



Original Article

Feeding Practice during Infancy: A Hospital Based Study

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ABSTRACT

Optimal infant feeding practices are crucial for the nutritional status, growth, development, and ultimately the survival of infants and young children. Proper feeding of infants can reduce childhood mortality and morbidity significantly. This study was done to know the feeding patterns of the infants in the Sylhet region who were admitted into a tertiary care hospital. This hospital-based, cross-sectional study was carried out at Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, from January 2018 to June 2018. The aim of the study was to find out the feeding practices during the first year of life among hospitalised infants. For the study, 128 mother-child pairs were purposively interviewed. A questionnaire was used for data collection with the verbal consent of the mother. All the children were 1 month to 12 months old. One hundred and ten infants were given colostrum, but 18 children (14%) were given prelacteal feeds. All the children aged 1 to 3 months were given breast milk, but bottle feeding or formula milk was also introduced in 59% of cases during this period. Although breast milk was continued at a high percentage (72% in 10-12 month olds) during the first year of life, the rate of bottle feeding increased with advancing age. Early weaning was found to be very common, and in the majority of cases (>50%), rice or suji was given. Dietary diversity was very poor, as less than fifty percent of the infants above six months were given eggs, flesh food, or vegetables and fruits. Approximately 50% of infants in the age group 10-12 months were given commercial cereal or canned food. Continuation of breast feeding and offering colostrum to the infants were satisfactory. The main problems revealed from the study were early complementary feeding, poor dietary diversity, and a significant prevalence of formula milk and commercial canned foods or cereals.

Keywords: Breastfeeding, Bottle feeding, Complementary feeding, Infant and young child feeding.

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INTRODUCTION

The first year of life provides the platform for remarkable growth and development, setting the trajectory for a child's life. The total brain volume doubles in the first year of life, and the infant acquires

new competence in all developmental domains. Especially the dramatic growth of infants during the first year of life (A 3-fold increase in weight and a 50% increase in length) imposes unique nutritional needs¹.

The growth during infancy is rapid, critical for neurocognitive development, and has the highest energy and nutrient requirements relative to body size compared with other periods of growth. In this phase of life, nutrient deficiency can limit growth, impair

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immune function, and increase morbidity and mortality². Infant and young child feeding (IYCF) refers to the feeding practices of children from the time of birth to the completion of 2 years of age. IYCF includes the early initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life, and complementary feeding starting at seven months and continuing until the completion of two years with continued breastfeeding³.

Breast milk is the gold standard of infant nutrition, and breastfeeding is the gold standard of infant feeding⁴. Breastfeeding provides survival, optimal growth, nutrition, and development for infants and young children⁵. Breastfeeding is a well-established and recommended intervention for the improvement of child nutrition. Studies have demonstrated that it reduces the death of infants and children. It is one of the most critical factors for the growth and development of infants and is globally endorsed as being the best for any neonate⁶.

The World Health Organisation (WHO) recommends the practice of exclusive breastfeeding (EBF) for infants for the first six months of life after birth. EBF means that the infant receives only breast milk. No other liquids or solids are given, with the exception of oral rehydration solution (ORS) or medicines⁷.

A universal (90%) increase in breastfeeding is estimated to prevent around 13% of all deaths among children under five years of age in low and middle-income countries⁸. However, globally, 50% of infants under one month of age and 30% of infants aged one to five months are exclusively breastfed⁹.

On the other hand, artificial feeding or bottle feeding is bothersome as it exposes the hazards of nutritional deficiencies from over-dilution of the formula, gastroenteritis, and other superadded infections. Long-term sequelae of artificial feeding include lactose intolerance, obesity, atherosclerosis, relatively poor learning ability, and population explosion¹⁰.

Suboptimal breastfeeding still accounts for the deaths of 1.4 million children under five years of age and 10% of the disease burden in children younger than five years¹¹.

Complementary feeding is the process when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore, other foods and liquids are needed alongside breast milk¹².

The transition from EBF to semisolid food is a very vulnerable period because it is the time when malnutrition starts in many infants, leading to a high prevalence of malnutrition and infection in children under five years of age worldwide¹³.

Complementary foods should contain all food groups: staples, vitamins, and minerals¹⁴.

The appropriateness, safety, and timing of initiation of complementary feeding are used to assess its effectiveness. The incidence of malnutrition rises during the first 6-8 months of life, indicating the importance of appropriate complementary feeding¹⁵.

Inappropriate feeding practices such as the untimely introduction of complementary foods, improper frequency of feeding, and low dietary diversity have been shown to increase the risk of undernutrition among under five children¹⁶.

Malnutrition has been responsible, either directly or indirectly, for 60% of the 10.9 million deaths annually among children under five. Over two-thirds of these deaths, which are often associated with inappropriate feeding practises, occur during the first year of life¹⁷.

The nutritional status of the children in Bangladesh has improved over the past few decades. The level of stunting in children under five has declined from 43% in 2007 to 33% in 2014, and wasting has declined from 15% to only 14% in 2014¹⁸.

Despite the improvement, only 23% of children aged 6-23 months are fed appropriately according to IYCF guidelines in Bangladesh. Unfortunately, the rate of IYCF practises is lowest in Sylhet (24.4%) only after Chittagong (22.4%), which is no doubt an alarming situation for the children of Sylhet¹⁸.

Considering the types of food and frequency, the whole process of infant feeding practice is gradually completed by one year, thereafter, the amount is gradually increased. As there is a paucity of literature on complementary feeding practices during infancy in this region, the present study was undertaken to find out the feeding practices during the first year of life among hospitalised infants.

MATERIALS AND METHODS

This cross-sectional study was conducted in the paediatric ward of Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, during the period of January 2018 to June 2018. A total of 135 mothers were interviewed. Out of them, seven were excluded due to incomplete data or a refusal to continue the study. At the end, 128 mothers were finally considered for analysis. Mothers with their admitted children from one month to one year of age were interviewed purposively. All mothers were interviewed after informed verbal consent. Data were collected through predesigned questionnaires. Data on age at admission (Mother and baby), maternal education, occupation, parity, types of family, and their dwelling place were

collected. Information also included infants' gender, maturity during birth, place of birth, and mode of delivery. A history of prelacteal feeding was taken along with the duration of EBF; various items of food given to different age groups were also enlisted. Information regarding bottle feeding for various age groups of babies was documented. Dietary data were collected up to one year of age for the infants. All 128 children were distributed among four age groups: 1-3 months, 4-6 months, 7-9 months, and 10-12 months, and their feeding history was catalogued accordingly. Data analysis was done using Microsoft Office Excel 2010, and the data were presented as frequency and percentage.

RESULTS

The study population comprises 128 mother-child pairs. Among the study children, 90 (70.3%) were male and 38 (29.7%) were female; 22 (17.2%) children belong to the 1-3 month group, 45 (35.1%) to the 4-6 month group, 43 (33.6%) to the 7-9 month group, and 18 (14.1%) to the 10-12 month group, respectively (Table-I).

Among the mothers, 23 (18%) were less than 20 years of age, 91 (71.1%) were in the 20-30 years age group, and 14 (10.9%) were above 30 years of age. Most of them (92.2%) were homemakers, and only 7.8% were working mothers. On the educational background, 17 (13.3%) mothers were illiterate, 55 (42.9%) studied

below the secondary school certificate (SSC), and 56 (43.8%) mothers passed the SSC or were studying higher classes. Eighty-four (65.6%) mothers had less than three children during the study period. Sixty-five (50.8%) children came from nuclear families, whereas 63 (49.2%) came from joint families. Most of the study children (78.9%) came from rural areas. Regarding maternal health, 45 mothers (35.1%) had a body mass index (BMI) less than 18.5, 71 (55.5%) had a BMI between 18.5-24.9, and the rest (9.4%) had a BMI of 25 or more (Table-II).

Foods given to infants at different months of age are shown in table-III. It was found that 100% of infants were given breast milk in the first 3 months, but bottle feeding was also introduced in 59.1% of cases during this period. In this group, 40.9% were on EBF. In the 4-6 month group, breast feeding was reduced to 93.3%, and only 24% of children were on EBF. Bottle feeding was given to 68.9% of children in the 4-6 month age group. In 7-9-month-old children, the breast feeding rate was 93% and bottle feeding was 65.1%, whereas in the 10-12-month-old group, breast feeding and bottle feeding were 72.2% and 66.7%, respectively (Table-III).

One hundred and ten mothers (85.9%) gave their infants colostrum after birth. Prelacteal feeds were offered to 18 (14.1%) children. Most of the cases of prelacteal food were formula milk (11 cases), followed by sugar (5 cases) and honey (2 cases) (Table-IV).

Table-I: Background factors of index children, N=128

Characteristics of the children		Frequency	Percentage
Age (Months)	Up to 3	22	17.2
	4-6	45	35.1
	7-9	43	33.6
	10-12	18	14.1
Gender	Male	90	70.3
	Female	38	29.7
Gestational maturity	Term	99	77.3
	Preterm	29	22.7
Place of birth	Home	53	41.4
	Government hospital	45	35.2
	Private hospital	30	23.4
Mode of delivery	NVD	83	64.8
	CS	45	35.2

*NVD- Normal vaginal delivery, CS- Caesarean section

Table-II: Factors of index mothers, N=128

Characteristics of the mother and family		Frequency	Percentage
Age (Years)	<20	23	18
	20-30	91	71.1
	>30	14	10.9
Education	Illiterate	17	13.3
	<SSC	55	42.9
	≥SSC	56	43.8
Occupation	Home maker	118	92.2
	Working mother	10	7.8
Parity	<3	84	65.6
	3-4	38	29.7
	≥5	06	4.7
Body mass index	<18.5	45	35.1
	18.5-24.9	71	55.5
	≥25	12	9.4
Family income (BDT)	<10000	15	11.7
	10,000-20,000	41	32
	>20000	72	56.3
Family members	<5	31	24.2
	≥5	97	75.8
Types of family	Nuclear or single	65	50.8
	Joint family	63	49.2
Dwelling place	Urban	27	21.1
	Rural	101	78.9

*SSC- Secondary school certificate

Table-III: Food items given to infants of different age groups, N=128

Food items	1-3 months n=22	4-6 months n=45	7-9 months n=43	10-12 months n=18
Breast milk	22 (100%)	42 (93.3%)	40 (93%)	13 (72.2%)
EBF	9 (40.9%)	11 (24.4%)	--	--
Bottle feeding	13 (59.1%)	31 (68.9%)	28 (65.1%)	12 (66.7%)
Rice (Rice gruel/rice with lentil)	12 (54.5%)	23 (51.1%)	35 (81.4%)	15 (83.3%)
Suji (Semolina)	4 (18.2%)	15 (33.2%)	12 (27.9%)	2 (11.1%)
Fruits	--	--	5 (11.6%)	3 (16.7%)
Vegetables	--	2 (4.4%)	9 (20.9%)	8 (44.4%)
Egg	--	--	9 (20.9%)	6 (33.3%)
Fish/meat	--	--	4 (9.3%)	4 (22.2%)
Commercial cereal	--	1 (2.2%)	7 (16.3%)	8 (44.4%)

*EBF- Exclusive breast feeding

Table-V: Colostrum and prelacteal feeding, N=128

Types of food	Number	Percentage
Colostrum	110	85.9
Honey	2	1.6
Sugar water	5	3.9
Powder milk	11	8.6

DISCUSSION

Overall, feeding practices were found to be unsatisfactory in this study. Most of the mothers (85.9%) fed their children colostrum, but the rate of prelacteal feeding was also high (14.1%). Although 27% of Bangladeshi children receive prelacteal feeding, in Sylhet division, it was 18%¹⁸. The study showed a similar trend to the national survey. BDHS 2007 reported that 92% of children received colostrum. There was a wide variation in prelacteal feeding practices in different studies. In a study in West Bengal, the overall prevalence of prelacteal feeding was 26.7%¹⁹, whereas corresponding figures were 8% in rural Bangladesh and 71% in urban Bangladesh^{20,21}.

Although this practice was prevalent across cultures, other liquids with breastfeeding in the first six months of life were unnecessary and harmful because they limited the frequency of sucking by the infants and exposed the children to the infection. The likelihood of a child receiving colostrum increases with maternal education by increasing awareness regarding colostrum feeding²².

In the present study, exclusive breastfeeding was 41% in the first three months of life and declined to only 24% in the 4-6 month group. Although breastfeeding was continued in 100% of cases in the 1-3 month group, and 93% in the 4-6 month age group.

According to BDHS 14, 55% of infants under six months were exclusively breastfed. The present study showed that the EBF rate is far lower than the national level. Although BDHS 14 showed 55% of children under six months were on EBF, only 32% of those aged 4-5 months were exclusively breastfed. This figure supports the present study, where the declining trend of EBF with advancing infantile age persists (41% in the 1-3 month group to 24% in the 4-6 month group). On the other hand, Paul et al. found that EBF for six months affected only 9.8% of cases. Most children (54.1%) were on EBF for only one month. Approximately 84% of children were breastfed partially. The result of this study was in deep contrast with other studies as well as national survey²³. In

another study, the EBF rate was only 20%¹⁷. A similar result was found by Faruque et al. in their study, which was only 15%²². But a study conducted by Chakrabarty et al. found that 66.8% of 0-6-month-old children were on EBF, which was similar to the BDHS 2014 result as well as that of Dasgupta et al. (66.7%)^{24,25}.

In a study of rural Bangladesh, the rate of EBF was found to be 78.3% in the first month and sharply declined to 10.7% in 6 months²⁶. There was significant variation in the rate of EBF in different studies, but all studies showed a declining rate of EBF with age, which could be attributed to early weaning practices.

The EBF rate in our study was low, but it was not surprising as the median duration of EBF in the Sylhet division was the lowest (3.9 months) in the country (BDHS 2014)¹⁸.

Despite having a low rate of EBF in the study, breast milk continued to be given to babies in a significant percentage during the first year of life, supporting the national survey (96%, BDHS 14). Paul et al. also found partial breast feeding at 83%²³.

Bottle-feeding has become a nightmare nowadays. The present studies showed the practise of bottle feeding in 59.1% and 68.9% of cases in the age groups of 1-3 months and 4-6 months, respectively. BDHS 14 showed formula milk feeding was 8.4% and 14.3% in the 2-3 month and 4-6 month age groups, respectively, which was much lower than the current study¹⁸. But Paul et al. found a higher rate of bottle feeding (74.2%), almost resembling the present study²³. Chakrabarty et al. showed that in infants below six months, 27.7% of infants were given plain water, fruit juice, formula milk, or cow's milk along with breastfeeding, and 6.5% were fed formula alone. No doubt, a much lesser figure than the current study²⁴. Bottle feeding was found to be practised by 22% of children in South India and 26% in a Delhi-based study^{27,28}. Both numbers are relatively lower than what was found in our study. A similar trend was found by Sinhababu et al. where bottle feeding was sharply decreased at the age of 9-11 months¹⁹.

Because of the associated exposure to pathogens and interference with successful breastfeeding, bottle feeding was strongly discouraged¹⁹. As bottle-fed babies have a higher chance of getting sick, this may explain the higher rate of bottle-feeding in our study, which was carried out on hospitalised children.

Early weaning was found to be very common in this study. The commonest food item used was rice, followed by semolina (Suji). Rice was given in more than 50% of cases, either as gruel or khichuri. Similar

findings were found by Paul et al. where early weaning was found to be 49.2%²³. This correlates with studies done by Heinig et al., Lindsay et al., Kumudha et al. and Giasuddin et al^{29,30,31,32}.

Rice was the commonest source of grain-based food throughout the first year of life as it was cheap and available, followed by suji, but the use of suji as a major source of food was sharply reduced at 10-12 months of age. These two were the main carbohydrate-rich foods found in the current study. Similar findings were found by Paul et al. where they observed rice and lentils being used in making khichuri³³.

Eggs were given in 21% of cases in the 7-9 month age group and 33% of cases in the 10-12 month group. Fish or meat was offered to 9% of children in the 7-9 month age group and in 22% of cases in 10-12 month age group. These findings are consistent with those of Paul et al. and Manikam et al^{33,34}.

Complementary feeding with vegetables ranged from 21% to 44% in 6 to 12 month periods, whereas fruits were given only in 12% to 17% of cases. Similar poor feeding practises were found by Paul et al. and Manikam et al^{33,34}.

Although the BDHS 14 report showed relatively better feeding practises (Flesh food 43%, fruits and vegetables 40%), if we consider dietary diversity, a large portion of our children are eating inappropriate and less nutritious diets. Children should take at least four groups of food from a list of seven food groups: grains, roots and tubers, legumes and nuts, dairy products, flesh foods (Meat, fish, and poultry), eggs, vitamin A-rich fruits and vegetables, and other fruits and vegetables³.

Overall, 23% of the children aged 6-23 months are fed appropriately according to recommendations by IYCF practise¹⁸. The proportion of children consuming vitamin A-rich food and iron-rich food was lowest in Sylhet, 63% and 49.7%, respectively¹⁸. The result is consistent with the present study.

Another study by Akther et al. showed common family foods were rice, lentils, and vegetables. Only 10.8% of children were fed fish, meat, or egg¹⁷.

No doubt, almost all studies show inappropriate complementary feeding and poor dietary diversity in our country, especially in the Sylhet region.

Feeding of commercial cereal has been increasing day by day, even in the low-income group in our country. Commercial cereal is not recommended in IYCF, but our study showed that the use of this kind of food increases alarmingly as the baby grows up (16% in the

7-9 month group and 44% in 10-12 month group). Similar results were found by Lindsay et al. and Paul et al^{30,33}.

Mothers are easily convinced by attractive packaging, easy preparation, the acceptability of babies when offered, and aggressive marketing policies of companies. Sometimes it is a status symbol for many mothers too. It is an emerging problem in Bangladesh and abroad. This type of food causes an economic burden to the family and increases the child's health hazards.

Early initiation of complementary feeding is a great problem in Bangladesh as well as many other countries. Our study shows a high rate of early weaning. But early initiation of complementary feeding rate was sometimes low and sometimes high, ranging from 13.2% by five months in Saha et al. and 16.9% in Sultana et al. to a higher rate of 44.5% and 47.8% reported respectively by Khan et al. and Salim et al^{35,36,37,38}. In the USA, 21% of mothers introduce solid foods before four months, 34% in Italy, and 51% in UK^{39,40,41}. So, the situation is similar in both rich and poor countries, showing inappropriate feeding practises by children everywhere.

CONCLUSION

Feeding practise in Bangladesh, especially in the Sylhet region, is far from ideal condition. Important observation is that a high percentage of children are being offered prelacteal feeds, bottle feeding, and commercial formula feeding, with a lack of dietary diversity being very prevalent.

RECOMMENDATION

An awareness-building programme about child care and feeding practises should be included in antenatal and postnatal care and also convey the right message about IYCF to parents and families. Electronic and print media may play an important role in disseminating information about comprehensive nutrition and health education for mothers and caregivers throughout the country.

LIMITATIONS

The study was a hospital-based effort with a small number of respondents. Community-based studies are required to represent the values of the general population. The study data was collected on a recall basis; hence, the study has a component of recall bias. With respect to complementary feeding practises, feeding consistency and frequency were not taken into

consideration, which is again a limitation.

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