



KNOWLEDGE, ATTITUDES, AND ASSOCIATED FACTORS TOWARD BREASTFEEDING AMONG MOTHERS WITH INFANTS LESS THAN 24 MONTHS ATTENDING PRIMARY HEALTH CARE CENTERS IN BASRA, IRAQ: A CROSS- SECTIONAL STUDY

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ABSTRACT

Background: Breastfeeding is fundamental to infant health and development; however, exclusive breastfeeding (EBF) remains suboptimal in Iraq and other Arab countries. Understanding maternal knowledge, attitudes, and factors influencing breastfeeding practices is important for developing effective interventions. **Objective:** To assess breastfeeding knowledge and attitudes among mothers of infants aged ≤ 24 months attending primary health care centers (PHCCs) in Basra Governorate and identify factors associated with EBF. **Methods:** A cross-sectional study was conducted in five PHCCs in Basra from October 2024 to March 2025. Using systematic random sampling, 320 mothers were recruited. A validated bilingual questionnaire assessed sociodemographic and obstetric characteristics, breastfeeding knowledge, attitudes, and EBF practices. Data were analyzed using Chi-square tests and binary logistic regression. **Results:** Participants had a mean age of 27.4 ± 5.8 years. Good breastfeeding knowledge was observed in 54.4%, positive attitudes in 71.3%, and EBF for six months in 48.4%. Higher maternal education (AOR=2.71), breastfeeding counseling (AOR=3.08), vaginal delivery (AOR=1.94), and multiparity (AOR=1.68) were independently associated with EBF. Urban residence was not statistically significant (AOR=1.52, 95% CI: 0.93–2.49). **Conclusion:** EBF remains suboptimal among mothers attending PHCCs in Basra. Strengthening antenatal and postnatal breastfeeding counseling, particularly for less-educated mothers and those undergoing cesarean delivery, may improve EBF practices.

KEYWORDS: Breastfeeding; exclusive breastfeeding; knowledge; attitudes; primary health care; Basra; Iraq; cross-sectional study.

INTRODUCTION

Breastfeeding is widely recognized as the optimal form of infant nutrition and an important intervention for improving maternal and child health. Human milk provides an appropriate balance of nutrients and bioactive components required for growth, immune development, and neurodevelopment during early life. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend initiation of breastfeeding within the first hour after birth, exclusive breastfeeding (EBF) for the first six months of life, and continued breastfeeding with appropriate complementary feeding for up to two years or

beyond.^[1,2] EBF refers to feeding an infant only breast milk, without additional food or liquids, including water, except for necessary medicines or nutritional supplements. These recommendations are supported by evidence demonstrating important short- and long-term health benefits of breastfeeding.^[3] Breastfeeding protects infants against common childhood illnesses, particularly gastrointestinal and respiratory infections, while contributing to healthy growth and development. It is also associated with benefits extending beyond infancy, including favorable developmental and metabolic outcomes.^[3] For mothers, breastfeeding provides additional health benefits and represents a cost-effective

feeding strategy for families and health systems. Nevertheless, breastfeeding practices remain below recommended levels in many populations. The 2023 Global Breastfeeding Scorecard reported that approximately 48% of infants younger than six months were exclusively breastfed globally, demonstrating substantial progress but also persistent gaps in achieving optimal breastfeeding practices.^[2] The challenge is particularly relevant in Arab countries, where EBF prevalence remains comparatively low. Regional data have demonstrated considerable variation in breastfeeding practices, reflecting differences in socioeconomic conditions, maternal employment, cultural beliefs, family influences, and access to appropriate breastfeeding support.^[4] Evidence from Iraq similarly indicates variation in breastfeeding knowledge and practices. Previous research in Basra has documented important deficiencies in infant feeding practices, emphasizing the continuing need for breastfeeding promotion within maternal and child health services.^[5,6] Breastfeeding behavior is influenced by a complex interaction of maternal knowledge, attitudes, previous experience, and social and healthcare factors. Maternal education, employment, parity, mode of delivery, family support, and professional breastfeeding counseling may influence breastfeeding initiation, exclusivity, and duration.^[7-10] In particular, cesarean delivery may interfere with early breastfeeding through delayed mother–infant contact and delayed initiation, while appropriate professional support can facilitate successful breastfeeding.^[10,11] Primary health care centers represent an important point of contact for providing antenatal and postnatal breastfeeding education. However, contemporary evidence concerning breastfeeding knowledge, attitudes, and associated factors among mothers attending PHCCs in Basra remains limited. Therefore, this study aimed to assess breastfeeding knowledge and attitudes among mothers with infants aged ≤ 24 months attending PHCCs in Basra Governorate and to identify sociodemographic and obstetric factors associated with exclusive breastfeeding practice.

METHOD

A facility-based cross-sectional descriptive and analytical study was conducted among mothers attending five primary health care centers (PHCCs) in Basra Governorate, Iraq: Al-Jumhuriyah, Al-Zubair, Abu Al-Khasib, Al-Qurna, and Shatt Al-Arab. Data were collected from October 2024 to March 2025. Eligible participants were mothers aged ≥ 15 years, residing in Basra for at least six months, with an infant aged ≤ 24 months, who provided written informed consent. Mothers with medical contraindications to breastfeeding, those whose infants had congenital conditions preventing normal feeding, and those who declined participation were excluded. The sample size was calculated using the single-population proportion formula, assuming an exclusive breastfeeding (EBF) prevalence of 55%, a

5.5% margin of error, and a 95% confidence level. After allowing for non-response, 330 mothers were targeted, of whom 320 completed the study. Participants were recruited using systematic random sampling at each PHCC. Data were collected using a structured bilingual Arabic-English questionnaire comprising four sections. The first assessed sociodemographic and obstetric characteristics. The second included 10 breastfeeding knowledge items; correct responses received one point, with scores ≥ 7 classified as good knowledge. The third comprised seven attitude statements rated on a five-point Likert scale, with negative statements reverse-scored; scores $\geq 24/35$ indicated a positive attitude. The fourth assessed EBF practice and reasons for non-EBF. Content validity was evaluated by two obstetricians and one public health nutritionist. A pilot study involving 30 mothers was conducted, and Cronbach's alpha coefficients were 0.74 and 0.79 for knowledge and attitude scales, respectively. Data were analyzed using IBM SPSS Statistics version 28. Descriptive statistics, Chi-square tests, and binary logistic regression were applied. Variables with $p < 0.25$ in univariate analysis were entered into the multivariable model. Adjusted odds ratios (AORs) with 95% confidence intervals were reported, with $p < 0.05$ considered statistically significant. Ethical approval was obtained from the Basra Health Directorate Research Ethics Committee (BHD-EC-2024-017), and written informed consent was obtained from all participants.

RESULTS

A total of 330 questionnaires were distributed, and 320 were returned fully completed (response rate: 97.0%). The mean maternal age was 27.4 ± 5.8 years (range: 15–44 years). The majority of participants were housewives (74.1%), had secondary-level education (35.3%), and resided in urban areas (65.6%). Regarding parity, 24.4% were primiparous, 53.1% had 2–3 children, and 22.5% had ≥ 4 children. Approximately 43.1% had delivered by cesarean section. Only 44.1% reported having received breastfeeding counseling during pregnancy or after delivery. Full socio-demographic details are presented in Table 1.

Table 1: Socio-demographic and Obstetric Characteristics of Study Participants (N = 320).

Variable	n	%
Maternal Age (years)		
15–19	32	10.0
20–29	172	53.8
30–39	97	30.3
≥40	19	5.9
Education Level		
No formal education	38	11.9
Primary	62	19.4
Secondary	113	35.3
Diploma	59	18.4
University or higher	48	15.0
Occupation		
Housewife	237	74.1
Employed	60	18.8
Student	23	7.2
Place of Residence		
Urban	210	65.6
Rural	110	34.4
Parity (Number of Children)		
1 (Primiparous)	78	24.4
2–3	170	53.1
≥4	72	22.5
Mode of Delivery		
Vaginal	182	56.9
Cesarean Section	138	43.1
Received Breastfeeding Counseling		
Yes	141	44.1
No	179	55.9

Overall, 54.4% (n = 174) of mothers demonstrated good breastfeeding knowledge (score $\geq 7/10$), while 45.6% (n = 146) had poor knowledge. The highest correct response rates were observed for the item 'Breastfeeding protects the child from infections' (88.4%) and 'Colostrum is beneficial for the baby' (85.3%). Conversely, knowledge

gaps were most pronounced for the item 'Breastfeeding can be continued even if the mother is working' (correct: 41.6%) and 'Formula milk is not equivalent to breast milk' (correct: 46.9%). Item-level responses are shown in Table 2.

Table 2: Mothers' Responses to Individual Breastfeeding Knowledge Items (N = 320).

Knowledge Item	Correct Response n (%)	Correct Answer
B1. Breastfeeding should start within 1 hour of birth	234 (73.1)	Yes
B2. Colostrum is beneficial for the baby	273 (85.3)	Yes
B3. EBF means breast milk only, no water or other foods	218 (68.1)	Yes
B4. EBF is recommended for the first 6 months	210 (65.6)	Yes
B5. Breastfeeding should continue up to 2 years or more	195 (60.9)	Yes
B6. Breastfeeding protects the child from infections	283 (88.4)	Yes
B7. Breastfeeding is beneficial for the mother's health	261 (81.6)	Yes
B8. Formula milk is NOT equivalent to breast milk	150 (46.9)	No
B9. Frequent breastfeeding increases milk production	189 (59.1)	Yes
B10. Breastfeeding can be continued even if the mother is working	133 (41.6)	Yes

EBF = exclusive breastfeeding.

The majority of mothers demonstrated positive attitudes toward breastfeeding. Overall, 71.3% (n = 228) scored $\geq 24/35$, indicating a positive attitude. Near-universal agreement was observed for 'Breastfeeding is the best way to feed a baby' (agree/strongly agree: 92.8%) and 'Family support is important for successful breastfeeding'

(91.6%). A notable proportion of mothers agreed that 'Breastfeeding in public places is embarrassing' (43.8%), and 38.1% expressed agreement that 'Working mothers cannot breastfeed successfully'. Attitude responses are presented in Table 3.

Table 3: Mothers' Responses to Breastfeeding Attitude Items (N = 320)

Attitude Item	Strongly Agree/ Agree n (%)	Neutral n (%)	Disagree/ Strongly Disagree n (%)	Mean Score (SD)
C1. Breastfeeding is the best way to feed a baby	297 (92.8)	14 (4.4)	9 (2.8)	4.6 (0.7)
C2. Formula feeding is more convenient than breastfeeding*	138 (43.1)	71 (22.2)	111 (34.7)	2.8 (1.2)
C3. Breastfeeding in public places is embarrassing*	140 (43.8)	55 (17.2)	125 (39.1)	2.9 (1.3)
C4. Family support is important for successful breastfeeding	293 (91.6)	17 (5.3)	10 (3.1)	4.5 (0.8)
C5. Working mothers cannot breastfeed successfully*	122 (38.1)	67 (20.9)	131 (40.9)	2.7 (1.3)
C6. Breastfeeding strengthens the emotional bond between mother and child	278 (86.9)	26 (8.1)	16 (5.0)	4.3 (0.9)
C7. I feel confident in my ability to breastfeed	196 (61.3)	64 (20.0)	60 (18.8)	3.7 (1.1)

* Negative items, reverse-scored. SD = standard deviation.

Exclusive breastfeeding for the first six months was reported by 48.4% (n = 155) of mothers. Among the 165 mothers who did not practice EBF, the most commonly cited reason was perceived low milk supply (37.6%), followed by family advice to supplement (22.4%), return

to work or study (19.4%), and health-related reasons (12.1%). 'Other' reasons (formula preference, infant dissatisfaction) accounted for 8.5%. These data are illustrated in Figure 1.

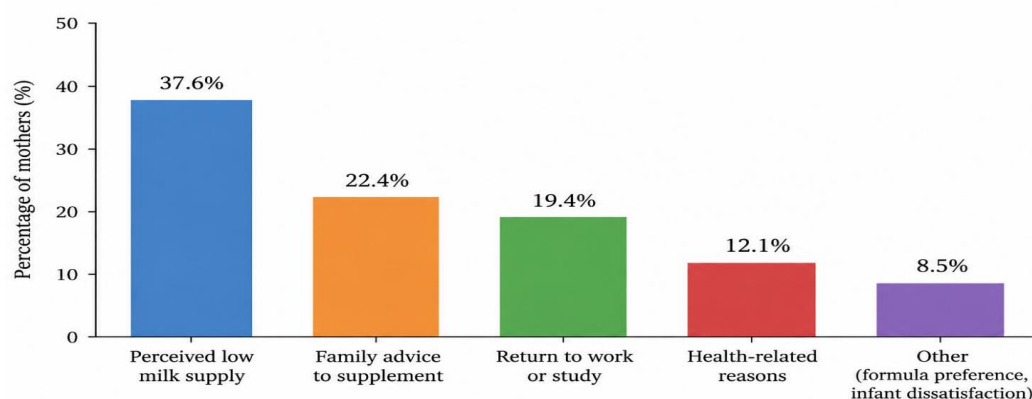


Figure 1. Main reasons for non-exclusive breastfeeding among mothers who did not practice EBF for 6 months (n = 165).

Chi-square analyses revealed that EBF practice was significantly associated with maternal education (p < 0.001), receipt of breastfeeding counseling (p < 0.001), mode of delivery (p = 0.003), parity (p = 0.012), and

residence (p = 0.041). Maternal occupation and the child's age group were not significantly associated with EBF in univariate analysis. These associations are summarized in Table 4.

Table 4: Univariate Analysis: Association Between Socio-Demographic Variables and Exclusive Breastfeeding Practice (N = 320).

Variable	EBF Yes n (%)	EBF No n (%)	χ^2	p-value
Education Level				
Low (no formal/primary)	33 (33.0)	67 (67.0)	22.4	< 0.001
Secondary/diploma	84 (49.1)	88 (50.9)	—	—
University or higher	38 (79.2)	10 (20.8)	—	—
Received Counseling				
Yes	89 (63.1)	52 (36.9)	28.7	< 0.001
No	66 (36.9)	113 (63.1)	—	—
Mode of Delivery				

Vaginal	103 (56.6)	79 (43.4)	9.0	0.003
Cesarean Section	52 (37.7)	86 (62.3)	—	—
Parity				
1 (Primiparous)	31 (39.7)	47 (60.3)	8.9	0.012
2–3	88 (51.8)	82 (48.2)	—	—
≥4	36 (50.0)	36 (50.0)	—	—
Residence				
Urban	107 (51.0)	103 (49.0)	4.2	0.041
Rural	48 (43.6)	62 (56.4)	—	—

After adjusting for all covariates in the logistic regression model, four variables emerged as significant independent predictors of EBF (Table 5). Mothers with university or higher education were 2.71 times more likely to practice EBF than those with low education (AOR 2.71, 95% CI 1.54–4.76; $p < 0.001$). Receipt of breastfeeding counseling was the strongest predictor (AOR 3.08, 95% CI 1.89–5.01; $p < 0.001$). Vaginal

delivery was associated with a 94% higher likelihood of EBF compared with cesarean section (AOR 1.94, 95% CI 1.12–3.36; $p = 0.018$). Multiparous mothers (parity 2–3) had higher odds of EBF compared with primiparous mothers (AOR 1.68, 95% CI 1.01–2.80; $p = 0.046$). Urban residence did not reach statistical significance after adjustment (AOR 1.52, 95% CI 0.93–2.49; $p = 0.098$).

Table 5: Multivariate Binary Logistic Regression: Predictors of Exclusive Breastfeeding (N = 320)

Variable	AOR	95% CI	Wald χ^2	p-value
Higher Education (University vs. Low)	2.71	1.54 – 4.76	12.3	< 0.001
Received Breastfeeding Counseling (Yes vs. No)	3.08	1.89 – 5.01	22.1	< 0.001
Vaginal Delivery (vs. Cesarean Section)	1.94	1.12 – 3.36	5.8	0.018
Parity 2–3 (vs. Primiparous)	1.68	1.01 – 2.80	3.9	0.046
Urban Residence (vs. Rural)	1.52	0.93 – 2.49	2.7	0.098

AOR = Adjusted Odds Ratio; CI = Confidence Interval. Reference categories: low education, no counseling, cesarean section, primiparous, rural.

DISCUSSION

The present study provides insight into breastfeeding knowledge, attitudes, practices, and associated factors among mothers attending PHCCs in Basra. Although 71.3% of participants demonstrated positive attitudes toward breastfeeding, only 54.4% had good knowledge and 48.4% reported exclusive breastfeeding (EBF) for the first six months. This discrepancy between favorable attitudes and actual practice suggests that positive perceptions alone may be insufficient to overcome practical, educational, and healthcare-related barriers. Similar gaps between knowledge, attitudes, and EBF practice have been reported in other populations.^[12,13] Knowledge was particularly limited regarding continuation of breastfeeding among working mothers and the non-equivalence of formula to breast milk. These findings emphasize the need for breastfeeding education to extend beyond general messages about benefits and address practical misconceptions. Recent Iraqi evidence likewise indicates that maternal education is strongly associated with breastfeeding knowledge, supporting targeted educational approaches for younger and less-educated mothers.^[14] Perceived insufficient milk supply was the leading reason for non-EBF, reported by 37.6% of mothers who did not exclusively breastfeed, followed by family advice and return to work or study. This finding is consistent with a systematic review showing that perceived insufficient milk is a major reason for breastfeeding discontinuation and is associated with breastfeeding knowledge, self-efficacy, and formula

supplementation.^[15] Therefore, early assessment of breastfeeding technique and maternal reassurance may help prevent unnecessary supplementation. Breastfeeding counseling showed the strongest independent association with EBF (AOR=3.08), while higher maternal education (AOR=2.71), vaginal delivery (AOR=1.94), and multiparity (AOR=1.68) were also independently associated with EBF. Urban residence was not independently significant after adjustment ($p=0.098$). These findings are broadly consistent with a recent systematic review identifying maternal knowledge, support, education, multiparity, and vaginal delivery among factors associated with EBF.^[16] The association with vaginal delivery is also supported by evidence showing lower early breastfeeding rates following cesarean delivery.^[17] Collectively, the findings highlight PHCCs as an important setting for strengthening structured antenatal and postnatal breastfeeding counseling, particularly for primiparous, less-educated, and cesarean-delivered mothers. However, because of the cross-sectional design, the observed associations should not be interpreted as causal.

CONCLUSION

This study demonstrates that while most mothers in Basra's PHCCs hold positive attitudes toward breastfeeding, knowledge gaps persist and nearly half fail to achieve the WHO-recommended six months of exclusive breastfeeding. Breastfeeding counseling, higher maternal education, vaginal delivery, and

multiparity are independent facilitators of EBF. These findings support urgent investment in structured lactation counseling programs integrated into antenatal and postnatal PHCC care, with particular attention to first-time mothers, cesarean-delivered women, and those with limited education. To achieve the WHO 2025 EBF target in this setting, policymakers must ensure privacy for breastfeeding in public facilities and establish workplace lactation support.

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