





BMJ Open Effective breastfeeding technique and associated factors among lactating mothers in Gidan District, North-East, Ethiopia: a community-based cross-sectional study

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ABSTRACT

Objective To assess effective breastfeeding technique (EBT) and associated factors among lactating mothers in Gidan District, North-East Ethiopia.

Design A community-based cross-sectional study.

Setting Gidan District, North-East Ethiopia.

Participants A total of 786 lactating mothers were included between 30 March and 29 April 2021.

Outcome EBT.

Methods A multistage sampling technique was employed to recruit participants. Pretested interviewer-administered questionnaires and an observational checklist were used to collect the data. Individual scores of three variables about breast feeding, namely positioning, attachment and suckling, were computed to generate the outcome variable, that is, breastfeeding technique. Binary logistic regression analyses were carried out to determine the association between independent variables and EBT. Statistical significance was declared at a value of $p \leq 0.05$ with a corresponding 95% CI.

Results Overall, the prevalence of EBT was 42.9% (326/760). Having antenatal care follow-up (adjusted OR (AOR)=1.75; 95% CI 1.10 to 2.77), delivering at health institutions (hospital AOR=2.85; 95% CI 1.22 to 6.66 and health centre AOR=2.15; 95% CI 1.25 to 3.68), and receiving postpartum home visits by the health extension workers (HEWs) (AOR=2.12; 95% CI 1.55 to 2.92) were significantly associated with the practice of EBT.

Conclusion The study showed that the prevalence of EBT was low. The finding highlights the importance of promoting utilisation of antenatal care follow-up, institutional delivery and postpartum home visits by HEWs, which play a substantial role in promoting EBT.

INTRODUCTION

Breastfeeding technique (BFT) is defined as the composite of positioning, attachment and suckling during breast feeding.¹ Position indicates the capacity of the mother to carry her child on her body. At the same time, attachment denotes whether the mother attaches

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Since the outcome variable was computed by scores given by different observers, some necessary measures, including delivering training and providing time to practice in a real environment before the data collection, were incorporated to reduce measurement errors and interobserver variability.
- ⇒ Due to interobserver variability and the Hawthorne effect, the study might not be free from bias.
- ⇒ Using the registration book as a sampling frame may introduce selection bias as new lactating mothers might not get registered.

the baby to her breast and to her nipple, keeping most of the areola in the baby's mouth.² Similarly, suckling is a part of the BFT, which reflects the infant's performance of expressing milk, which can be explained by the depth and speed of sucking.¹ These techniques collectively imply the status of breastfeeding infants. The WHO and UNICEF recommend breast feeding within 1 hour of birth and exclusive breast feeding (EBF) for the first 6 months.³ As a result, infants can get the required amount of energy and nutrients. Applying effective breastfeeding techniques (EBTs) can foster sufficient milk production and release.⁴ In addition, appropriate breast feeding helps prevent communicable and non-communicable diseases.⁵

On the other hand, ineffective breastfeeding technique (IBT) is attributed to poor positioning, attachment and suckling, which could result in early cessation of EBF and put infants at risk.⁶ Several pieces of evidence show that more than half of mothers with IBT discontinue EBF earlier, resulting in severe

infectious and non-infectious chronic diseases in their children.⁶⁻⁹ Globally, more than half a million infants die each year due to nutritional deficiency attributed to suboptimal breastfeeding.¹⁰ Aside from the mortality, there are hundreds of thousands of children whose growth and development is impaired.¹¹ In Ethiopia, suboptimal breastfeeding practices (including IBTs) contribute to the higher under-five mortality resulting from malnutrition.¹²⁻¹³ In the country, the burden of malnutrition, particularly undernutrition, begins at an early stage of life, and it is believed to be due to suboptimal breastfeeding practices.¹³⁻¹⁴

IBT not only threatens infants' lives but also negatively impacts the health of the mother.¹⁵ IBT is one of the major causes of cracked nipples among lactating mothers.¹⁵ Nipple damage, mastitis and other similar complications are more common among lactating mothers with IBT.⁷

The practice of EBT varies across different settings. For instance, in South Ari district, southern Ethiopia 36.5%,⁹ Harar city, eastern Ethiopia 43.4%,¹⁶ Gondar town, Ethiopia 48%,¹⁷ West Denmark 52%,¹⁸ Libya 48%.⁷ Furthermore, small localised studies in India found that the practice of EBT ranged from 30.3% to 51%.¹⁹⁻²¹ Multiple factors like parity, maternal and child age, level of education, place of delivery, antenatal care (ANC), postnatal care (PNC), knowledge of BFTs, and counselling about EBT are some of the identified factors that can affect the practice of EBT.⁹⁻¹⁷⁻²²⁻²³

There have been several strategies to avert the problem, although sufficient improvement has not been observed in the past decade.¹¹ The WHO and the baby-friendly hospital initiative have designed EBT counselling, teaching and demonstrations for mothers in all maternity care services and all mothers with sick children in accordance with the Integrated Management of Neonates and Childhood Illness guidelines.⁶⁻²⁴ Ethiopia has also recently incorporated IBT into the national acute malnutrition management guidelines as a diagnostic criterion for severe acute malnutrition among infants under 6 months.²⁵

Nutritional problems among children remain the most significant challenge towards achieving the Ethiopian government's target to end childhood undernutrition by 2030 with a commitment to the 'Seqota' Declaration.²⁶ To achieve the aforementioned target, we need to encourage EBT during infancy, and early childhood and science-backed interventions would have a significant role.

Although few studies have been conducted in Ethiopia, almost all of them were conducted among mothers who pursued health services (institution-based) in which those women considerably have better knowledge about healthy practices.⁷⁻⁹⁻¹⁶⁻¹⁷ In addition, previous studies have been conducted, including on mothers soon after birth, before the mother is stabilized and becomes comfortable, which could ultimately affect the BFTs.⁸⁻⁹⁻¹⁸ Moreover, there was a paucity of evidence concerning EBT in northern Ethiopia. Therefore, this study aimed to assess EBT and identify its associated factors among lactating

mothers. The findings will provide evidence for policy makers and the concerned bodies to work on identified attributes to further improve the practice of EBT.

METHODS

Study setting, design and period

A community-based cross-sectional study was conducted from 30 March to 29 April 2021, in Gidan District, North Wollo Zone, North-East Ethiopia. The district is 595 km from Addis Ababa, the capital of Ethiopia, and it has 2 urban and 21 rural kebeles (the lowest administrative unit). Close to half (49.7%) of the population in the district is female. Under-five children and lactating mothers account for 15.2% (22523) and 4.3% (6320) of the population, respectively. The district has 6 health centres and 23 health posts that provide routine health services to the catchment population.²⁷

Study participants

All lactating mothers (mother-infant pairs) having infants under 6 months of age in the selected kebeles in Gidan District were included. Lactating mothers who were critically ill or unable to breast feed their infants and infants with a critical illness at the time of data collection were excluded from the study.

Sample size determination and sampling procedures

The sample size was calculated using a single population proportion formula, considering the following statistical assumptions: margin of error 5% (0.05), Z-value 1.96 corresponding to 95% confidence level, 10% non-response, design effect of 2, and the proportion of EBT 36.5%, which gave a final sample size of 786.⁹

A multistage sampling technique stratified by urban and rural kebeles was employed. Of the 21 rural and 2 urban kebeles found in the district, 30% of the total kebeles (6 rural kebeles and 1 urban kebele) were selected by a simple random sampling technique. The list of lactating mothers with children aged under 6 months was taken from the health extension workers' (HEWs') registration book of each selected kebele's health post and considered as a sampling frame. Then, the sample size was proportionally allocated to each selected kebele considering the number of lactating mothers. Simple random sampling using the OpenEpi random program V.3 was used to draw the participants from each kebele.

Variable measurement and definition of terms

Positioning

Positioning was defined as good when at least three out of four criteria for infant positioning were fulfilled. Positioning was defined as average if any two of the four criteria were correctly applied, whereas positioning was defined as poor when only one or none of the criteria had been fulfilled.⁹⁻²⁸

Attachment

The attachment was described as good when at least three out of four criteria had been fulfilled. The attachment

was described as average if any two of the four criteria had been fulfilled. The attachment was described as poor when only one or none of the four criteria had been fulfilled.

Suckling

Suckling was described as effective when at least two out of three criteria had been fulfilled. Suckling was described as ineffective if only one or none of the three criteria had been fulfilled.^{9 28}

- ▶ **Slow suckling:** Suckling pattern of an infant about one suck per second.²⁹
- ▶ **Deep suckling:** The baby's cheeks are not drawn inward and are rounded during a feed, evidenced by visible or audible swallowing after every one or two sucks.²⁹

Effective BFT

EBT is the combination of at least two criteria from positioning, three criteria from attachment and two criteria from suckling.^{16 18}

Breast problem

A mother is said to have breast problems if she has any of the following:

- ▶ **Inverted nipple:** A portion of or the entire nipple is buried below the plane of the areola and does not evert at all.³⁰
- ▶ **Engorgement:** Breasts are painfully overfull.
- ▶ **Cracked nipple:** Any damage and excoriation to the integrity of the skin on the nipple.
- ▶ **Mastitis:** An inflammatory condition of the breast, which may or may not be accompanied by infection.³¹

Data collection tools and quality control

A structured observational checklist adopted from the WHO breastfeeding observational checklist and interviewer-administered questionnaires was developed on reviewing different related literature.^{8 9 22 23 32} According to the WHO criteria, we developed and adopted an arbitrary scoring and grading system to grade positioning, infant's mouth attachment and effective suckling during breast feeding.³³ Each criterion scored 1 point (table 1).

Eight female BSc midwives (data collectors) and two supervisors from the same field with experience in research and fieldwork coordination participated in the data collection process. Data collectors and supervisors were oriented and trained for 1 day, with a focus on how to interview, examine and diagnose mothers with breast problems, tips to score the observational checklist, and bias controlling mechanisms. The data collectors also received simulation/real-environment training, and their score was compared with see the effect of interobserver variability. This was repeated until the result of two data collectors on the same participant became approximately the same by helping and providing corrective measures. Moreover, we recruited data collectors having similar educational statuses and considerable similar experiences to reduce interobserver variability.

Table 1 Criteria and grading system for positioning, attachment and suckling among lactating mothers in Gidan District, North-East Ethiopia, 2021 (n=760)

Criteria for correct body positioning:		
▶ Baby's body is close to the mother's body		
▶ Baby body and neck are straight		
▶ Baby's face is towards the mother's breast		
▶ The whole body is supported by the mother		
Criteria for grading body positioning:	Grade	Score
None or only one out of four criteria has been fulfilled	Poor	0–1
Any two of the four criteria have been fulfilled	Average	2
Three/all the four criteria for body positioning have been fulfilled	Good	3–4
Criteria for correctness of attachment:		
▶ More areola is seen above the baby's top lip		
▶ Baby's mouth is wide open		
▶ Baby's lower lip is turned outwards		
▶ Baby's chin is touching the breast		
Criteria for grading of correct attachment:	Grade	Score
None or only one out of four criteria has been fulfilled	Poor	0–1
Any two of the four criteria have been fulfilled	Average	2
Any three or all the four criteria have been fulfilled	Good	3–4
Criteria for correctness of effective suckling:		
▶ Slow suckling		
▶ Deep suckling		
▶ Sometimes pausing		
Criteria for grading of effective suckling:	Grade	Score
▶ None or only one of the three criteria has been achieved	Ineffective	0–1
▶ Any two or all three criteria have been achieved	Effective	2–3

The questionnaires were pretested on 40 study participants (5%) in Gubalafto district, and modifications were made according to the pretest results. The data collectors approach the participants by introducing themselves and interviewing the selected respondent after obtaining oral informed consent.

The data collectors observed BFT while the mother was at home in a private place. To reduce the Hawthorne effect, mothers were oriented to show how they routinely breast fed their infant, and that they won't be judged by their way of doing it. The observation lasted at least 5 min, and the data collectors recorded the breastfeeding positioning, attachment and suckling as per the WHO breastfeeding observation checklist. If the infant had breast fed in the previous 1 hour, the mother was asked when the infant would have the next feed, and the observation assessment was planned accordingly. After observation, the participants were interviewed for the interviewer-administered questionnaires. The data collectors linked the mothers who had breast problems such as mastitis, engorgement and cracked nipple, to the nearest health facilities.

**Table 2** Sociodemographic characteristics of respondents at Gidan District, North-East Ethiopia, 2021 (n=760)

Variables	Categories	Frequency	Per cent (%)
Age of the mother, years	<20	74	9.7
	20–25	197	25.9
	26–30	306	40.3
	>30	183	24.1
Religion	Orthodox	757	99.6
	Muslim	3	0.4
Educational status of the mother	Not attending formal education	435	57.2
	Primary school	233	30.7
	Secondary school and above	92	12.1
Occupation of the mother	Housewife	645	84.9
	Government employed	83	10.9
	Self employed	24	3.1
	Other*	8	1.1
Marital status	Married	684	90.0
	Single	53	7
	Windowed	16	2.1
	Other†	7	0.9
Educational status of the husband	Not attending formal education	372	54.3
	Primary school	202	29.4
	Secondary school and above	110	16
Occupation of the husband	Farmer	552	80.7
	Government employed	51	7.4
	Self employed	61	8.9
	Other‡	20	2.9
Residence	Rural	573	75.4
	Urban	187	24.6

*Student
†Divorced and separated
‡Daily labour and soldier

Data processing and analysis

The collected data were checked manually for completeness and consistency. Then the data were entered into the EpiData V.4.6 software package and exported to Stata V.14 for cleaning, coding and analysis. Descriptive statistics were described using frequencies, percentages, mean and SD, and presented using tables, figures and text. Normality tests such as kurtosis and skewness were employed to examine the distribution of continuous variables and identify the appropriate summary measures.

EBT was ascertained by computing the positioning, attachment and suckling scores. The scores of each item of the three techniques have been computed first. In other words, questions to measure positioning were computed and categorised as good, average and poor.

Then, to create a dummy variable, good and average positioning were merged as good and labelled as '1' and poor positioning was coded as '0'. The same procedure was applied for attachment. Moreover, suckling was categorised and coded as effective and ineffective suckling.

The outcome variable was dichotomised as 'effective' and 'ineffective' BFT, and it was labelled as '1' and '0', respectively. Binary logistic regression analysis was applied. Independent variables with a value of $p=0.2$ in the bi-variable analysis were considered in the multi-variable model. Variables with a value of $p\leq 0.05$ were regarded as statistically significant. Adjusted OR (AOR) with its corresponding 95% CI was used to examine the strength and direction of the association.

ETHICAL APPROVAL

A letter of support was taken from the district administrative office and handed to the selected kebeles. After a brief explanation of the study objective and purpose, oral informed consent was obtained from each participant. Participants were also informed that participation was voluntary, and they had the right to withdraw from the study at any time during the data collection. After the interview, the data collectors advised/demonstrated to the mother the EBT if the mother-infant pair had an IBT. Furthermore, all data obtained from participants were kept confidential and used for this study only. The study was also conducted according to the recommendations of the Helsinki declaration.

Patient and public involvement statement

Lactating mothers were included in this study by providing valuable information, including measurements. Nevertheless, they have never been involved in the study design, protocol, data collection tools, and reporting and disseminating the findings.

RESULTS

Sociodemographic characteristics

A total of 760 breastfeeding mothers participated, resulting in a response of 96.7%. The mean age of participants was 26.98 (± 5.3) years. About 40.3% of participants fell within the age category of 26–30 years. A bit more than three-fourths (75.4%) of the respondents were rural dwellers, and almost all (99.6%) participants were orthodox Christian followers. Regarding the educational status of the mothers, more than half (57.2%) of them had no formal education (table 2).

Obstetric and infant characteristics

About 80.5% and 85.5% of the mothers were multipara and had an ANC visit for their index child, respectively. More than half (55%) of the participants received BFT counselling immediately after delivery (table 3).

Table 3 Obstetric and infant characteristics of the respondent at Gidan District, North-East Ethiopia, 2021 (n=760)

Variables	Categories	Frequency (n)	Per cent (%)
Parity	Primipara	148	19.5
	Multipara	612	80.5
Antenatal care visit	Yes	650	85.5
	No	110	14.5
BFT counselling during ANC	Yes	492	75.7
	No	158	24.3
Place of delivery	Hospital	40	5.2
	Health centre	632	83.2
	Home	88	11.6
BFT counselling immediately after delivery	Yes	378	56.3
	No	294	43.7
Postnatal care	Yes	143	18.8
	No	617	81.2
Age of the infants	≤60 days	307	40.4
	60–120 days	249	32.7
	121–179 days	204	26.9
Sex of the infants	Male	322	42.4
	Female	438	57.6
Breast problems	Yes	21	2.8
	No	739	97.3
Breastfeeding experiences	Yes	616	81.0
	No	144	19.0
Received postpartum home visit by HEW	Yes	374	49.2
	No	386	50.8
Being member of WDA	Yes	156	20.5
	No	604	79.5
Previous information about BFT	Yes	506	66.6
	No	254	33.4

ANC, antenatal care; BFT, breastfeeding technique; HEW, health extension worker; WDA, woman development army.

Prevalence of EBT

The overall prevalence of mothers who practised EBT was 42.9% (95% CI 39.4% to 46.4%). Good breastfeeding positioning, attachment and sucking were observed

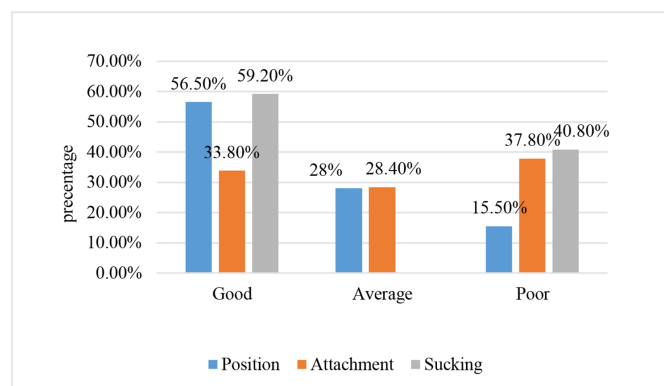


Figure 1 Positioning, attachment and suckling of infant during feeding at Gidan District, North-East Ethiopia, 2021 (n=760).

among 56.5%, 33.8% and 59.2% of mothers, respectively (figure 1).

Factors associated with EBT

After adjusting for potential confounding factors, variables such as ANC follow-up, place of delivery and receiving postpartum home visits by HEWs remained significantly associated with EBT. The odds of EBT among mothers who had ANC follow-up during their index pregnancy was 1.75 times (AOR=1.75, 95% CI 1.10 to 2.77) higher than their counterparts. Similarly, the odds of practising EBT was 2.15 (AOR=2.15, 95% CI 1.25 to 3.68) and about 2.85 (AOR=2.85, 95% CI 1.22 to 6.66) times higher among mothers who had delivered at health centres and hospitals, respectively, compared with those who had delivered at home. Likewise, EBT was twice higher (AOR=2.12, 95% CI 1.55 to 2.92) among respondents who had received postpartum home visits by the HEWs as compared with those who had received no postpartum home visits by the HEWs (table 4).

Table 4 Association of EBT with different characteristics of lactating mothers in Gidan District, North-East Ethiopia, 2021 (n=760)

Variables	EBT		COR (95% CI)	AOR (95% CI)
	Yes (n, %)	No (n, %)		
Age of the mother, years				
<20	19 (27)	55 (73)	1	1
20–25	77 (38.6)	120 (61.4)	1.86 (0.94 to 3.05)	1.48 (0.78 to 2.81)
26–30	147 (48)	159 (52)	2.68 (1.43 to 4.37)	2.31 (0.91 to 3.70)
>30	83 (45.4)	100 (54.6)	2.40 (1.24 to 4.04)	1.85 (0.95 to 3.63)
Educational status of the mother				
No formal education	189 (43.4)	246 (56.6)	1	1
Primary education	88 (37.8)	145 (62.2)	0.79 (0.57 to 1.09)	0.79 (0.56 to 1.12)
Secondary education and above	49 (57.3)	43 (42.7)	1.48 (0.94 to 2.33)	1.18 (0.71 to 1.96)
Parity				
Primipara	49 (33.1)	99 (66.9)	1	1
Multipara	277 (45.3)	335 (54.7)	1.67 (1.15 to 2.44)	1.17 (0.75 to 1.83)
Antenatal care				
Yes	293 (45.1)	357 (54.9)	1.92 (1.24 to 2.96)	1.75 (1.10 to 2.77)*
No	33 (30)	77 (70)	1	1
Place of delivery				
Hospital	22 (57.5)	18 (42.5)	3.40 (1.77 to 8.61)	2.85 (1.22 to 6.66)*
Health centre	283 (44.6)	349 (55.4)	2.59 (1.55 to 8.61)	2.15 (1.25 to 3.68)†
Home	21 (23.9)	67 (76.1)	1	1
Membership of WDA				
Yes	86 (55.1)	70 (44.9)	1.86 (1.26 to 2.57)	1.41 (0.96 to 2.07)
No	240 (39.8)	364 (60.2)	1	1
Received postpartum visit by HEW				
Yes	205 (54.5)	169 (45.5)	2.66 (1.93 to 3.49)	2.12 (1.55 to 2.92)†
No	121 (31.6)	265 (68.4)	1	1
Brest problem				
Yes	6 (28.6)	15 (71.4)	0.52 (0.2 to 1.36)	0.55 (0.20 to 1.51)
No	320 (43.3)	419 (66.7)	1	1
Residency				
Urban	94 (50.3)	93 (49.7)	1.49 (1.07 to 2.07)	1.41 (0.97 to 2.05)
Rural	232 (40.5)	341 (59.5)	1	1

Hosmer-Lemeshow goodness of fit (p=0.22), Multicollinearity test (VIF)=1.68.

*Significant at p<0.05

†Significant at p<0.01

AOR, adjusted OR; COR, Crude Odd Ratio; EBT, effective breastfeeding technique; HEW, health extension workers; VIF, Variance inflation factor; WDA, women development army.

DISCUSSION

EBT is the ideal way of promoting EBF. A baby who breast feeds effectively shows readiness for feeding and latches on deeply at the breast that satisfies the infant's nutritional requirements and maintains the mother's comfort.³⁴ This study aimed to determine the prevalence of EBT and identify associated factors among lactating mothers in Gidan District, North-East Ethiopia.

The prevalence of EBF was 42.9% (95% CI 39.4% to 46.4%), which implies that several infants in the study areas are suffering from the aftermaths of suboptimal

breastfeeding, such as malnutrition. This finding is in line with the studies conducted in India (43%) and Harar, Ethiopia (43.4%).^{21 35} However, the result of this study is higher than that of studies conducted in a West Bengal hospital, India (30.3%) and Ari District, southern Ethiopia (36.5%).^{9 19} The observed discrepancy might be due to the time gap between the studies. Since the former studies were conducted in 2013, in which there have been different strategies, including BFT counseling, promoting institutional delivery, and postpartum home visits by HEWs, that are presumed to improve maternal

practices in EBT.³⁶ The existence of some variability in the obstetric characteristics of participants between the studies could also be another reason for the above variation. For instance, the proportion of mothers who had ANC visits and received counselling during the ANC follow-up in this study was higher (75.4%) as compared with the study conducted in southern Ethiopia (59.2%), where having ANC visits and obtaining breastfeeding counselling service during the follow-up showed an improved practice of EBT.^{9 21} In light of this, the current promotion strategies to improve ANC follow-up and breast feeding should be strengthened to improve BFT and maintain the health of children.

On the other hand, the proportion of EBT in the current study is lower than in previous studies done in Gondar, North-West Ethiopia (48%), Libya (48%), the rural population of India (51%) and West Denmark (52%).^{7 17 18 20} The possible explanation might be the difference in the study setting, in which the former studies were based at health institutions that recruited mothers who came to the health facilities either for vaccination or PNC services. These populations are usually considered to have better health literacy and opportunities for breastfeeding counselling. In addition, the proportion of educated participants (secondary school and above) was lower (12.1%) in our study compared with the studies conducted earlier (in the rural populations of India (78.1%) and West Denmark (71.1%)). As a result, the prevalence of EBT may be lower than their findings.^{18 20} Although no association has been observed between the level of education and EBT practice in our study, several shreds of evidence indicate that the level of education impacts individuals' health literacy. It can also be an influencing factor for practising EBT.³⁷

Mothers who had ANC follow-up had higher odds of exhibiting EBT than their counterparts. The finding is consistent with studies conducted in South-East Nigeria.³⁸ Mothers who visit health institutions for ANC follow-up receive counselling about BFT that enhances their awareness, understanding and appreciation of the sequelae of IBT and further promotes their practice.^{9 39} Moreover, mothers who had ANC follow-up during pregnancy were more likely to have an institutional delivery that makes them lose the opportunity to receive postpartum breastfeeding counselling.^{9 21 40} Thus, strengthening the existing effort to improve ANC follow-up and institutional delivery would help improve breastfeeding practice beyond preventing life-threatening maternal and neonatal complications.

Likewise, the odds of EBT were 2.15 and 2.85 times higher among participants who had delivered at the health centre and hospital, respectively, as compared with mothers who had delivered at home. The finding is congruent with previous evidence from the Bhaktapur district of Nepal, and Harar, Ethiopia.^{35 41} Women who had delivered at health institutions might possibly have a better opportunity to receive counselling related to BFT immediately after delivery. That will further have a positive

impact on the mothers' BFT.³⁵ Furthermore, women who had delivered at home were usually less educated and had less access to health messages, which might impact healthy practices, including EBT.^{42 43}

Similarly, postpartum home visits by HEWs have a positive association with adopting EBT. The odds of having EBT was 2.12 times higher among mothers who had received postpartum home visits by HEWs compared with their counterparts. The possible reason could be that women who have received postnatal home visits by the HEW might get breastfeeding counselling and demonstration that will help mothers improve their attitude, knowledge and practice regarding BFT. Furthermore, women who receive postpartum home visits from HEWs may receive psychological support from the HEWs, which further promotes EBTs, as mothers' psychosocial well-being significantly impacts their care and practice towards their baby.^{44 45} The result is a call for action to further improve postnatal home visits to promote EBT and infant nutrition.

This finding shows more than half of lactating mothers are not practising EBT, which implies thousands of infants are receiving insufficient nutrients to maintain their growth and development. Therefore, it is crucial to counteract the problem by working on the mothers' skills in BFT.

The study had better strength in measuring the outcome. Since the outcome variable was computed by scores given by different observers, different measures, including delivering training and providing time to practise in a real environment before the data collection, were done to reduce measurement errors and interobserver variability.

On the other hand, this study was not without limitations. Even though all possible strategies such as using female data collectors, providing training for data collectors, employing pretest, using standardised tools, and securing privacy were applied, the study might not be free from bias due to introducing interobserver variability and the Hawthorne effect. In addition, using the HEWs registration book as a sampling frame may introduce selection bias as new lactating mothers might not get registered.

CONCLUSION

The study revealed that the prevalence of EBT was low. The finding highlights the importance of promoting utilisation of ANC follow-up, institutional delivery and postpartum home visits by HEWs, which play a substantial role in promoting EBT.

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Contributors DBA conceived the idea for this study, developed the proposal, supervised fieldwork, and was involved with the analysis, interpretation and writing of the manuscript. YAH and EGM assisted with the conception of the study, and were involved with the method development, analysis and interpretation of the findings. DZD and WDN participated in the analysis, and were involved with the

interpretation of the findings and writing of the manuscript. All the authors have read, revised and approved the final manuscript. DBA is acting as guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Consent obtained directly from patient(s).

Ethics approval This study involves human participants and was approved by the Institutional Review Board (IRB) of the University of Gondar, College of Medicine and Health Sciences, Institute of Public Health (Ref. No: IPH/142/2013). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All the data generated in this study are included in this manuscript. The data sets used and analysed to produce the current manuscript can be obtained from the corresponding author upon request.

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