ORIGINAL ARTICLE

Infant and Young Child Feeding Practices among Mothers in Lahore, Pakistan: A Cross-Sectional Study

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Doi: doi.org/10.53685/jshmdc.v2i1.14

ABSTRACT

Background: Inadequate child feeding practices lead to malnutrition, higher under-five mortality rates and adverse effects on quality of life. This study aimed to assess the breastfeeding and complementary feeding practices of mothers as well as the influence of various sociodemographic factors on them in local families of Lahore.

Materials & Methods: This is a cross-sectional, descriptive study. It was conducted in CMH (Combined Military Hospital), Lahore in 2018. It comprises a sample of 203 mothers with children of at least two years of age, from various urban areas of Lahore. The subjects were selected on the basis of the inclusion criteria. Mothers with psychiatric illnesses and children with congenital anomalies were excluded from the study. Mothers were app-roached in the pediatric outpatient departments of four tertiary care hospitals of Lahore. Responses were re-corded using a modified version of the Action Contre La Faim (ACF) questionnaire. Independent sample t-test and chi-square test were applied for analysis of the data.

Results: Early initiation of breastfeeding within one hour from birth was observed in 83.3% children. Most children were administered colostrum (69.5%). The rate of exclusive breastfeeding for the first six months was 45.3%. A child was being breastfed 8.21 ± 6.67 (mean ± SD) times a day. Maternal educational status, total number of adults in a household, and access to free healthcare were identified as important factors influencing the practice of breastfeeding. Porridge, khichdi, eggs, fruit and yoghurt were the most frequently used complementary foods.

Conclusion: A high rate of an early start of breastfeeding and a low rate of exclusive breastfeeding for at least six months were predominant in our population. Administration of colostrum was observed in approximately two-thirds of the study participants. Education of the mother, type of the family system (nuclear or combined), and access to free healthcare strongly influence the breastfeeding practices.

Key Words: Breastfeeding, complementary feeding, infant and child nutrition, malnutrition, Pakistan

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Received 26.05.21, Revised 07.06.21,
Accepted 08.06.21

INTRODUCTION

Breastfeeding is an unparalleled way of feeding infants to favor appropriate growth and development. The vast majority of mothers can and should breastfeed[1].Optimal feeding practices dur-ing the first 2 years of life are of prime importance because evidence indicates that sub-optimal feeding results in malnutrition which can lead to stunting as well

as short and long-term sequelae, including decreased survival, impaired physical growth and cognitive development, poor school enrollment and performance, and reduced productivity and earnings in adult life[2,3].

A quarter of the world's children live in South Asia and 34% of them have stunted growth[3]. In South Asia, Pakistan has the second highest rate of childhood stunting. Thirty-eight percent of the Pakistani children are stunted and 7% are wasted (thin for height), which is indicative of chronic maln-utrition[4]. Direct or indirect malnutrition has been considered responsible for 60% of the 10.9 million annual under-five deaths globally. With 409,000 annual under-five deaths, Pakistan ranks 3rd in the world[3]. Inappropriate infant and young child feeding (IYCF) practices have been associated with most of these deaths, which occur during the first year of life[1].Appropriate breast-feeding and complementary feeding practices can reduce the rate of under-five deaths secondary to undernutrition[5].

Optimal IYCF practices, according to WHO guidelines, include an early start of breastfeeding with-in 1 hour after birth and administration of colostrum. This should be followed by exclusive breast-feeding for the first 6 months of life, and then by nutritionally adequate and safe comple-mentary foods for up to 2 years of age and beyond[6]. Infants who cannot be breastfed should receive an appropriate breast milk substitute such as infant formula[1,7].

Exclusive breastfeeding is defined as feeding with breast milk only and no other foods or liquids (not even water), with the exception of medications, vitamin or mineral supplements[6]. Whereas, infant feeding with other foods and liquids in addition to breast milk, when breast milk alone is insufficient to meet the increasing nutritional demands of the growing infant, is called complementary feeding[7].

Since the total caloric requirements of children in-crease with age, WHO recommends that they should be given semisolid foods at the beginning of complementary feeding, i.e. at 6 months, then moved on to "finger foods" (snacks that the child can eat without help) by 8 months, and by 12 months of age the child should eat the same types of foods as the rest of the family, while continuing adequate breastfeeding up to 2 years of age[7]. The foods given to complement breastfeeding should also be diverse, adequately nutritious, and safe[7]. Otherwise, it can lead to diarrhea, growth ret-ardation and protein-energy malnutrition[7].

Improving child feeding practices in lactating mothers is essential to deal with suboptimal child nutritional and mortality statuses. This requires the adoption of strategies for nutritional counsel-ing, supplementation of fortified foods, and most importantly, educating mothers about appropriate practices.

Various studies conducted previously in Pakistan have reported the rate of an early start of exclusive breastfeeding within one hour after birth to range from 7.4% to 20%, that of administration of colostrum to be 83.6%, and the rate of exclusive breast-feeding to be 87.9%[4,8,9].

The objectives of this study were to determine the breastfeeding and complementary feeding pract-ices, and their influencing factors among mothers of Lahore, Pakistan.

MATERIALS AND METHODS

This cross-sectional, descriptive study was conducted at CMH (Combined Military Hospital), Lahore. The data were collected in 2018 at four tertiary care hospitals of Lahore, namely CMH Lahore, Services Hospital, Jinnah Hospital and Sheikh Zayed Hospital. The patients presenting at CMH Lahore are usually from military households and are entitled to free healthcare. Whereas, the patients presenting at rest of the aforementioned

hospitals are mostly from civilian households and self-finance health services.

The ethical approval letter was issued by the Ethical Review Committee of CMH Lahore Medical College & Institute of Dentistry, Lahore (reference number: 67/ERC/CMHLMC), and informed consent was obtained from the study participants at the time of data collection.

The inclusion criteria for this study were that the child should be of at least 2 years of age and that the mother must have remained directly involved in feeding (breastfeeding and complementary feeding) of the child for that period of time. Children with any congenital anomaly, and mothers labelled with any medical or psychiatric morbidity that could obstruct the feeding process e.g. depression, dementia etc., were excluded from the study.

An adapted form of the ACF (Action Contre La Faim) questionnaire for assessing breastfeeding practices was developed to record demographic details of the child and mother, mother's educational status, breastfeeding practices, and foods used for complementary feeding[10]. Using OpenEpi (version 3.0), a minimum sample size of 211 was considered to be appropriate with a confidence interval of 95%. The mothers were approached in the paediatric outpatient departments of the aforementioned hospitals. The questionnaires were filled after taking informed consent from the mothers. The data were collected over a period of 6 months.

The data analysis was done with SPSS version 21 (IBM Chicago, IL, USA). Descriptive analysis was carried out for frequencies and percentages of demographic variables and breastfeeding practices. Independent sample t-test was used to determine the mean difference in the frequency of breastfeeding per day according to the child's gender. The chi-square test was used to see the relationship between various sociodemographic factors and breastfeeding practices. A two-tailed p-value <0.05 was accepted as statistically significant.

RESULTS

A total of 203 children were included in the study. Of them, 141 (69.5%) were male in gender and the rest (30.5%) female. Regarding the educa-tional level of mothers, 61 (30%) had secondary level education (30%); 9 (4.4%) had postgraduate-level education, whereas 42 (20.7%) had received no formal education. A total of 122 (60.1%) households contained 1 - 4 adults and 103 (50.7%) mothers had access to free healthcare. The child and maternal demographic factors are detailed in Table 1.

Of the 203 children, 169 (83.3%) children were started on breastfeed within one hour from birth, 141 (69.5%) were given colostrum, 164 (80.8%) were breastfed on demand, and 158 (77.8%) were breast fed at night. The average number of times a child was being breastfed per day was 8.21 ± 6.67 (Mean ± SD). Table 2 depicts the frequencies of various breastfeeding practices. A total of 92 (45.3%) children had been exclusively breastfed for at least 6 months (6 – 12 months) and started on complementary foods thereafter. The age of children at the onset of complementary feeding has been illustrated in figure 1.

Cumulatively, 107 (52.7%) children were started on complementary feeding before 6 months of age, which represents the rate of early cessation of exclusive breastfeeding.

Assessment of the types of foods being used for complementary feeding revealed that the foods being used for this purpose were porridge or cereals, khichdi (a local dish prepared from rice and pulses), powdered milk, animal milk (e.g. cow milk), tea or water with sugar, infant formula, yoghurt, vegetables, fruit, eggs and meat. Porridge or cereals were the most commonly used complementary food, being consumed by (n=130,

Table 1: Demographic Characteristics of the Study Population (n=203)

Characteristic(s)	Number	%
Child's gender		
Male	141	69.5
Female	62	30.5
Maternal age (years)		
< 25	52	25.6
25 – 29	90	44.4
30 – 34	51	25.1
≥ 35	10	4.9
Mother's educational level		
No formal education	42	20.7
Primary level	35	17.2
Secondary level	61	30.0
Intermediate level	24	11.8
≥ Graduate level	41	20.2
Number of adults in the household		
1 – 4	122	60.1
5 – 8	60	29.6
9 – 12	16	7.8
13 – 16	2	1
17 – 20	3	1.5
Access to free healthcare		
Yes	103	50.7
No	100	49.3
Total (n)	203	100

64.0%) children. The percentages of children consuming these foods are shown in figure 2.

Because there were more male children than female children in our sample, the sample sizes for independent sample t-test were matched by randomly selecting 62 boys. The t-test showed that boys were being breastfed more frequently (9.50±6.91) than girls (6.73±6.24). This difference was statistically significant (p=0.021; 95% CI=0.43, 5.12).

Influence of various socio-demographic factors on breastfeeding practices was determined by carrying out chi-square tests. Maternal age did not significantly influence the breastfeeding practices

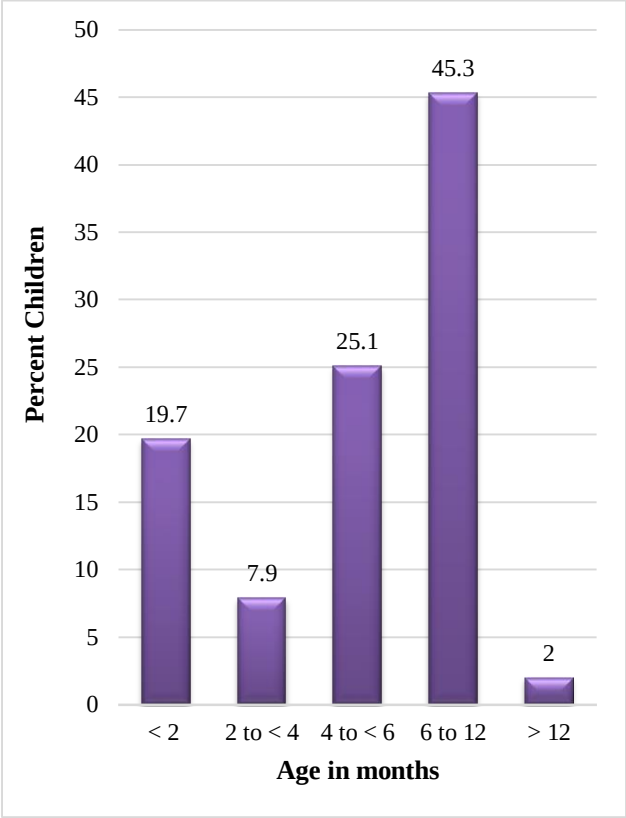

Figure 1: Children's Age at the Onset of Complementary Feeding

(Table 2). The educational level of the mother had a significant effect on breastfeeding on demand ($\chi2$=11.634, p=0.020) and the age of cessation of exclusive breastfeeding (< 6 months vs. ≥ 6 months) ($\chi2$=11.819, p=0.019) (Table 3).

Similarly, the total number of adults in the household (≤ 4 vs. > 4) played a significant role in determining early initiation of breastfeeding after birth ($\chi2$= 4.349, p=0.037), breastfeeding on demand ($\chi2$= 3.915, p= 0.048), and the age of cessation of exclusive breastfeeding ($\chi2$= 4.398, p= 0.036) (Table 4). In the same way, access to free healthcare played a significant role in determining the number of times a child was being breastfed per day (≤12 vs. >12) ($\chi2$= 5.563, p=0.018) and the age of cessation of exclusive breastfeeding ($\chi2$= 14.860, p < 0.001) (Table 5).

Table 2: Influence of Maternal Age on Child Feeding Practices

Breastfeeding Practices		Maternal Age (years) 20-24	25-29	30-34	≥ 35	χ^2 p value
Initiation of breastfeeding within one hour from birth	Yes (169)	43 (25.44)	77 (45.56)	44 (26.04)	5 (2.96)	χ^2=5.375 p=0.146
	No (34)	9 (26.47)	13 (38.24)	8 (23.53)	4 (11.76)	
Administration of colostrum	Yes (141)	38 (26.95)	60 (42.55)	37 (26.24)	6 (4.26)	χ^2=0.755 p=0.860
	No (62)	14 (22.58)	30 (48.39)	15 (24.19)	3 (4.84)	
Breastfeeding on demand	Yes (164)	41 (25.00)	78 (47.56)	38 (23.17)	7 (4.27)	χ^2=4.175 p=0.243
	No (39)	11 (28.21)	12 (30.77)	14 (35.90)	2 (5.13)	
Breastfeeding at night	Yes (158)	38 (24.05)	74 (46.84)	39 (24.68)	7 (4.43)	χ^2=1.929 p=0.587
	No (45)	14 (31.11)	16 (35.56)	13 (28.89)	2 (4.44)	
No. of times a child was breastfed/day	≤12 (175)	42 (24.00)	78 (44.57)	46 (26.29)	9 (5.14)	χ^2=2.971 p=0.396
	>12 (28)	10 (35.71)	12 (42.86)	6 (21.43)	0 (0.00)	
Age of cessation of exclusive breastfeeding	< 6 months (107)	26 (24.30)	49 (45.79)	28 (26.17)	4 (3.74)	χ^2=0.535 p=0.911
	≥ 6 months (96)	26 (27.08)	41 (42.71)	24 (25.00)	5 (5.21)	

Table 3: Influence of Maternal Educational Status on Child Feeding Practices

Breastfeeding Practices		Educational Status of Mother: No formal education	Primary	Secondary	Intermediate	≥ Graduate	χ^2 p value
Initiation of breastfeeding within one hour from birth	Yes (169)	35 (25.44)	28 (16.57)	55 (32.54)	17 (10.06)	34 (20.12)	χ^2=5.013 p=0.286
	No (34)	7 (26.47)	7 (20.59)	6 (17.65)	7 (20.59)	7 (20.59)	
Administration of colostrum	Yes (141)	30 (26.95)	22 (15.60)	44 (31.21)	14 (9.93)	31 (21.99)	χ^2=3.133 p=0.536
	No (62)	12 (22.58)	13 (20.97)	17 (27.42)	10 (16.13)	10 (16.13)	
Breastfeeding on demand	Yes (164)	35 (25.00)	25 (15.24)	57 (34.76)	18 (10.98)	29 (17.68)	χ^2=11.634 p=0.020
	No (39)	7 (28.21)	10 (25.64)	4 (10.26)	6 (15.38)	12 (30.77)	
Breastfeeding at night	Yes (158)	35 (24.05)	26 (16.46)	52 (32.91)	18 (11.39)	27 (17.09)	χ^2=6.456 p=0.168
	No (45)	7 (31.11)	9 (20.00)	9 (20.00)	6 (13.33)	14 (31.11)	
No. of times a child was breastfed/day	≤12 (175)	33 (24.00)	29 (16.57)	56 (32.00)	23 (13.14)	34 (19.43)	χ^2=6.238 p=0.182
	>12 (28)	9 (35.71)	6 (21.43)	5 (17.86)	1 (3.57)	7 (25.00)	
Age of cessation of exclusive breastfeeding	< 6 mon (107)	23 (24.30)	19 (17.76)	24 (22.43)	11 (10.28)	30 (28.04)	χ^2=11.819 p=0.019
	≥ 6 mon (96)	19 (27.08)	16 (16.67)	37 (38.54)	13 (13.54)	11 (11.46)	

Table 4: Influence of Total Number of Adults in the Household on Child Feeding Practices

Breastfeeding Practices		Total number of adults in the household ≤ 4	> 4	χ^2 p value
Initiation of breastfeeding within one hour from birth	Yes (169) No (34)	107 (63.31) 15 (44.12)	62 (36.69) 19 (55.88)	χ^2= 4.349 p=0.037
Administration of colostrum	Yes (141) No (62)	85 (60.28) 37 (59.68)	56 (39.72) 25 (40.32)	χ^2= 0.007 p=0.935
Breastfeeding on demand	Yes (164) No (39)	104 (63.42) 18 (46.15)	60 (36.59) 21 (53.85)	χ^2= 3.915 p= 0.048
Breastfeeding at night	Yes (158) No (45)	96 (60.76) 26 (57.78)	62 (36.69) 19 (55.88)	χ^2= 0.130 p=0.719
No. of times a child was breastfed/day	≤12 (175) >12 (28)	107 (61.14) 15 (53.57)	68 (39.72) 13 (40.32)	χ^2= 0.577 p= 0.447
Age of cessation of exclusive breastfeeding	< 6 mon. (107) ≥ 6 mon. (96)	57 (53.27) 65 (67.71)	50 (36.59) 31 (53.85)	χ^2= 4.398 p= 0.036

Table 5: Influence of Access to Free Healthcare on Child Feeding Practices

Breastfeeding Practices		Access to free healthcare Yes	No	χ^2 p value
Initiation of breastfeeding within one hour from birth	Yes (169) No (34)	85 (50.30) 18 (52.94)	84 (49.70) 16 (47.06)	χ^2= 0.079 p=0.778
Administration of colostrum	Yes (141) No (62)	72 (51.06) 31 (50.00)	69 (48.94) 31 (50.00)	χ^2= 0.019 p=0.889
Breastfeeding on demand	Yes (164) No (39)	78 (47.56) 25 (64.10)	86 (52.44) 14 (35.90)	χ^2= 3.449 p= 0.063
Breastfeeding at night	Yes (158) No (45)	77 (48.73) 26 (57.78)	81 (51.27) 19 (42.22)	χ^2= 1.146 p= 0.284
No. of times a child was breastfed/day	≤12 (175) >12 (28)	83 (47.43) 20 (71.43)	92 (52.57) 8 (28.57)	χ^2= 5.563 p=0.018
Age of cessation of exclusive breastfeeding	< 6 mon. (107) ≥ 6 mon. (96)	68 (63.55) 35 (36.46)	39 (36.45) 61 (63.54)	χ^2= 14.860 p < 0.001

DISCUSSION

According to our study, 69.5% of newborns were fed colostrum. However, similar studies in Pakistan have reported varying rates of colostrum feeding, e.g. 83.6% and 96%, whereas it was reported to be just 23.5% in a study carried out in our neighboring country, India[8,11,12]. This variation may be related to differences in literacy rates, awareness of

mothers regarding optimal feeding practices, cultural influences and variations among socioeconomic statuses across different settings[13,14]. The rest of the mothers (30.5%) in our setting reported various reasons for not administering colostrum such as the mother's lack of knowledge regarding its significance, admission of the child to an intensive care unit after birth, or insufficient milk production as reported by 5.9% of the mothers.

UNICEF recommends starting the breastfeeding within one hour after birth, as it enhances new-born survival and reduces the risk of infections and early death[6]. Previous studies from Pakistan report a very low rate of early initiation of breast-feeding with rate as low as 20% and 23.9%[4,15]. However, mothers in our setting had a very good rate (83.3%) of early initiation of breastfeeding. This difference could be attributed to the fact that these studies included samples from rural areas as well. In contrast, present study was carried out in an urban area, where tertiary-level hospital care is readily available and the general health awareness is better than that in rural areas[16].

Studies exploring the rate of exclusive breastfeeding for the first six months in Pakistan report varied results, and range from 48% to 87.9%[4,9,15]. Present study determined this rate to be 45.3% among mothers in our setting. Even though the recommended age of initiation of complementary foods is 6 months, but 52.7% of the mothers in present study reported having initiated complementary feeding before this age. In other words, the rate of early cessation of exclusive breastfeeding is high. A study carried out in a different setting by Mnyani et al. showed that the rate of early cessation was increasing at an alarming rate as well[17].

The researchers observed that infant boys were breastfed more frequently than infant girls. This may be attributed to the general notion within the community that male babies have greater nutritional needs than female babies. Similar findings were reported in a study conducted in our neighboring country of Iran[18].

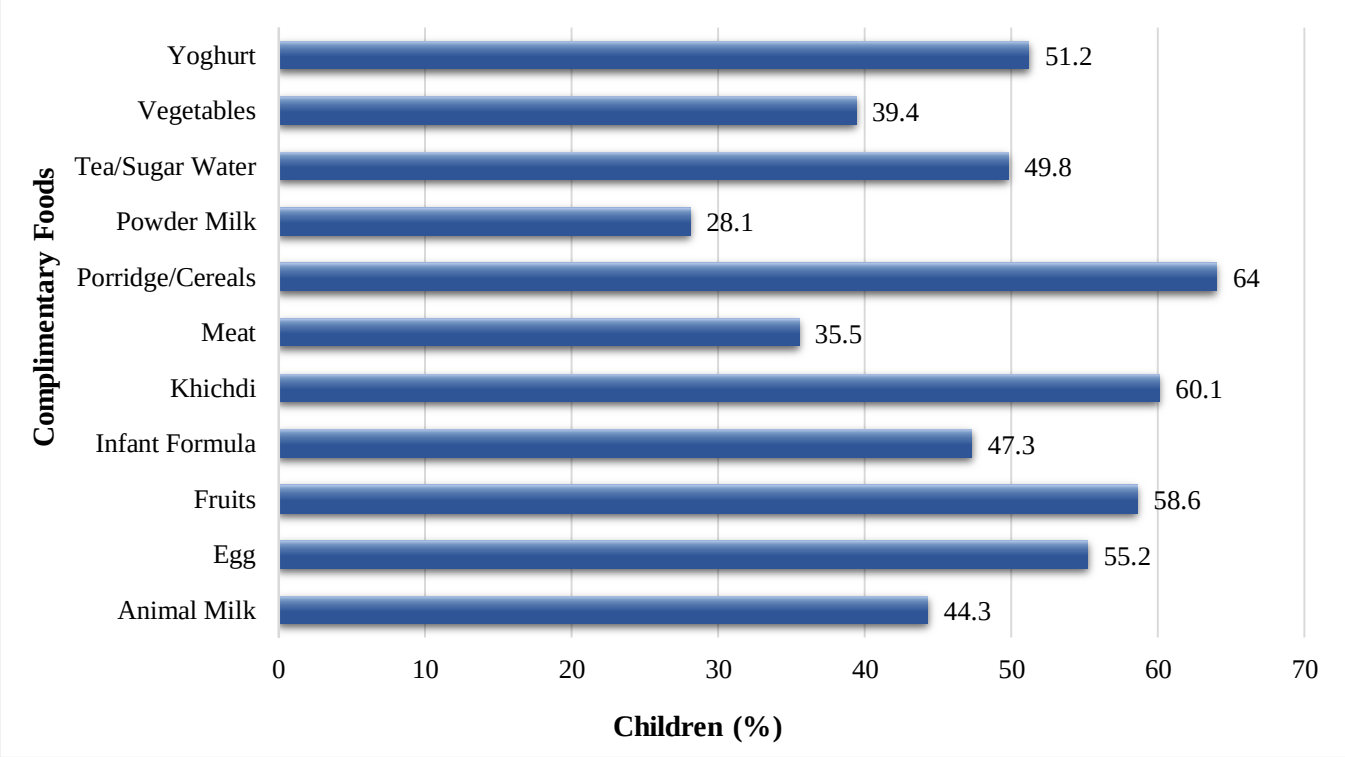

Figure 2: Children (%) Consuming Different Complementary Foods (n=203)

Present study found the maternal educational status to be a significant influencer of the breast-feeding practices, especially the age of cessation of exclusive breastfeeding. This significant relat-ionship between the mother's educational level and breastfeeding practices has also been reported in previous studies[19–21]. However, the former was not significantly linked to the administration of colostrum in present study. Mothers in households with less number of adults i.e. nuclear families, were more likely to breastfeed their children from birth, on demand, and exclusively for at least 6 months than mothers from households with extended families. In the latter, a greater number of individuals residing in a single household may lead to an increased burden of household chores and responsibilities on lactating mothers at the expense of the time and attention devoted to their child. Similar findings were reported in a study that mothers in nuclear families have a better perception of appropriate child feeding[22]. A higher frequency of breastfeeding per day was observed in mothers with access to free healthcare. This may be explained by the fact that these mothers have easier access to appropriate antenatal counse-ling on breastfeeding than their counterparts, who must self-finance such services.

Most studies call for interventions aimed at imp-roving infant feeding practices and preventing malnutrition, such as community-based awareness programs, maternal education about breastfeeding, and nutritional counseling. These interventions can minimize the inconveniences faced with breastfeeding and would be helpful in improving IYCF practices[21,23].

Limitations

The limitations of this study include the restriction of our sample population to only mothers who presented at hospitals, reliance on mothers' memory of past events which could produce recall bias, and not recording the mothers' economic status for evaluation as a determinant of breast-feeding and complementary feeding.

CONCLUSION

The rate of an early start of breastfeeding within one hour after birth was high among our study participants. Almost two-thirds of the participants observed administration of colostrum. However, the rate of exclusive breastfeeding for at least six months is low. Diverse food groups were being used for complementary feeding of the children and mostly comprised Porridge/Cereals, Khichdi, fruits and eggs. The Educational level of mother strongly influences the duration of exclusive breastfeeding, but not the administration of colostrum. Mothers with access to free healthcare services and those residing under nuclear family system have better breastfeeding practices than mothers without access to free healthcare and those residing under combined family system respectively.

Conflicts of interest

There authors have no conflicts of interest.

Contributors

Initial design of the study was done by Dr. Faisal Farooq, Dr. Mohsin Raza and Dr. Zoofishan Imran. Data collection and manuscript drafting was done by Dr. Faisal Farooq, Dr. Mohsin Raza, Dr. Fatima Zulfiqar, Dr. Fareeha Gul, and Dr. Hassaan Altaf. Data analysis and interpretation were done by Dr. Faisal Farooq and Dr. Zoofishan Imran. All authors critically revised and approved the final manuscript.

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