

Research Article

Breastfeeding Practices among Healthcare Professionals Versus the General Population: A Comparative Study

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ABSTRACT

Background: Breastfeeding is an important component of maternal and child health, yet recommended practices are not consistently followed across different population groups.

Objective: This study aimed to assess breastfeeding practices and compare important feeding-related factors among healthcare professionals and women from the general population.

Methods: A comparative cross-sectional study was conducted at Aga Khan Health Services, Pakistan and Nishtar Hospital Multan from January 2023 to September 2023, including 331 mothers with previous or current breastfeeding experience. Data were collected using a structured questionnaire covering sociodemographic characteristics, obstetric history, breastfeeding initiation, pre-lacteal feeding, colostrum use, exclusive breastfeeding, complementary feeding, breastfeeding duration, and workplace-related practices.

Results: Early initiation of breastfeeding within one hour was reported by 27.8% of mothers, while 14.2% practised exclusive breastfeeding to six months. Pre-lacteal feeding was highly prevalent at 84.3%, whereas 71.6% of mothers gave colostrum to their infants. Continued breastfeeding to 24 months was reported by 44.8% of mothers with completed breastfeeding histories. Respondent category and parity were significantly associated with exclusive breastfeeding. Vaginal delivery was independently associated with higher odds of early breastfeeding initiation compared with cesarean section, while mothers with medical or postgraduate education had lower odds of pre-lacteal feeding.

Conclusion: Recommended breastfeeding practices were not consistently followed in the study population. Early initiation and exclusive breastfeeding were relatively low, whereas pre-lacteal feeding was common.

Keywords: Breastfeeding, Healthcare Professionals, General Population, Exclusive Breastfeeding, Pre-Lacteal Feeding.

INTRODUCTION

Breastfeeding is one of the most effective practices to support infant growth, development, immunity and survival. It also provides important maternal health benefits and strengthens early mother–infant bonding [1]. Based on the World Health Organization (WHO) and UNICEF guidance, breastfeeding should begin within the first hour after birth, continue as exclusive breastfeeding for six months then provide appropriate complementary foods while maintaining

breastfeeding for up to two years and beyond [2,3]. However, the ideal practices around breastfeeding are far from the reality of the world; recent estimates by WHO have just been reduced to around 47% of babies under 6 months old are exclusively breastfed. A number of maternal, social, cultural and occupational factors have been shown to have an effect on breastfeeding practices [4]. Factors that can impact breastfeeding initiation and continuation include maternal education, family support, mode of delivery, traditional feeding practices,

maternity leave, workload, having appropriate time or breaks to breastfeed, and having access to suitable facilities to express and store breast milk [5]. According to National Nutrition Survey 2018, 48.4% of infants between 0 to 5 months of age were exclusively breastfed and 45.8% started breastfeeding in the first hour after birth in Pakistan. A high proportion of children are still being breastfed at 1 year (68.4%) and 2 years (56.5%), highlighting a level of underachievement in child feeding practices when compared to recommended levels [6,7]. Healthcare workers are a significant research population as they are providers of breastfeeding information, and, in most cases, mothers facing similar issues as other mothers in relation to breastfeeding. They may be expected to have more knowledge about and access to maternal and child health information as part of their professional education and experience which, in turn, would be expected to lead to greater adherence to recommended breastfeeding practices [8]. But, knowledge does not always lead to personal practice. Even doctors and nurses, as well as other health care workers, can find their working hours, shift work, and short maternity leave, lack of lactation rooms, poor breastfeeding breaks, and problems with expressing breast milk or storing milk affect optimum breastfeeding [9]. Findings from one study in India revealed that 54% of healthcare workers initiated breastfeeding within one hour, 60% actively breastfed exclusively for at least six months and workplace breastfeeding support was significantly related to exclusive breastfeeding. The same issues have been noted in Pakistan [10]. In hospitals providing tertiary care, a study of working women doctors revealed that most of the doctors were on maternity leave, but only about 15% had proper breaks for breastfeeding and there was scanty provision of breastfeeding corners and childcare facilities. Previous Pakistani studies among working women also found that exclusive breastfeeding differed significantly by occupation with a lower rate among doctors as compared to some other groups of working women. The results indicate that the knowledge a professional possesses alone is not enough to achieve the recommended behaviour when breastfeeding [11,12].

Objective

This study aimed to assess breastfeeding practices and compare important feeding-

related factors among healthcare professionals and women from the general population.

METHODOLOGY

A comparative cross-sectional study was conducted at Aga Khan Health Services, Pakistan and Nishtar Hospital Multan from January 2023 to September 2023. The women in this study had prior or current breastfeeding experience. A final study sample of 331 participants was obtained. The participants were divided into two groups: "Healthcare professionals" and "Women from general population" based on their occupational background. Professionally trained or experienced people in the healthcare sector were classified as a healthcare professional group while participants who are not professionally trained or experienced in the healthcare sector were classified as general population. Women were included if they had been or currently breastfeeding, they had at least one child for whom there was a need to provide breastfeeding and infant-feeding information, and they were part of the healthcare professional or general population group, and were willing to participate in the study. Participants had to be able to read and answer the study questionnaire. Women with no previous breastfeeding experience and women who could not provide reliable data on their breastfeeding and infant-feeding practices were excluded. Those who did not provide a sufficiently complete questionnaire or information needed for inclusion in the study were also excluded. There was no evidence that questionnaires were excluded due to some missing responses to specific questions.

Data Collection

Structured questionnaire was used to collect data for sociodemographic data, obstetric history, breastfeeding practices, complementary feeding and breastfeeding difficulties. The sociodemographic and obstetric section comprised of marital status, educational status, age of mother, family structure, parity, place of delivery, person conducting delivery, mode of delivery, age of child and maternal health status. Breastfeeding section included breastfeeding education or training and timing of first contact with the newborn, timing of breastfeeding initiation, type of first feed, use of pre-lacteal feeds, feeding of colostrum, exclusive breastfeeding practices, complementary feeding, use of pacifiers, duration of breastfeeding, expression of breast

milk, and breastfeeding-related difficulties. Participants were asked the age at which they first laid eyes on their baby after delivery and how many days it took for him/her to be given to them. Data about the time of first breastfeeding, how feeding was initiated (properly or not) and the first type of feed offered to the infant were collected. The participants were also enquired about whether a pre-lacteal feed was offered prior to establishing a breast-feeding feed and what type of feed was offered. Honey, ghutti and other feeds were reported as pre-lacteal feeds. Colostrum practices were measured by reporting whether or not colostrum was fed to the baby or thrown out. The feeding practices during the first six months of the infant's life were inquired. Details were obtained of whether the baby was breast fed or given other feeds in addition, such as water, honey, formula milk, gripe water, and other feeds. Breastfeeding, pacifiers and formula milk were also evaluated. The participants were asked if they had provided cow/buffalo milk and if it had been diluted with water, how it was diluted and if there was sugar added to the formula or animal milk. Where appropriate, responses that were similar in meaning were categorized for statistical analysis. The age at which complementary feeding or weaning was started was asked. The responses were categorized into clinically relevant groups, such as the early group (before 6 months), the mid group (6 months) and the late group (after 6 months). Information was also gathered on the first complementary food fed to the baby (such as porridge, yogurt, cerelac, khichri and other foods). Questionnaires also included questions on when the tea, other supplementary drinks (cold beverage, juice), and tea was served to the participants. The primary outcome measures were breastfeeding education, timing of mother-infant contact, timing of breastfeeding initiation, pre-lacteal feeds, feeding of colostrum, type of first feed, breastfeeding practices in the first 6 months,

complementary feeding, breastfeeding duration, breast milk expression, breastfeeding difficulties at work and maternal breastfeeding complications, satisfaction with breastfeeding.

Statistical Analysis

IBM SPSS Statistics v26.0 were the software used to analyze the data. Data on participants' characteristics and breastfeeding practices were summarized using descriptive statistics. Categorical data were presented as frequencies and percentages (n (%)). The breastfeeding attitudes of healthcare workers were compared with those of the general population of women. Associations between two categorical variables (where the assumptions of the chi-square test were met) were tested using Pearson's chi-square test. Fisher's exact test was used in cases of small cell frequencies. All statistical analyses were performed in a two-tailed fashion and a p-value < 0.05 was deemed statistically significant. Frequencies, percentages and p-values were used for the presentation of results.

RESULTS

The total numbers of mother-child pairs analysed was 331. The mean maternal age was 31.9 years (SD 6.8, range 18–55); the distribution was reasonably symmetrical with a peak in the late twenties/early thirties (Figure 1). The median monthly household income was 15,000 Pakistani rupees (range ranged from 1000 to 160,000). Most children were female (199/330; 60.3%), most mothers were multiparous (281/331; 84.9%), and most families lived in urban areas (284/331; 85.8%) and within joint family systems (233/331; 70.4%). The most common mode of delivery was spontaneous vaginal delivery (167/331; 50.5%) followed by spontaneous vaginal delivery with episiotomy (77/331; 23.3%) and caesarean section (87/331; 26.3%). The full socio-demographic profile is presented in Table 1.

Table 1. Socio-demographic characteristics of the study participants (N = 329 with complete maternal age and child sex; two participants with missing values for these variables were excluded from this table).

Characteristic	Category	n (%) or mean (SD)
Maternal age (years)	Mean (SD)	31.9 (6.8)
Child sex	Male	131 (39.8)
	Female	198 (60.2)
Maternal education	Up to matriculation	258 (78.4)
	Intermediate or graduate	51 (15.5)

	Medical or postgraduate	20 (6.1)
Monthly household income (PKR)	Median (range)	15,000 (1,000–160,000)
Family type	Joint family	231 (70.2)
	Single unit	98 (29.8)
Residence	Urban	283 (86.0)
	Rural	46 (14.0)
Parity	Primipara	50 (15.2)
	Multipara	279 (84.8)
Mode of delivery	Caesarean section	86 (26.1)
	Spontaneous vaginal	166 (50.5)
	Spontaneous vaginal with episiotomy	77 (23.4)
Maternal health status	Healthy	323 (98.2)
	Other (chronic illness / dependence)	6 (1.8)

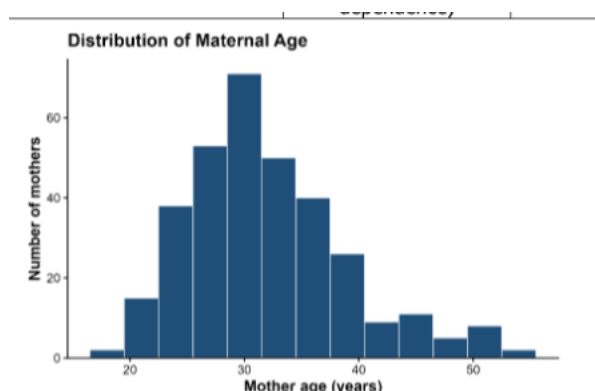


Figure 1. Distribution of maternal age among 330 mothers with a recorded age. The histogram shows an approximately symmetrical distribution centred in the late twenties to early thirties.

Adherence to recommended infant-feeding practices was generally low (Table 2, Figure 2). Early initiation of breastfeeding within one hour of birth was reported by 27.8% of mothers (92/331; 95% CI 23.0–33.0). Exclusive breastfeeding to six months, defined according to the WHO criterion, was achieved by only 14.2% of mothers (47/331; 95% CI 10.6–18.4). In contrast, pre-lacteal feeding was highly

prevalent, reported by 84.3% of mothers (279/331; 95% CI 79.9–88.0). Colostrum was fed to the infant by 71.6% of mothers (237/331; 95% CI 66.4–76.4), continued breastfeeding at 24 months was reported in 44.8% (126/281; 95% CI 38.9–50.9), and a pacifier or soother was used by 21.8% (72/330; 95% CI 17.5–26.7).

Table 2. World Health Organization core infant and young child feeding indicators, with exact binomial 95% confidence intervals.

Indicator	Denominator (n)	Numerator	% (95% CI)
Early initiation of breastfeeding (within 1 hour)	331	92	27.8 (23.0–33.0)
Pre-lacteal feeding (any)	331	279	84.3 (79.9–88.0)
Colostrum fed to infant	331	237	71.6 (66.4–76.4)
Exclusive breastfeeding to 6 months (WHO-aligned)	331	47	14.2 (10.6–18.4)

Continued breastfeeding at 24 months	281	126	44.8 (38.9–50.9)
Pacifier or soother used	330	72	21.8 (17.5–26.7)

The distribution of exclusive-breastfeeding duration (truncated at the six-month threshold) is shown in Figure 3; although a large group of mothers reported breastfeeding to around six

months, only a minority did so exclusively once the provision of other foods and liquids was taken into account.

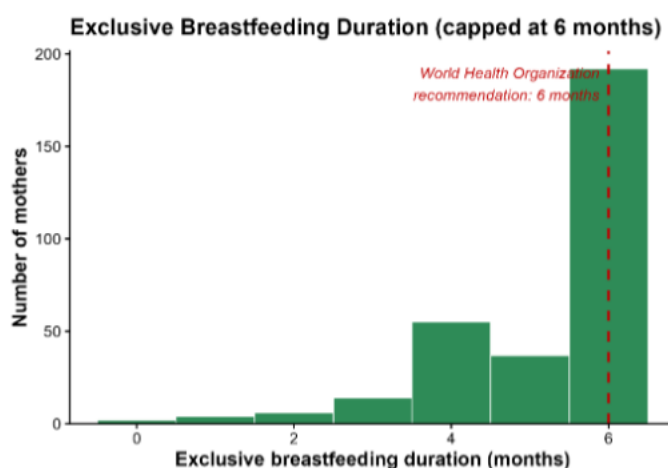


Figure 2. Distribution of reported exclusive-breastfeeding duration, truncated at the World Health Organization six-month threshold. The dashed line marks the recommended six-month duration.

In bivariate analysis, mode of delivery was associated with early initiation of breastfeeding ($p = 0.014$), although this association did not remain significant after FDR adjustment (adjusted $p = 0.082$); no other socio-demographic factor was significantly associated with early initiation (Table 3). In the

multivariable logistic-regression model, mode of delivery remained the principal independent determinant. Compared with caesarean section, mothers who delivered by spontaneous vaginal birth had more than twice the odds of early initiation (aOR 2.52; 95% CI 1.25–5.05; $p = 0.009$).

Table 3. Bivariate associations between socio-demographic factors and the two principal feeding outcomes (early initiation of breastfeeding and exclusive breastfeeding to six months), with Benjamini–Hochberg false-discovery-rate-adjusted p-values

Factor	Outcome	Test	p-value	Adjusted p
Mode of delivery	Early initiation	Chi-squared	0.014	0.082
Parity	Early initiation	Chi-squared	0.115	0.258
Education	Early initiation	Fisher exact	0.089	0.229
Respondent category	Exclusive breastfeeding	Chi-squared	0.001	0.013
Parity	Exclusive breastfeeding	Chi-squared	0.005	0.044
Education	Exclusive breastfeeding	Fisher exact	0.049	0.147
Mode of delivery	Exclusive breastfeeding	Chi-squared	0.034	0.124
Breastfeeding course	Exclusive breastfeeding	Chi-squared	0.034	0.124

Table 4. Multivariable logistic-regression model of factors independently associated with early initiation of breastfeeding ($n = 330$).

Predictor	aOR	95% CI	p-value
Maternal age (per year)	1.00	0.96–1.03	0.817
Education: intermediate or graduate (vs up to matriculation)	0.60	0.28–1.30	0.196

Education: medical or postgraduate (vs up to matriculation)	1.11	0.39–3.13	0.843
Residence: rural (vs urban)	0.88	0.43–1.83	0.738
Parity: multipara (vs primipara)	0.46	0.23–0.93	0.031
Delivery: spontaneous vaginal (vs caesarean)	2.52	1.25–5.05	0.009
Delivery: spontaneous vaginal with episiotomy (vs caesarean)	2.94	1.36–6.35	0.006
Breastfeeding course: no (vs yes)	0.81	0.48–1.36	0.427

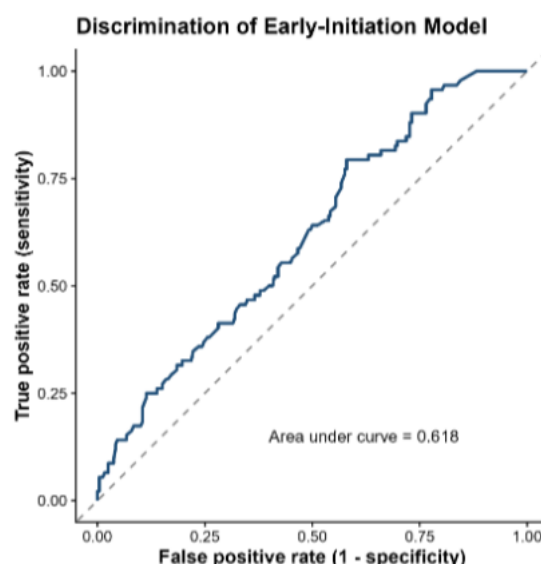


Figure 3. Receiver-Operating-Characteristic Curve for the Early-Initiation Logistic-Regression Model. The area under the Curve was 0.62, Indicating Modest Discrimination.

Among mothers who did not practise exclusive breastfeeding, the most frequently reported reasons were that formula feed was given (34.1%) and a perception that breast milk was insufficient ("feed was not adequate", 22.4%), followed by social reasons (16.5%) and a subsequent pregnancy (15.3%) (Figure 4).

Among mothers who had stopped breastfeeding before two years, a subsequent pregnancy was by far the most common reason, reported by just over half of these mothers (50.9%), followed by the infant refusing the breast (20.0%) (Figure 8).

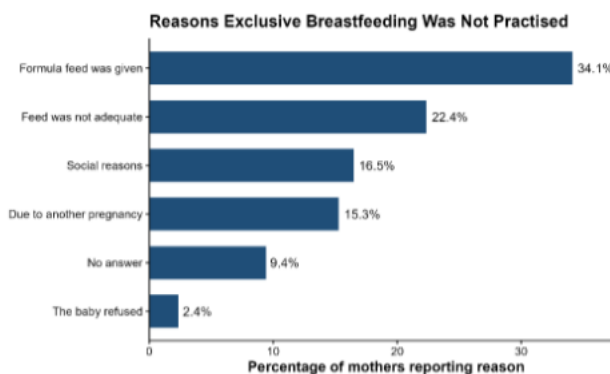


Figure 4. Reported reasons for not practising exclusive breastfeeding, among mothers who did not exclusively breastfeed. Bars show the percentage of mothers giving each reason.

Among the 281 mothers who had stopped breastfeeding, the median completed duration of breastfeeding was 18 months (95% CI 18–24) (Figure 9). The duration of breastfeeding differed by mode of delivery (log-rank $p = 0.042$; Figure 10). In the Cox proportional-hazards model, mothers with an intermediate or graduate education had a higher rate of breastfeeding cessation than those educated up

to matriculation (HR 1.45; 95% CI 1.03–2.05; $p = 0.032$); other factors, including mode of delivery and parity, were not independently associated with the timing of cessation (Table 5). As age at cessation was recorded only for mothers who had already stopped, these results describe completed breastfeeding durations.

Table 5. Cox proportional-hazards model for cessation of breastfeeding among mothers who had stopped ($n = 281$). HR, hazard ratio; CI, confidence interval. A hazard ratio above 1 indicates a higher rate of breastfeeding cessation (shorter duration).

Predictor	HR	95% CI	p-value
Delivery: spontaneous vaginal (vs caesarean)	0.97	0.71–1.31	0.835
Delivery: spontaneous vaginal with episiotomy (vs caesarean)	0.72	0.51–1.02	0.062
Parity: multipara (vs primipara)	1.12	0.77–1.62	0.556
Education: intermediate or graduate (vs up to matriculation)	1.45	1.03–2.05	0.032
Education: medical or postgraduate (vs up to matriculation)	1.60	0.90–2.83	0.108
Residence: rural (vs urban)	0.80	0.57–1.12	0.195

DISCUSSION

The present study examined breastfeeding and infant-feeding practices among 331 mothers with a specific focus on differences by respondent category and breastfeeding determinants that included early initiation, exclusive breastfeeding, pre-lacteal feeding, and breastfeeding duration. The results reflect significant discrepancies between recommendations for infant feeding and maternal feeding practices. Only 27.8% of participants reported initiation of breastfeeding within one hour, 14.2% were exclusively breastfed till 6 months and 84.3% were reported to feed with pre-lacteal foods. In contrast 71.6% of mothers gave colostrum and 44.8% of mothers who had completed their breastfeeding history had continued to breastfeed to 24 months. The results indicate that these children would not have been breastfed according to WHO and UNICEF guidelines: breastfeed within the first hour of life, breastfeed only, and then breastfeed with complementary foods until two years of age or older. Compared with other studies, the number of mothers starting to breastfeed within an hour in the present study was low. The ratio of those who met the recommended early-initiation criterion was only 27.8%. This is significantly lower than the early initiation rate of 68% observed in large study of 4800 mothers of low socio-economic status in Sindh,

Pakistan. In the earlier study, factors associated with early initiation were identified as institutional delivery, skilled birth attendance, skin to skin contact, antenatal guidance and normal delivery. A comparable study of health care workers reported early initiation in 54% of the mothers who participated in the study. Variations between studies might be attributed to variations in the study setting, maternal characteristics, hospital practices, recall period, and immediate postpartum breastfeeding support [13].

The present study found that mode of delivery was an important factor influencing early breastfeeding initiation. Compared to cesarean delivery, spontaneous vaginal delivery was associated with over twice the odds of early initiation (aOR 2.52; 95% CI 1.25–5.05) and spontaneous vaginal delivery with episiotomy was associated with nearly three times the odds (aOR 2.94; 95% CI 1.36–6.35). These findings are similar to previous studies conducted in Pakistan which revealed that normal delivery was positively associated with timely initiation of breastfeeding. In addition to the delay in contact with the infant that can occur during the cesarean delivery process, mothers may be uncomfortable, may have to endure general anesthesia, may be separated from the infant, and may require routine hospital care, all of which can cause a delay in infant–mother contact [14]. This discovery demonstrates that

allowing early skin-to-skin contact and breastfeeding after operative delivery, when mother and baby are both well, is crucial. Additionally, the relationship between parity and early initiation was found to be independent. The odds of early breastfeeding initiation were 0.46 (95% CI 0.23–0.93; $p = 0.031$) lower for multiparous mothers compared to primiparous mothers. While breastfeeding may be expected to be easier after the first pregnancy, multiparous women are also likely to maintain their previous breastfeeding and infant-feeding habits. Also, variation in circumstances during the pregnancy or earlier breastfeeding history, or the amount of counselling received during later pregnancies could play a role. Since this was an observational study, the association can not be viewed as evidence that multiparity is the cause of delayed initiation [15].

Another primary issue of concern was exclusive breastfeeding. 14.2% of mothers met the WHO guideline for exclusive breastfeeding up to six months. This is significantly lower than the current global estimate, as per WHO, about 47% of babies under 6 months were exclusively breastfed in the year 2018-2025. It is also less than the 41.5% exclusive breastfeeding rates among working women in Pakistan and 60% among healthcare professionals in a study in India. The reason for this relatively low estimate in the present study was probably the exclusive breastfeeding limitation, as the babies in the current study were only classified as exclusively breastfed if water, honey, formula, gripe water, or other liquids were provided during the first six months. This is because mothers can claim they breastfed for six months even if other fluids and foods were fed at the same time. The study data also indicated that many mothers reported breastfeeding for around 6 months, and significantly less number of mothers met the criteria for exclusive breastfeeding. Exclusive breastfeeding was significantly associated with the respondent category in the bivariate analyses and remained significant in the adjusted analyses ($p = 0.001$; adjusted $p = 0.013$). After adjustment, parity was also highly correlated with exclusive breastfeeding (adjusted $p = 0.044$). Previous studies in Pakistan revealed that there was significant difference in exclusive breastfeeding by occupational groups, with doctors showing least exclusive breastfeeding compared to other occupational groups [17]. Other research among health care professionals has also demonstrated a significant association between

exclusive breastfeeding and breastfeeding support in the workplace. Therefore, the professional knowledge should be taken in conjunction with maternity leave and duty schedules, breastfeeding breaks, access to lactation room, family support, and institutional policies. The breastfeeding trend toward using breastfeeding for longer duration was more positive. The median time for mothers who were fully breastfeeding until was 18 months, and 44.8% continued breastfeeding for 24 months. In those who did not continue for 2 years, the most commonly mentioned reason was pregnancy (50.9%) followed by refusal of the breast by the infant (20.0%). The results suggest that although initiation and exclusivity were an issue, most mothers managed to continue to breastfeed for a relatively long time [18,19]. The results have implications for maternal and child health services. This isn't a one-way street; the promotion of breastfeeding should go past the delivery of information. Immediate postpartum support, early mother–infant contact, no need for unnecessary pre-lacteal feeding, counselling on perceived insufficient milk and lactation support after discharge should be emphasized. Healthcare institutions should also make sure that healthcare workers have a sufficient maternity leave, lactation breaks, lactation rooms, and lactation facilities for them to express and safely store breastmilk in.

Several limitations should be taken into consideration when interpreting the study. It was cross-sectional and causal relationships could not be determined and the mothers' recall of breastfeeding practice was not always accurate, especially if they had older children. There may be social desirability bias in self-reported practices. A few variables did not have all observations and so denominators varied slightly from analysis to analysis. Also, the possibility of residual confounding due to factors like maternity leave, workload, maternal influence, access to lactation facilities, infant illness, and breastfeeding intentions cannot be ruled out. Although there are a number of constraints, the study offers valuable information on several aspects of breastfeeding behaviour and some areas for increasing breastfeeding support.

CONCLUSION

The study concluded that breastfeeding practices among the participants were not fully aligned with recommended infant-feeding guidelines. Pre-lacteal feeding was very

common, while early breastfeeding and exclusive breastfeeding for six months were relatively uncommon. Only 27.5% of mothers started breastfeeding within an hour of giving birth, 14.2% continued exclusively breastfeeding until six months, and 84.3% reported using pre-lacteal feeds. On the other hand, 71.6% gave colostrum, and 44.8% of mothers with completed breastfeeding histories continued breastfeeding until 24 months. While mode of delivery was a significant determinant of early breastfeeding initiation, with vaginal delivery associated with higher odds of timely initiation, respondent category and parity were significantly associated with exclusive breastfeeding. Pre-lacteal feeding was also less likely in mothers with more education. These results emphasize the need for stronger breastfeeding education, improved post-delivery support, discouragement of pre-lactation feeding, and improved workplace and institutional support to improve breastfeeding practices among healthcare professionals and the general population of women.

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