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

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ABSTRACT

Background: UNICEF and WHO recommend colostrum as newborns’ perfect food that should be initiated within the first hour after birth.

Objective: To assess colostrum avoidance practices and associated factors among mothers of children aged <24 months in Raya Kobo district, North-eastern Ethiopia.

Methods: A quantitative community-based cross-sectional study supplemented by qualitative method was used. Descriptive statistics, binary and multivariable logistic regression analyses were used in the statistical analysis.

Results: Colostrum avoidance was practiced by 13.5% (95% confidence interval: 10.99–16.33) of mothers having children aged <24 months. In multivariable logistic regression analysis, giving birth at home, mother-heading households, lack of awareness on the advantages of colostrum and late initiation of breastfeeding remained statistically significant factors associated with colostrum avoidance practices.

Conclusion: Promoting institutional delivery, timely initiation of breastfeeding and creating awareness on the advantages of colostrum feeding are recommended interventions to reduce colostrum avoidance.

KEYWORDS: colostrum, Raya Kobo, Ethiopia.

BACKGROUND

Optimal breastfeeding practices rank among the most effective interventions to improve child health [1]. Studies showed that globally 60% of infant and young child deaths attributed to suboptimal breastfeeding practices [1–3]. Suboptimal breastfeeding is responsible for 45% of neonatal infectious deaths, 30% of diarrheal deaths and 18% of acute respiratory deaths in children <5 years of age [4]. The
risk of mortality due to diarrheal and other infectious diseases is higher in infants who are either partially breastfed or not breastfed at all [1]. In Ethiopia, about 18% of the infant deaths have been attributed to poor feeding practices [5].

The practice of optimal breastfeeding starts from the first minute of birth. UNICEF and WHO recommend colostrum as newborns’ perfect food that should be initiated within the first hour after birth. Colostrum is the first liquid that is produced in the first few hours after delivery [6]. It is called ‘inger’ in Amharic language by the rural Amhara communities [7]. Colostrum is thick, sticky and clear to yellowish in color. It contains proteins, vitamin A and maternal antibodies important to the newborn’s nutrition until lactation is fully established [6].

Colostrum establishes important bacteria in the baby’s gut. It also acts as ‘paint’, coating the infant’s gastrointestinal tract. Therefore, colostrum provides natural immunity (baby’s first immunization) against many bacteria and viruses [6, 8]. In 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 [7, 9, 10]. This is also a common practice in Ethiopia [11].

Colostrum feeding was recommended in the Ethiopian Infant and Young Child Feeding Guideline that was developed in 2004 [12]. However, colostrum avoidance is still practiced in many parts of Ethiopia including Amhara regional state. Moreover, there is a paucity of evidence regarding factors associated with colostrum avoidance in Ethiopia, particularly in Raya Kobo District. Hence, this study aimed to investigate factors associated with colostrum avoidance among mothers of children aged <24 months in Raya Kobo District, North-eastern Ethiopia.

**METHODS**

**Study design and sampling procedure**

This study was conducted in Raya Kobo district of Amhara region, North-eastern Ethiopia from December to 18 January 2014. A quantitative community-based cross-sectional study, supplemented by a qualitative study, was used on mothers of children aged <24 months. In this study, 630 mother–child pairs were included. There are 42 kebeles (the smallest administrative unit in Ethiopia) in Raya Kobo district. One urban kebele and seven rural kebeles were selected by simple random sampling technique for this study. The sample size was proportionally allocated for urban and rural kebeles by assuming there could be a difference regarding colostrum avoidance between urban and rural residents. The households that had eligible study subjects were identified by the assistance of the health extension workers logbook, and systematic random sampling technique was used to choose the household for the interview.

**Measurements**

In this study, the outcome variable was colostrum avoidance practice among mothers of children aged <24 months. Colostrum avoidance is the failure to feed infants the first, thick and yellowish milk that is produced in the first 3 days after birth [6]. Avoiding colostrum was coded as ‘1’, while colostrum feeding was coded as ‘0’ for regression analysis. The independent variables were maternal characteristics (age, educational status, religion, ethnicity and marital status), household characteristics (area of residence, i.e. urban–rural, household head and family size), husband’s educational status, child’s sex, antenatal care utilization, place of delivery, breastfeeding initiation and the mother’s awareness on the advantages of colostrum feeding. Antenatal care utilization was defined as having at least one visit to a health institution for checkup purpose during the pregnancy of the index child [13].

**Data collection instrument and process**

Quantitative data were collected using a pretested, structured and interviewer-administered questionnaire adopted from the Ethiopian Demographic and Health Survey [11] and the national nutrition survey questionnaire [14]. The quantitative data were collected by trained data collectors using the Amharic version of the questionnaire. Focus group discussions (FGDs) and in-depth interviews were used to collect the qualitative data by a trained BSc nurse with the assistance of two note takers. The participants for FGD and in-depth interviews were
selected purposively based on their role in the community to explore cultural beliefs about colostrum avoidance practices. Two FGDs were undertaken in a group of grandmothers (women who had at least one grandchild), each composed of eight discussants. The in-depth interviews were undertaken with four traditional birth attendants (two trained and two untrained traditional birth attendants).

Statistical analysis
After the completeness and consistency of the quantitative data were checked on the printed form of the questionnaire, it was cleaned, coded and entered into EpiData version 3.02. The data analysis was performed by using SPSS version 16.0 statistical package for analysis. Descriptive statistics were used to show the prevalence of colostrum avoidance practices, reason for discarding colostrum and the mother’s awareness on the advantages of colostrum. Binary and multivariable logistic regression analyses were carried out to identify the factors associated with colostrum avoidance. Variables found statistically significant at $p$-value < 0.25 [15] during binary logistic regression analysis were included in the multivariable logistic regression model. Both crude and adjusted odds ratios (AORs) were reported with 95% confidence interval (CI). Variables at $p$-value < 0.05 in the final multivariable model were concluded as factors associated with colostrum avoidance.

Qualitative data were transcribed into English text by the principal investigator. Thematic framework analysis approach was used to analyze the qualitative data. Finally, the result was presented in triangulation with the quantitative findings.

Ethical consideration
A letter of ethical approval was obtained from the Institutional Health Research Ethics Review Committee of Haramaya University. Permission was obtained from Raya Kobo district and a support letter was written to each selected kebele. Informed written consent was taken from the participants before the interview. Illiterate mothers were consented by their thumb print after verbal consent. The participants were also assured about the confidentiality of the information they provided.

RESULTS
Colostrum avoidance practices
Colostrum was discarded by 13.5% (95% CI: 10.99–16.33) of mothers of children aged <24 months. Among those who discarded colostrum, 25.9% of mothers reasoned out that they believe colostrum is not good. Above 23.5% of the mothers discarded colostrums because it is tradition. About 58% of mothers were not aware about advantages of colostrum (Table 1).

In relation to colostrum avoidance, a 39 year old discussant said, ‘colostrum cannot prevent disease rather it causes abdominal cramp; it is yellowish dirty food that should be discarded’ (FGD—Grandmother).

Mothers reported that the most influential individuals for colostrum avoidance were grandmothers (44%), untrained traditional birth attendants (44%) and husbands (12%).

In support of the idea of colostrum discarding, a 42 year old mother said, ‘in our community colostrum is believed to cause abdominal cramp, therefore to prevent such problem as grandmother of children I recommend my daughter to discard colostrum for the first three days before breastfeeding initiation’ (FGD—Grandmother).

A 45 year old woman said, ‘Since colostrum causes abdominal cramp and raw butter cleans infants’ stomach, I recommend mothers to discard colostrum and to feed their infants with raw butter before breastfeeding initiation. In rich families mothers discard colostrum and feed newborns with raw butter with the first 3–7 days’ (In-depth interview—untrained traditional birth attendant).

A 37 year old woman said, ‘Since colostrum is sticky and yellowish it seems dirty, but I recommend mothers to feed their infants with colostrums’ (In-depth interview—trained traditional birth attendant).

Binary logistic regression analysis showed that living in rural places, mother-heading households, giving birth at home, late initiation of breastfeeding and
mothers that did not know advantages of colostrum were statistically associated with colostrum avoidance at p-value <0.25 (Table 2). However, maternal age, educational status, ethnicity, marital status, husband’s educational status and antenatal care attendance were not found significantly associated with colostrum avoidance at p-value <0.25 in the binary logistic regression model. Thus, these variables were not included in multivariable regression analysis model.

In multivariable logistic regression analysis, giving birth at home, mother-heading households, lack of awareness on advantage of colostrum and late initiation of breastfeeding remained statistically significant factors associated with colostrum avoidance at p-value <0.25 in the binary logistic regression model. Thus, these variables were not included in multivariable regression analysis model.

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In this study, mothers of children aged <24 months reported that grandmothers and untrained traditional birth attendants were the most influential individuals to discard colostrum. Moreover, FGDs and in-depth interviews revealed that grandmothers and untrained traditional birth attendants thought colostrum causes abdominal cramp in infants. Therefore, they influence other mothers to discard colostrum. Likewise, grandmothers of the child tend to have strong influence on their daughters not to feed colostrum to their infants in Somalia [9] and Bangladesh [8].

Mothers who were not aware of the advantages of colostrum were 5.5 times more likely to discard colostrum compared with mothers who were aware of the advantages of colostrum for infants. Similarly, colostrum is discarded primarily because of lack of basic information about the importance of colostrum for infants in Somali [9]. In addition, qualitative findings in Raya Kobo showed that, mothers thought

Table 1. Distribution of respondents based on colostrum avoidance practices in Raya Kobo district, 2014

| Variable | Frequency (n) (%) |
|----------|------------------|
| Mother knows what colostrum is? | |
| (n = 630) | |
| Yes | 348 (55.2) |
| No | 282 (44.8) |
| Colostrum discarded (n = 630) | |
| Yes | 85 (13.5) |
| No | 545 (86.5) |
| Reasons to discard colostrum (n = 85)a | |
| Colostrum is not good | 22 (25.9) |
| Tradition | 20 (23.5) |
| Colostrum is dirty | 19 (22.4) |
| Influenced by other person | 16 (18.8) |
| Infant unable to feed | 13 (15.3) |
| Delayed lactation | 11 (12.9) |
| Colostrum is yellow/thick | 9 (10.6) |
| Awareness on advantages of colostrums (n = 630) | |
| Yes | 366 (58.1) |
| No | 264 (41.9) |

aVariables with multiple responses.
colostrum as yellowish-dirty milk that is not good for infants. A study in Tigray region of Ethiopia also revealed that colostrum is perceived as not good for infants, and more than half of the mothers had no knowledge on colostrum feeding [20]. Other studies from Goba, South-eastern Ethiopia and Jimma Arjo, South-western Ethiopia districts also found that colostrum is believed to cause disease [10, 21]. There were also similar findings from Foni Kansala district of Gambia [22].

Late initiation of breastfeeding was associated with colostrum avoidance practices. Compared with mothers who initiated breastfeeding within 1 h of delivery, mothers who initiated breastfeeding beyond 1 h of delivery were 2.4 times more likely to discard colostrum. This could be because of the fact that those mothers who discarded the colostrum might take more time to discard it and initiate breastfeeding later. The reverse might be also correct. When mothers tend to initiate breastfeeding later, they would have more time for infant feeding malpractices like colostrum avoidance.

Mothers who delivered the index child at home were 2.6 times more likely to practice colostrum avoidance compared with mothers who gave birth at health institutions. Similarly, in India, mothers who gave birth at home were more likely to discard colostrum compared with mothers who gave birth at health institutions [23]. Grandmothers and traditional birth attendants usually attend the birth in homes. The FGDs and in-depth interviews findings showed that grandmothers and traditional birth attendants usually attend the birth in homes. The FGDs and in-depth interviews findings showed that grandmothers and traditional birth attendants usually attend the birth in homes.

### Table 2. Binary and multivariable logistic regression analysis showing factors associated with colostrum avoidance among mothers of children aged less than 24 months in Raya Kobo district, 2014

| Variable                        | Colostrum avoidance n (%) | Crude odds ratio (COR) (95% CI) | Adjusted odds ratio (AOR) (95% CI) |
|---------------------------------|---------------------------|---------------------------------|-----------------------------------|
| Residence                       |                           |                                 |                                   |
| Urban                           | 5 (5.7)                   | 1                               | 1                                 |
| Rural                           | 80 (14.8)                 | 2.9 (1.13–7.31) \(^{b}\)        | 1.7 (0.59–4.66)                   |
| Religion of mother              |                           |                                 |                                   |
| Orthodox                        | 52 (12.3)                 | 1                               | 1                                 |
| Muslim                          | 33 (15.9)                 | 1.4 (0.84–2.17)                 | 0.9 (0.56–1.65)                   |
| Household headship              |                           |                                 |                                   |
| Mothers of index child          | 16 (28.1)                 | 2.8 (1.52–5.35) \(^{b}\)        | 2.6 (1.08–6.44) \(^{b}\)         |
| Other person \(^{a}\)          | 69 (12.0)                 | 1                               | 1                                 |
| Family size                     |                           |                                 |                                   |
| 2                               | 6 (26)                    | 2.4 (0.91–6.46)                 | 1.0 (0.24–4.15)                   |
| 3-4                             | 31 (13.5)                 | 1.1 (0.66–1.75)                 | 0.9 (0.55–1.69)                   |
| >5                              | 48 (10)                   | 1                               | 1                                 |
| Delivery place                   |                           |                                 |                                   |
| Home                            | 76 (15.9)                 | 3 (1.47–6.15) \(^{b}\)         | 2.6 (1.13–5.79) \(^{b}\)         |
| Health institution              | 9 (5.9)                   | 1                               | 1                                 |
| Breastfeeding initiation time    |                           |                                 |                                   |
| <1 h                            | 40 (8.9)                  | 1                               | 1                                 |
| >1 h                            | 38 (21.6)                 | 2.8 (1.73–4.55) \(^{b}\)       | 2.4 (1.44–4.00) \(^{b}\)         |
| Maternal awareness on advantage of colostrums |                       |                                 |                                   |
| Yes                             | 12 (4.5)                  | 1                               | 1                                 |
| No                              | 73 (19.9)                 | 5.2 (2.78–9.86) \(^{b}\)       | 5.5 (2.63–11.32) \(^{b}\)        |

\(^{a}\)Respondent’s husband, father and mother.

\(^{b}\)Statistically significant variables at \(^{p}\) < 0.05. Hosmer-Lemeshowgoodness-of-fit = 0.719.
attendants thought colostrum caused abdominal cramps in infants. Therefore, giving birth at home may create a favorable environment for different socio-cultural malpractices such as the practice of colostrum avoidance. Alternatively, mothers who gave birth in health institutions might be advised by health professionals about the advantages of colostrum.

Household-head mothers were 2.6 times more likely to discard colostrum compared with mothers who were not household heads. This could be explained in such a way that mothers who were household heads might be self-directed and may lack the supportive advice offered on the importance of colostrum feeding for newborns compared with mothers who were not household heads.

One of the strengths of this study was that it included both quantitative and qualitative methods. This study has also limitations. The first limitation was that information obtained from mothers having children aged <24 months is subject to recall bias. The study also shares the limitation of the cross-sectional study design.

CONCLUSION
Colostrum avoidance was more common among mothers who lacked awareness on the advantages of colostrum feeding, who gave birth at home, who practiced improper commencement of breastfeeding and mothers who were household heads. Promoting institutional delivery, timely initiation of breastfeeding and creating awareness on the advantages of colostrum feeding are recommended interventions to reduce colostrum avoidance.

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REFERENCES
1. Jones G, Steketee R, Black R, et al. How many child deaths can we prevent this year? Lancet 2003;362:65–71.
2. WHO. Global Strategy for Infant and Young Child Feeding. Geneva, Switzerland: A joint WHO/UNICEF statement. Geneva: WHO, 2003.
3. WHO. Indicators for Assessing Infant and Young Child Feeding Practices. Part 3: Country profiles. Geneva: WHO, 2010.
4. WHO. Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. Available at http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf, 2009.
5. ETHIOPIAN PROFILES TEAM AED LINKAGES. Why nutrition matters. The Ethiopian profiles analysis. Addis Ababa, Ethiopia: AED/Linkages, 2005.
6. WHO/UNICEF. Baby-friendly hospital initiative (BFHI). Revised, Updated and Expanded for Integrated Care. Section 3, Breastfeeding Promotion and Support in a Baby-friendly Hospital: A 20-hour Course for Maternity Staff. 2009.
7. Rogers N, Abdi J, Moore D, et al. Colostrum avoidance, prelacteal feeding and late breast-feeding initiation in rural Northern Ethiopia. Public Health Nutr 2011;14: 2029–36.
8. Haider R, Rasheed S, Sanghvi T, et al. Breastfeeding in infancy: identifying the program-relevant issues in Bangladesh. Int Breastfeed J 2010;5:21.
9. FAO/FSAU. Infant and Young Child a Feeding and Health Seeking Practices. Somali Knowledge Attitude Practices Study (KAPS). Published by United Nations Food and Agricultural Organisation/Food Security Analysis Unit, PO Box 1230, Village Market, Nairobi, Kenya, 2007.
10. Tamiru D, Belachew T, Loha E, et al. Sub-optimal breastfeeding of infants during the first six months and associated factors in rural communities of Jimma Arjo Woreda, Southwest Ethiopia. BMC Public Health 2012;12:363.
11. Central Statistical Agency (CSA) Ethiopia. Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: CSA and ORC Macro, 2011.
12. Federal Ministry of Health Ethiopia(FMOH). National strategy for Infant and Young Child Feeding (IYCF). Family Health Department Ethiopia. Available at http://motherchildnutrition.org/nutrition-protection-promotion/pdf/mcn-national-strategy-for-infant-and-young-child-feeding-ethiopia.pdf. 2004.
13. Tura G. Antenatal care service utilization and associated factors in Metekel Zone, Northwest Ethiopia. Ethiopian J Sci 2009;19:111–18.
14. Ethiopian Health and Nutrition Institute(EHNRI). Nutritional baseline survey report for the national nutrition program of Ethiopia. http://wwwephigovet/images/nutrition/nutrition%20baseline%20survey%20report.pdf. 2010.
15. Peter C, Jack V. Automated variable selection methods for logistic regression produced unstable models for predicting acute myocardial infarction mortality. J Clin Epidemiol 2004;57:1138–46.
16. Egata G, Berhane Y, Worku A. Predictors of non-exclusive breastfeeding at 6 months among rural mothers in east Ethiopia: a community-based analytical cross-sectional study. Int Breastfeed J 2013;8:8.

17. Seid AM, Yesuf ME, Koye DN. Prevalence of exclusive breastfeeding practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia. Int Breastfeed J 2013;8:14.

18. Raina SK, Mengi V, Gurdeep S. Differentials in colostrum feeding among lactating women of block RS Pura of J and K: A lesson for nursing practice. Iran J Nurs Midwifery Res 2012;17:386–9.

19. Dashti M, Scott JA, Edwards CA, et al. Determinants of breastfeeding initiation among mothers in Kuwait. Int Breastfeed J 2010;5:7.

20. Ali D, Tedla M, Subandoro A, et al. Alive & Thrive Baseline Survey Report: Ethiopia. Washington, DC: Alive & Thrive, 2011.

21. Setegn T, Gerbaba M, Belachew T. Determinants of timely initiation of breastfeeding among mothers in Goba Woreda, South East Ethiopia: A cross sectional study. BMC Public Health 2011;11:217.

22. Njai M, Dixey R. A study investigating infant and young child feeding practices in FoniKansala district, western region, Gambia. J Clin Med Res 2013;5:71–9.

23. Raval D, Jankar DV, Singh MP. A study of breast feeding practices among infants living in slums of Bhavnagar city, Gujarat, India. Healthline J Indian Assoc Prevent Soc Med 2011;2:78–83.