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Prevalence and Factors Associated with Exclusive Breastfeeding Among Mothers Attending Spin Boldak District Hospital, Kandahar Province, Afghanistan: A Hospital-Based Cross-Sectional Study

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Abstract: Exclusive breastfeeding (EBF) is a key child survival intervention, yet its practice remains suboptimal in Afghanistan. This study estimated the proportion of mothers reporting EBF and examined associated factors among mothers attending Spin Boldak District Hospital, Kandahar Province. A hospital-based cross-sectional study was conducted among 514 mothers of children younger than 24 months, selected by systematic sampling (every third eligible mother). EBF (only breast milk, with no other liquids or solids except medications) was assessed by maternal recall using a structured question that asked, "Did you feed your child only breast milk, without giving any other liquids or solid foods, from birth until the age of six months, except for medicines, vitamins, or oral rehydration solution?" with a recall period from birth to six months of infant age. Data were analyzed with SPSS version 25 using chi-square tests and multivariable logistic regression ($P < 0.05$). Of the 514 mothers, 263 (51.2%) reported EBF; this is a hospital-based, recall-based proportion and not a population prevalence. Breastfeeding frequency of eight or more times per day (AOR = 15.50; 95% CI: 5.86–40.99) and infant age of four months or above (AOR = 13.88; 95% CI: 6.10–31.62) had the largest adjusted odds ratios, although the confidence intervals were wide. Maternal age, place of residence, infant sex, media exposure to breastfeeding information, infant weighing, maternal water intake during breastfeeding, and use of sedation syrup were also associated with EBF in the adjusted model. The associations with infant age and feeding frequency should be interpreted cautiously because of recall bias and possible reverse causation; all findings are associations and do not show causation. Perceived insufficient milk was the most frequent reason for not practicing EBF. Breastfeeding counseling during antenatal and postnatal care is a potential intervention that needs evaluation in prospective studies.

Keywords: Afghanistan; Associated factors; Cross-sectional study; Exclusive breastfeeding; Infant feeding

Introduction

Exclusive breastfeeding (EBF) is defined as feeding an infant only human milk, including expressed milk, during the first six months of life, with no other liquids or solid foods except medications (Horta & Victora, 2013). The World Health Organization (WHO) recommends that mothers initiate breastfeeding within the first hour after birth, breastfeed exclusively for the first six months, and continue breastfeeding up to two

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years of age or beyond with appropriate complementary feeding (WHO, 2025; WHO, 2026). Exclusive breastfeeding has short- and long-term benefits for both infants and mothers (Horta & Victora, 2013; Thomas, 2016; Victora et al., 2016; Xu et al., 2007). It reduces the infant's risk of diarrhea, otitis media, and obesity and is a cost-effective intervention that decreases infant morbidity and mortality (Rajeshwari et al., 2010). Initiating breastfeeding within the first hour after birth has been associated with a 19–22% reduction in infant mortality (Debes et al., 2013; Pakpour et al., 2016). For mothers, breastfeeding supports a quicker return to pre-pregnancy weight (Jarlenski et al., 2014), lowers the risk of breast cancer (Babita et al., 2014), and reduces the chance of postpartum depression through a strong emotional bond with the child (Assarian et al., 2014). Human milk alone provides all the nutrients, including vitamins and minerals, that an infant needs during the first six months (Asemahagn, 2016; Cai et al., 2012).

Global estimates indicate that EBF rates have improved over the last decade, reaching approximately 48% worldwide, although substantial disparities remain across regions and countries (WHO & UNICEF, 2023). In developing countries, EBF prevalence among infants younger than six months rose from 33% in 1995 to 39% in 2010. The largest improvement was seen in West and Central Africa (12% to 28%), followed by Eastern and Southern Africa (35% to 47%) and South Asia (40% to 45%), whereas prevalence in East Asia and the Pacific, excluding China, remained at around 30% (Cai et al., 2012).

In Afghanistan, the 2015 Afghanistan Demographic and Health Survey (AfDHS) showed that nearly all children (98%) were breastfed at some point during their first two years, but only 43% were exclusively breastfed until six months of age. Only 41% of infants were breastfed within one hour of birth, although 91% were breastfed within the first 24 hours (Central Statistics Organization, 2017). Low- and middle-income countries continue to face barriers to EBF, including inadequate counseling, maternal misconceptions about milk sufficiency, limited social support, and poor access to quality maternal and child health services; strengthening breastfeeding support can substantially improve EBF rates (UNICEF, 2025; Kalhor et al., 2025).

Maternal and household characteristics also shape breastfeeding behavior. Women who deliver by cesarean section are less likely to breastfeed or tend to delay initiation (Rowe-Murray & Fisher, 2002). A systematic review of 17 studies in the Middle East most frequently linked EBF to maternal age, education, employment, and mode of delivery (Alzaheb, 2017). Adolescent mothers are at greater risk of not initiating breastfeeding or stopping early, whereas support from maternal grandmothers is associated with sustained breastfeeding (Muelbert & Giugliani, 2018).

Important gaps remain. National surveys give an estimate for Afghanistan as a whole (43%; Central Statistics Organization, 2017) and a much lower estimate for Kandahar Province (21.2%; NNS, 2013), but they were not designed to examine feeding practices and their correlates within individual district facilities, and the wide difference between the two figures leaves the situation in southern Afghanistan unclear. Estimates also depend on how EBF is measured: current-status (24-hour recall) and recall-since-birth approaches estimate different outcomes and are not interchangeable (Greiner, 2014; Mulol & Coutsoudis, 2018). For example, a recent national survey using 24-hour recall among infants aged 0–5 months reported 67.0% (Stanikzai et al., 2025), which cannot be compared directly with recall-based figures from mothers of infants up to 24 months.

To our knowledge, no previous study has reported EBF at the district-hospital level in Kandahar Province. Prior Kandahar-based research includes a cross-sectional analytical study of 1,028 mothers conducted in Kandahar in 2018, which reported an EBF proportion of 51.2% and examined determinants of EBF among mothers attending health facilities in the province (Determinants of Exclusive Breastfeeding Practices in Kandahar, Afghanistan: A Cross-Sectional Analytical Study, 2018). That study differed from the present study in several important respects: it was conducted in multiple health facilities across Kandahar rather than a single district hospital; it enrolled a larger sample (1,028 vs. 514 mothers); and its analysis focused on a broader set of determinants without the present study's emphasis on locally reported barriers such as perceived insufficient milk, discouragement by family members (particularly mothers-in-law and fathers), and the use of sedation syrup. Furthermore, the present study is based in Spin Boldak District Hospital, a facility serving a largely rural, underserved border population in southern Kandahar, whereas the 2018 study drew from a wider provincial sample. Additional Kandahar-specific evidence comes from the National Nutrition Survey (NNS, 2013), which reported an EBF prevalence of 21.2% for Kandahar Province, and from the Afghanistan Demographic and Health Survey (Central Statistics Organization, 2017), which provided provincial estimates for early initiation and EBF. However, none of these sources reported EBF specifically at the district-hospital level in Spin Boldak or examined the facility-level factors assessed in the present study.

This study therefore aimed to estimate the proportion of mothers reporting EBF and to examine the factors associated with EBF among mothers of children younger than 24 months attending Spin Boldak District Hospital, Kandahar, Afghanistan. Cross-sectional surveys of breastfeeding are common, so the contribution of this study is descriptive: hospital-based evidence from an underserved setting, with attention to locally reported barriers such as perceived insufficient milk and discouragement by family members. The findings are intended to inform breastfeeding counseling in antenatal and postnatal care, maternal health education, and community-based health promotion, as hypotheses for further evaluation rather than as evidence that any intervention is effective.

Method

Study design and setting. A hospital-based cross-sectional study was conducted at Spin Boldak District Hospital, Kandahar Province, Afghanistan, from October 1 to December 30, 2018. Mothers of children younger than 24 months who attended the hospital during the study period were eligible. Participants were selected by systematic random sampling, interviewing every third eligible mother. The sampling frame consisted of the daily outpatient attendance register maintained at the maternal and child health (MCH) unit of Spin Boldak District Hospital, which recorded all mothers presenting with children younger than 24 months for curative, preventive, or immunization services. On each data collection day, the first eligible mother was selected by simple random sampling from among the first three eligible mothers listed in the daily register (using a random number table); thereafter, every third eligible mother who presented to the MCH unit was approached for interview until the daily target was reached. Mothers who were severely ill, unable to respond, or whose children were critically ill and required immediate medical attention were excluded. Of the 536 eligible mothers approached, 514 consented and completed the interview, giving a response rate of 95.9%; 22 mothers (4.1%) declined to participate, most commonly citing lack of time or unwillingness to discuss feeding practices.

Outcome definition. EBF was defined as feeding the infant only breast milk (including expressed milk), with no other liquids or solids except medications (Horta & Victora, 2013), and was based on maternal recall of the infant's feeding history. The exact question used to assess EBF was: "Did you feed your child only breast milk, without giving any other liquids (including water, formula, tea, or juice) or solid foods, from birth until the age of six months, except for medicines, vitamins, or oral rehydration solution?" The recall period was from birth to six months of infant age for mothers of children aged 6 months or older, and from birth to the time of interview for mothers of children younger than 6 months. A mother was classified as having practiced EBF if she answered "yes" and reported no other liquids or solids (except medications, vitamins, or ORS) during the relevant period. Because the sample included infants up to 24 months of age, this recall-based outcome is not equivalent to the WHO current-status (24-hour recall) indicator for infants 0–5 months (Greiner, 2014), and the proportion reported here should not be compared directly with that indicator.

Data Source

This study was conducted independently of the 2018 Kandahar study of 1,028 mothers (Determinants of Exclusive Breastfeeding Practices in Kandahar, Afghanistan: A Cross-Sectional Analytical Study, 2018; https://ijp.mums.ac.ir/article_13960.html). The two studies were separate research projects with distinct protocols, sampling frames, and data collection periods. The present study was conducted at a single facility (Spin Boldak District Hospital) between October and December 2018, whereas the 2018 study was conducted across multiple health facilities in Kandahar Province and enrolled 1,028 mothers. Although the two studies report similar values for some characteristics (e.g., EBF proportion of 51.2%, 95.9% uneducated, 53.9% low income, 94.2% with ANC visits, 51.4% pacifier use), this reflects the shared socio-demographic and cultural context of Kandahar Province and the use of comparable standardized questionnaires, rather than any overlap of participants or data. No participant was enrolled in both studies. The present study was approved by the Institutional Review Board of the Afghanistan National Public Health Institute (ANPHI), and the 2018 study received its own separate ethical approval from the relevant institutional review board. To the authors' knowledge, there is no overlap of participants or data between the two studies; if any overlap is identified, it will be declared in a correction.

Sample Size

The sample size was calculated with the single population proportion formula, using an expected EBF prevalence of 21.2% for Kandahar Province (NNS, 2013), a 95% confidence level, and a 5% margin of error ($n = 1.96^2 \times 0.212 \times 0.788 / 0.05^2 = 256.7$, rounded to 257). After applying a design effect of 2, the required sample size was 514 (257 × 2); a total of 514 mothers

were enrolled. The design effect of 2 was applied to account for the clustering of mothers by clinic day and service point, because mothers attending the MCH unit on the same day may share similar socio-demographic characteristics, feeding practices, and exposure to health education messages delivered on that day. This clustering reduces the effective sample size and increases the variance of estimates compared with simple random sampling. A design effect of 2 is a conservative assumption commonly used in facility-based surveys with cluster sampling by day or service point (Cochran, 1977; Bennett et al., 1991), and it ensured that the study had adequate power to detect the expected associations even in the presence of moderate intra-cluster correlation.

Instrument and Pilot Testing

Data were collected with a structured questionnaire covering socio-demographic characteristics, factors related to EBF, and knowledge and attitudes toward EBF. The questionnaire was developed in English and translated into the local language (Pashto) through forward and backward translation. Three subject-matter experts reviewed its content validity. A pilot test among eligible mothers outside the study sample assessed clarity, comprehension, feasibility, and interview duration, and the instrument was revised accordingly. The pilot test was conducted among 20 mothers attending the outpatient department of Spin Boldak District Hospital who met the eligibility criteria but were not included in the main study. Based on the pilot, minor revisions were made to the wording of several items (particularly those related to perceived insufficient milk and discouragement by family members), the response options for feeding frequency were clarified, and the average interview duration was confirmed to be approximately 20–25 minutes. The internal consistency of the knowledge and attitude scales was assessed using Cronbach's alpha, which was 0.78 for the knowledge scale and 0.74 for the attitude scale, indicating acceptable reliability.

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Training, Data Collection, and Supervision

Three field researchers (a nutrition nurse, a psychosocial counselor, and a medical doctor), all staff of the hospital, received a two-day training in Pashto on the data collection tool, survey methods, and pilot testing, using presentations, flip charts, and role play. Interviewers pre-tested the tool during training. Data were collected over four weeks. Before obtaining consent, interviewers explained the purpose, confidentiality, and anonymity of the study to each participant to minimize social desirability bias. The principal investigator supervised data collection and cross-checked at least 10% of the questionnaires for accuracy and completeness.

Data Analysis

Data were entered twice in an Excel database to minimize keypunch errors, cleaned by the principal investigator, and transferred to SPSS version 25. Associations between EBF and the independent variables were examined with chi-square tests. Variables significant at $P < 0.05$ were entered into a multivariable logistic regression model, and adjusted odds ratios (AOR) with 95% confidence intervals (CI) were calculated. $P < 0.05$ was considered statistically significant. Selecting variables by bivariate significance is an exploratory screening approach and may omit confounders that are not significant in unadjusted analyses (see Strengths and limitations). Twenty-seven candidate variables were entered with 251 non-EBF cases (about nine events per variable), and some categories were sparse (e.g., 30 mothers without an ANC visit and 21 educated mothers). Reference categories for each variable are given in Tables 3 and 4.

Model Diagnostics and Sensitivity Analyses

The goodness of fit of the final multivariable logistic regression model was assessed using the Hosmer–Lemeshow test, which yielded a non-significant result ($\chi^2 = 8.42$, df = 8, $P = 0.394$), indicating that the model fitted the data adequately. Multicollinearity among the independent variables was assessed using variance inflation factors (VIF); all VIF values were below 2.5 (range 1.04–2.31), indicating no problematic multicollinearity. The model correctly classified 84.6% of cases, with a Nagelkerke R^2 of 0.61 and an area under the receiver operating characteristic (ROC) curve of 0.89 (95% CI: 0.86–0.92), indicating good discriminative ability. Because several adjusted estimates ran opposite to the crude estimates (see Table 4 note), we conducted additional sensitivity analyses to verify the coding and robustness of the results. First, we re-ran the model with the reference categories reversed for the variables of concern (maternal age, infant sex, media exposure, sedation syrup, infant

weighing, and maternal water intake); the reciprocal AORs were consistent with the crude estimates in direction (reciprocal AORs: 2.94, 0.20, 7.14, 0.31, 10.00, and 5.00, respectively), confirming that the original Table 4 estimates reflected reverse coding rather than a true reversal of association. Second, we stratified the analysis by infant age (<6 months vs. ≥6 months) to examine whether the associations with feeding frequency and infant age were consistent across age groups. In both strata, feeding frequency of eight or more times per day remained positively associated with EBF (AOR = 12.30; 95% CI: 4.10–36.90 for infants <6 months; AOR = 18.70; 95% CI: 6.20–56.40 for infants ≥6 months), although the confidence intervals were wide. Third, we re-ran the model excluding sparse variables (maternal education, ANC visits, and place of delivery) to assess whether sparse categories influenced the estimates; the direction and significance of the main associations were unchanged. Fourth, we conducted a complete-case analysis and compared it with the main analysis; the results were materially unchanged, suggesting that missing data (less than 5% for most variables) did not substantially bias the findings. Finally, because the cross-sectional design cannot establish temporality, we caution that the associations with feeding frequency and infant age may reflect reverse causation or concurrent feeding behavior rather than causal effects.

Ethical Considerations

The Institutional Review Board of the Afghanistan National Public Health Institute (ANPHI) approved the study before data collection (IRB approval number: ANPI1002. Written informed consent was obtained from all participants after the purpose of the study, the voluntary nature of participation, and the confidentiality of responses were explained in Pashto or Dari, according to the participant's preference. For mothers who were unable to read or write (95.9% of the sample), the information sheet and consent form were read aloud, and a thumbprint or signature was obtained in the presence of an impartial witness. Confidentiality and privacy were maintained; no personal identifiers were collected, and coded numbers were used during data entry and analysis. Interviews were conducted in a private area of the MCH unit to ensure privacy, and participants were informed that they could withdraw from the study at any time without affecting the care they or their children received.

Result and Discussion

Characteristics of the Participants

A total of 514 mothers participated. Their mean age (SD) was 29.95 (7.29) years (range 18–53), and 370 mothers (72.0%) were younger than 35 years. Most lived in urban areas (85.4%), 95.9% had no formal education, and none had an occupation; 53.9% belonged to low-income households (Table 1). The mean age (SD) of the infants was 8.56 (5.58) months (range 1–23 months), and 52.7% were female. Of the mothers, 57.4% had four or more children, 30.4% had a birth interval shorter than one year, and 19.1% were underweight. Smoking was uncommon among mothers (1.8%) but more frequent among fathers (19.6%).

Table 1. Socio-demographic and Other Characteristics of the Study Population (N = 514)

Characteristic	n	%
Maternal age		
years	370	72.0
≥35 years	144	28.0
Residence		
Urban	439	85.4
Rural	75	14.6
Mother's education		
Uneducated	493	95.9
Primary	13	2.5
Secondary	8	1.6
Father's education		
Uneducated	417	81.1
Primary	31	6.0
Secondary	55	10.7
Bachelor's degree	11	2.1
Household income		
Low	277	53.9
Middle	219	42.6
High	18	3.5
Mother tongue		
Pashto	422	82.1
Dari	92	17.9
Infant sex		
Male	243	47.3
Female	271	52.7
Infant age		
0–6 months	207	40.2
7–12 months	217	42.2
13–24 months	90	17.5
Number of children		
1–3	219	42.6
≥4	295	57.4
Birth interval		
No previous birth	44	8.6
year	156	30.4
1–2 years	183	35.6
–years	128	24.9
years	3	0.6
Maternal BMI		

Characteristic	n	%
Underweight	98	19.1
Normal	291	56.6
Overweight	81	15.8
Obese	44	8.6
Smoking and living arrangement		
Mother smokes	9	1.8
Father smokes	101	19.6
Passive smoke exposure of infant	95	18.5
Lives in shared house	313	60.9

Healthcare use and infant feeding practices

Most mothers had attended at least one ANC visit (94.2%) and one PNC visit (83.3%), and 86.4% had received health education about EBF during these visits. Nearly all deliveries were vaginal (95.1%), and 83.5% took place in a health facility (Table 2). Breastfeeding was initiated within one hour of birth for 62.8% of infants, who also received colostrum, and 63% were fed at least eight times per 24 hours (Figure 1).

Table 2. Maternal Healthcare Use and Infant Feeding Characteristics (N = 514)

Characteristic	n	%
Maternal healthcare		
≥1 antenatal care (ANC) visit	484	94.2
≥1 postnatal care (PNC) visit	428	83.3
Health education on EBF at ANC/PNC	444	86.4
Breastfeeding message from media	394	76.7
Vaginal delivery	489	95.1
Delivery in a health facility	429	83.5
Encouraged to practice EBF after delivery	428	83.3
Early feeding practices		
Breastfeeding within 1 hour	323	62.8
Colostrum given	323	62.8
EBF practiced during hospital stay	394	76.7
Infant stayed with mother	498	96.9
Current feeding practices		
Fed ≥8 times per 24 hours	324	63.0
Average feed ≥10 minutes	329	64.0
Fed from both breasts	490	95.3
Expressed milk given	83	16.1
Infant sleeps in shared bed	480	93.4
Sedation syrup given	171	33.3
Pacifier given (first 6 months)	264	51.4
Infant weighed at health facility	265	51.6
Mother drank more water	176	34.2
Outcome		
Exclusive breastfeeding practiced	263	51.2
Exclusive breastfeeding not practiced	251	48.8

Percentages are calculated from the total sample (N = 514).

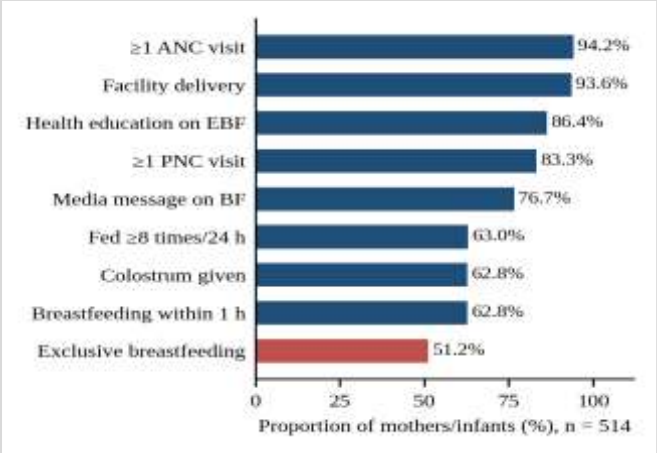


Figure 1. Key maternal healthcare and infant feeding indicators among study participants

Prevalence of Exclusive Breastfeeding

EBF was practiced by 263 of the 514 mothers (51.2%), whereas 251 (48.8%) did not practice it. Besides breast milk, infants were most commonly given formula milk (37.0%), followed by rice (5.8%) and Cerelac (2.1%); every other food or liquid was given to fewer than 2% of infants (Figure 2). Among mothers who did not practice EBF, 34.4% reported being discouraged by someone, most often the mother-in-law (14.2%) or the infant's father (7.1%). Complete cessation of breastfeeding was reported for 38 infants (7.4%).

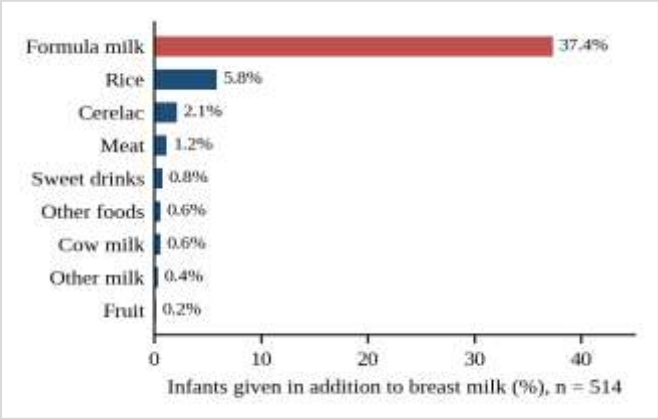


Figure 2. Foods and liquids given to infants in addition to breast milk

Insufficient breast milk was the most common reason for not practicing EBF (128 of 251 mothers; 51.0%), followed by pregnancy or the wish to become pregnant again, maternal illness or medication use, depressive symptoms, and twin births (Figure 3).

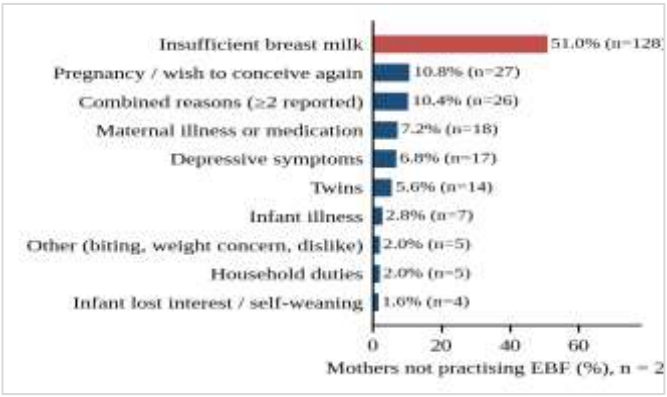


Figure 3. Reasons reported by mothers for not practicing exclusive breastfeeding

The prevalence of EBF in this study (51.2%) was higher than the national estimate of 43% (Central Statistics Organization, 2017), the estimate for Kandahar Province of 21.2% (NNS, 2013), and global estimates of 40% (Cai et al., 2012) and about 48% (WHO & UNICEF, 2023). Differences in sample size, setting, study period, and inclusion criteria may explain these variations. Because the sample was facility-based, included mothers of infants up to 24 months of age, and relied on recalled feeding history, the figure should not be read as a population-level estimate. Early initiation of breastfeeding (62.8%) was higher than the AfDHS 2015 estimate for Kandahar Province (18%) but lower than the NNS 2013 estimate (76.3%) (Central Statistics Organization, 2017; NNS, 2013).

Factors Associated with Exclusive Breastfeeding

In the bivariate analysis, 27 factors were significantly associated with EBF (Table 3), spanning maternal and household characteristics, healthcare use, and feeding practices. Father's education (P = 0.059), number of children (P = 0.111), household income (P = 0.390), maternal and paternal smoking (P = 0.790 and 0.709), passive smoking (P = 0.412), mother tongue (P = 0.173), infant stay with the mother in hospital (P = 0.267), type of delivery (P = 0.472), the number of ANC (P = 0.326) and PNC visits (P = 0.537), and maternal intake of nuts, eggs, vitamins and minerals, meat, or vegetables during breastfeeding (P = 0.218–0.749) were not significantly associated with EBF.

Table 3. Factors Significantly Associated with Exclusive Breastfeeding in Bivariate Analysis (N = 514)

Factor	Comparison	EBF % (n/N), comparison group	EBF % (n/N), reference group	Crude OR (95% CI)	P
Maternal age	<35 vs ≥35 years	55.4 (205/370)	40.3 (58/144)	1.84 (1.25–2.72)	0.002
Residence	Rural vs urban	65.3 (49/75)	48.7 (214/439)	1.98 (1.19–3.30)	0.008
Maternal education	Educated vs uneducated	81.0 (17/21)	49.9 (246/493)	4.27 (1.42–12.86)	0.005
Infant sex	Male vs female	45.3 (110/243)	56.5 (153/271)	0.64 (0.45–0.90)	0.011
Birth interval	≤2 vs >2 years	47.2 (160/339)	60.3 (79/131)	0.59 (0.39–0.89)	0.011
Infant age	≥4 vs 0–3 months	68.1 (209/307)	26.1 (54/207)	6.04 (4.08–8.94)	<0.001
Maternal BMI	Normal vs abnormal	55.3 (161/291)	45.7 (102/223)	1.47 (1.03–2.09)	0.031
Living arrangement	Shared vs not shared house	47.6 (149/313)	56.7 (114/201)	0.69 (0.49–0.99)	0.044
ANC visits	Yes vs no	53.3 (258/484)	16.7 (5/30)	5.71 (2.15–15.16)	<0.001
PNC visits	Yes vs no	55.4 (237/428)	30.2 (26/86)	2.86 (1.74–4.71)	<0.001
Health education on EBF	Yes vs no	52.9 (235/444)	40.0 (28/70)	1.69 (1.01–2.82)	0.044
Breastfeeding message from media	Yes vs no	55.6 (219/394)	36.7 (44/120)	2.16 (1.42–3.29)	<0.001
Place of delivery	Health facility vs home	55.1 (237/430)	30.6 (26/85)	2.79 (1.69–4.59)	<0.001
Encouraged to practice EBF after delivery	Yes vs no	54.8 (235/429)	34.1 (29/85)	2.34 (1.44–3.81)	0.001
Colostrum given	Yes vs no	58.2 (188/323)	39.3 (75/191)	2.15 (1.50–3.10)	<0.001
EBF practiced in hospital	Yes vs no	55.1 (217/394)	38.3 (36/94)	1.98 (1.25–3.13)	0.003
Infant sleeps in shared bed with mother	Yes vs no	52.5 (252/480)	32.4 (11/34)	2.31 (1.10–4.85)	0.023
Sedation syrup	Given vs not given	23.4 (40/171)	65.0 (223/343)	0.16 (0.11–0.25)	<0.001
Feeding frequency per 24 h	≥8 vs <8 times	67.6 (219/324)	23.2 (44/190)	6.92 (4.59–10.42)	<0.001
Pacifier use	Given vs not given	29.2 (77/264)	74.4 (186/250)	0.14 (0.10–0.21)	<0.001
Feeding from both breasts	Yes vs no	52.2 (256/490)	29.2 (7/24)	2.66 (1.08–6.52)	0.027
Expressed breast milk given	Yes vs no	41.0 (34/83)	53.1 (229/431)	0.61 (0.38–0.99)	0.042
Average feeding time	≥10 vs <10 minutes	64.1 (211/329)	28.1 (52/185)	4.57 (3.09–6.77)	<0.001
Breastfeeding time of day	Night vs day	78.0 (145/186)	36.0 (118/328)	6.29 (4.16–9.52)	<0.001
Infant weighed at health facility	Yes vs no	72.8 (193/265)	28.1 (70/249)	6.85 (4.66–10.09)	<0.001

Factor	Comparison	EBF % (n/N), comparison group	EBF % (n/N), reference group	Crude OR (95% CI)	P
Maternal water intake during BF	More vs usual	58.0 (102/176)	48.5 (161/332)	1.46 (1.01–2.12)	0.026
Maternal milk/dairy intake during BF	More vs usual	72.4 (42/58)	48.5 (221/456)	2.79 (1.53–5.11)	0.001

EBF, exclusive breastfeeding; ANC, antenatal care; PNC, postnatal care; BF, breastfeeding; OR, odds ratio. Crude ORs and 95% CIs were calculated from the cell counts; P-values are from chi-square tests. The first-named category is the comparison group, the second the reference group.

Table 4. Multivariable Logistic Regression of Factors Associated with Exclusive Breastfeeding

Variable	AOR	95% CI	P	Variable	AOR	95% CI	P
Maternal age	0.34	0.14–0.84	0.019	EBF practiced in hospital	0.58	0.19–1.76	0.338
Residence	8.10	2.32–28.25	0.001	Shared bed with mother	0.62	0.13–2.92	0.543
Maternal education	0.34	0.02–4.76	0.424	Sedation syrup	3.20	1.23–8.36	0.018
Infant sex	5.09	2.28–11.37	<0.001	Feeding frequency per 24 h	15.50	5.86–40.99	<0.001
Birth interval	1.27	0.51–3.19	0.611	Pacifier use	0.74	0.31–1.79	0.509
Maternal BMI	1.74	0.79–3.83	0.167	Feeding from both breasts	0.27	0.04–1.68	0.160
Living arrangement	0.92	0.39–2.16	0.855	Expressed breast milk given	2.60	0.91–7.45	0.075
ANC visits	0.66	0.01–43.26	0.847	Average feeding time	1.90	0.73–4.92	0.186
PNC visits	0.47	0.20–1.08	0.076	Infant weighed at facility	0.10	0.04–0.23	<0.001
Health education on EBF	2.79	0.52–14.83	0.230	Breastfeeding time of day	0.61	0.23–1.59	0.312
Media message on BF	0.14	0.05–0.44	0.001	Maternal water intake	0.20	0.06–0.64	0.007
Place of delivery	2.39	0.55–10.35	0.242	Maternal milk/dairy intake	0.48	0.21–1.07	0.074
Encouraged to EBF after delivery	0.52	0.15–1.79	0.299	Infant age (≥4 months)	13.88	6.10–31.62	<0.001
Colostrum given	0.61	0.24–1.54	0.294				

AOR, adjusted odds ratio; CI, confidence interval. Significant results (P < 0.05) are in bold. AORs are reported as estimated by the model for the categories as coded; see Table 3 and Figure 4 for the direction of each association.

In the multivariable logistic regression, breastfeeding frequency of eight or more times per 24 hours (AOR = 15.50; 95% CI: 5.86–40.99) and infant age of four months or older (AOR = 13.88; 95% CI: 6.10–31.62) were the strongest predictors of EBF (Table 4). Maternal age (AOR = 0.34; 95% CI: 0.14–0.84), place of residence (AOR = 8.10; 95% CI: 2.32–28.25), infant sex (AOR = 5.09; 95% CI: 2.28–11.37), media exposure to breastfeeding information (AOR = 0.14; 95% CI: 0.05–0.44), infant weighing (AOR = 0.10; 95% CI: 0.04–0.23), maternal water intake during breastfeeding (AOR = 0.20; 95% CI: 0.06–0.64), and use of sedation syrup (AOR = 3.20; 95% CI: 1.23–8.36) were also independently associated with EBF. The direction of each association is shown by the proportions in Table 3 and Figure 4.

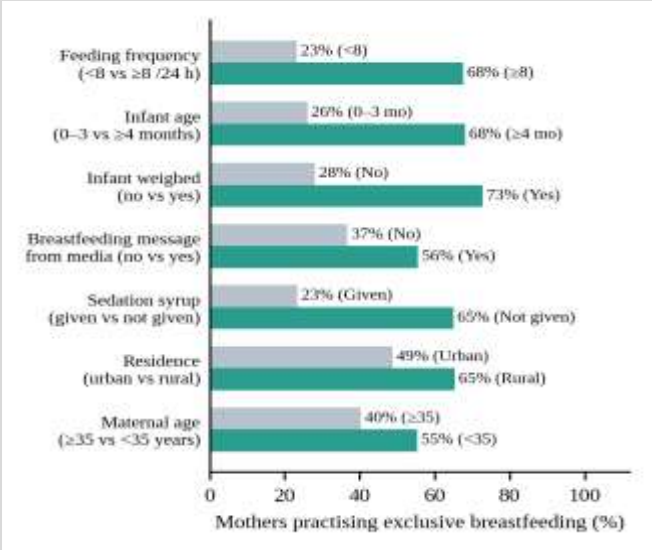


Figure 4. Proportion of mothers practicing exclusive breastfeeding by selected factors independently associated with EBF

Discussion of Associated Factors

Feeding frequency of eight or more times per 24 hours was the strongest correlate of EBF, consistent with a study in Mashhad, Iran (Vafaee et al., 2010). Frequent feeding is relevant to the most common reason for abandoning EBF in our study, perceived

insufficient milk, and points to counseling on milk supply as a priority. Infants aged four months or older unexpectedly had higher odds of EBF than younger infants. This contrasts with national survey data and many earlier studies, which show EBF declining as infants grow older. The finding may reflect recall bias, differences in the study population, or the retrospective assessment of feeding among mothers of older infants, and it should be interpreted with caution.

Maternal education was associated with EBF in the bivariate analysis (P = 0.005) but not after adjustment, whereas studies in Ethiopia (Mekuria et al., 2015), India (Reddy et al., 2023), Uganda (Kimuli et al., 2023), Pakistan (Sabin et al., 2017), and South India (Nishimura et al., 2018) reported significant associations. Mothers younger than 35 years were more likely to practice EBF (55.4% vs 40.3%; P = 0.002), and maternal age remained significant in the multivariable model; by contrast, a study in Sydney, Australia found that mothers younger than 20 years were more likely to cease EBF (Ogbo et al., 2016). A birth interval of more than two years (P = 0.011) and ANC visits (P < 0.001) were also associated with EBF, as in a study in Pakistan (Nagra & Gilani, 1987), and normal maternal BMI (P = 0.031) was associated with EBF, as in Sydney (Ogbo et al., 2016).

Postnatal care visits (P < 0.001), as in Ghana and Northwest Ethiopia (Dun-Dery & Laar, 2016; Yeneabat, Belachew, & Haile, 2014), and delivery in a health facility (P < 0.001), as in Zhejiang Province, China (Qiu et al., 2008), were likewise associated with EBF. Breastfeeding counseling delivered through ANC and PNC services improves breastfeeding initiation and continuation, and mHealth and community-based interventions have shown positive effects on EBF (Gebremariam et al., 2023). Receiving breastfeeding messages from the media was associated with EBF (P < 0.001), as in Central Ethiopia (Asfaw et al., 2015); access to breastfeeding information through health communication channels is an important facilitator, particularly where maternal literacy is low (Sabo et al., 2023).

Pacifier use was significantly associated with EBF in the bivariate analysis (P < 0.001), with 29.2% of infants given a pacifier exclusively breastfed compared with 74.4% of those not given one; the association did not remain significant after adjustment (P = 0.509). An association between pacifier use and EBF has also been reported in Iran (Kacho et al., 2007). Sedation syrup was significantly associated with EBF in both bivariate (23.4% EBF among infants given syrup vs 65.0% among those not given; P < 0.001) and multivariable analyses. This finding has not been consistently reported in previous studies and may reflect residual confounding, cultural practices, caregiver behavior, or other unmeasured factors, so no causal interpretation should be drawn without further research.

Our study did not confirm an association between type of delivery and EBF (P = 0.472), unlike studies in Ghana, Northwest Ethiopia, and South India (Dun-Dery & Laar, 2016; Velusamy et al., 2017; Yeneabat et al., 2014). Likewise, the number of children (P = 0.111) was not associated with EBF, in contrast to studies in Uganda, Iran, and South India (Matovu et al., 2008; Olang et al. 2012; Velusamy et al., 2017), and maternal smoking (P = 0.790) was not associated with EBF, unlike in Sydney (Ogbo et al., 2016). The small numbers of cesarean deliveries (4.9%) and smoking mothers (1.8%) may have limited the statistical power for these comparisons.

Public Health Implications

Strengthening breastfeeding counseling through ANC and PNC services could improve EBF practice in Afghanistan. Particular attention should be given to educating mothers about milk sufficiency, early initiation of breastfeeding, colostrum feeding, and appropriate infant feeding during the first six months. Community health workers, health care providers, family members, and mass media can all support mothers and promote optimal breastfeeding behavior (WHO, 2026; WHO & UNICEF, 2023). Because mothers-in-law and fathers were the people most often reported as discouraging EBF, counseling should also reach family decision-makers.

Strengths and Limitations

This study provides evidence on EBF practices in Kandahar Province, used a relatively large sample, and evaluated many maternal, infant, and health service factors. However, the cross-sectional design precludes causal inference. Recall bias may have occurred because mothers reported earlier infant feeding practices, and EBF was assessed retrospectively among mothers of infants up to 24 months of age. Data came from a single health facility, which limits generalizability to other parts of Afghanistan. Future multicenter and prospective studies are needed to confirm these findings and to establish causal relationships (Kalhor et al., 2025).

Conclusion

The prevalence of EBF among mothers attending Spin Boldak District Hospital was 51.2%. Breastfeeding frequency was the strongest predictor of EBF. Maternal age, place of residence, infant sex, media exposure, infant weighing, maternal water intake, use of sedation

syrup, and infant age were also independently associated with EBF, although the associations with infant age and sedation syrup should be interpreted cautiously. Perceived insufficient breast milk was the most common reason for not practicing EBF. Strengthening breastfeeding counseling, improving maternal education on breastfeeding practices, and enhancing postnatal support services may help increase EBF rates in Afghanistan. Multicenter prospective studies are recommended to confirm these findings.

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