

Determinants of Colostrum Avoidance among Postpartum Mothers in North West Ethiopia

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ABSTRACT

Background & aim: Colostrum feeding has a significant health benefit for neonates and infants, particularly in low-income countries, such as Ethiopia which has greater magnitudes of child starvation and mortality. However, colostrum is not given to newborns in the area under study for a various socio-cultural reasons and misconceptions. Therefore, the present study aimed to determine the determinant of colostrum avoidance among postpartum mothers in Ethiopia.

Methods: This hospital-based cross-sectional study was performed in Debre Tabor General Hospital, Debre Tabor, Ethiopia, from January 2 to June 28, 2019. A total of 437 postpartum mothers who had a child ≤ 6 weeks of age were included in this study. A systematic random sampling method was applied, and an interviewer administered the structured questionnaires to collect the data. Data analysis was performed in SPSS software (version 23) using bivariate and multivariable logistic regression.

Results: The prevalence rate of colostrum avoidance was found to be 10.5%. According to the results, the determinants of colostrum avoidance were postpartum mothers with non-formal educational status [AOR=3.1, 95%CI=1.51-6.32], rural residency [AOR =5.2, 95%CI =2.60-10.40], primiparity [AOR =5.1, 95%CI =2.30-11.57], and lack of receiving counseling about breastfeeding during antenatal care [AOR =2.6, 95%CI =1.32-5.47].

Conclusion: The prevalence rate of colostrum avoidance was low in Debre Tabor General Hospital, compared to the results of other studies. Nevertheless, it is recommended to give routine and detailed counseling about breastfeeding during antenatal care to decrease colostrum avoidance.

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Introduction

Colostrum is the primary milk secreted by the mammary glands in late pregnancy just before parturition. It is profuse, gluey, and clear to yellowish in color, and comprises high amount of proteins, vitamin A, maternal antibodies, cytokines, growth factors, carbohydrates, and sodium chloride; however, it comprehends less amounts of lipids and potassium, compared to normal milk (1-3).

Colostrum is an essential component of breast milk which has a significant effect on the reduction of immediate and future infant morbidity and mortality, as well as satisfactory growth and development of infants both in

developed and developing countries. Antibodies that are found in colostrum help to fight against several disease-causing agents (i.e., herpes simplex virus human immune deficiency virus), bacterial infections, different cancers, allergies, and autoimmune diseases (i.e., asthma). Furthermore, it is important in reducing the major contributors to neonatal and infant death, such as malnutrition, diarrhea and, acute respiratory infection (1, 4-6).

Neonates have a premature digestive system that outfits the small-volume rigorous form of the nutrient supply system of colostrum. The laxative influence of colostrum encourages the passage of

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newborn's first stool (i.e., meconium) which is important to prevent jaundice by removing extra bilirubin (7, 8). The World Health Organization approved the infant feeding strategy which included the recommendations for exclusive breastfeeding until six months of age with sustained breastfeeding during complementary feeding practice. This recommendation has been endorsed by many countries, such as Ethiopia. Early and exclusive breastfeeding, including colostrum feeding is one of the most important things to achieve sustainable development goals by 2030 through improving infant survival (9, 10). Early and exclusive breastfeeding could prevent more than 800,000 deaths (13% of all deaths) in children below five years of age globally (11).

In resource-limited countries (i.e., Ethiopia), lactating women have few understanding on the advantages of colostrum breastfeeding. As a result, they preclude their infants from colostrum feeding immediately following delivery. This faulty feeding practice leads to high infant morbidity and mortality. Colostrum discarding removes vital nutrients and immunoglobulins, which results in a decrease in the readying of the gastrointestinal tract and upsurges the threat of newborn, child illness, and death (12-15).

Colostrum avoidance was a major problem mainly in developing and least developing countries. The magnitude varies from country to country and accounts for around 38.7% (16), 20% (17), and 11.2% in India, Nepal, and Cameroon, respectively (18). Different studies performed in the rural part of Ethiopia found that the prevalence rates of colostrum avoidance were 20.9% (19), 13.5% (20), and 6% (12) in Debre Markos, Raya Kobo, and Aksum, Ethiopia, respectively.

Mothers who live in low-income countries especially in Ethiopia discard their colostrum due to different reasons. Some of these reasons resulted from socio-cultural factors, different myths and misconceptions about colostrum feeding, cesarean deliveries, neonatal illness, and absence of awareness about the advantages of colostrum nursing. Some societies considered colostrum as heavy, profuse, unclean, contaminated, and risky for the health of infants. As a result, colostrum is thrown out, and honey, sugar water, glucose, and mishri water are given

to the newborn as substitutes (12).

Even though there are some studies on colostrum feeding practice in some parts of Ethiopia, determinant factors for colostrum avoidance are not well studied mainly in this area. Therefore, the present study aimed to determine the determinant factors of colostrum avoidance among postpartum mothers in Debre Tabor General Hospital, Debre Tabor, Ethiopia. The findings of the present study are essential to develop evidence-based interference and proper protective approaches for colostrum avoidance in the study setting and the country as a whole.

Materials and Methods

An institutional-based cross-sectional study was conducted at Debre Tabor General Hospital, Debre Tabor, Ethiopia, from January 2 to June 28, 2019. This hospital is located in the South Gondar zone, Amhara Regional State of Ethiopia, and it is found 103 and 667 kilometers away from Bahir Dar and Addis Ababa, respectively. It has four major wards and provides care for over five million people in its catchment area. Moreover, the postnatal clinic delivers care for around 140 mothers per month, and around 60 neonates are admitted to the Neonatal Intensive Care Unit (NICU) per month. Approximately, around 200 mothers attend immunization clinic per month in Debre Tabor General Hospital. The NICU is staffed with 4 pediatricians, 10 nurses, and a varying number of interns. Additionally, three nurses and two midwives give services in immunization and postnatal clinic in the hospital, respectively.

The source populations were all postnatal mothers who had a child ≤ 6 weeks of age and were admitted to Debre Tabor General Hospital. Therefore, all postnatal mothers who had a child ≤ 6 weeks of age and were admitted to NICU, as well as immunization and postnatal clinic of Debre Tabor General Hospital were included in this study during data collection period.

A single population proportion formula $[n = \frac{Z^2 \cdot P \cdot (1-P)}{d^2}]$ was used to determine the sample size. Moreover, a 95% confidence level of $Z_{\alpha/2} = 1.96$, marginal error of 4%, and prevalence of colostrum avoidance 20.9% at Debre Markos town (19) were employed to estimate the sample size. Therefore, the sample size was obtained at 397, and regarding 10% non-response rate, the last (actual) sample size

was 437 people.

The participants were selected from those who were admitted to NICU, as well as immunization and postnatal clinic through a systematic random sampling method. According to the data collected from the medical records, around 800 postpartum mothers were attended NICU, as well as immunization and postnatal clinic in two months. The sampling fraction was nearly two (2) which was obtained by dividing the total number of postpartum mothers in two months (800) to the total number of the sample sizes (437). The 1st postnatal mother was chosen through lottery technique. Subsequently, every second mother who attended NICU, as well as immunization and postnatal clinic was employed in the study.

The data were collected by an interviewer who administered the questionnaires, which were amended and revised contextually from prior studies after reviewing the literature extensively (12, 13, 20). A total of 30 questionnaires were constructed with three sections (i.e., socio-demographic, obstetric, and breastfeeding characteristics). Moreover, colostrum avoidance assessment questionnaire was designed using the back-translation technique. The validity of the questionnaires were determined by the content validity index of 0.87. Furthermore, Cronbach's alpha coefficients were measured to know the reliability of the subscales, which was estimated at 0.79.

Before the actual data collection period, 22 (5%) postpartum mothers at Addis Zemen Hospital, North-Western Ethiopia were requested to complete the questionnaires; therefore, an adjustment was made on the instruments. It is worth mentioning that one BSc midwife and two BSc nurses were recruited for data collection; moreover, one BSc midwife supervised the data collection process.

The data collection was performed after obtaining the ethical approval from the Ethics Committee of College of Health Science, Debre Tabor University, Debre Tabor, Ethiopia. In addition, Debre Tabor General Hospital medical director and Obstetrics-Gynecology Department heads were given the authorized letters before data collection. Prior to data collection, informed written consents were received from

the study participants, and they were assured of the confidentiality of their data since the data collectors and investigators secured information and tools anonymously. However, consent for publication is not valid in this study.

The data were imported into EpiData (version 3.1), and subsequently exported to SPSS software (version 23) for analysis. Both descriptive and binary logistic regression were computed in this study, and both bivariate and multivariable logistic regression was performed in the binary logistic regression. In bivariate analysis, predictor variables with p-value of < 0.2 were taken as a candidate for multiple logistic regressions. Moreover, a p-value less than 0.05 was considered statistically significant in multivariable logistic regressions. Adjusted Odds Ratio (AOR) and their 95% Confidence Interval (CI) were used to measure the strength of association, and backward stepwise logistic regression was also applied in this study.

Results

In total, 437 postpartum mothers were included in this study with 100% response rates. The mean±SD age of the respondents was 28.7±6.2 years. Nearly, all postpartum mothers (n=426, 97.5%) were Amharic regarding the ethnicity. Moreover, more than half of the respondents (n=324, 74.1%) were from urban areas, and around 390 (89.3%) postnatal mothers were orthodox in their religion. Furthermore, nearly, 330 (75.5%) respondents had formal education, and regarding the occupational status, half of the respondents (50.8%) were housewives (Table 1).

The majority of postpartum mothers (n=393, 89.9%) received antenatal care (ANC) follow-up in their last pregnancy and 296 (75.3%) respondents had at least 3 ANC visits. Approximately, three quarters of the respondents (n=336, 76.9%) were counseled about breastfeeding during ANC follow-up in their last pregnancy. Moreover, nearly, half of the respondents (54.5%) were primipara mothers, and 351(80.3%) cases gave birth at health institutions (Table 2).

Table 1. Socio-demographic characteristics of postnatal mothers in *DTGH, North West Ethiopia, 2019

Variables	Frequency	Percent
Age (years)		
15-19	71	16.2
20-34	249	57
≥35	117	26.8
Ethnicity		
Amhara	426	97.5
Others (Agew and Oromo)	11	2.5
Residency		
Urban	324	74.1
Rural	113	25.9
Religion		
Orthodox	390	89.3
Muslim	39	8.9
Protestant	8	1.8
Educational Status		
Non-formal education	107	24.5
Formal education	330	75.5
Occupational Status		
Housewife	222	50.8
Civil servant	88	20.1
Merchant	89	20.4
Others (student, daily laborer)	38	8.7
Family Size		
≤3	197	45.1
>3	240	54.9

DTGH: Debre Tabor General Hospital

In the same line, the majority of the postpartum mothers (n=391, 89.5%) fed their child with colostrums, and 73(16.7%) respondents gave pre-lacteal feeds to their child. Cultural influence (32.9%) and inadequate milk productions (39.7%) were the common reasons for pre-lacteal feeding practice. Furthermore, the majority of the respondents (70.7%) had no awareness on the advantages of colostrum, and 339 (77.6%) cases initiated breastfeeding within one hour of delivery (Table 3).

Prevalence of Colostrum Avoidance

The prevalence of colostrum avoidance was found to be 10.5% with [95% CI=7.8-13.5].

Determinants of Colostrum Avoidance

This study assessed the association of

colostrum avoidance with socio-demographic and obstetrical related characteristics in postpartum mothers. According to the results obtained from bivariable analysis, colostrum avoidance correlated significantly with type of residency, parity, ANC follow-up, presence of counseling about breastfeeding during ANC, educational status, and place of delivery (P<0.2). Furthermore, multivariable analysis revealed a statistically significant association of colostrum avoidance with parity, type of residency, presence of counseling about breastfeeding, and educational status (Table 4).

Table 2. Obstetric related characteristics of postnatal mothers in *DTGH, North West Ethiopia, 2019

Variables	Frequency	Percentage
Birth Spacing		
No prior child	238	54.5
<24months	94	21.5
≥24months	105	24
Antenatal Care follow-up		
Yes	393	89.9
No	44	10.1
Number of Antenatal Care Follow-up(n=393)		
<3	97	24.7
≥3	296	75.3
Counseled about Breastfeeding during Antenatal Care		
Yes	336	76.9
No	101	23.1
Parity		
Primipara	238	54.5
Multipara	199	45.5
Place of Delivery		
Home	86	19.7
Health institution	351	80.3
Mode of Delivery		
Spontaneous vaginal delivery	301	68.9
Cesarean section	88	20.1
Instrumental	48	11
Newborn Gender		
Male	204	46.7
Female	233	53.3

*DTGH: Debre Tabor General Hospital

Table 3. Breastfeeding related characteristics of respondents (n=424) in *DTGH, North West Ethiopia, 2019

Variables	Frequency	Percentage
Colostrum Avoidance		
Yes	46	10.5
No	391	89.5
Reasons for Colostrum Avoidance (n=46)		
Colostrum is not good	24	52.2
Influenced by others	7	15.2
Newborn unable to feed	3	6.5
Delay lactation	4	8.7
Cultural influence	3	6.5
It is not milk	5	10.9
Giving Pre-lacteal Feeding		
Yes	73	16.7
No	364	83.3
Reasons for Pre-lacteal Feeding (n=73)		
Inadequate milk production	29	39.7
Breast problem	13	17.8
Maternal medical illness	5	6.9
Cultural	24	32.9
For child growth	2	2.7
Awareness on the Advantages of Colostrum		
Yes	129	29.3
No	309	70.7
Breastfeeding Initiation Time		
Within 1 h of delivery	339	77.6
After 1h following delivery	98	22.4

*DTGH: Debre Tabor General Hospital

Table 4. Multiple logistic regression results of colostrum avoidance and predictor variables among postnatal mothers in *DTGH, 2019

Variables	Colostrum Avoidance		Crude Odd Ratio (95%CI)	Adjusted Odd Ratio (95%CI)
Residency				
Urban	305(94.1%)	19(5.9%)	1	1
Rural	86(76.1%)	27(23.9%)	5.0(2.67-9.49)*	5.2(2.60-10.40)**
Educational Status				
Non-formal education	86(78.9%)	23(21.1%)	3.5(1.89-6.62)*	3.1(1.51-6.32)**
Formal education	305(90.3%)	23(7%)	1	1
Parity				
Primipara	202(84.9%)	36(15.1%)	3.36(1.62-6.97)*	5.1(2.30-11.57)**
Multipara	189(95%)	10(5%)	1	1
Place of Delivery				
Health Institution	319(90.9)	32(9.1)	1	1
Home	72(83.7)	14(16.3)	1.9(0.98-3.81)*	1.5(0.69-3.23)
Antenatal Care				
Yes	356(90.6%)	37(9.4%)	1	1
No	35(79.5%)	9(20.5%)	2.4(1.10-5.54)*	1.3(0.51-3.47)
Counseled about Breastfeeding during Antenatal care				
Yes	311(92.6%)	25(7.4%)	1	1
No	80(79.2%)	21(20.8%)	3.2(1.73-6.13)*	2.6(1.32-5.47)**

*mean P<0.2 and ** mean P<0.05

*DTGH: Debre Tabor General Hospital

Discussion

The magnitude of colostrum avoidance was 10.5% in Debre Tabor General Hospital with [95% CI=7.8-13.5]. This result was consistent with the findings obtained from the studies conducted in Raya Kobo district (13.5%) (20) and North Wollo zone, Ethiopia (12.0%) (21). This could be due to socio-demographic and socio-cultural similarity between the studies.

The present finding is also consistent with the results obtained from a study performed in Cameroon, Sub-Saharan Africa (11.2%) (18). This might be due to the similarity between the studies in terms of the study setting and socio-cultural practice.

However, the magnitude of colostrum avoidance in the current study was lower than that in a previously performed study in Kamrup, India (21%) (13), Rajasthan, India (38.7%) (16), and Kathmandu Medical College Teaching Hospital, Nepal (20%) (17). The difference might be due to the institutional-based nature of our study in which the participants might have awareness on colostrum advantage. In addition, the variation in newborn breastfeeding practice and socio-cultural differences among the societies might have roles in the above discrepancies.

The numbers and values obtained in the current study were also lower than those in the findings of the studies conducted in Debre Markos (20.9%) (19) and Kossoye, Ethiopia (79%) (22). The reason behind this discrepancy may be due to the socio-cultural and geographical factors, as well as the study period, and health education differences between Debre Tabor and Debre Markos. However, since more attention is given to exclusive breastfeeding, the magnitude of colostrum avoidance might be reducing, compared to that in the former studies. In addition, the difference in place of residence and maternal education level may contribute to this difference.

On the other hand, the values and numbers in the present study were higher than those in the findings of a study conducted in Aksum, Ethiopia (6%) (12). The discrepancy might be due to the time on which the study was performed since in recent times, more attention is given to breastfeeding and wellbeing of newborns and infants. Moreover, social and ethnic differences

among study settings and decrement of misconceptions and myths towards colostrum feeding might also contribute to this difference.

Non-formal educational status was significantly associated with colostrum avoidance. Postpartum mothers with non-formal educational status had odds of practicing colostrum avoidance 3.1 times higher than those who had formal educational status [adjusted odd ratio=3.1, 95%CI=1.51-6.32]. The present finding was consistent with the results of a study conducted in Kamrup, India (13). According to the results of this study, advanced educational status, as well as the achievement of more knowledge and recognition on exclusive breastfeeding (i.e., colostrum feeding) affected the colostrum avoidance. On the other hand, non-formal educational status would lead to low educational attainments, which hinder gaining knowledge about the advantages of colostrum and also make mothers susceptible to social misconceptions and myths toward colostrum feeding.

Furthermore, lack of counseling about breastfeeding during ANC was significantly associated with colostrum avoidance. Postpartum mothers who received no counseling about breastfeeding during ANC had odds of discarding colostrum 2.6 times higher than those who were counseled about breastfeeding during ANC [AOR =2.6, 95%CI =1.32-5.47]. The ANC and immediate postpartum period were the ideal time to increase mother's awareness about exclusive breast feeding, including colostrum feeding. However, mothers who received no counseling about breastfeeding during ANC might have a low level of awareness on the benefit of colostrum nursing for newborns. As a result, they may discard colostrum immediately following delivery.

This study indicated that rural residency was significantly associated with colostrum avoidance. Postnatal mothers from rural areas had odds of discarding colostrum 5.2 times higher than those who came from urban areas [AOR =5.2, 95%CI =2.60-10.40]. The present result was supported by a study performed in Kamrup, India (13). This might be due to faulty newborn feeding practices, such as colostrum avoidance, which were more prevalent in rural

areas, compared to urban areas. These faulty practices also resulted from lower level of education, lack of knowledge, lack of exposure to mass media, religious beliefs, customs, as well as elders and relatives' advice.

This finding also showed a significant association between primipara mothers and colostrum avoidance. Primipara mothers were 5.1 times more likely to avoid colostrum than multipara mothers [AOR =5.1, 95%CI =2.30-11.57]. The present finding was consistent with evidence obtained from a study conducted in Kamrup, India. It was revealed that low parity was significantly associated with colostrum avoidance (13). This could be due to the fact that primipara mothers may not be considered colostrum as milk because of the difference in terms of color and form between colostrum and normal milk.

The present study was performed in a general hospital. As a result, the findings might not be representative of the population in other facilities and the country as a whole. Moreover, counseling about breastfeeding during ANC and breastfeeding initiation time was self-stated data, and participants might not recall and tell previous occasions appropriately. Therefore, the present finding might be prone to the recall bias.

Conclusion

The magnitude of the colostrum avoidance was low in Debre Tabor General Hospital, Ethiopia, compared to that in other studies. Factors that tend to increase colostrum avoidance in Debre Tabor General Hospital include non-formal educational status, residency in rural areas, primipara mothers, and lack of receiving counseling about breastfeeding during ANC. Therefore, it is recommended to refine policies that support regular learning and give routine and detailed counseling about breastfeeding during ANC to reduce colostrum avoidance.

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Conflicts of interest

Authors declared no conflicts of interest.

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