Nor. Afr. J. Food Nutr. Res. 2024; 8 (18): 96 – 105

https://doi.org/10.51745/najfnr.8.18.96-105

Check for updates

ORIGINAL ARTICLE

AfAc Publisher
With Knowledge We Publish

Infant, Child, and Adolescent Nutrition

Breastfeeding knowledge, attitude, and practices among mothers at EPI centers in the Northern part of Dhaka city

Hasina Afroz [1], Supta Mondal [1], Taslima Khatun [1], Farzana Saleh [1], Md. Anower Hussain [2]

[1] Bangladesh University of Health Sciences (BUHS), Department of Community Nutrition, 125/1 Darus Salam, Mirpur 1, Dhaka-1216. Bangladesh. moumitaleo2@gmail.com/ suptamondal@rocketmail.com/tasumoni11@yahoo.com

[2] Bangladesh University of Health Sciences (BUHS), Department of Community Dentistry, 125/1 Darus Salam, Mirpur 1, Dhaka-1216. Bangladesh. ayonshafi@hotmail.com

ABSTRACT

Background and aims: Breastfeeding (BF) is a vital component of newborn care, providing immunization and essential immunities and fostering a strong mother-infant bond. This study, a pioneering investigation in our country, aimed to evaluate the knowledge, attitudes, and practices (KAP) surrounding BF among mothers visiting Expanded Program on Immunization (EPI) centers. **Subjects and Methods:** A descriptive cross-sectional study was conducted from June to December 2021, involving 400 mother-child pairs selected using purposive sampling. A semi-structured questionnaire adapted from the Food and Agriculture Organization (FAO) was administered to assess participant KAP regarding BF. Chi-squared tests and binary logistic regression analyses were employed to analyze the data. **Results**: Approximately 63%, 65%, and 69% of mothers exhibited satisfactory knowledge, attitudes, and practices towards BF, respectively. The mothers' education level ($p = 0.0001$), economic status ($p = 0.0001$), and habitat ($p = 0.001$) were significantly associated with their knowledge about BF. Of the participants, 85% received education on BF before delivery ($p = 0.0001$), and 98% received it after delivery ($p = 0.03$), both demonstrating significant associations with good BF knowledge. Additionally, a significant association ($p = 0.008$) was observed between economic status and mothers' attitudes toward breastfeeding. Among the sociodemographic variables examined, only the mother's age demonstrated a significant influence ($p = 0.009$) on breastfeeding practices, with approximately 38% of mothers aged over 25 exhibiting good breastfeeding practices. Binary logistic regression analysis revealed that mothers' education, older age, monthly income, and receiving BF education during pregnancy and after delivery were significantly associated ($p \leq 0.05$) with satisfactory KAP on BF. **Conclusion**: The findings indicate that knowledge, attitudes, and practices towards breastfeeding among mothers attending EPI centers in our country are generally satisfactory. Education, older age, monthly income, and the receipt of BF education during and after pregnancy emerged as significant determinants of positive KAP on BF.

Keywords: Breastfeeding, knowledge, attitude, practice, EPI center, Bangladesh.

ARTICLE INFORMATION

Corresponding author: Farzana Saleh
E-mail: salehfarzana42@gmail.com
Tel: +880 (173-80-85-007)

Received: May 13, 2024
Revised: June 08, 2024
Accepted: September 29, 2024
Published: October 12, 2024

Article edited by:
Pr. Khaled Méghit Boumédiène

Article reviewed by:
Dr. Shaheen Ahmed
Dr. Kazi Rumana Ahmed
Dr. Sharmin Hossain

Cite this article as Afroz, H., Mondal, S., Khatun, T., Saleh, F., Hussain, M.A. (2024). Breastfeeding knowledge, attitude, and practices among mothers at EPI centers in the Northern part of Dhaka city. (2024). *The North African Journal of Food and Nutrition Research, 8* (18): 96 – 105. https://doi.org/10.51745/najfnr.8.18.96-105

1 Introduction

In the past two decades, there has been significant progress worldwide in improving the nutritional health of individuals, especially children. However, child malnutrition continues to be a persistent public health issue, endangering the achievement of Sustainable Development Goal (SDG) 3, which strives to ensure healthy lives and well-being for all by 2030. Globally, around 22.2% of children experience stunting, 7.5% face wasting, and 5.6% deal with overweight conditions. These statistics closely align with data from Bangladesh, where 24% of children experience stunting, 11% exposure to wasting, and 2% are overweight (National Institute of Population Research and Training [NIPORT], 2023).

Inadequate early childhood nutrition can detrimentally affect a child's physical and emotional growth in the short and long run while constraining adult achievement and productivity. Health experts recognize breastfeeding (BF) as the recommended method for supplying young infants with essential nutrients crucial for healthy development (Hansen,

2016). Extensive evidence (Bowatte et al., 2015; Peres et al., 2015) indicates that BF lowers the risk of specific infections and non-communicable diseases (NCDs) and decreases the likelihood of breast and ovarian cancer (Chowdhury et al., 2015; Horta et al., 2015). Furthermore, BF offers economic and environmental benefits to society (Rollins et al., 2016).

The Holy Qur'an repeatedly emphasizes the importance of BF for up to 24 months, citing verses in Al-Baqarah (2:233), Al-Ahqaf (16:15), Luqman (31:14), Nisa (4:23), Talaq (65:6), Hajj (22:2), and Qasas (28:12, 28:7).

Numerous studies (Al Ketbi et al., 2018; Altamimi et al., 2017; Bala et al., 2020; Basrowi et al., 2019; Cascone et al., 2019; Edemba et al., 2022; Hamze et al., 2019; Ishak et al., 2014; Khasawneh et al., 2020; Leshi & Amoo, 2023; Tadele et al., 2016; Vijayalakshmi et al., 2015; Zhou et al., 2010) have focused on mothers' knowledge, attitudes, and behaviors regarding breastfeeding in both developing and industrialized countries. Additionally, in Bangladesh, several studies (Akter & Rahman, 2010; Ara et al., 2018; Rana et al., 2020; Sultana et al., 2022) have suggested providing breastfeeding education to mothers to enhance their practices.

Despite the aforementioned studies, breastfeeding rates in our country remain low. According to the Bangladesh Demographic Health Survey (BDHS) in 2022 (NIPORT, 2023), the prevalence of exclusive breastfeeding (EBF) among Bangladeshi children aged 0 – 5 months declined from 65% in 2017 – 2018 to 55% in 2022 (NIPORT, 2023). Health experts widely acknowledge that women's sociodemographic characteristics, willpower, and level of motivation are key determinants of their adherence to appropriate BF practices (Bass et al., 2016; Boccolini et al., 2015). However, pediatricians, midwives, and general practitioners also play a pivotal role in promoting BF. The Operational Plan (OP) of the National Nutrition Services (NNS) (Public Health and World Health Wing & Ministry of Health & Family Welfare., 2017) in Bangladesh addressed the importance of BF, and emphasized the need to promote, protect, and support infant and young child feeding (IYCF) practices.

Hence, it is essential to investigate the level of knowledge, attitudes, and practices (KAP) surrounding breastfeeding, as well as the sociodemographic factors that influence these variables. Such an exploration can contribute to reducing infant morbidity and mortality. In Bangladesh, the government, with the support of UNICEF and WHO, initiated the Expanded Program on Immunization (EPI) in 1979. The program aimed to immunize all children by 1990, thereby preventing vaccine-preventable diseases (VPDs) and eradicating poliomyelitis (Keja et al., 1988). Through the EPI, mothers of children under two years old can enhance their understanding of breastfeeding. However, despite its potential benefits, no previous studies have examined the KAP regarding breastfeeding among mothers visiting EPI centers in Bangladesh. To address this knowledge gap, we conducted the current study to assess the KAP of mothers regarding breastfeeding in the EPI centers located in the northern part of Dhaka city.

2 Subjects and Methods

2.1 Study design and study setting

A cross-sectional study was conducted among women attending all EPI centers located within Mirpur-1, Dhaka North City Corporation, from June to December 2021.

2.2 Study population

Applying a sample size calculation appropriate for a cross-sectional study, considering the current proportion of EBF at 55% in Bangladesh (NIPORT, 2015) and a 10% non-response rate, we estimated a minimum sample size of 418. Consequently, we selected 400 mother-child pairs for interviews from all the EPI centers in the study.

2.3 Study tools and data collection

Data collection utilizes an interviewer-administrated semi-structured questionnaire comprising four sections. The questionnaire was developed based on FAO guidelines for assessing nutrition-related knowledge, attitudes, and practices (Yvette Fautsch Macías & Peter Glasauer., 2014). Section 1 encompassed sociodemographic information about mothers. Section 2 consisted of questions aimed at assessing breastfeeding knowledge, such as identifying the initial food for newborns, awareness of EBF, understanding of EBF, duration of breastfeeding, and its benefits for both the baby and mother. Section 3 included statements regarding attitudes towards breastfeeding (e.g., perceived benefits, barriers, advantages of 'on-demand' BF, and self-confidence). Lastly, section 4 focused on the breastfeeding practices of mothers (e.g., BF during the previous night, use of cup/bottle or spoon, arrangements for alternate caregivers, and introduction of other foods to the baby). A scoring system was implemented, awarding one mark for each correct answer and no marks for incorrect ones across all categories. The total score for correct answers within each category was calculated, and the level of KAP was determined through quartile statistical analysis. Prior to the main study, a pilot study involving 30 participants was conducted to validate the questionnaires.

2.4 Data analysis

The collected data underwent screening to identify errors and ensure completeness before being analyzed using IBM SPSS software for Windows version 26.0 (SPSS Inc, Chicago, USA). The analysis involved presenting frequencies and

percentages in tables and charts. The KAP questionnaire consisted of 13 questions assessing BF knowledge, six items evaluating BF attitudes, and 12 items examining BF practices. For Chi-squared (X^2) test analysis and Binary Logistic regression, the KAP score was dichotomized into 'poor' and 'good' categories. A p-value of ≤0.05 was considered statistically significant.

2.5 Ethical approval

All procedures performed in studies involving human participants were by the institution's ethical standards and with the Helsinki Declaration and its later amendments or comparable ethical standards. The study received ethical approval from the Ethics and Research Review Committees of the Bangladesh University of Health Sciences (BUHS/BIO/EA/19/223). Informed consent was obtained from all individual participants prior to their inclusion in the study.

3 Results

The study comprised 400 lactating mothers aged [years, mean (± SD) 25 (± 4.10)]. The majority (99%) of the mothers were married. Regarding education, approximately 40% had completed primary to 8th grade, 34% had secondary and higher secondary level education, 18% were graduates, and only 8% were illiterate. Ninety-four percent of the mothers were homemakers, 55% of fathers had service jobs, 35% were businesspeople, and 10% were laborers. Geographically, nearly half (48%) of the mothers lived in urban areas, 47% in semi-urban areas, and only 5% in slum areas. The median monthly family income was [taka, median (range) 25,000 (8,000 to 300,000)].

3.1 Breastfeeding knowledge of mothers in the EPI centers

Table 1 illustrates the breastfeeding knowledge of women attending EPI centers. It shows that 65% of mothers knew that breastmilk was the primary food for a newborn. However, 34% mentioned Prelacteal feeds such as honey, *jiggery* (brown sugar from sugar cane), *ghee* (clarified butter), and *ghutti* (herbal paste). Regarding EBF, only 35.5% correctly understood its definition, while 64.5% did not. Approximately 36% of mothers advocated for EBF up to 6 months, with 64% unaware of the recommended duration. Most (95%) agreed to feed their baby 'on-demand'. Regarding the benefits of breastfeeding, 66% believed it promoted healthier growth, while only 2% were aware of its role in developing the baby's immune system, protecting against obesity, and in healthier growth. Around 38% knew alternative methods for working mothers to provide breast milk, while 57% were unaware. Twenty percent of mothers stated they would seek help from healthcare providers if faced with breastfeeding challenges, while 69% said they would seek assistance from both healthcare providers and family members.

Table 1. Breastfeeding knowledge of mothers in the EPI centers (n = 400)

Variables	n (%)
As the first food a newborn baby should receive	
- Only breastmilk	263 (65)
- Prelacteal feeds like honey, *jaggery*, *ghee*, and *ghutti*	136 (34)
- Don't know	1 (1)
Definition of EBF	
- Exclusive breastfeeding means that the infant gets only breastmilk and no other liquids or foods	142 (35.5)
- Don't know	258 (64.5)
Recommendation of EBF	
- From 0 to 6 months	143 (36)
- Don't know	257 (64)
A baby ≤6 months be breastfed	
- On demand, whenever the baby wants	381 (95)
- Other time schedule made by mother/ caregiver	19 (5)
Advantages of breastfeeding for an infant during the first six months	
- Grows healthily	266 (66)
- Protect from diarrhea and other infections	15 (4)
- Protect against obesity and chronic diseases in adulthood	4 (1)
- All of the above	8 (2)
- Grows healthily and protects from diarrhea and other infections	83 (21)
- Grows healthily and protects against obesity and chronic diseases in adulthood	24 (6)
An alternative method for a working mother to provide breast milk to her baby upon returning to work	
- Expressing breastmilk by hand, storing it, and asking someone to give breastmilk to the baby	155 (38)
- Feed other milk like cow, goat, artificial	18 (5)
- Don't know	227 (57)
If a mother meets challenges with breastfeeding, methods to overcome them	
- Seeking help from healthcare providers like doctors, nurses, nutritionists, health educators	80 (20)
- Seeking help from family members	43 (10)
- Seeking help from peer mothers	2 (1)
- Seeking help from healthcare providers like doctors, nurses, nutritionists, health educators, and family members	275 (69)

3.2 Attitude toward breastfeeding among mothers in the EPI centers

Regarding the perceived benefits of EBF for six months, 98% of mothers said it benefits the baby. Similarly, 98% of mothers viewed breastfeeding on demand positively, with 81% reporting no difficulties. However, 5% encountered average difficulties during on-demand feeding, and 14% found it challenging. Regarding self-confidence during

breastfeeding, 93% of mothers felt confident, while 6% reported average confidence levels. When it came to expressing and storing breast milk for later feeding by someone else, 44% of mothers lacked confidence (Table 2).

Table 2. Attitude toward breastfeeding among mothers in the EPI centers (n=400)

Variables	n (%)
How good do you think to breastfeed your baby exclusively for six months?	
- Good	392 (98)
- You are not sure	7 (1)
- Not good	1 (1)
How good do you think to breastfeed your baby on demand that is when the baby wants to feed?	
- Good	394 (98)
- You are not sure	5 (1)
- Not good	1 (1)
How difficult is it for you to breastfeed your child on demand?	
- Not difficult	325 (81)
- so-so	21 (5)
- Difficult	54 (14)
How confident do you feel in breastfeeding your child?	
- Confident	373 (93)
- so-so	23 (6)
- Not confident	4 (1)
How confident do you feel expressing and storing breast milk so that someone else can feed your baby?	
- Confident	75 (19)
- so-so	148 (37)
- Not confident	177 (44)

3.3 Breastfeeding practices among mothers in the EPI centers

Figure 1 illustrates the distribution of mothers based on their breastfeeding practices. Approximately 69% of mothers engaged in exclusive breastfeeding, while 31% did not adopt this practice.

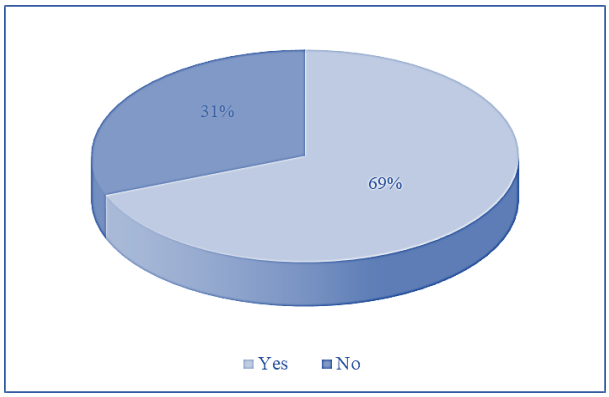

Figure 1. Distribution of the mothers according to the exclusive breastfeeding (n=400)

3.4 Association between the level of KAP on breastfeeding Vs sociodemographic factors

Table 3 presents the summarized results of the X2 analysis, examining the relationship between levels of KAP and sociodemographic variables among mothers. Mothers' education level showed a significant relationship (p=0.0001) with their knowledge about BF. Almost all (99%) educated mothers demonstrated good knowledge of BF. Additionally, economic status (p = 0.0001) and habitat (p = 0.001) significantly influenced knowledge, with 69% of mothers from higher economic groups and 98% from urban areas exhibiting good knowledge of BF, respectively. Education on breastfeeding during antenatal care (ANC) is crucial for child development. Of the participants, 85% received education on BF before delivery (p = 0.0001), and 98% received it after delivery (p = 0.03), both showing significant associations with good knowledge of BF. A significant association (p=0.008) was observed between economic status and mothers' attitudes toward breastfeeding, with over half (56%) of those from higher economic groups exhibiting a favorable attitude.

Conversely, 61% of mothers from lower income groups displayed an unfavorable attitude toward breastfeeding. Interestingly, 34.3% of mothers who received education on the benefits of breastfeeding during ANC did not demonstrate a favorable attitude toward breastfeeding. In contrast, 87% of mothers who did not receive education during ANC showed a significant (p = 0.0001) favorable attitude toward breastfeeding. Only the mother's age demonstrated a significant role (p = 0.009) in breastfeeding practices among the sociodemographic variables examined. Specifically, 38% of mothers aged over 25 exhibited good breastfeeding practices.

3.5 Analysis of mothers' knowledge, attitude, and practice regarding breastfeeding for children aged 0-6 months using binary logistic regression

The results from binary logistic regression analysis revealed several significant associations. Firstly, the education level of mothers showed a negative and significant association (β = -2.71; p = 0.01; OR = 0.06; 95% CI 0.009 – 0.52) with the total knowledge score, indicating that higher education levels were linked with lower knowledge scores. Conversely, monthly income (β = 0.0001; p = 0.0001; OR = 1.000; 95% CI 1.000 – 1.000), receiving education on breastfeeding before delivery (β = 0.945; p = 0.001; OR = 2.57; 95% CI 1.47 – 4.49), and total attitude score (β = 0.266; p = 0.023; OR = 1.31; 95% CI 1.03 – 1.64) were positively associated with the total knowledge score. Mothers residing in urban areas were twelve times more likely to have a positive attitude

Table 3. Summary results of χ2 analyses between the level of KAP on breastfeeding Vs different types of sociodemographic variables (n = 400)

Variables	X^2	d.f	p	OR	95%CI	
					Lower	Upper
Level of Knowledge (poor, good)						
- Mother's age (≤25/>25 years)	2.92	1	0.11	1.41	0.95	2.10
- Mother's education (illiterate/ literate)	24.37	1	**0.0001**	29.04	3.92	214.9
- Mother's occupation (employed/ homemaker)	3.35	1	0.07	0.44	0.18	1.08
- Monthly income (low/high)	98.93	1	**0.0001**	9.06	5.73	14.33
- Habitat (slum/urban)	11.12	1	**0.001**	8.32	1.91	36.23
- BF education during pregnancy period (yes/no)	37.96	1	**0.0001**	0.225	0.138	0.369
- BF education after delivery (yes/no)	5.44	1	**0.03**	5.08	1.12	23.008
Level of Attitude (favorable /unfavorable)						
- Mother's age (≤25/>25 years)	0.062	1	0.89	0.93	0.55	1.57
- Mother's education (illiterate/ literate)	3.15	1	0.09	3.46	0.81	14.83
- Mother's occupation (employed/ homemaker)	3.16	1	0.086	0.437	0.171	1.11
- Monthly income (low/high)	7.28	1	**0.008**	2.02	1.21	3.41
- Habitat (slum/urban)	0.557	1	0.555	0.675	0.239	1.91
- BF education during pregnancy period (yes/no)	14.74	1	**0.0001**	0.243	0.112	0.524
- BF education after delivery (yes/no)	0.119	1	1.000	1.31	0.286	5.96
Level of Practice (poor/good)						
- Mother's age (≤25/>25 years)	7.14	1	**0.009**	0.579	0.387	0.866
- Mother's education (illiterate/ literate)	1.31	1	0.272	1.55	0.727	3.31
- Mother's occupation (employed/ homemaker)	1.41	1	0.275	1.73	0.69	4.34
- Monthly income (low/high)	1.54	1	0.222	1.288	0.863	1.92
- Habitat (slum/urban)	0.314	1	0.656	1.29	0.524	3.19
- BF education during pregnancy period (yes/no)	3.26	1	0.08	0.669	0.432	1.03
- BF education after delivery (yes/no)	1.41	1	0.283	2.009	0.619	6.52
- Gender (girl/boy)	0.15	1	0762	0.924	0.622	1.37

BF= Breastfeeding; KAP= Knowledge, Attitude, and Practice

towards breastfeeding compared to those in slum areas (β = 2.55; p = 0.003; OR = 12.81; 95% CI 2.42 – 67.69). Additionally, mothers who received breastfeeding education during the antenatal period (β = 1.45; p = 0.006; OR = 4.31; 95% CI 1.52 – 12.19) were significantly more likely to have a positive attitude towards breastfeeding. Furthermore, both the total knowledge score (β = 0.285; p = 0.0001; OR = 1.33; 95% CI 1.15 – 1.54) and total practice score (β = 0.532; p = 0.0001; OR = 1.71; 95% CI 1.35 – 2.15) were positively associated with the total attitude score. Older mothers were also twice as likely to have favorable breastfeeding practices as younger mothers (β = 0.516; p = 0.03; OR = 1.67; 95% CI 1.05 – 2.66). Lastly, both the total knowledge score (β = 0.238; p = 0.0001; OR = 1.269; 95% CI 1.132 – 1.423) and total attitude score (β = 0.515; p = 0.0001; OR = 1.673; 95% CI 1.310 – 2.138) demonstrated significant positive associations with favorable breastfeeding practices (Table 4).

4 Discussion

The findings of our study regarding BF practices were quite promising when compared to studies conducted in other countries. The study revealed that 69% of mothers adhered to exclusive breastfeeding (EBF) for up to 6 months. However, only 63% of the respondents demonstrated average knowledge, and 65% of mothers exhibited a favorable attitude toward breastfeeding in this study. The present findings are consistent with the results from studies conducted in the Noakhali Sadar Upazila (Sultana et al., 2022) and the Mother and Child Hospital in Dhaka city (Hasan et al., 2021). However, the percentage of the BF practices observed in our study notably exceeded that of mothers in rural areas of Rajshahi district (Rana et al., 2020), Mirzapur sub-district (Joshi et al., 2014) as well as the percentage reported in the Bangladesh Demographic and Health Survey 2022 (NIPORT, 2023). Comparable findings were observed in South Jordan (Altamimi et al., 2017), Indonesia (Basrowi et al., 2019), and Italy (Cascone et al., 2019). We observed variations in the prevalence of EBF across different regions: Eastern and Southern Africa (55%), Latin America and the Caribbean (38%), North America (35%), West and Central Africa (34%), Eastern Europe and Central Asia (33%), East Asia and Pacific (30%), Middle East and North Africa (30%), and globally (42%) (Hossain et al., 2018). Comparisons with results from South-East Asian countries revealed opposite trends. Studies conducted in India (Bala et al., 2020; Vijayalakshmi et al., 2015), and Pakistan (Jamil et al., 2018; Murtaza et al., 2022) indicated

a need for more accurate breastfeeding practices despite an encouraging attitude. Our results can likely to be attributed to several factors, such as a significant portion (48%) of mothers living in urban areas, 40% of the mothers having completed up to the 8th grade in education, and the majority of the mothers being homemakers.

In our study, when mothers were asked about the advantages of breastfeeding, many of them spontaneously highlighted that breast milk plays a crucial role in enhancing infant immunity and reducing the risk of infections, even before being prompted directly to respond to that question. Numerous other research (Altamimi et al., 2017; Bala et al., 2020; Cacho & Lawrence, 2017; Khasawneh et al., 2020; Tadele et al., 2016) aimed at evaluating women's understanding of breastfeeding benefits have reached similar conclusions.

We examine women's attitudes toward breastfeeding and their difficulties in practicing it. The majority (98%) expressed a positive attitude, often demonstrated by their preference for colostrum as the first feeding for their infants and their belief that breast milk is cost-effective and enhances mother-infant bonding. Despite this positive attitude, 19% found 'on demand' feeding challenging, and 44% lacked confidence in expressing and storing breast milk when they returned to work. Study from Jordan (Khasawneh et al., 2020) has shown a positive association between a positive attitude and planning to breastfeed. However, to ensure successful breastfeeding practice, addressing issues related to culture and traditions and improving the availability of support is essential (Appiah et al., 2021; Ishak et al., 2014).

A positive attitude empowers women with solid motivation, reflected in their practices. In the present study, more than half (69%) of the women practiced breastfeeding. In contrast, other studies in Bangladesh (Hasan et al., 2021; Hossain et al., 2018; Joshi et al., 2014; Rana et al., 2020; Sultana et al., 2022) have shown suboptimal breastfeeding practices. This study occurred at EPI centers, where formal breastfeeding education was not provided. However, mothers who brought their babies for vaccination at these centers often inquired about their baby's well-being from nurses. Nurses, in turn, provided unofficial advice on infant and young child feeding (IYCF) to the mothers. Additionally, mothers received suggestions and advice from other mothers.

Mothers with older age, education, employment, monthly income, residing in urban areas, and breastfeeding education during and after pregnancy from professional staff demonstrated favorable knowledge and attitudes, good practices regarding BF, as determined by chi-squared tests and binary logistic regression. This finding aligns with Hossain M et al. (2018), who reported a higher rate of exclusive breastfeeding practice among literate mothers. Martínez Galiano & Delgado Rodríguez (2013) also noted that initiation, prevalence, and duration of breastfeeding in the first two months were higher among women who attended prenatal birthing classes, particularly if they were educated. Mothers from wealthier quintiles may have better education and easier access to media and health services, leading to increased awareness and conscientiousness about breastfeeding. Additionally, research (Ministry of Health., 2011) has shown that healthcare workers' motivation significantly predicts knowledge changes. For successful initiation and maintenance of breastfeeding, mothers require encouragement and support not only from their families and communities but also from the healthcare system. In our study, 96% of mothers received breastfeeding advice from health staff after delivery, and 70% received education during ANC visits. This counseling and education played a significant role in enhancing mothers' knowledge.

Conversely, a study in a rural area (Joshi et al., 2014) reported a low prevalence of EBF due to a lack of support from family members and insufficient advice from healthcare staff during ANC visits and deliveries in hospitals. Therefore, promoting optimal breastfeeding practices starting well before delivery and integrating breastfeeding education into antenatal care is imperative. Another study (Ouyang et al., 2016) found that 70% of mothers believed breastfeeding alone was sufficient nutrition for a 6-month-old infant without any other food or drink. Radzyminski & Callister (2016) discovered that breastfeeding mothers cited knowledge of breastfeeding as a reason for not choosing formula feeding. A significant finding of our study was that most mothers exhibited good knowledge of breastfeeding, consistent with previous results indicating that lactating mothers from developing countries (Azeem et al., 2010; Hasan et al., 2021; Jamil et al., 2018; Murtaza et al., 2022; Sultana et al., 2022; Vijayalakshmi et al., 2015) possess adequate knowledge of exclusive breastfeeding. Hanafi et al. (2014) noted that education, age, and employment status predict increased knowledge, attitudes, and practices favorable to breastfeeding.

In our study, breastfeeding education during antenatal care visits significantly influenced attitudes toward breastfeeding ($p \leqslant 0.05$). Maternal attitude toward infant feeding is an important predictor of breastfeeding initiation. We found that mothers had a neutral attitude toward breastfeeding, with attendance at prenatal birthing classes predicting a more positive attitude. Prenatal education was associated with knowledge of the health benefits of breast milk, despite concerns about inconvenience or discomfort when breastfeeding in public. Less educated mothers tended to have more positive attitudes toward formula use and were likelier to introduce formula earlier than more educated mothers. Moreover, mothers with higher family incomes tend to have more positive attitudes toward breastfeeding. In our study, mothers demonstrated average knowledge, neutral attitudes, and favorable practices toward breastfeeding. While our

results align with the study by Sultana et al. (2022) regarding knowledge and attitude, they differ regarding breastfeeding practices. Vijayalakshmi et al. (2015) found that most mothers had neutral knowledge and attitudes toward breastfeeding. The differences in our findings could be attributed to our sample collection from EPI centers, where mothers received unofficial advice from healthcare workers and peer support from other mothers. Additionally, our mothers received breastfeeding education during and after deliveries.

The present study has several limitations that warrant consideration. First, establishing cause-effect associations is impossible due to its cross-sectional nature. Second, as research was conducted among mothers seeking care at a health facility, the findings may represent only some of the community. Including all EPI centers in the study would have been more suitable for evaluating the level of knowledge, attitudes, and practices of exclusive breastfeeding at EPI centers. Third, the study employed a nonprobability sampling technique, which could impact the generalizability of the findings. In non-probability sampling, samples are often conveniently chosen, leading to a higher chance of sampling bias. Future studies should consider using a simple random sampling technique to minimize this. Fourth, while the study included qualitative and quantitative aspects, the evaluation was based solely on quantitative analysis. The study did not follow a regular timeframe due to the coronavirus (COVID-19) pandemic,

Table 4. Binary logistic regression for estimating the odds ratio and 95% confidence interval of good knowledge, favorable attitude and good practice of mothers on breastfeeding practices among children 0-6 months in EPI center at Mirpur-1

Independent variables	ß	Sig.	Odds ratio	95% C.I. for EXP(ß) Lower	Upper
Dependent variable: Total Knowledge Score					
Age of mothers (years)					
≤ 25	Reference				
>25	-0.059	0.81	0.942	0.58	1.53
Education level of mothers					
Illiterate	Reference				
Literate	-2.71	**0.01**	0.06	0.009	0.52
Occupation of mothers					
Employed	Reference				
Homemaker	0.851	0.18	2.34	0.68	8.005
Monthly income (BDT)	0.0001	**0.0001**	1.000	1.000	1.000
Habitat of mothers					
Slum	Reference				
Urban	-0.49	0.58	0.62	0.11	3.44
BF education of mothers during the pregnancy period					
No	Reference				
Yes	0.945	**0.001**	2.57	1.47	4.49
BF education of mothers after delivery					
No	Reference				
Yes	0.923	0.258	0.397	0.08	1.96
Total Attitude Score	0.266	**0.023**	1.31	1.03	1.64
Total Practice Score	0.110	0.152	1.116	0.960	1.29
Cox & Snell R^2=0.24					
Hosmer & Lemeshow test=0.011					
Dependent variable: Total Attitude Score					
Age of mothers (years)					
≤ 25	Reference				
>25	0.325	0.31	1.38	0.74	2.58
Education level of mothers					
Illiterate	Reference				
Literate	-1.62	0.100	0.197	0.028	1.36
Occupation of mothers					
Employed	Reference				
Homemaker	0.713	0.231	2.04	0.636	6.54
Monthly income (BDT)	0.0001	0.979	1.000	1.000	1.000
Habitat of mothers					
Slum	Reference				
Urban	2.55	**0.003**	12.81	2.42	67.69
BF education of mothers during the pregnancy period					
No	Reference				
Yes	1.45	**0.006**	4.31	1.52	12.19
BF education of mothers after delivery					
No	Reference				
Yes	1.56	0.112	4.71	0.69	33.16
Total Knowledge Score	0.285	**0.0001**	1.33	1.15	1.54
Total Practice Score	0.532	**0.0001**	1.71	1.35	2.15
Cox & Snell R^2=0.19					
Hosmer & Lemeshow test=0.401					
Dependent variable: Total Practice Score					
Age of mothers (years)					

≤ 25	Reference				
>25	0.516	**0.03**	1.67	1.05	2.66
Education level of mothers					
Illiterate	Reference				
Literate	0.053	0.91	1.05	0.422	2.63
Occupation of mothers					
Employed	Reference				
Homemaker	-0.429	0.434	0.651	0.223	1.91
Monthly income (BDT)	0.0001	0.372	1.000	1.000	1.000
Habitat of mothers					
Slum	Reference				
Urban	-0.002	0.997	0.998	0.321	3.09
BF education of mothers during the pregnancy period					
No	Reference				
Yes	0.042	0.875	1.04	0.617	1.75
BF education of mothers after delivery					
No	Reference				
Yes	-0.231	0.734	0.794	0.209	3.01
Total Knowledge Score	0.238	**0.0001**	1.269	1.132	1.423
Total Attitude Score	0.515	**0.0001**	1.673	1.310	2.138
Cox & Snell R^2=0.146					
Hosmer & Lemeshow test=0.258					

ß for standardized regression coefficient. CI=Confidence Interval.

significantly impacting various aspects of people's lives. During the pandemic time, the researchers encountered difficulties conducting the study. Mothers were reluctant to participate in interviews, and the EPI center authorities were unwilling to share information. Despite these challenges, the researcher completed the study.

5 Conclusion

The findings of this study indicate that mothers in the study population exhibited generally satisfactory levels of knowledge, attitudes, and practices regarding breastfeeding. Factors such as education, older age, monthly income, and education on breastfeeding during and after pregnancy were determinants of satisfactory KAP. To achieve Millennium Development Goal 4 and increase breastfeeding rates, interventions must prioritize education. The government is encouraged to implement programs that promote exclusive BF practices among mothers through breastfeeding demonstrations. EPI centers can serve as strategic locations for mothers to enhance their knowledge, attitudes, and practices regarding breastfeeding. Further Longitudinal studies are essential to gain a deeper and more comprehensive understanding of how geographical and socio-economic factors influence breastfeeding outcomes.

Source of funding: The authors received no financial support for this article's research, authorship, and publication.
Acknowledgments: Researchers expressed their appreciation to the mothers who participated in the study.
Previous submissions: None.
Authors' Contribution: A. H., M.S.: Conceptualization, data curation, and formal analysis. T.K.: investigation, writing original draft. F.S.: Conceptualization, methodology, formal analysis, investigation, visualization, reviewing, editing original draft. M.A.H.: project administration, and supervision.
Conflicts of Interest: The authors declare no conflicts of interest.
Preprint deposit: Authors did not share this manuscript as a preprint deposit.

References

Akter, S., & Rahman, M. M. (2010). Duration of breastfeeding and its correlates in Bangladesh. *Journal of Health, Population, Nutrition*, *28*(6), 595. https://doi.org/10.3329/jhpn.v28i6.6608 [Crossref] [Google Scholar] [PubMed] [Publisher]

Al Ketbi, M. I., Al Noman, S., Al Ali, A., Darwish, E., Al Fahim, M., & Rajah, J. (2018). Knowledge, attitudes, and practices of breastfeeding among women visiting primary healthcare clinics on the island of Abu Dhabi, United Arab Emirates. *International Breastfeeding Journal*, *13*, 26. https://doi.org/10.1186/s13006-018-0165-x [Crossref] [Google Scholar] [PubMed] [Publisher]

Altamimi, E., Al Nsour, R., Al Dalaen, D., & Almajali, N. (2017). Knowledge, attitude, and practice of breastfeeding among working mothers in South Jordan. *Workplace Health & Safety*, *65*(5), 210–218. https://doi.org/10.1177/2165079916665395 [Crossref] [Google Scholar] [PubMed] [Publisher]

Appiah, P. K., Amu, H., Osei, E., Konlan, K. D., Mumuni, I. H., Verner, O. N., Maalman, R. S., Kim, E., Kim, S., Bukari, M., Jung, H., Kofie, P., Ayanore, M. A., Amenuvegbe, G. K., Adjuik, M., Tarkang, E. E., Alhassan, R. K., Donkor, E. S., Zotor, F. B., Kweku, M., … Kim, S. Y. (2021). Breastfeeding and weaning practices among mothers in Ghana: A population-based cross-sectional study. *PloS One*, *16*(11), e0259442. https://doi.org/10.1371/journal.pone.0259442 [Crossref] [Google Scholar] [PubMed] [Publisher]

Ara, G., Khanam, M., Papri, N., Nahar, B., Haque, M. A., Kabir, I., & Dibley, M. J. (2018). Peer counselling improves breastfeeding practices: A cluster randomized controlled trial in urban Bangladesh. *Maternal & Child Nutrition*, *14*(3), e12605. https://doi.org/10.1111/mcn.12605 [Crossref] [Google Scholar] [PubMed] [Publisher]

Azeem, Z., Qadir, U., Afzal, M. F., & Sultan, M. A. (2010). Knowledge, Attitude and Practice of Breastfeeding in Urban Community of Lahore: A Cross Sectional Study. *Annals of King Edward Medical University*, *16*(4), 299-299.

https://doi.org/10.21649/akemu.v16i4.250 [Crossref] [Google Scholar] [Publisher]

Bala, K., Sahni, B., Bavoria, S., & Narangyal, A. (2020). Knowledge, attitude, and breast-feeding practices of postnatal mothers in Jammu: A community hospital based cross sectional study. *Journal of Family Medicine and Primary Care, 9*(7), 3433–3437. https://doi.org/10.4103/jfmpc.jfmpc_333_20 [Crossref] [Google Scholar] [PubMed] [Publisher]

Basrowi, R. W., Sulistomo, A. W., Adi, N. P., Widyahening, I. S., & Vandenplas, Y. (2019). Breastfeeding Knowledge, Attitude, and Practice among White-Collar and Blue-Collar Workers in Indonesia. *Journal of Korean Medical Science*, *34*(45), e284. https://doi.org/10.3346/jkms.2019.34.e284 [Crossref] [Google Scholar] [PubMed] [Publisher]

Bass, J. L., Gartley, T., & Kleinman, R. (2016). Unintended consequences of current breastfeeding initiatives. *JAMA Pediatrics*, *170*(10), 923-924. https://doi.org/10.1001/jamapediatrics.2016.1529 [Crossref] [Google Scholar] [PubMed] [Publisher]

Boccolini, C., Siqueira, Carvalho, M., Lazaro de, & Oliveira, M., Inês Couto de. (2015). Factors associated with exclusive breastfeeding in the first six months of life in Brazil: a systematic review. *Revista de Saude Publica*, *49*. https://doi.org/10.1590/s0034-8910.2015049005971 [Crossref] [Google Scholar] [PubMed] [Publisher]

Bowatte, G., Tham, R., Allen, K., Tan, D., Lau, M., Dai, X., & Lodge, C. (2015). Breastfeeding and childhood acute otitis media: a systematic review and meta-analysis. *Acta Paediatrica*, *104*, 85-95. https://doi.org/10.1111/apa.13151 [Crossref] [Google Scholar] [PubMed] [Publisher]

Cacho, N. T., & Lawrence, R. M. (2017). Innate immunity and breast milk. *Frontiers in Immunology*, *8*, 257783. https://doi.org/10.3389/fimmu.2017.00584 [Crossref] [Google Scholar] [PubMed] [Publisher]

Cascone, D., Tomassoni, D., Napolitano, F., & Di Giuseppe, G. (2019). Evaluation of knowledge, attitudes, and practices about exclusive breastfeeding among women in Italy. *International Journal of Environmental Research Public Health*, *16*(12), 2118. https://doi.org/10.3390/ijerph16122118 [Crossref] [Google Scholar] [PubMed] [Publisher]

Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., . . . Martines, J. (2015). Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. *Acta Paediatrica*, *104*, 96-113. https://doi.org/10.1111/apa.13102 [Crossref] [Google Scholar] [PubMed] [Publisher]

Edemba, P. W., Irimu, G., & Musoke, R. (2022). Knowledge attitudes and practice of breastmilk expression and storage among working mothers with infants under six months of age in Kenya. *International Breastfeeding Journal*, *17*(1), 33. https://doi.org/10.1186/s13006-022-00469-6 [Crossref] [Google Scholar] [PubMed] [Publisher]

Hamze, L., Mao, J., & Reifsnider, E. (2019). Knowledge and attitudes towards breastfeeding practices: A cross-sectional survey of postnatal mothers in China. *Midwifery*, *74*, 68-75.https://doi.org/10.1016/j.midw.2019.03.009[Crossref] [Google Scholar] [PubMed] [Publisher]

Hanafi, M. I., Shalaby, S. A. H., Falatah, N., & El-Ammari, H. (2014). Impact of health education on knowledge of, attitude to and practice of breastfeeding among women attending primary health care centres in Almadinah Almunawwarah, Kingdom of Saudi Arabia: controlled pre–post study. *Journal of Taibah University Medical Sciences*, *9*(3), 187-193. https://doi.org/10.1016/j.jtumed.2013.11.011 [Crossref] [Google Scholar] [Publisher]

Hansen, K. (2016). Breastfeeding: a smart investment in people and in economies. *Lancet*, *387*(10017), 416. https://doi.org/10.1016/s0140-6736(16)00012-x [Crossref] [Google Scholar] [PubMed] [Publisher]

Hasan, M., Hassan, M. N., Khan, M. S. I., Tareq, M. A., & Afroj, M. S. (2021). Prevalence, knowledge, attitudes and factors associated with exclusive breastfeeding among mothers in Dhaka, Bangladesh: a cross-sectional study. *Population Medicine*, *3*(September), 1-7. https://doi.org/10.18332/popmed/140132 [Crossref] [Google Scholar] [Publisher]

Horta, B. L., Loret de Mola, C., & Victora, C. G. (2015). Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. *Acta Paediatrica*, *104*, 30-37. https://doi.org/10.1111/apa.13133 [Crossref] [Google Scholar] [PubMed] [Publisher]

Hossain, M., Islam, A., Kamarul, T., & Hossain, G. (2018). Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh: a country based cross-sectional study. *BMC Pediatrics*, *18*(1), 1-9. https://doi.org/10.1186/s12887-018-1076-0 [Crossref] [Google Scholar] [PubMed] [Publisher]

Ishak, S., Adzan, N. A. M., Quan, L. K., Shafie, M. H., Rani, N. A., & Ramli, K. G. (2014). Knowledge and beliefs about breastfeeding are not determinants for successful breastfeeding. *Breastfeeding Medicine*, *9*(6), 308-312. https://doi.org/10.1089/bfm.2013.0124 [Crossref] [Google Scholar] [PubMed] [Publisher]

Jamil, M., Khanum, A., Omer, M. T., & Hamid, M. H. (2018). Knowledge, attitude and breastfeeding practices of mothers of infants: an experience from a tertiary care hospital in Lahore. *Proceedings SZPGMI*, *32*(3), 1-7. https://doi.org/10.47489/p000s323z6841-7mc [Crossref] [Google Scholar] [Publisher]

Joshi, P. C., Angdembe, M. R., Das, S. K., Ahmed, S., Faruque, A. S. G., & Ahmed, T. (2014). Prevalence of exclusive breastfeeding and associated factors among mothers in rural Bangladesh: a cross-sectional study. *International Breastfeeding Journal*, *9*, 1-8.

https://doi.org/10.1186/1746-4358-9-7 [Crossref] [Google Scholar] [PubMed] [Publisher]

Keja, K., Chan, C., Hayden, G., & Henderson, R. H. (1988). Expanded programme on immunization. *World Health Statistics Quarterly. Rapport Trimestriel de Statistiques Sanitaires Mondiales*, *41*(2), 59-63. https://doi.org/10.1002/9780470693841.ch8 [Crossref] [Google Scholar] [Publisher]

Khasawneh, W., Kheirallah, K., Mazin, M., & Abdulnabi, S. (2020). Knowledge, attitude, motivation and planning of breastfeeding: a cross-sectional study among Jordanian women. *International Breastfeeding Journal*, *15*, 1-9. https://doi.org/10.1186/s13006-020-00303-x [Crossref] [Google Scholar] [PubMed] [Publisher]

Leshi, O. O., & Amoo, S. A. (2023). Breastfeeding knowledge, attitude, intention and practice of women in Purdah in Ibadan, Nigeria. *The North African Journal of Food Nutrition Research*, *7*(15), 9-19. https://doi.org/10.51745/najfnr.7.15.9-19 [Crossref] [Google Scholar] [Publisher]

Martínez Galiano, J. M., & Delgado Rodríguez, M. (2013). Early initiation of breastfeeding is benefited by maternal education program. *Revista da Associação Médica Brasileira*, *59*, 254-257. https://doi.org/10.1016/s2255-4823(13)70465-x [Crossref] [Google Scholar] [PubMed] [Publisher]

Ministry of Health. (2011). *Primary health care centres breastfeeding policy and procedure in Madinah region*.

Murtaza, M., Ahmed, K. A., Abbasi, M., Farooq, A., Shafique, M., & Ahmed, N. (2022). The Knowledge, Attitude, and Practice of Mothers Regarding Breast Feeding and Factors Affecting It at A Tertiary Care Hospital. *Annals of Punjab Medical College*, *16*(2), 123-127. https://doi.org/10.29054/apmc/2022.1237 [Crossref] [Google Scholar] [Publisher]

National Institute of Population Research and Training, Medical Education and Family Welfare Division, & Ministry of Health and Family Welfare Dhaka Bangladesh. (2023). *Bangladesh Demographic and Health Survey 2022*. [Publisher]

National Institute of Population Research and Training (NIPORT), Mitra and Associates, & ICF International. (2015). *Bangladesh Demographic and Health Survey 2014: Key Indicators*. [Publisher]

Ouyang, Y.-Q., Su, M., & Redding, S. R. (2016). A survey on difficulties and desires of breast-feeding women in Wuhan, China. *Midwifery*, *37*, 19-24. https://doi.org/10.1016/j.midw.2016.03.014 [Google Scholar] [PubMed] [Publisher]

Peres, K. G., Cascaes, A. M., Nascimento, G. G., & Victora, C. G. (2015). Effect of breastfeeding on malocclusions: a systematic review and meta-analysis. *Acta Paediatrica*, *104*, 54-61. https://doi.org/10.1111/apa.13103 [Crossref] [Google Scholar] [PubMed] [Publisher]

Public Health and World Health Wing, & Ministry of Health & Family Welfare. (2017). Second National Plan of Action for Nutrition. In IPHN & BNNC (Eds.). Dhaka, Bangladesh: WHO, UNICEF, UNFPA, FAO, The World Bank, gain. [Publisher]

Radzyminski, S., & Callister, L. C. (2016). Mother's beliefs, attitudes, and decision making related to infant feeding choices. *Journal of Perinatal Education*, *25*(1), 18-28. https://doi.org/10.1891/1058-1243.25.1.18 [Crossref] [Google Scholar] [PubMed] [Publisher]

Rana, M. M., Islam, M. R., Karim, M. R., Islam, A. Z., Haque, M. A., Shahiduzzaman, M., & Hossain, M. G. (2020). Knowledge and practices of exclusive breastfeeding among mothers in rural areas of Rajshahi district in Bangladesh: A community clinic based study. *PLoS One*, *15*(5), e0232027. https://doi.org/10.1371/journal.pone.0232027 [Crossref] [Google Scholar] [PubMed] [Publisher]

Rollins, N. C., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C. K., Martines, J. C., . . . Victora, C. G. (2016). Why invest, and what it will take to improve breastfeeding practices? *Lancet*, *387*(10017), 491-504. https://doi.org/10.1016/s0140-6736(15)01044-2 [Crossref] [Google Scholar] [PubMed] [Publisher]

Sultana, M., Dhar, S., Hasan, T., Shill, L. C., Purba, N. H., Chowdhury, A. I., & Shuvo, S. D. (2022). Knowledge, attitudes, and predictors of exclusive breastfeeding practice among lactating mothers in Noakhali, Bangladesh. *Heliyon*, *8*(10). https://doi.org/10.1016/j.heliyon.2022.e11069 [Crossref] [Google Scholar] [PubMed] [Publisher]

Tadele, N., Habta, F., Akmel, D., & Deges, E. (2016). Knowledge, attitude and practice towards exclusive breastfeeding among lactating mothers in Mizan Aman town, Southwestern Ethiopia: descriptive cross-sectional study. *International Breastfeeding Journal*, *11*, 1-7. https://doi.org/10.1186/s13006-016-0062-0 [Crossref] [Google Scholar] [PubMed] [Publisher]

Vijayalakshmi, P., Susheela, T., & Mythili, D. (2015). Knowledge, attitudes, and breast feeding practices of postnatal mothers: A cross sectional survey. *International Journal of Health Sciences*, *9*(4), 364. https://doi.org/10.12816/0031226 [Crossref] [Google Scholar] [PubMed] [Publisher]

Yvette Fautsch Macías, & Peter Glasauer. (2014). *FAO Guidelines for assessing nutrition-related knowledge, attitudes and practices*. Food and Agriculture Organization of the United Nations. [Google Scholar]

Zhou, Q., Younger, K. M., & Kearney, J. M. (2010). An exploration of the knowledge and attitudes towards breastfeeding among a sample of Chinese mothers in Ireland. *BMC Public Health*, *10*, 1-11. https://doi.org/10.1186/1471-2458-10-722 [Crossref] [Google Scholar] [PubMed] [Publisher]