Omute and Kirungi
Bulletin of the National Research Centre (2022) 46:124
https://doi.org/10.1186/s42269-022-00810-3

Bulletin of the National Research Centre

RESEARCH Open Access

Breast-feeding practices and maternal employment in health facilities of Lira District, Northern Uganda

Tom Omute[1,2*] and Gloria Kirungi[1]

Abstract

Background: In Uganda, many working mothers stop breast-feeding before the end of the mandatory maternity leave of 60 days. Inadequate breast-feeding is a risk factor for infant morbidity and mortality. Thus, understanding of the factors that influence breast-feeding is essential so as to advocate for the appropriate breast-feeding practices. This cross-sectional study assessed the pre-lacteal feeding (PLF), early initiation of breast-feeding (EIBF) and exclusive breast-feeding (EBF) and the associated factors for PLF, EIBF and EBF among working mothers in health facilities in Lira District, Northern Uganda.

Results: Among 376 mothers who participated, the prevalence of PLF, EIBF and EBF was 23.2%, 67.0% and 43.9%, respectively. Mode of delivery was significantly associated with PLF (AOR = 0.39, 95% CI 0.22–0.68, $p < 0.01$), while mode of delivery (AOR = 3.77, 95% CI 2.19–6.47, $p < 0.01$), length of daily working time (AOR = 0.49, 95% CI 0.29–0.82, $p < 0.01$) and paid maternity leave (AOR = 0.45, 95% CI 0.22–0.95, $p < 0.05$) were the statistically significant factors associated with EIBF. Age-group, income level, mode of delivery (AOR = 0.26, 95% CI 0.09–0.74, $p < 0.05$), distance to workplace (AOR = 0.45, 95% CI 0.26–0.78, $p < 0.01$), paid maternity leave (AOR = 0.45, 95% CI 0.22–0.95, $p < 0.01$), breast-feeding space (AOR = 0.30, 95% CI 0.16–0.59, $p < 0.05$) and breast-feeding break (AOR = 0.84, 95% CI 0.47–1.50, $p < 0.01$) were the significant factors associated with EBF.

Conclusions: Exclusive breast-feeding and pre-lacteal feeding among working mothers in health facilities in Lira District are lower than the national averages, but prevalence of early initiation of breast-feeding is higher than the national average.

Keywords: Exclusive breast-feeding, Maternal employment, Pre-lacteal feeding, Lango subregion, Uganda

Background

Breast-feeding practices are activities that mothers undertake to feed their infants. Pre-lacteal feeding (PLF), early initiation of breast-feeding (EIBF) and exclusive breast-feeding (EBF) are some of the common breast-feeding practices (WHO 2018). PLF, practiced to varying degrees across the globe, is the act of giving fluid or semi-solid foods to an infant before initiation of breast-feeding during the first 3 days after birth (Talbert et al. 2018). On the other hand, EIBF is the initiation of breast-feeding within 1 hour of birth (UNICEF 2018). The WHO expounds EBF as a breast-feeding practice wherein the infant in the first 6 months receive only breast milk and no other liquids or solids (not even water), with the exception of oral rehydration solution, syrups, minerals or medicines (WHO 2018).

Inadequate breast-feeding is a risk factor for infant morbidity and mortality. However, it is challenging for employed mothers to practice EBF (Tadesse et al. 2019). In Uganda, many working mothers stop breast-feeding before the end of the mandatory maternity leave of

*Correspondence: omutetom123@gmail.com; tomute@lirauni.ac.ug
[1] Department of Public Health, Faculty of Health Sciences, Uganda Christian University, P.O. Box 4, Mukono, Uganda
Full list of author information is available at the end of the article

60 days. The Ugandan government and other stakeholders have strived to improve EBF (Clara 2018), but breast-feeding practices in the war-torn Lango subregion where Lira District is located have remained suboptimal (Napyo et al. 2020; UBOS 2018). The aim of this study was therefore to assess breast-feeding practices (PLF, EIBF and EBF) and the associated factors among working mothers in some health facilities of Lira District, Northern Uganda.

Methods

This study is reported following STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines (Additional file 1: Table S1).

Study area and participants

This study was conducted in Lira District (2°14′59.6"N 32°53′59.5"E) in Lango subregion of Northern Uganda. It is approximately 342 km North of Kampala (Uganda's capital) by road. All other districts in the subregion were carved out of Lira which was originally Lango District. The district share frontiers with Agago and Pader districts to the North, Otuke and Alebtong to the East, Dokolo to the South, Apac and Kwania to the Southwest, and Kole and Oyam to the West. The total population of the district is 408,043, out of which 211,380 (51.8%) are females and 196,663 (48.2%) are males (UBOS 2017). Most women in formal employment in Lira are employed in educational institutions, health facilities and commercial institutions.

Study design and study population

This study was a cross-sectional study which targeted working mothers in 36 health facilities across Lira District. Mothers with infants less than 6 months of age and were living and working in health facilities in the district for over 2 years were the source population.

Inclusion and exclusion criteria

The study included mothers of 18 years and above who have been resident in Lira District for the last 2 years, are formally employed in government or private health facilities, have a biological child below 6 months old, are fluent in English language and were willing to participate in the study. Non-biological, seriously ill mothers (with medical reasons for not breast-feeding), non-consenting mothers and mothers unable to communicate due to hearing loss were excluded from the study.

Sample size determination and sampling procedure

Single population proportion formula ($n = z^2\, p\, (1-p)/e^2$) was used (Kasiulevičius et al. 2006). Using the prevalence of EBF (p) in Uganda = 65.5%, 95% confidence interval (z), 5% marginal error (e) and accounting for 10% non-response rate (Napyo et al. 2020), the sample size was found to be 382.

Based on the proportion of government (52%) versus private (48%) facilities, 19 government and 17 private facilities (out of 48 health facilities) were chosen (Additional file 2: Table S2). Participants were selected by simple random sampling. (199 and 183 participants were selected from government and private health facilities, respectively.)

Operational definitions

Breast-feeding

Feeding of an infant or young child with breast milk either directly from human breasts by suckling or by expressed breast milk.

Early initiation of breast-feeding

Initiating breast-feeding within the first hour of birth.

Pre-lacteal feeding

Cultural practice of giving a newly born child any fluid or semisolid food such as water, black tea, honey, sugar solution, herbal paste, and so forth, before initiating breast-feeding, usually lasting for the first 3 days after delivery.

Exclusive breast-feeding

Mother breast-fed and no other liquids or solids were given, to the child aged less than 6 months in the 24 h prior to the survey, with the exception of oral rehydration solution, supplements or medicines (Adugna et al. 2017).

Continued breast-feeding

The feeding process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk.

Working mother

Mother who is formally employed either by government or by non-government organization on full-time or part-time basis, where the employer has the power or right to control and direct the working mother on how the work is to be performed.

Partial breast-feeding

Giving a baby some breast-feeds, and some artificial feeds, either milk or cereal, or other food (Adugna et al. 2017).

Seriously ill mothers

Working mothers who are either unconscious, unable to give the required information for this study or have medical reasons for not breast-feeding.

Conceptual framework and study measurement of variables

Breast-feeding practices are a product of several factors which influence a woman's decision to breast-feed or not. The relationship between these factors and how they influence breast-feeding practices is shown in the Conceptual Framework used in this study (Fig. 1).

The dependent variables in this study were the breast-feeding practices, which were measured in terms of giving of pre-lacteal feeds, early initiation of breast-feeding (within 1 hour postpartum) and exclusive breast-feeding for 6 months. These breast-feeding practices are influenced by socio-demographic, work-related as well as obstetric factors which contribute to a woman's decision to breast-feed. The independent variables were the predictors of breast-feeding practices. These were measured in terms of socio-demographic, work-related and obstetric factors which influence breast-feeding practices. Socio-demographic factors such as mother's age, level of education, marital status, number of children and income level are believed to influence a mother's decision to breast-feed or not. Work-related factors such as type of employer, length of daily working time, provision of paid maternity leave, workplace breast-feeding policies such as provision of breast-feeding breaks and space for breast-feeding influence the breast-feeding practices of the working mothers. Furthermore, obstetric factors such as number of antenatal visits, receiving breast-feeding counselling, place and type of delivery influence the breast-feeding practices adopted by working mothers.

Knowledge and attitude of mothers regarding breast-feeding are the mediating variables in this study. They strengthen or weaken the influence of the predictors of breast-feeding (socio-demographic, work-related and obstetric factors) on breast-feeding practices. Good knowledge about breast-feeding and a positive attitude of mothers improve the likelihood of them adopting good breast-feeding practices and vice versa.

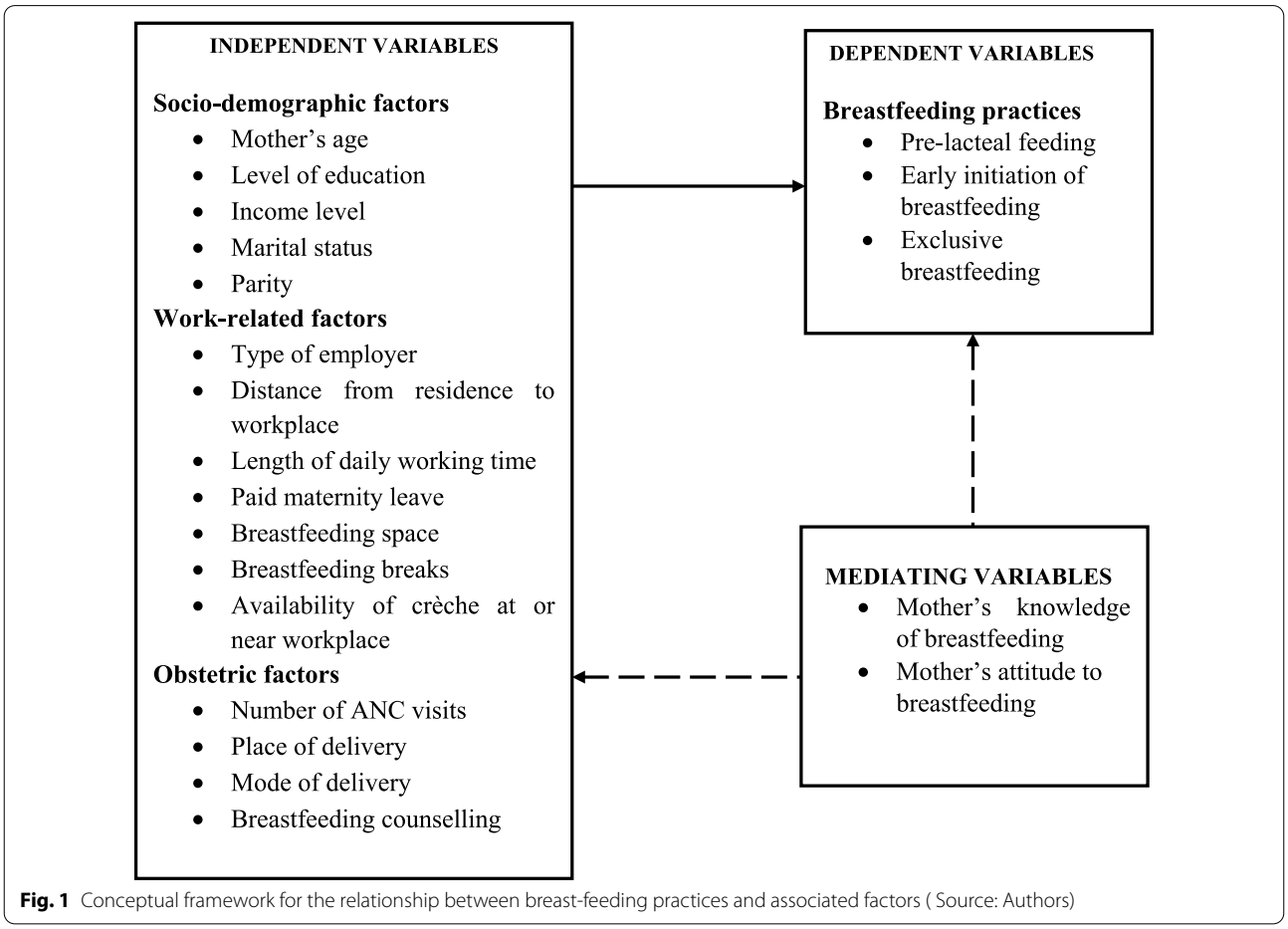

Fig. 1 Conceptual framework for the relationship between breast-feeding practices and associated factors (Source: Authors)

Data collection

Data were collected by trained research assistants using a pretested interviewer-administered questionnaire in English. The questions were constructed based on previous studies (Napyo et al. 2020). The questionnaire had socio-demographic variables and breast-feeding practices: PLF, EIBF and EBF.

Data analysis

Data were manually checked, coded and entered in Stata 15 (StataCorp, College Station, Texas, USA). Descriptive statistics were then used to summarize the data (Napyo et al. 2020). Association between socio-demographic characteristics, work-related and obstetric factors was investigated using chi-square test. Variables that were significantly associated were considered for multivariate logistic regression (at $p < 0.05$) to determine the potential predictors of breast-feeding practices.

Results

By the end of the study, a response rate of 98.43% by the participants was realized.

Socio-demographic characteristics of participants

The majority of the respondents (72.87%) were married and within 18–30 years of age (Table 1). Most participants (40.96%) had diploma, with monthly earnings between Uganda shillings (UgX) 1 to 500,000 (41.49%). Most respondents had two children or more (67.82%).

Breast-feeding practices among working mothers

PLF was practiced by 23.2% of the respondents using sugar/glucose solution, warm water, animal milk, honey syrup, black tea and passion juice (Table 2). On the other hand, EIBF was practiced by 67.0% of the mothers, while EBF was practiced by 43.9% of the respondents.

Factors associated with breast-feeding practices

Socio-demographic factors

Only age-group and income level were found to be statistically significant factors associated with breast-feeding practices in Lira health facilities (Tables 3, 4, 5, 6). Age-group of 31–40 (AOR = 2.22, CI = 1.28–3.85) or 41 and above (AOR = 6.93, CI = 1.76 –27.2) had very high odds and were more likely to practice EBF compared to the 18–30 group (Table 4). For income level, there were reduced odds of EBF among working mothers with increasing income level. Working mothers who earned between UgX 1,000,001 and 1,500,000 were less likely

Table 1 Socio-demographic and household characteristics of study participants (N = 376)

Variable	Frequency	Percentage
Age (years)		
18–30	244	64.89
31–40	120	31.91
41 and above	12	3.19
Marital status		
Married	274	72.87
Single	80	21.28
Separated	13	3.46
Widowed	9	2.39
Monthly income (UgX)		
1–500,000	156	41.49
501,000–1,000,000	135	35.9
1,000,001–1,500,000	48	12.77
1,500,001 and above	37	9.84
Level of education		
Certificate	145	38.56
Diploma	154	40.96
Bachelor's degree	71	18.88
Master's degree	6	1.6
Number of children ever given birth to		
Less than 2	121	32.18
Two and above	255	67.82

Table 2 Prevalence of breast-feeding practices among health working mothers in Lira District (N = 376)

Variable	Frequency	Percentage
Pre-lacteal feeding		
Yes	87	23.2
No	288	76.8
Type of fluid or food given		
Sugar/glucose	37	43.02
Warm water	15	17.44
Tea	7	8.14
Passion juice	4	4.65
Honey syrup	11	12.79
Animal milk	12	13.95
Time of initiation of breast-feeding		
Within an hour after birth	252	67.02
Between 1 and 24 h	107	28.46
After 24 h	17	4.52
Time of introduction of other food		
Before 6 months	214	56.91
From 6 months	162	43.09
Frequency of breast-feeding		
< 10 times a day	173	46.01
> 10 times a day	203	53.99

Table 3 Bivariate analysis of factors associated with pre-lacteal feeding

Evaluated factor	No	Yes	Total	χ^2	p value
Age (years)	n (%)	n (%)			
18–30	183 (75.08)	60 (24.92)	243		
31–40	97 (80.83)	23 (19.17)	120	1.417	0.492
41+	9 (75.00)	3 (25.00)	12		
Marital status					
Married	212 (77.66)	61 (22.44)	273		
Single	60 (75.00)	20 (25.00)	80	0.249	0.969
Separated	10 (76.92)	3 (23.08)	12		
Widow	7 (77.78)	2 (22.22)			
Level of education					
Certificate	110 (70.51)	46 (29.49)	256		
Diploma	127 (82.47)	27 (17.53)	154	11.42	0.010*
Bachelor's degree	57 (81.43)	13 (18.57)	70		
Master's degree	6 (100.00)	0 (0.00)	6		
Income level (UgX)					
1–500,000	109 (69.87)	67 (30.13)	176		
500,001–1,000,000	104 (77.61)	30 (22.39)	134	12.238	0.007*
1,000,001–1,500,000	44 (91.70)	4 (8.30)	48		
1,500,000+	32 (86.49)	5 (13.51)	37		
Number of children					
< 2 children	84 (70.00)	36 (30.00)	120	4.579	0.032*
> = 2 children	204 (80.00)	51 (20.00)	255		
ANC attendance					
< 4times	8 (66.67)	4 (33.33)	12		
4 times and above	281 (77.41)	18 (22.59)	299	0.759	0.384
Place of delivery					
Health facility	256 (75.51)	83 (24.49)	339	4.803	0.028*
Home	33 (91.67)	3 (8.33)	36		
Mode of delivery					
Caesarian	61 (63.54)	35 (36.46)	96	12.73	0.000*
Normal	227 (81.36)	52 (18.64)	279		
Ever received breast-feeding counseling					
Yes	242 (79.08)	64 (21.92)	306	4.873	0.027*
No	46 (66.67)	23 (33.33)	69		
Type of employer					
Government	163 (84.46)	30 (15.54)	193	13.082	0.000*
Private	125 (68.68)	57 (31.32)	182		
Working hours					
Up to 8 h	180 (80.36)	44 (19.64)	224	3.025	0.082
Above 8 h	109 (72.67)	41 (27.33)	150		
Distance to workplace					
Less than 2 kms	96 (76.80)	29 (23.20)	125		
2–5 kms	111 (73.51)	40 (26.49)	151	2.945	0.229
More than 5kms	82 (82.83)	17 (17.17)	99		
Have paid maternity leave					
Yes	255 (79.19)	67 (20.81)	322	5.826	0.016*
No	34 (64.15)	19 (35.85)	53		
Provision of breast-feeding space					
Yes	56 (64.37)	21 (35.63)	77	1.032	0.31

Table 3 (continued)

Evaluated factor	No	Yes	Total	χ^2	p value
No	233 (78.19)	65 (21.81)	298		
Breast-feeding break					
Yes	75 (68.8)	34 (31.20)	109	5.509	0.019*
No	213 (80.08)	53 (19.92)	266		
Knowledge					
Good	283 (77.11)	84(22.89)	367	0.019	0.888
Poor	6 (75.00)	2(25.00)	8		
Attitude					
Positive	267 (77.17)	79(22.83)	346	0.029	0.865
Negative	22 (78.57)	6(21.43)	28		

*Significant at $p < 0.05$

(AOR = 0.42, 95% CI 0.16–1.17) to practice EBF than their counterparts earning UgX 1–500,000.

Obstetric factors

Normal delivery was a statistically significant factor associated with PLF (AOR = 0.39, 95% CI 0.22–0.68), EIBF (AOR = 3.77, 95% CI 2.19–6.47) and EBF (AOR = 0.26, 95% CI 0.09–0.74) (Tables 3, 4, 5). Mothers who had normal delivery were less likely to practice PLF and EBF but were more likely to practice EIBF compared to those who delivered by caesarean section.

Work-related factors

Length of daily working time, distance to workplace, paid maternity leave, breast-feeding space and daily breast-feeding break were statistically significant at multivariate analysis. Mothers who worked for more than 8 h (AOR = 0.49, 95% CI 0.29–0.82) were 0.49 times less likely to initiate breast-feeding early as compared to those who worked for less than 8 h. This implies that working for longer hours is a big hindrance to EIBF (Tables 4, 5). With respect to distance to workplace, mothers who traveled 2–5 km to their workplaces (AOR = 0.45, 95% CI 0.26–0.78) were found to be 0.45 times less likely to practice EBF compared to their counterparts who traveled less than 2 km (Tables 4, 6). Mothers who did not get paid maternity leave (AOR = 0.45, 95% CI 0.22–0.95) were less likely to practice EIBF but EBF. Mothers who reported lack of breast-feeding space (AOR = 0.30, 95% CI 0.16–0.59) and no breast-feeding break at workplace (AOR = 0.84, 95% CI 0.47–1.50) had significantly lower odds of EBF.

Discussion

Among the 376 mothers who participated in the study, the prevalence of PLF, EIBF and EBF was 23.2%, 67.0% and 43.9%, respectively. Mode of delivery was significantly associated with PLF, while mode of delivery, length of daily working time and paid maternity leave were the statistically significant factors associated with EIBF. Age-group, income level, mode of delivery, distance to workplace, paid maternity leave, breast-feeding space and breast-feeding break were the significant factors associated with EBF.

The majority of the respondents in this study were married, within 18–30 years of age, holding diploma and earnings between Uganda shillings (UgX) 1 and 500,000 per month. Most respondents had two children and above (67.82%) which indicates that the majority of women employed in the health facilities in Lira are still in reproductive age. These statistics agree with previous reports in Lira District (Mukunya et al. 2019; Napyo et al. 2020).

PLF was practiced by 23.2% of the respondents using sugar/glucose solution, warm water, animal milk, honey syrup, black tea and passion juice. This corroborates a previous report in Lira District (Mukunya et al. 2017). This prevalence rate is higher than 12.7% previously reported for HIV-exposed infants in Lira (Napyo et al. 2020) but lower than 25.1% for Lango subregion, the national average of 26.6% (UBOS 2018) and 32.2% for some countries in the Sub-Sahara (Berde & Ozcebe 2017). This could be due to good knowledge and awareness of the dangers of PLF by the respondents, who are health workers. PLF is not a good practice and has been shown to delay the initiation of breast-feeding, interferes with EBF and increases the risk of illness, stunting, hospitalization and mortality in newborns (Chea & Asefa 2018; Mengistu et al. 2013; Nguyen et al. 2020). It is also important that cultural beliefs also influence infant breast-feeding practices, especially PLF (Abie & Goshu 2019), for example, believing that giving babies honey protect them against false teeth and colic pain (Mukunya et al. 2019).

Table 4 Multivariate analysis of factors associated with breast-feeding practices

Variables	Pre-lacteal feeding		Early Initiation of breast-feeding		Exclusive breast-feeding	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Age (years)						
18–30					1.00	
31–40					2.22	(1.28–3.85)**
41 +					6.93	(1.76–27.2)**
Marital status						
Married			1.00			
Single			0.59	(0.32–1.11)		
Separated			0.38	(0.08–1.75)		
Widow			0.22	(0.05–1.04)		
Level of education						
Certificate	1.00		1.00		1.00	(0.43–1.84)
Diploma	0.57	(0.26–1.24)	0.96	(0.46–2.10)	0.89	(0.25–1.49)
Bachelor's degree	0.60	(0.22–1.62)	1.24	(0.49–3.11)	0.61	(0.22–11.8)
Master's degree	-	-	-	-	1.61	
Income level (UgX)						
1–500,000	1.00		1.00		1.00	
500,001–1,000,000	1.65	(0.75–3.63)	0.94	(0.45–1.98)	0.61	(0.29–1.27)
1,000,001–1,500,000	0.64	(0.17–2.34)	1.77	(0.59–5.31)	0.42	(0.16–1.17)*
1,500,000 +	1.05	(0.27–4.10)	2.25	(0.64–7.99)	0.26	(0.08–0.85)
Number of children						
< 2 children	1.00		1.00			
> = 2 children	0.66	(0.38–1.15)	1.26	(0.72–2.21)		
ANC						
< 4times			1.00			
4 times and above			2.69	(0.69–10.4)		
Place of delivery						
Health facility	1.00		1.00			
Home	0.43	(0.20–1.53)	2.85	(0.93–8.72)		
Mode of delivery						
Caesarian	1.00		1.00		1.00	
Normal	0.39	(0.22–0.68)**	3.77	(2.19–6.47)**	0.26	(0.09–0.74)*
Ever received breast-feeding counseling						
Yes	1.00		1.00		1.00	
No	1.76	(0.94–3.31)	0.72	(0.39–1.33)	1.05	(0.57–1.76)
Type of employer						
Government	1.00		1.00		1.00	
Private	1.80	(0.94–3.46)	1.25	(0.67–2.34)	0.98	(0.54–1.76)
Working hours						
Up to 8 h	1.00		1.00			
Above 8 h	1.26	(0.71–2.19)	0.49	(0.29–0.82)**		
Distance to workplace						
Less than 2 kms					1.00	
2–5 kms					0.45	(0.26–0.78)**
More than 5 kms					0.34	(0.33–1.22)
Have paid maternity leave						
Yes			1.00		1.00	
No			0.45	(0.22–0.95)*	2.36	(1.10–5.03)**

Table 4 (continued)

Variables	Pre-lacteal feeding		Early Initiation of breast-feeding		Exclusive breast-feeding	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Provision of breast-feeding space						
Yes	1.00		1.00		1.00	
No	1.50	(0.74–3.03)	1.17	(0.60–2.28)	0.30	(0.16–0.59)*
Breast-feeding break						
Yes	1.00		1.00		1.00	
No	0.56	(0.30–1.04)	1.73	(0.95–3.15)	0.84	(0.47–1.50)**
Attitude						
Positive			7.09	(2.64–19.1)**		
Good			1.00			

** $p < 0.01$, * $p < 0.05$, 1.0 = reference category, *AOR* adjusted odds ratio, *CI* confidence interval

On the other hand, EIBF was practiced by 67.02% of the mothers, which is higher than that of Lango subregion (44.8%), the national average (66.1%) (UBOS 2018) but lower than 76.8%, 78.8% and 73.1% previously reported in Ethiopia (Abie & Goshu 2019; Bimerew et al. 2016; Tewabe 2016). This is a good indicator of optimal infant and young child feeding among working mothers in Lira District. A meta-analysis report for Sub-Saharan countries showed that EIBF prevalence varied from 37.84% in Central Africa to 69.31% in Southern Africa, while Eastern Africa stood at 61.82% (Issaka et al. 2017). WHO report (WHO 2017a) indicated that the global prevalence of EIBF is 49%, with the highest in Italy (94%) and lowest in Saudi Arabia (23%). The high prevalence of EIBF in this study could be attributed to the better understanding of the recommended breast-feeding practices among working mothers who were health workers and had positive attitude toward breast-feeding. Further, most participants were young mothers. Previous studies indicate that elder mothers are less likely to practice EIBF (Abie & Goshu 2019). These attributes could be exploited by the healthcare system to further improve EIBF among breast-feeding mothers outside formal employment in Lira and beyond. EIBF confers various benefits, including increased immunity, reduced risk of diarrhea and decreased infant mortality (Abie & Goshu 2019; Lawrence & Lawrence 2016; Mugadza et al. 2018; UNICEF 2018; WHO 2017b).

EBF was practiced by 43.09% of the respondents, indicating that its prevalence among the working mothers is higher than previously reported for HIV-exposed infants in the district (42.9%) (Napyo et al. 2020) but lower than the national average of 66% (UBOS 2018) and the global target of 70% (UNICEF 2018). This is a likely contributor to under-feeding of infants and young children which may result into higher child morbidity and mortality. Chhetri et al. (Chhetri et al. 2018) reported EBF prevalence of 17.5% among working mothers in Udupi taluk of India. Another study (Tadesse et al. 2019) in Ethiopia reported EBF prevalence of 24.8% among mothers. These findings are corroborated by the present study.

This study revealed that only age-group and income level were statistically significant factors associated with breast-feeding practices in Lira health facilities. Specifically, the age-group of 31–40 or 41 and above had high odds and were more likely to practice EBF compared to the 18–30 group. This implies that older mothers are more likely to practice EBF than the younger ones, which corroborates previous reports in Uganda (UBOS 2018), Malawi and Zimbabwe (Chipojola et al. 2020) and Bangladesh (Agho et al. 2021). For income level, reduced odds of EBF were evident among working mothers with increasing income level. Working mothers who earned more money were less likely to practice EBF probably because of the ability of high-income earners to easily afford breast milk substitutes. This agrees with a previous report in Uganda (UBOS 2018) and Ghana (Mensah et al. 2017).

For obstetric factors, normal delivery was significantly associated with PLF (AOR = 0.39, 95% CI 0.22–0.68), EIBF (AOR = 3.77, 95% CI 2.19–6.47) and EBF (AOR = 0.26, 95% CI 0.09–0.74). Mothers who delivered normally tended to not practice PLF and EBF but were more likely to practice EIBF compared to those who delivered by caesarean section. This report is congruent with a report from Turkey (Yılmaz et al. 2017) but contrary to a report from Ethiopia (Adugna et al. 2017).

For work-related factors, the length of daily working time, distance to workplace, paid maternity leave, breast-feeding space and daily breast-feeding break were statistically significant at multivariate analysis. Mothers who worked for more than 8 h were less likely to

Table 5 Bivariate analysis of factors associated with early initiation of breast-feeding

Evaluated factor	No	Yes	Total	χ^2	p value
Age (years)	n (%)	n (%)			
18–30	158 (64.75)	86 (35.25)	244		
31–40	87 (72.5)	33 (27.5)	120	2.61	0.272
41 +	7 (58.33)	5 (41.67)	12		
Marital status					
Married	193 (70.44)	81 (29.56)	274		
Single	47 (58.75)	33 (41.25)	80	6.18	0.103
Separated	8 (61.54)	5 (38.46)	13		
Widow	4 (44.44)	5 (55.56)	9		
Level of education					
Certificate	86 (59.31)	59 (40.69)	145		
Diploma	108 (70.13)	46 (29.87)	154	8.77	0.03*
Bachelor's	52 (73.24)	19 (26.76)	71		
Master's	6 (100)	0 (0.00)	6		
Income level (UgX)					
1–500,000	91 (58.33)	65 (41.67)	156		
500,001–1,000,000	90 (66.67)	45 (33.33)	135	15.82	0.001*
1,000,001–1,500,000	40 (83.33)	8 (16.67)	48		
1,500,000 +	31 (83.79)	6 (16.21)	37		
Number of children					
< 2 children	74 (61.16)	47 (38.84)	121	2.78	0.096
≥ 2 children	178 (69.80)	77 (30.20)	255		
ANC visits					
< 4times	5 (41.67)	7 (58.33)	12		
4 times and above	247 (67.87)	117 (32.14)	364	3.61	0.058
Place of delivery					
Health facility	221 (65)	119 (35)	340	6.56	0.010*
Home	31 (86.11)	5 (13.89)	36		
Mode of delivery					
Caesarian	43 (44.79)	53 (55.21)	96	28.82	0.000*
Normal	209 (74.64)	71 (25.36)	280		
Ever received breast-feeding counseling					
Yes	211 (68.95)	95 (31.05)	306	2.78	0.096
No	40 (57.14)	30 (42.86)	70		
Type of employer					
Government	142 (73.20)	52 (26.80)	194	6.91	0.009*
Private	110 (60.44)	72 (39.56)	182		
Working hours					
Up to 8 h	164 (72.89)	61 (27.11)	225	8.26	0.004*
Above 8 h	88 (58.67)	62 (41.33)	150		
Distance to workplace					
Less than 2 kms	92 (73.06)	34 (26.94)	126		
2–5 kms	98 (64.90)	53 (35.10)	151	3.22	0.200
More than 5 kms	62 (63.63)	37 (37.37)	99		
Have paid maternity leave					
Yes	227 (70.28)	96 (29.72)	323	11.00	0.001*
No	25 (47.17)	28 (52.83)	53		
Provision of breast-feeding space					
Yes	43 (55.84)	34 (44.16)	87	5.47	0.019*

Table 5 (continued)

Evaluated factor	No	Yes	Total	χ^2	p value
No	209 (69.90)	90 (30.10)	299		
Breast-feeding break					
Yes	62 (56.36)	48 (43.64)	110	7.99	0.005*
No	190 (71.43)	76 (28.57)	266		
Knowledge					
Good	247 (67.12)	121 (32.88)	368	0.076	0.783
Poor	5 (62.5)	3 (37.5)	8		
Attitude					
Positive	245 (70.61)	102 (29.39)	347	24.45	0.000*
Negative	7 (25.00)	21 (75.00)	28		

*Significant at $p < 0.05$

Table 6 Bivariate analysis of factors associated with exclusive breast-feeding

Evaluated factor	No	Yes	Total	χ^2	p value
Age (years)					
18–30	.098 (40.17)	146 (59.83)	244		
31–40	56 (46.67)	64 (53.33)	120	4.19	0.123
41 +	8 (66.67)	4 (33.33)	12		
Marital status					
Married	124 (45.26)	150 (54.74)	274		
Single	29 (36.25)	51 (63.75)	80	3.43	0.331
Separated	4 (30.77)	9 (69.23)	13		
Widow	5 (55.56)	4 (44.44)	9		
Level of education					
Certificate	82 (56.55)	63 (43.45)	145		
Diploma	60 (38.96)	94 (61.04)	154	21.13	0.000*
Bachelor's degree	18 (25.35)	53 (74.65)	71		
Master's degree	2 (33.33)	4 (66.67)	6		
Income level (UgX)					
1–500,000	90 (57.69)	66 (42.31)	156		
500,001–1,000,000	52 (38.52)	83 (61.48)	135	28.08	0.000*
1,000,001–1,500,000	12 (25)	36 (75)	48		
1,500,000 +	8 (21.62)	29 (78.38)	37		
Number of children					
< 2 children	47 (38.84)	74 (61.16)	122	1.31	0.253
> = 2 children	115 (40.10)	140 (54.90)	255		
ANC visits					
< 4 times	4 (33.33)	8 (66.67)	12		
4 times and above	158 (43.41)	206 (56.59)	364	0.481	0.488
Place of delivery					
Health facility	157 (41.17)	183 (53.82)	340	13.84	0.000*
Home	5 (13.89)	31 (86.11)	36		
Mode of delivery					
Caesarian	42 (43.75)	54 (56.25)	96	0.023	0.879
Normal	120 (42.86)	160 (57.14)	280		
Ever received breast-feeding counselling					
Yes	127 (41.50)	179 (58.50)	306	1.68	0.195

Table 6 (continued)

Evaluated factor	No	Yes	Total	χ^2	p value
No	35 (50.00)	35 (50.00)	70		
Type of employer					
Government	68 (35.05)	126 (64.95)	194	10.55	0.001*
Private	94 (51.65)	88 (48.35)	182		
Working hours					
Up to 8 h	99 (44.00)	126 (56.00)	225	0.147	0.702
Above 8 h	63 (42.00)	87 (58.00)	150		
Distance to workplace					
Less than 2 kms	72 (57.14)	54 (42.86)	126		
2–5 kms	56 (37.09)	95 (62.91)	151	15.46	0.000*
More than 5 kms	34 (34.34)	65 (65.66)	99		
Have paid maternity leave					
Yes	127 (39.32)	196 (60.68)	323	13.25	0.000*
No	35 (66.04)	18 (33.96)	53		
Provision of breast-feeding space					
Yes	55 (71.43)	22 (28.57)	77	31.72	0.000*
No	107 (37.79)	192 (64.21)	299		
Breast-feeding break					
Yes	63 (57.27)	47 (43.73)	110	12.76	0.005*
No	99 (37.22)	167 (62.78)	266		
Knowledge					
Good	158 (42.93)	210 (57.07)	368	0.159	0.690
Poor	4 (50.00)	4 (50.00)	8		
Attitude					
Positive	148 (42.65)	199 (57.35)	347	0.570	0.450
Negative	14 (50.00)	14 (50.00)	28		

*Significant at $p < 0.05$

initiate EBF, indicating that working for longer hours is a big hindrance to EIBF. This finding agrees with that of Snyder et al. (2018) who reported that women who work for long hours need more workplace support to improve their breast-feeding practices. With respect to distance to workplace, mothers who traveled longer distances to their workplaces were less likely capable of practicing EBF. This points that long distance to the place of work is a barrier to EBF since working mothers are more likely to leave their babies at home as they work. Similarly, mothers who did not get paid maternity leave were less likely to practice EIBF but EBF. This is contrary to findings from other studies which reported that the absence of paid maternity leave reduces the odds of EBF among working mothers (Snyder et al. 2018). Paid maternity leave avails opportunity to working mothers to stay longer with their babies and increases the likelihood of practicing EBF. Mothers who reported lack of breast-feeding space and no breast-feeding break had significantly lower odds of EBF. Indeed, presence of a designated space where working mothers can conveniently breast-feed and provision of daily breast-feeding breaks are good incentives for working mothers to practice EBF (Lauer et al. 2019).

Study limitations

This study had some limitations. Though both government-owned and private health facilities were included in this study, some health facilities were excluded. Secondly, we recognize that even if this study sampled participants from households, there would have been some who were working and others not. Such data would have provided a better comparison than this study have done. Lastly, the questionnaire survey used is prone to recall bias. To overcome this, respondents were allowed sufficient time to reflect on the questions before responding. Data collectors were also trained to acquire best skills of data collection to improve the accuracy and volume of data compiled.

Conclusions

Exclusive breast-feeding and pre-lacteal feeding among working mothers in health facilities in Lira District (Northern Uganda in general) are lower than the national averages, but the prevalence of EIBF is higher than the national average.

Abbreviations

AOR: Adjusted odds ratio; CI: Confidence interval; EIBF: Early initiation of breast-feeding; EBF: Exclusive breast-feeding; PLF: Pre-lacteal feeding; UgX: Uganda shillings.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s42269-022-00810-3.

Additional file 1: Table S1. STROBE Checklist

Additional file 2: Table S2. List of Health Facilities in Lira District

Acknowledgements

We thank all the health facilities, their management and the working mothers who participated and shared their knowledge in the study. The authors are indebted to Bonny Aloka, Everline Apio and Bosco Opio for the assistances and support rendered during this research. Sincere thanks are due to Timothy Omara (Universität für Bodenkultur Wien, Vienna) for the technical advices and support offered in preparation and English proofreading of this article.

Author contributions

TO and GK designed the study. TO collected the data and analyzed the collected data. GK supervised the study. TO wrote the first draft of the manuscript. Both authors revised and approved the final manuscript.

Funding

This research received no external funding.

Availability of data and materials

The datasets supporting the conclusions of this study are available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

The ethical clearance of this study was obtained from the Research Ethics Committee of Uganda Christian University (Clearance No. UCUREC-2020-33). Administrative clearance was sought from Lira District Health Officer and from the In-charges of all the government and private health facilities that were selected for the study. Eligible working mothers were informed about the purpose, methods, risks, benefits, confidentiality and voluntary participation in the study. Working mothers who consented signed informed consent forms.

Consent for publication

Not applicable.

Competing interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Author details

[1]Department of Public Health, Faculty of Health Sciences, Uganda Christian University, P.O. Box 4, Mukono, Uganda. [2]Department of Biochemistry, Faculty of Medicine, Lira University, P.O. Box 1035, Lira, Uganda.

Received: 11 December 2021 Accepted: 12 April 2022
Published online: 28 April 2022

References

Abie BM, Goshu YA (2019) Early initiation of breastfeeding and colostrum feeding among mothers of children aged less than 24 months in Debre Tabor, northwest Ethiopia: a cross-sectional study. BMC Res Notes 12(1):65

Adugna B, Tadele H, Reta F, Berhan Y (2017) Determinants of exclusive breastfeeding in infants less than six months of age in Hawassa, an urban setting. Ethiopia Int Breastfeed J 12:45

Agho KE, Ahmed T, Fleming C, Dhami MV, Miner CA, Torome R, Ogbo FA, On Behalf Of The Global Maternal And Child Health Research Collaboration GloMACH (2021) Breastfeeding practices among adolescent mothers and associated factors in Bangladesh (2004–2014). Nutrients 13: 557

Berde AS, Ozcebe H (2017) Risk factors for prelacteal feeding in Sub-Saharan Africa: a multilevel analysis of population data from twenty-two countries. J Public Health Nutr 11:1953–1962

Bimerew A, Teshome M, Kassa G (2016) Prevalence of timely breastfeeding initiation and associated factors in Dembecha district, North West Ethiopia: a cross-sectional study. Int Breastfeed J 11:28

Chea N, Asefa A (2018) Prelacteal feeding and associated factors among newborns in rural Sidama, South Ethiopia: a community based cross-sectional survey. Int Breastfeed J 13:7

Chhetri S, Raoa AP, Gudd V (2018) Factors affecting exclusive breastfeeding among working mothers in Udupi Taluk, Karnataka. Clin Epidemiol Glob Health 6:216–219

Chipojola R, Lee GT, Chiu HY, Chang PC, Kuo SY (2020) Determinants of breastfeeding practices among mothers in Malawi: a population-based survey. Int Health 12:132–141

Clara K (2018) Breastfeeding practices among working mothers attending postnatal clinics in two hospitals in Kampala, Uganda. Occupat Environ Med 78:A537

Issaka AI, Agho KE, Renzaho AM (2017) Prevalence of key breastfeeding indicators in 29 Sub-Saharan Countries: a meta-analysis of demographic and health surveys (2010–2015). BMJ Open 7:e014145

Kasiulevičius V, Šapoka V, Filipavičiūtė R (2006) Theory and practice: sample size calculation in epidemiological studies. Gerontolojia 7:225–231

Lauer E, Armenti K, Henning M, Sirois L (2019) Identifying barriers and supports to breastfeeding in the workplace experienced by mothers in the new hampshire special supplemental nutrition program for women, infants, and children utilizing the total worker health framework. Int J Environ Res Public Health 16:529

Lawrence RA, Lawrence RM (2016) Breastfeeding: a guide for the medical profession, 8th edn. Elsevier, Saunders

Mengistu K, Alemu K, Destaw B (2013) Prevalence of malnutrition and associated factors among children aged 6–59 months at Hidabu Abote District, North Shewa, Oromia Regional State. J Nutr Disord Ther T 1:001

Mensah K, Acheampong E, Anokye FO, Okyere P, Appiah-Brempong E, Adjei RO (2017) Factors influencing the practice of exclusive breastfeeding among nursing mothers in a peri-urban district of Ghana. BMC Res Notes 10(1):466

Mugadza G, Zvinavashe M, Gumbo FZ, Pedersen BS (2018) Early breastfeeding initiation and incidence of neonatal sepsis in Chipinge District Zimbabwe. Int J Contemp Pediatr 5:1–5

Mukunya D, Tumwine JK, Nankabirwa V, Ndeezi G, Odongo I, Tumuhamye J, Tongun JB, Kizito S, Napyo A, Achora V, Odongkara B, Tylleskar T (2017) Factors associated with delayed initiation of breastfeeding: a survey in Northern Uganda. Glob Health Action 10:1410975

Mukunya D, Nankabirwa V, Ndeezi G, Tumuhamye J, Tongun JB, Kizito S, Napyo A, Achora V, Odongkara B, Arach AA, Tylleskar T, Tumwine JK (2019) Key decision makers and actors in selected newborn care practices: a community-based survey in northern Uganda. Int J Environ Res Public Health 16:1723

Napyo A, Tumwine JK, Mukunya D, Waako P, Tylleskär T, Ndeezi G (2020) Exclusive breastfeeding among HIV exposed infants from birth to 14 weeks of life in Lira, Northern Uganda: a prospective cohort study. Glob Health Action 13:1833510

Nguyen P, Binns CW, Ha AVV, Chu TK, Nguyen LC, Duong DV, Do DV (2020) Lee AH (2020) Prelacteal and early formula feeding increase risk of

infant hospitalisation: a prospective cohort study. Arch of Dis Childhood 105:122–126
Snyder K, Hansen K, Brown S, Portratz A, White K, Dinkel D (2018) Workplace breastfeeding support varies by employment type: the service workplace disadvantage. Breastfeed Med 13:23–27
Tadesse F, Alemayehu Y, Shine S, Asresahegn H, Tadesse T (2019) Exclusive breastfeeding and maternal employment among mothers of infants from 3 to 5 months old in the Fafan zone, Somali Regional State of Ethiopia: a comparative cross-sectional study. BMC Publ Health 19:1015
Talbert AW, Tsofa B, Mumbo E, Berkley JA, Mwangome M (2018) Knowledge of, and attitudes to giving expressed breastmilk to infants in rural coastal Kenya; focus group discussions of first time mothers and their advisers. Int Breastfeed J 13:16
Tewabe T (2016) Timely initiation of breastfeeding and associated factors among mothers in Motta town, East Gojjam zone, Amhara regional state, Ethiopia 2015: a cross-sectional study. BMC Pregnancy Childb 16(1):314
UBOS (2017) The national population and housing census 2014—area specific profile series. Kampala, Uganda: Government of Uganda. https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/KAMPALA-KCCA.pdf
UBOS (2018) Uganda demographic and health survey 2016. Kampala, Uganda and Rockville, Maryland, USA: UBOS and ICF. https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf
UNICEF (2018) Breastfeeding, a mother's gift for every child. UNICEF, New York, Geneva. https://www.aidsdatahub.org/sites/default/files/resource/breastfeeding-mothers-gift-every-child.pdf
WHO (2017a) Early initiation of breastfeeding. Retrieved from e-Library of Evidence for Nutrition Actions (e-LENA): https://www.who.int/elena/titles/commentary/early_breastfeeding/en/
WHO (2017b) Guideline: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. World Health Organization. https://apps.who.int/iris/handle/10665/259386
WHO (2018) Guideline: counselling of women to improve breastfeeding practices. https://www.who.int/publications/i/item/9789241550468
Yılmaz E, Öcal FD, Yılmaz ZV, Ceyhan M, Kara OF, Küçüközkan T (2017) Early initiation and exclusive breastfeeding: factors influencing the attitudes of mothers who gave birth in a baby-friendly hospital. Turk J Obstet Gynecol 14:1–9

Publisher's Note