ORIGINAL ARTICLE

TIMELY INITIATION OF BREASTFEEDING AND ASSOCIATED FACTORS AMONG INFANTS IN SELECTED DISTRICTS OF NORTHWEST ETHIOPIA: A COMMUNITY BASED CROSS-SECTIONAL STUDY

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ABSTRACT

Background: *Timely initiation of breastfeeding, starting within an hour of birth, protects infants and children against death and illness. The rate of timely initiation of breastfeeding remains low in many Sub-Sahara African countries, including Ethiopia. Hence, this study was aimed to determine the prevalence of timely initiation of breastfeeding and associated factors in Northwest Ethiopia.*

Methods: *A community-based cross-sectional study was conducted in Dabat and Debark districts from North Gondar Zone, and Wogera district from the Central Gondar administrative zone. The study was done from April 6-16, 2019. A total of 1544 mothers who have infants aged<6 months were selected by a two-stage stratified random sampling technique. Data was collected using an interviewer-administered structured questionnaire using a tablet-based data collection application software. Socio-demographic, reproductive, obstetric, and neonatal health-related characteristics were tested for statistical association with timely initiation of breastfeeding. A multivariable logistic regression model was used to identify the associated factors, and STATA 14.0 statistical software was used to analyze the data.*

Results: *A total of 1471 mothers of children aged less than 6 months were included with the response rate of 95.3%. The participants' mean age was 27.8 years (SD± 6.7).The prevalence of timely initiation of breastfeeding was 55.3% (813/1471). Mothers who gave birth at health institution (AOR=3.6 (95% CI: 2.8, 4.5)), not having a frequent neonatal illness (AOR=2.2 (95% CI: 1.1, 4.4)), normal neonatal birth weight (>2.5kg) (AOR=1.8 (95% CI: 1.4, 2.2)), attending a formal education (AOR=1.3 (95% CI: 1.1, 1.6)), being an urban resident (AOR=1.7 (95% CI: 1.3, 2.1)), being a multiparous (AOR=1.6 (95% CI: 1.2, 2.1)), and having first pregnancy from 19-25 years of age (AOR=1.4 (95% CI: 1.1, 1.8)) were more likely to timely initiate breastfeeding than counterparts.*

Conclusions: *The prevalence of timely initiation of breastfeeding in Northwest Ethiopia was 55.3%. Therefore, healthcare providers and programs should strengthen health facility delivery, promote the advantage of timely initiating breastfeeding, and educate women on the drawbacks of early pregnancy on timely breastfeeding initiation by focusing on rural residences.*

Keywords: *Prevalence, timely initiation, breastfeeding, associated factors, Northwest Ethiopia.*

BACKGROUND

Breastfeeding is one of the most effective ways to ensure child survival [1]. Provision of mother's breast milk to infants within one hour of birth is referred to as "early initiation of breastfeeding" and ensures that the infant receives the colostrum, or "first milk", which is rich in disease protective factors. Besides, breast milk contains nearly all the nutrients an infant needs in the first six months of life [2]. Timely initiation of breastfeeding benefits infants by protecting against mortality and illnesses caused by infections such as pneumonia, diarrhea,

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and sepsis. Evidence also shows that when breastfeeding was initiated within an hour, about 22% of neonatal mortality could be prevented [3].

The 2016 Ethiopian Demographic and Health Survey (EDHS) report indicated that only 73% of mothers initiate breastfeeding within an hour of birth [4]. Other studies in Ethiopia showed regional variations on the timely initiation of breastfeeding [5].

Multiple studies reported various factors associated with the timely initiation of breastfeeding. Among the various factors reported, place of delivery, mode of delivery, breastfeeding counseling during antenatal care (ANC) visits, parity, and maternal education seems to be more influential [3,6-10].

Although there are studies on the prevalence of breastfeeding in Ethiopia, they were all done either in a single city or town. Hence, the study participants are dominated by urban residents, which is difficult to generalize the findings to the general population. This study, therefore, aimed to assess the prevalence of timely initiation of breastfeeding among mothers who had infants less than 6 months of age in Debark, Dabat, and Wogera districts, Northwest Ethiopia. The findings of this study will provide valuable data to promote the timely initiation of breastfeeding to reduce neonatal mortality and morbidity in the study area.

METHOD AND MATERIAL

Study design, study period, and study area: A community-based cross-sectional study was conducted from April 6-16, 2019. Participants were selected from Dabat, Debark, and Wogera districts in Northwest Ethiopia. The total population of this area was estimated to be 3.7 million in 2017. Women of childbearing age are estimated to account for 49% of the population. The study area has three government hospitals, namely; Debark, Dabat, and Amba Giorgis Hospitals, and 50 health centers [11].

Sample size and sampling strategy: The sample size was determined by using Statcalc in EpiInfo version 7.1.5.0. We assumed a 5% level of significance,4% margin of error, and 5% non-response rate. For the timely initiation of breastfeeding, we took an estimated prevalence of 48.7% [6]. Using the above estimates, a total of 1544 study participants were included in the study.

A multistage stratified random sampling technique was used to select mothers who had children aged less than 6 months. We selected mothers who gave birth within the last 6 months to reduce recall bias. Three districts were randomly selected from Northwest Ethiopia. Out of those three districts, administrative neighborhoods were randomly selected proportional to size. Mothers who live in those neighborhoods were offered the opportunity to be included in the study.

Data collection instrument and procedure: A pretested, interviewer-administered questionnaire was used to collect data. The data collection tool was designed using a tablet-based data collection application called Open Data Kit (ODK) software (version 1.8.1). The questionnaire was translated into the local language (Amharic). Six supervisors having different expertise (Pediatricians, Biostatistician, and public health experts with terminal degree) were involved. A one-day training was given to data collectors and supervisors on data collection, ethical aspects, and methods of communication. Data were collected by

these six trained, first-degree midwives and nurses. The data collectors collected the information through a face-to-face interview of mothers at their homes. The consistency and completeness of the data was regularly checked by supervisors (clinicians and researchers) throughout the entire data collection period.

Variables

Dependent variable: Timely initiation of breastfeeding practice was considered as the dependent variable of this study. If a mother put her baby to breast milk within an hour, timely initiation of breastfeeding practice was considered as "YES", and if not, they were labelled as "NO" as per the World Health Organization (WHO) recommendations [2]. According to the WHO infant and young child feeding rating on early initiating of breastfeeding, the prevalence of timely initiation of breastfeeding was considered as poor when it ranges 0-29%, fair when it ranges 30-49%, good when it ranges 50-89%, and very good when it ranges 90-100%.

Independent variables: The independent variables included the socio-demographic characteristics of mothers, healthcare service use by the mothers, and the socio-demographic characteristics of infants.

Data processing and analysis: All the electronic data were entered into STATA version 14.0 for analysis. Data quality was checked for completeness and consistency. Descriptive statistics were used. Bivariate analysis was performed to identify candidate variables using a p-value of ≤ 0.25.

Multi-collinearity between the candidate variables was checked by using the Variance Inflation Factor (VIF) at a cut-off point of 10. Variables having a VIF value of less than 10 indicate the absence of multi-collinearity. Multivariable analysis using a backward stepwise selection method was carried out to control for possible confounding variable and to determine the presence of statistical significance between explanatory variables and the outcome variable. Finally, statistical significance was declared at a p-value of <0.05, and odds ratio with 95% CI was used to measure the degree of association between independent variables and timely initiation of breastfeeding. Model fitness was also checked using Hosmer-Lemeshow goodness of fit test.

Ethical considerations: Ethical clearance was obtained from the University of Gondar Institutional Review Board (IRB) (Ethics ID: O/V/P/ RCS/05/1818/2018). Written informed consent was obtained from mothers. Assent was obtained from the mothers with age less than 18 years of age. Information about the potential benefits, confidentiality, and the possibility of withdrawing from the interview even without giving reasons was given to the study participants. All interviews were conducted in a private setting where confidentiality is maintained.

RESULT

Socio-demographic characteristics of mothers: Out of 1544 mothers selected for the study, 1471 (95.3%) mothers consented and were enrolled in the study. The mean age was 27.8 years (SD±6.7). The majority of the mothers (894/1471, 60.8%) and their husbands (788/1471, 53.6%) had no formal education. Most of the respondents (1401/1471, 95.2%) were married and 1041/1471, 70.8% live in rural areas **(Table 1)**.

Table 1: Socio-demographic characteristics of respondents, Northwest Ethiopia, April 2019 (n=1471).

Variables	Category	n (%)
Age of mothers (year)	15 - 24	492 (33.5)
	25 - 34	656 (44.6)
	≥ 35	323 (21.9)
Residence	Urban	430 (29.2)
	Rural	1041 (70.8)
Marital status	Single	34 (2.3)
	Married	1401 (95.2)
	Others*	36 (2.5)
Maternal education	No formal education	895 (60.8)
	Primary education	377 (25.7)
	Secondary education	178 (12.2)
	College and above	21 (1.4)
Occupation of the mother	Housewife	1364 (92.7)
	Merchant	47 (3.2)
	Others**	60 (4.1)
Husband education	No formal education	788 (53.6)
	Primary education	523 (35.6)
	Secondary education	130 (8.8)
	College and above	30 (2.0)
Husband occupation	Farmer	1279 (87.0)
	Merchant	67 (4.6)
	Government employee	51 (3.4)
	Others+	74 (5.0)
Religion	Orthodox Christian	1426 (96.9)
	Muslim	45 (3.1)
Household income	Poor	489 (33.2)
	Medium	448 (30.5)
	Rich	534 (36.3)
Media use	None	735 (50.0)
	Telephone/Mobile	616 (41.9)
	Radio	75 (5.1)
	Television	45 (3.1)

***= *Single, separated, and widowed*
+=*Government employee, daily laborer, and student*
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Reproductive and obstetric characteristics: Among 1471 mothers, 35.9% got pregnant before turning 18 years of age. Nearly half of the participants (51%) had 2 under-five children, and most mothers (80.3%) attended ANC for their last infant. About 748 (51%) mothers deliver in a health facility, but only 162 (11%) mothers attended postnatal care **(Table 2)**.

Table 2: Reproductive and obstetric characteristics of mothers, Northwest Ethiopia, April 2019 (n=1471).

Variables	Category	n (%)
Age at first pregnancy	≤ 18 years	528 (35.9)
	19-25 years	902 (61.3)
	≥ 26 years	41 (2.8)
Number of pregnancies	1 -3	825 (56.1)
	4 or more	646 (43.9)
Number of <5 children	One	685 (46.7)
	Two	742 (50.5)
	Three or more	41 (2.8)
Having ANC visit	Yes	1181 (80.3)
	No	290 (19.7)
Number of ANC visits (n=1181)	One	93 (7.8)
	Two	190 (16.1)
	Three	434 (36.8)
	Four	464 (39.3)
Gestational age	Term	1443 (98.2)
	Pre or post term	27 (1.9)
Place of delivery	Home	723 (49.2)
	Health facility	748 (50.8)
Mode of delivery	SVD	1393 (94.7)
	Instrumental	78 (5.3)
Delivery assistant	Traditional birth attendant	481 (32.7)
	Mother in-law/ relatives	222 (15.1)
	Health center staff	566 (38.5)
	Hospital staff	170 (11.6)
	Others*	32 (2.2)
PNC visits	Yes	162 (11.0)
	No	1309 (89.0)

*=Health extension worker, anyone available, and herself.

Infant feeding characteristics and neonatal health problems: The prevalence of timely breastfeeding initiation was found to be 55.3%. Only 163 (11.1%) children were exclusively breastfed until 6 months of life and 1008 (32%) of them were provided colostrum after birth. Fever and fast breathing were observed among 106 (7.2%) and 67 (4.6%) children during the neonatal period, respectively **(Table 3)**.

Table 3: Infant feeding and health-related characteristics, Northwest Ethiopia, April 2019 (n=1471).

Variables	Category	n (%)
Sex of the child	Female	737 (50.1)
	Male	734 (49.9)
Birth weight	Low (<2.5kg)	531 (36.1)
	Normal (≥2.5kg)	940 (63.9)
Parity	Primiparous	327 (22.2)
	Multiparous	1144 (77.8)
Breastfeeding characteristics		
Timely initiation of breastfeeding	Yes	813 (55.3)
	No	658 (44.7)
Exclusive breastfeeding	Yes	163 (11.1)
	No	1306 (88.9)
Give colostrum	Yes	1008 (68.5)
	No	463 (31.5)
Anything given before breastfeeding	Yes	250 (17.0)
	No	1221 (83.0)
If yes, what was given (n=250)	Butter	141 (56.4)
	Water	43 (17.2)
	Cow milk	60 (24.0)
	Other*	06 (2.4)
Neonatal health problems		
Fever	Yes	106 (7.2)
	No	1365 (92.8)
Fast breathing	Yes	67 (4.6)
	No	1404 (95.4)
Cough	Yes	61 (4.2)
	No	1410 (95.8)
Inability to suck or feed	Yes	41 (2.8)
	No	1430 (97.2)
Diarrhea	Yes	21 (1.4)
	No	1450 (98.6)

*=Cow milk and honey.

Factors associated with timely initiation of breastfeeding: Bivariate and multivariate analyses were performed to identify factors associated with the timely initiation of breastfeeding. On bivariate analysis, place of delivery, residence, maternal education, husband education, household income, age at first pregnancy, having ANC visit, neonatal birth weight, parity, and frequent neonatal illness were significantly associated with the timely initiation of breastfeeding. In the multivariate analysis, place of delivery, maternal education, residence, maternal age at first pregnancy, neonatal birth weight, parity, and frequent neonatal illness were identified as predictor variables.

The odds of timely initiation of breastfeeding was nearly four times (AOR=3.6 (95% CI: 2.8, 4.5)) higher among health facility delivered infants than home-delivered infants. Neonates who had a normal birth weight (≥2.5kg) were almost two times (AOR=1.8 (95% CI: 1.4, 2.2)) more likely to initiate timely breastfeeding than those who had low birth weight(<2.5kg).

Mothers who attended a formal education were 1.3 times more likely (AOR=1.3 (95% CI: 1.1, 1.6)) to initiate breastfeeding than those who did not attend. Urban residents were nearly twice (AOR=1.7 (95% CI: 1.3, 2.1)) likely than rural resident to initiate timely breastfeeding to their children.

Similarly, multiparous mothers had more odds (AOR=1.6 (95% CI: 1.2, 2.1)) in initiating timely breastfeeding than primiparous mothers. Mothers who had their first pregnancy within 19-25 years of age were 1.4 times (AOR=1.4 (95% CI: 1.1, 1.8)) more likely to initiate timely breastfeeding than those who had their first pregnancy at <18 years of age. On the other hand, the odds of timely initiation of breastfeeding was twice (AOR=2.2 (95% CI: 1.1, 4.4)) higher among children without frequent neonatal illness **(Table 4)**.

Table 4: Factors associated with timely initiation of breastfeeding among children aged less than 6 months, Northwest Ethiopia, April 2019 (n=1471).

Variables	Timely initiation of breastfeeding		COR (95% CI)	AOR (95% CI)
	Yes	No		
Place of delivery				
Home	291	432	1	1
Health facility	522	226	3.4 (2.8, 4.3)	3.6 (2.8, 4.5)**
Residence				
Urban	278	152	1.7 (1.4, 2.2)	1.7 (1.3, 2.1)**
Rural	535	506	1	1
Maternal education				
Attended formal education	343	233	1.3 (1.1, 1.7)	1.3 (1.1, 1.6)*
Not attended formal education	470	425	1	1
Husband education				
Yes	397	286	1.2 (1.1, 1.5)	
No	416	372	1	
Household income				
Poor	245	244	1	
Medium	242	206	1.2 (1.1, 1.5)	
Rich	326	208	1.6 (1.2, 2.0)	
Age at first pregnancy				
≤ 18 years	261	267	1	1
19-25 years	533	369	1.5 (1.2, 1.8)	1.4 (1.1, 1.8)*
≥ 26 years	19	22	0.9 (1.1, 1.7)	0.7 (0.4, 1.5)
Having ANC visit				
Yes	136	154	1.5 (1.2, 2.0)	
No	677	504	1	
Birth weight				
Low (<2.5kg)	236	295	1	1
Normal (≥2.5kg)	577	363	2.0 (1.6, 2.5)	1.8 (1.4, 2.2)**
Parity				
Primiparous	171	156	1	1
Multiparous	642	502	1.2 (0.9, 1.5)	1.6 (1.2, 2.1)**
Frequent neonatal illness				
Yes	13	28	1	1
No	800	630	2.7 (1.4, 5.3)	2.2 (1.1, 4.4)*

** = p ≤ 0.05, ** = p ≤ 0.001*

DISCUSSION

This study assessed the prevalence and factors associated with the timely initiation of breastfeeding in Northwest Ethiopia. The finding of this study showed that the prevalence of timely initiation of breastfeeding was 55.3%. This prevalence is below the 2015 target level of 92% for Ethiopian Health Sector Development Program (HSDP)-IV and lower than most study findings in Ethiopia (73% to 83.7%) [4,7,8,10,12, 13], Bangladesh and Malawi [14, 15]. On the other hand, our finding is comparable with other studies in Ethiopia (57.6%),Tanzania (51%) and Bangladesh (67.3%) [16-18]. This discrepancy

might be due to the difference in access to information, maternal health service utilization and cultural practices before initiating breastfeeding. More than 90% of the mothers in this study had neither radio nor television as a source of information, and about 61% of them had no formal education.

We found that the prevalence of timely initiation of breastfeeding in the study area was good per WHO classification [2]. Hence, given the importance of timely initiation of breastfeeding, more needs to be done to improve it and bring progress from good to very good.

The key factors that were statistically associated with high odds of timely breastfeeding initiation were the place of delivery, maternal education, residence, maternal age at first pregnancy, birth weight, parity, and frequent neonatal illness. This study also showed that the odds of timely breastfeeding initiation among mothers who gave birth at health institutions were 3.6 times higher when compared to those who deliver at home. This finding is in congruent with similar other studies in Ethiopia, Uganda, Bangladesh, and Nepal [8,9,18,19-21]. This might be because mothers who delivered in health facilities might be aware of the importance of timely initiating breastfeeding when compared to those who had delivered at home.
The odds of timely initiation of breastfeeding were 2.2 times higher among mothers of neonates who did not frequently face neonatal illness than those who face frequent illness.

Similar findings were seen in India and Bangladesh [22,23]. This could have a detrimental effect on neonatal survival as up to two-thirds of the cells in colostrum are white blood cells that guard against infections [24]. Furthermore, about 69% of the mothers in this study did not give colostrum to their neonates and hence, they are prone to illness.

In this study, breastfeeding was twice more likely to be initiated early in mothers with neonates of normal birth weight ($\geq$2.5kg) than to those who had low birth weight (<2.5kg). This finding was consistent with a study done in Sri Lanka [25]. The reason for mothers with neonates of normal birth weight to early initiate breastfeeding could be explained by failure to put low birth weight infants to breast milk after birth, or the inability of low-birth-weight infants to take breast milk [26].

Urban residents were more likely to start breastfeeding on time than rural residents. This finding is supported by similar studies which are conducted in Ethiopia[6,27]. One study in Saudi Arabia showed the contrary which could be due to the socio-cultural differences and variations in delivery room practices [28,29]. Educating women during ANC about the importance and the implementation of practices during and/or after delivery are warranted in Saudi Arabia [30].

In this study, being multiparous was found to be an independent predictor of timely initiation of breastfeeding. The odds of timely initiation of breastfeeding was 1.6 times higher among multiparous mothers when compared to primiparous mothers. This finding was also supported by studies in Ethiopia and Turkey, which showed that breastfeeding initiation was later in primiparous mothers than multiparous mothers [6,31]. The possible explanation could be multiparous mothers might have a better experience and be informed about the timely initiation of breastfeeding by healthcare providers.

Mothers who got their first pregnancy from 19 – 25 years of age were 1.4 times more likely to timely initiate breastfeeding than those mothers who got pregnant at 18 years and below. Another local study

[7] indicated that maternal age at first pregnancy is the most important predictor for timely initiation of breastfeeding. However, it was not significant in multivariate analysis. The possible reason could be variations in the age structure of the study participants, where about one-third (34%) of the mothers in this study were below 25 years of age and 36% of these mothers got their first pregnancy before 19 years of age. Furthermore, about 71% of the study participants were rural residents.

Moreover, mothers who attended a formal education were1.3 times more likely to initiate breastfeeding timely for their neonates when compared to those mothers who did not attend any formal education. This finding is in agreement with studies done in Ethiopia, Tanzania and India [27,32-35].

Limitation of the study: Due to the cross-sectional nature of the study design, it is not able to show the temporal relationship between the outcome variable and explanatory variables. The time for breastfeeding initiation was self-reported by the mothers, which might have introduced recall bias. Thus, the findings of this study should be interpreted with consideration of these limitations.

CONCLUSION

The prevalence of timely initiation of breastfeeding was 55.3% in Northwest Ethiopia. Institutional delivery, a neonate with normal birth weight and no illness, maternal age of 19-25 years, living in urbanized areas, and attending a formal education contribute significantly to the timely initiation of breastfeeding. Therefore, strengthening maternal education on the benefits of timely initiation of breastfeeding through community-based education is vital in the study area. Healthcare workers and district health officials should focus on promoting health facility delivery and health-seeking behavior of the mothers using a locally contextual strategy is indispensable.

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