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Level and Predictors of Pre-Lacteal Feeding Practice in North Wollo Zone, Ethiopia: Institution - Based Cross-Sectional Study

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Abstract

Introduction: Pre-lacteal feeding persists in low and middle-income countries as deep-rooted nutritional malpractice and is top on the list of global public health concerns. The practice deprives newborns of valuable nutrients and protection of colostrum and exposes them to preventable morbidity and mortality. It imposes significant negative consequences on neonatal health, including increased risk of illness and mortality. Even though different studies revealed that pre-lacteal feeding practice decreased over time, the level and predictors of pre-lacteal feeding did not research.

Methods: An institution-based cross-sectional study was used. Descriptive statistics, binary and multivariable logistic regression analyses were used for the statistical analysis.

Results: One out of four children, 25 % (95% CI: 21% - 30%), was practice pre-lacteal feeding. In multivariable logistic regression analysis the most important predictors were colostrum avoidance Adjusted Odds Ratio (AOR): 3.280; 95%, Confidence Interval (CI): (1.660 - 6.482), maternal illiteracy AOR: 2.449; 95%, CI: (1.001 - 5.988), media exposure AOR: 2.030; 95%, CI: (1.182 - 3.485), maternal age 15 - 24 and 25 - 34 (AOR: 3.413; 95% CI: (1.489 - 7.819)) and (AOR: 2.532; 95% CI: (1.203 - 5.329) respectively, remained statistically significant predictors for pre-lacteal feeding practices.

Conclusion: The pre-lacteal feeding in this study was found to be 25.5%. It is recommended for promoting maternal literacy at a young age through different media for stopping colostrum avoidance, and pre-lacteal feeding. It is also better to study at a community level.

Keywords: *Colostrum Avoidance; Pre-Lacteal Feeding; Ethiopia; Maternal Age; North Wollo*

Abbreviations

EDHS: Ethiopian Demographic and Health Survey; IYCF: Infant and Young Feeding Practices; WHO: World Health Organization; SPSS: Statistical Product and Service Solutions

Introduction

World Health Organization (WHO) recommends exclusive breastfeeding until exactly 6 months of age, continued breastfeeding along with optimal complementary foods up to two years of age or beyond through emphasizing the new-born should start breastfeeding (BF) within an hour after birth [1,2]. BF, besides being natural and inexpensive, serves as the ideal source of infant nutrition [1,2]. It is not only easily digestible and meets the dietary requirements of the new-born but also provides a number of unique biological and psychological

benefits to the mother and child including family and community. The benefits of breastfeeding are enormous both for mothers and their infants. Some of these are: for the infant, provision of superior nutrition for optimum growth, adequate water for hydration, protection against infection and allergies and promotion of bonding and development, and for the mother; more rapid weight loss after birth, aids uterine involution and reduces bleeding after delivery and reduces risks of diseases such as breast and ovarian cancer [1]. There is evidence that improving BF practices would help to save the lives of around 823,000 children under five years of age, annually [3].

BF and human milks are the normative standards for infant feeding and nutrition [2]. BF is uniquely suited to the human infant, both in its nutritional composition and in the non-nutritive bioactive factors that promote survival and healthy development [3]. WHO and United Nations Child Emergency Fund (UNICEF) discourages this practice and recommends continuing breast feeding up to 2 years and beyond [2]. Despite these recommendations, in many parts of the globe including Ethiopian mothers give pre-lacteal foods to their child [4-6]. Infants experience greater velocity of growth in height and this distinction provides the biological basis for establishing separately recommended intakes for this age group [1].

Infant and young child feeding practices/IYCF/ were affected by maternal malnutrition, family casualties, and free distribution of breast milk substitutes and it is below the acceptable level [7]. To improve IYCF, several interventions were implemented; including, training of health workers, educating mothers, community networking and mobilisation, lactation- support service, baby friendly hospital initiative, mother - baby friendly spaces and support groups [8].

Pre-lacteal feeds are foods other than human milk that are given to new-borns before breastfeeding initiation usually in the first few days of life. In this study, we opted to use the term pre-lacteal feeding in order to align with the working definitions of the Demographic and Health Surveys used in various countries such as plain water, butter, honey, goat's milk, cow's milk, boiled water, and clean water are the commonly predominant pre-lacteal foods usually given to new-borns [6,9-14].

The magnitude of pre-lacteal feeding was still highest in East Africa including Ethiopia [12,15]. In different parts of the Eastern Africa, wealth index, birth interval, delivery mode, place of delivery, ANC visit, and community ANC visit were the possible determinant factors for the prevalence of pre-lacteal feeding [15,16].

In Ethiopia, one in four mothers gave pre-lacteal foods for their children. Mothers who gave birth at home are more prone to give pre-lacteal foods [16].

Even though there are some studies on pre-lacteal feeding practice in some parts of Ethiopia, the level and predictors for pre-lacteal feeding practices are not well studied mainly in this study area.

Aim of the Study

This study aimed to assess the level and predictors of pre-lacteal feeding practices among mothers having children aged under five years in North Wollo Zone, Ethiopia. The findings of this study are essential to develop evidence-based specific nutritional intervention approaches for pre-lacteal feeding practices primarily in the study setting and also throughout the country with similar socioeconomic characteristics as a whole.

Methods

Study area and design

An institution-based cross-sectional study was conducted in the North Wollo zone from 01 November to 24 December 2020. The Zone is found in Amhara National Regional State and located about 521 km from the capital, Addis Ababa. There are 14 districts, 6 public hospitals, 68 health centers and 296 functional health posts in the zone.

Study population and data collection

Three hundred eighty-five children aged 6 - 59 months, from one hospital and nine health centers, were included in the study. Data were collected using a pre-tested, interviewer-administered structured questionnaire. The questionnaire was prepared first in English and translated into Amharic (the local and national language), then back to English to check for consistency. The Amharic version of the questionnaire was used to collect the data. Eleven MPH students who can speak the local language were recruited as data collectors.

Study variables

In this study, the outcome variable was pre-lacteal feeding practices among mothers of children aged less than 24 months. Pre-lacteal feeding was understood as providing foods and/or drinks other than human milk for the infant before the initiation of breastfeeding [2]. The independent variables were maternal characteristics (age, occupation, educational status, marital status, religion), household characteristics (family size, household head for decision making), paternal educational status, maternal health service and obstetric characteristics (antenatal (ANC) visit, place of delivery, postnatal (PNC) visit, mode of delivery), child characteristics (sex, age), child feeding practices (colostrum feeding, pre-lacteal feeding, breastfeeding initiation, ever breastfeeding) and child feeding advice at ANC and PNC follow up.

Data processing and analysis

Data were checked for completeness and inconsistencies. It was also cleaned, coded and entered into Epi Data version 3.02. Then, SPSS version 25 was used to analyze the data. Descriptive statistics were estimated for continuous variables while frequency distribution was used to express the distribution of categorical variables and to show the prevalence of pre-lacteal feeding. Binary logistic regression analysis was performed. The crude odds ratio (COR) with a 95% confidence interval was estimated to assess the association between each independent variables and pre-lacteal feeding. Variables with a p-value < 0.25 in the binary logistic regression analysis were considered in the multivariable logistic analysis. The Hosmer-Lemeshow goodness-of-fit with enter procedure was used to test for model fitness. Adjusted odds ratio (AOR) with a 95% confidence interval was estimated to assess the strength of the association. Variables with a p-value < 0.05 in the multivariable logistic regression analysis were considered statistically significant and independent predictors of pre-lacteal feeding.

Result

Socio-demographic characteristics of study participants

A total of 385 mothers having children aged under five years were included in this study with 100% response rate. The mean (± SD) age of study respondents was 29.220 (± 6.107) years. Majority of respondents were Amhara ethnic group (98.2%) and married (94.3%) (Table 1).

Variables	Category	Pre-lacteal feeding practice		Total n (%)
		No n (%)	Yes n (%)	
Maternal age	15 - 24	53 (13.8)	28 (7.3)	81 (21)
	25 - 34	165 (42.9)	54 (14)	219 (56.9)
	35 and above	69 (17.9)	16 (4.2)	85 (22.1)
	Mean (± SD)	29.220 (± 6.107)		
Ethnicity	Amhara	285 (74)	93 (24.2)	378 (98.2)
	Others*	2 (0.5)	5 (1.3)	7 (1.8)

Religion	Orthodox	173 (44.9)	63 (16.4)	236 (61.3)
	Others**	114 (29.6)	35 (9.1)	149 (38.7)
Marital status	Married	277 (71.9)	8622.3 ()	363 (94.3)
	Others***	10 (2.6)	12 (3.1)	22 (5.7)
Maternal education	Illiterate	88 (22.9)	45 (11.7)	133 (34.5)
	Read and write	22 (5.7)	9 (2.3)	31 (8.1)
	Primary	79 (20.5)	25 (6.5)	104 (27)
	Secondary and above	98 (25.5)	19 (4.9)	117 (30.4)
Maternal occupation	Housewife	179 (46.5)	74 (19.2)	253 (65.7)
	Others****	108 (26.1)	24 (6.2)	132 (34.3)
Paternal education	Illiterate	87 (22.6)	43 (11.2)	130 (33.8)
	Read and write	41 (10.6)	20 (5.2)	61 (15.8)
	Primary	40 (10.4)	12 (3.1)	52 (13.5)
	Secondary and above	119 (30.9)	23 (6)	142 (36.9)
Index child sex	Female	132 (34.3)	38 (9.9)	170 (44.2)
	Male	155 (40.3)	60 (15.6)	215 (55.8)
Family size	≤ 4	153 (39.7)	54 (14)	207 (53.8)
	> 4	143 (34.8)	44 (11.4)	178 (46.2)
	Mean (± SD)	4.56 (± 1.613)		
Household decision maker	Other*****	36 (9.4)	23 (6)	59 (15.3)
	Male	251 (65.2)	75 (19.5)	326 (84.7)
Media exposure	Yes	180 (46.8)	51 (13.2)	231 (60)
	No	107 (27.8)	4712.2)	154 (40)
*Tigray, Oromia, **Protestant, Muslim, ***Single, divorced, widowed, ****Governmental, NGOs, daily labour, *****Female, grandfather, grand mother				

Table 1: *Socio-demographic characteristics of mothers having children aged under five years in North Wollo Zone, Ethiopia, 2021, (n = 385).*

Maternal health care characteristics

Almost one-tenth, 39 (10.1%) of mothers were not attended antenatal care (ANC) follow-up. Of all study participants, home delivery for the index child was one fifth (20.8%) (Table 2).

Variables	Category	Pre-lacteal feeding		Total n (%)
		No n (%)	Yes n (%)	
Antenatal care follow up	No	21 (5.5)	18 (4.7)	39 (10.1)
	1-3	113 (29.4)	37 (9.6)	150 (39)
	≥4	153 (39.7)	43 (11.2)	196 (50.9)
Place of delivery	Home	44 (11.4)	36 (9.4)	80 (20.8)
	Health institution	243 (63.1)	62 (16.1)	305 (79.2)
Mode of delivery	Caesarean section	24 (6.2)	10 (2.6)	34 (8.8)
	Vaginal	263 (68.3)	88 (22.9)	351 (91.2)
Postnatal care	No	123 (31.9)	38 (9.9)	161 (41.8)
	Yes	164 (42.6)	60 (15.6)	224 (58.2)
Birth order	First	99 (25.5)	36 (9.4)	135 (35.1)
	Second	82 (21.3)	25 (6.5)	107 (27.8)
	Third and above	106 (27.5)	37 (9.6)	143 (37.1)
Maternal nutrition status	MUAC below 23 cm	113 (29.4)	34 (8.8)	147 (38.2)
	MUAC 23 cm and above	174 (45.2)	64 (16.6)	238 (61.8)

Table 2: *Maternal health-related characteristics among mothers having children aged under five years in North Wollo Zone, Ethiopia, 2021 (n = 385).*

Child health care characteristics

About 361 (93.8%) mothers with children aged under five years breast have fed their children still. Nearly one - fourth of them were practicing colostrum avoidance practice (Table 3).

Variables	Category	Pre-lacteal feeding		Total n (%)
		No n (%)	Yes n (%)	
Initiation of breast feeding	Early	181 (47)	43 (11.2)	224 (58.2)
	Late	106 (27.5)	55 (14.3)	161 (41.8)
Breast feeding this child	No	12 (3.1)	12 (3.1)	24 (6.2)
	Yes	276 (71.4)	86 (22.3)	361 (93.8)
Colostrum avoidance	No	254 (66)	58 (15.1)	312 (81)
	Yes	33 (8.6)	40 (10.4)	73 (19)
Main source of foods	Own production	133 (34.5)	61 (15.8)	194 (50.4)
	Purchase	147 (38.2)	37 (9.6)	184 (47.8)
	Food donation/aid	7 (1.8)	0 (0)	7 (1.8)

Table 3: *Child feeing related characteristics among mothers having children aged under five years in North Wollo Zone, Ethiopia, 2021 (n = 385).*

Predictor of pre-lacteal feeding practice

Variables such as birth order, mode of delivery, family size, and maternal nutritional status were not eligible for pre-lacteal feeding during the statistical testing process in binary logistic regression analysis. The variables like paternal education, place of delivery, antenatal care visit, decision making, breast feeding initiation, and index child sex were associated with the dependent variable in the bi-variable regression analysis but they failed to maintain their association with the dependent variable in the multivariable logistic regression analysis. The multivariable analysis identified maternal education, media exposure, young maternal age and colostrum avoidance associated factors for pre-lacteal feeding (Table 4).

Variables/Category	Pre-lacteal feeding		COR (95% CI)	AOR (95% CI)
	No	Yes		
Paternal education				
Illiterate	87 (22.6)	43 (11.2)	2.557 (1.436-4.553)	1.029 (0.430-2.464)
Read and write	41 (10.6)	20 (5.2)	2.524 (1.258-5.065)	1.257 (0.487-3.244)
Primary	40 (10.4)	12 (3.1)	1.552 (0.708-3.401)	1.212 (0.463-3.176)
Secondary and above	119 (30.9)	23 (6)	1	1
Maternal education				
Illiterate	88 (22.9)	45 (11.7)	2.638 (1.435-4.847)	2.449 (1.001-5.988)***
Read and write	22 (5.7)	9 (2.3)	2.110 (0.843-5.284)	1.304 (0.387-4.397)
Primary	79 (20.5)	25 (6.5)	1.632 (0.839-1.177)	1.379 (0.603-3.155)
Secondary and above	98 (25.5)	19 (4.9)	1	1
Household decision maker				

Others****	36 (9.4)	23 (6)	1	1
Paternal	251 (65.2)	75 (19.5)	2.138 (1.193-3.831)	0.741 (0.359-1.530)
Index child sex				
Female	132 (34.3)	38 (9.9)	1	1
Male	155 (40.3)	60 (15.6)	1.345 (0.842-2.147)	0.961 (0.565-1.633)
Media exposure				
No	180 (46.8)	51 (13.2)	1.550 (0.976-2.463)	2.030 (1.182-3.485)***
Yes	107 (27.8)	4712.2)	1	1
Maternal age				
15 - 24	53 (13.8)	28 (7.3)	2.78 (1.119-4.638)	3.413 (1.489-7.819)**
25 - 34	165 (42.9)	54 (14)	1.411 (0.756-2.636)	2.532 (1.203-5.329)***
35 and above	69 (17.9)	16 (4.2)	1	1
Antenatal care visit				
No	21 (5.5)	18 (4.7)	3.050 (1.492-6.233)	1.098 (0.431-2.796)
1 - 3	113 (29.4)	37 (9.6)	1.165 (0.705-1.295)	1.084 (0.611-1.923)
≥ 4	153 (39.7)	43 (11.2)	1	1
Place of delivery				
Home	44 (11.4)	36 (9.4)	3.027 (1.904-5.401)	1.830 (0.906-3.698)
Health institution	243 (63.1)	62 (16.1)	1	1
Breast feeding initiation				
Early	181 (47)	43 (11.2)	2.184 (1.371-3.479)	1.612 (0.911-1.852))
Late	106 (27.5)	55 (14.3)	1	1
Colostrum avoidance				
No	254 (66)	58 (15.1)	1	1
Yes	33 (8.6)	40 (10.4)	5.308 (3.087-9.128)	3.280 (1.660-6.482)*
*P-value < 0.001, **P-value < 0.005, ***P < 0.05 ****Female, grandfather/mother				

Table 4: *Predictors of pre-lacteal feeding among mothers having children aged under five years in North Wollo Zone, Ethiopia, 2021 (n = 385).*

Discussion

This study was conducted to determine the level of pre-lacteal feeding and its predictors among lactating mothers in North Wollo Zone, Amhara region, Ethiopia.

In this study the overall pre-lacteal feeding practice was 25.5 % (95% CI: 21% - 30%). This finding is almost similar with studies revealed from Eastern Africa, Ethiopia demographic health survey 28.92% [13], Ethiopia meta-analysis 25.29% [16], pooled prevalence of Ethiopia 26,95% [17], Dabat district 26.8% [18], Hawela Tual Hawassa city catchment 25.5% [19], Rural eastern zone of Tigray 24.7% [20], Motta district 20.3 % [14], Sodo Zuria district 20.5% [21], Debre Tabor 20.2% [22], Debre Berhan 14.5%[23], Miza Aman town 21.9 % [24], and outside Ethiopian such as Southwest Nigeria 26.5% [11], and Port Harcourt Tertiary Hospital in Nigeria 29.5% [25], Bangladish 24.7% [26], and India 26% [27].

This study finding was higher than the previous studies from different parts of Ethiopia such as some parts of this study area 11.1 % [9], Jinka town 12.6% [28], Bure district 14.2% [29], Mettu district 14.2% [5], Gozamen district 17.1% [4], North Gonder zone 19.1% [30]. Studies conducted in African countries such as: Eastern Africa 12% [15], had lower pre-lacteal feeding as compared to this finding.

On the other hand this study was lower than other study revealed from Eastern Ethiopia 39% [15], from Ethiopia such as Raya kobo district 38.8% [6], Hareri 45.5% [31], Afar pastoralist community 75.5% [32], and also outside Ethiopian country with the example of Sub-Saharan Africa 32.2% [12], South Sudan 53% [33], Egypt 58% [34], Vietnam 56.5% [35], Karnataka 32.03% [36]. The possible explanation for this observed discrepancy might be the fact that the study population, socio-demographic characteristics, socio-cultural characteristics, study design, study period, and different study settings.

According to this study, maternal illiteracy, colostrum avoidance, young maternal age, and media exposure are predictor variables of for pre-lacteal feeding.

In this study regarding factors associated with pre-lacteal feeding, mothers who were not educated were 2.449 times more likely for pre-lacteal feeding practice as compared to their counterparts. This is consistent with studies revealed in North Gonder zone [30], Debre Berhan [23], Afar region [32], Jinka town [28], Egypt [34], Karnataka [36]. It might be due to the fact that due to lack of knowledge [6,15,16,18,19,28].

Mothers who avoid colostrum have 3.280 times more likely to practice pre-lacteal feeding practice as compared to those who had not avoided. This finding was consistently supported with studies revealed from South Sudan [33], Eastern Africa [15], North Gonder zone [30], Gozamen district [4], Motta district [14], Mettu district [5], rural eastern Tigray [20] and Sodo zuria district [21]. This finding was consistent with studies revealed from previous study of this area [6,9]. This might be due to the fact that lack of receiving antenatal care counseling about optimal breastfeeding practice [4,6,9,11,13-15,20-22,27,30,31,33,34,37], late initiation of breast feeding [4,6,9,11,16,20,28,31], friends influence [31] and home delivery [5,6,16-18,22,24,32].

Those mother who had media exposure about optimal feeding practice have protective effect on pre-lacteal feeding practices. This is consistent with study revealed from Bahirdar city [38] indicated that giving emphasis through mass media for optimal feeding practices is better.

Limitations of the Study

One of the limitations was recall bias. The second one is the lack of qualitative data supplementations and it also shares limitations of cross-sectional study design.

Conclusion

This study revealed that 25.5% of mothers having children aged under five years practice pre-lacteal feeding in North Wollo Zone. Factors that tend to increase pre-lacteal feeding in North Wollo Zone include maternal illiteracy, colostrum avoidance, young maternal age and media exposure. Therefore, it is recommended to polish policies for promoting maternal literacy at young age through different media for stopping colostrum avoidance, and pre-lacteal feeding. Finally, the scientific community should study with a prospective cohort study design including with supplementation of qualitative data to identify other potential independent predictors.

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Availability of Data and Materials

The data sets analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' Contributions

MLL had conceived and designed the study. All the Authors (MLL, NBY, and FWF) performed the statistical analysis, involved in the interpretation of findings, and manuscript preparation. Finally, all the authors read and approved this manuscript.

Ethical Approval

The study was approved by the Institutional Review Board (IRB) of Woldia University (Reference number: WDU/IRB/005/20; dated: 12 April 2020). The participants enrolled in the study were informed about the study objectives, expected outcomes, benefits and the risks associated with it. Consent was taken from the participants before the interview and measurement. Confidentiality of responses was maintained throughout the study.

Consent for Publication

Not applicable.

Competing Interests

All authors declared that they have no competing interests.

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