 (34.6%) of respondents thoughts to clean the mouth and throat of the baby. The most common prelacteal feeding was butter (81.1%). 164 participants out of total respondents they discard colostrums within five days after delivery (Table 4).

Table 4. Prevalance of prelacteal feeding of mothers children aged less than six months in Gozamen district, East Gojjam zone, North West Ethiopia, 2020 (n=741).

Variable	Category	Frequency (n)	Percent (%)
Prelacteal feeding (n=741)	Yes	127	17.1
	No	614	82.9
Types of prelacteal feeding (n=127)	Butter	103	81.1

Variable	Category	Frequency (n)	Percent (%)
Reason for prelacteal feeding (n=127)	Milk	19	15
	Water	5	3.9
	Breast milk cause thirsty	3	2.4
	Good for child growth	9	7.1
	Breastfeeding problem	17	13.4
	Maternal medical illness	18	14.2
	Cultural practice	22	17.3
	To calm baby	7	5.5
	To clean bowel and throat	44	34.6
Colostrum avoidance (n=741)	Others**	7	5.5
	Yes	164	22.1
Reasons for colostrum avoidance (n=164)	No	577	77.9
	Causes abdominal cramp and diarrhea	42	25.6
	Dirty	38	23.2
	Cultural practice	25	15.2
	Maternal medical illness	13	7.9
	My breast has no milk	14	8.5
	Not good for child growth	5	3
	Infant not feed	9	5.5
	Influence by others	12	7.3
	Others*	6	3.8
Time of initiation of breastfeeding (n=741)	More than one hour	290	39.1
	Within one hour	451	60.9
BF counseling on timely initiation	No	293	39.5
	Yes	448	60.5

3.5. Factors Associated with Prelacteal Feeding

Variables having p-value of less than 0.2 in the bivariable were included into the multivariable analysis. Those variables were household head, ANC follow, PNC visit, colostrum discarding, participation on pregnant woman forum, time of initiation of BF, number of ANC visits, attitude and knowledge of respondents. In multiple logistic regression model ANC visit, number of ANC visit, time initiation of BF and colostrum discarding were independent factors associated with prelacteal feeding. Mothers who had

no ANC follow up were 7.5 times more likely to practice prelacteal feeding [AOR: 7.53, CI; 3.32, 17.05] as compared to their counter parts. Those mothers who did not discard colostrum were 88.5% timeless likely to practice prelacteal feeding [AOR: 0.12, CI; 0.07, 0.12] as compared to those mothers who discarded colostrum. The odds of prelacteal feeding were 3.5 times higher in respondents who initiate BF more than one hour [AOR: 3.53, CI; 2.05, 6.11] than respondents who initiate BF less than one hour. Mothers who had single ANC visit were 2.89 times more likely to practice prelacteal feeding [AOR: 2.98 CI; 1.52, 5.85] as compared to their counter parts (Table 5).

Table 5. Bivariable and multivariable logistic regression analysis showing factors associated with prelacteal in Gozamen district, East Gojjam zone, North West Ethiopia, 2020 (n=741).

Variables	Prelacteal feeding		COR (95% CI)	AOR (95% CI)
	Yes	no		
Number of ANC visit				
<4	69	375	2.87 (1.55,5.32)	2.98 (1.52,5.852)*
More than 4	13	203	1	1
ANC				
No	45	36	8.81 (5.37,15.46)	7.53 (3.32,17.05)**
Yes	82	578	1	1
Attitude				
Unfavorable	56	113	3.51 (2.33,5.25)	1.05 (0.62,1.179)
Favorable	71	501	1	1
PNC visit				
No	40	134	1.65 (1.08,2.51)	1.06 (0.61,1.84)
Yes	87	480	1	1
House hold head				
No	112	572	0.55 (0.98,3.40)	1.21 (0.56,2.64)
Yes	15	42	1	1
Participation in pregnant woman form				
No	86	236	3.36 (2.5.04)	1.66 (0.92,2.99)
Yes	41	378	1	1
Colostrum discarding				
No	41	535	0.07 (0.05,0.11)	0.12 (0.07,0.12)**
Yes	86	79	1	1
Time of BF initiation				
More than 1 Hr	100	190	8.27 (5.23,13.11)	3.53 (2.05,6.11)**
Within 1 Hr	27	424	1	1
Knowledge				
Poor	81	153	5.31 (3.54,7.96)	0.88 (0.48,1.65)
Good	46	461	1	1

NB: *= $P < 0.05$ **= $P < 0.001$ 1 Reference Hosmer and Lemeshow goodness-of-fit p-value=0.549 AOR=Adjusted odds ratio COR =Crude odds ratio CI=Confidence interval

4. Discussion

This study tried to assess the prevalence of prelacteal feeding and associated factors among mothers of children age less than 6 months old in rural Northern Ethiopia.

Accordingly, the prevalence of prelacteal feeding was found to be 17.1% with 95%CI [14.3, 20]. This finding is in line with study done in Indian 16.9% [24] and Mettu district 14.2% [5]. This similarity might be due to similar study design and study setting.

However, this is lower than the findings of studies conducted in Rural Area of Maharashtra 42.7% [25] South

west Nigeria 26.3% [26] Mansoura, Egypt 58% [27] vientianm 73.3% [28] Himachal Pradesh 49.5% [29] western Nepal 30.6% [30], Southern Ethiopia [31], south sudan 53% [32] Dabat 56% [33] rural sidama 25.5% [34] Harari Ethiopia 45.4% [35], Mizan Aman town 22.6% [21], Raya Kobo district 38.8% [16], Afar regional state 42.9 [36] and Motta town 20.3% [6]. This discrepancy might be due to difference in sociodemographic, socioeconomic difference, cultural variability and infant feeding style that affects prelacteal feeding.

This finding also higher than studies done in Benin city of Nigeria 11.7% [37] Axum town 10.1% [9] and North eastern Ethiopia 11.1% [8]. This difference might be due to sociodemographic variation, cultural variability and infant feeding style.

Turning to the associated factors mothers who had no ANC follow up were 7.5 times more likely to practice prelacteal feeding [AOR: 7.53, CI; 3.32, 17.05] as compared to their counterparts. This finding is supported by studies done in South west Nigeria and Harari [26, 35]. The possible reason might be due to mother who have ANC visit may be have more information on the risks associated with prelacteal feeding and the may counseled by health professional [9].

Those mothers who did not discard colostrum were 88.5% times more likely to practice prelacteal feeding [AOR: 0.12, CI; 0.07, 0.12] as compared to those mothers who discarded colostrum. This finding is consistent with study done in Mettu district, South Sudan, Axum town, North Eastern Ethiopia, Mizan aman town and Motta town [5-9, 21, 32]. The possible explanation might be if mother provide colostrum to their child no need of additional foods [7].

The odds of PLF was 3.5 times higher in respondents who initiate BF more than one hour [AOR: 3.53, CI; 2.05, 6.11] than respondents who initiate BF less than one hour. This result is consistent with study done South west Nigeria, Harari and Afar regional state [26, 35, 36]. This might be due to the fact that as the time interval increase between delivery and breast feeding initiation they have more time to practice PLF and also the reverse is true prelacteal feeding may lead to delay initiation of breast feeding [38].

Once more, mothers who had less than four ANC visit were 2.89 times more likely to practice prelacteal feeding [AOR: 2.98 CI; 1.52, 5.85] as compared to their counterparts. This finding is supported with study done in Axum town [9]. The possible reason might be due to mothers who attend more than four ANC visit may be more exposure with health professional and they may advised by health professional in the fourth visit if they did not advised in the previous visits.

5. Limitations of the Study

This study shares limitation cross sectional study does not show cause effect relationship. It was also not triangulated by qualitative study and the information obtained from mothers might be prone to recall and information bias.

6. Conclusions

This study revealed that prelacteal feeding was found to be high. ANC follow up, time of BF initiation, colostrum discarding and number of ANC visit were significant independent predictors associated with prelacteal feeding. In order to take this practice community and institutional intervention is important like; strengthening timely initiation of breastfeeding, counseling to increase the number of ANC visit, changing the traditional attitude of the community on colostrum advantage for newborns, health education and creating community awareness on risks associated with prelacteal feeding are recommended interventions.

Abbreviations

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
BF	Breast Feeding
CA	Colostrum Avoidance
CI	Confidence Interval
EBF	Exclusive Breast Feeding
IYCF	Infant and Young Child Feeding
PCA	Principal Component Analysis
PLF	Prelacteal Feeding
PNC	Postnatal Care
SPSS	Statistical Package for Social Science

Ethics Approval and Consent to Participate

Ethical clearance and approval was obtained from the Institutional Review Board of University of Gondar. Then official letter was written to Gozamen district health office. Verbal informed consent was obtained from participants after explained well the purpose and objective of the study. Confidentiality was maintained at all levels of the study. Participant's engagement in the study was on voluntary basis; participants who were unwilling to participate in the study and those who wish to quit their participation were informed to do so without any restriction.

Author Contributions

MG, ZNA participated in the conception and design of the study, MG interpreted the data and drafted the initial manuscript. ZNA, NS and KM participated in commenting the document. All authors read and approved the final manuscript, contributed the critical review of the manuscript.

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Data Availability Statement

The datasets supporting the conclusions of this article are available upon request to the corresponding author.

Conflicts of Interest

The authors declare no conflicts of interest.

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