

## Perceptions of Mothers and Use of Breastmilk Substitutes in Dhaka, Bangladesh

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### ABSTRACT

To explore the actual practices and perceptions of giving breastmilk and breastmilk substitutes (BMS), this cross-sectional study was conducted among 326 mothers of low (income/month <Tk 4,000, n=163) and middle (income/month >Tk 4,000, n=163) socioeconomic status (SES) with infants aged 6-12 months in Dhaka city during February-April 2001. Qualitative data on perceptions of mothers on appropriate breast-feeding practices were also documented through focus-group discussions (FGDs). The prevalence of exclusive breast-feeding was low in both the socioeconomic groups but was comparatively higher among the mothers of middle SES (3.1% vs 12.3%,  $p<0.001$ ), although predominant breast-feeding was high among the mothers of low SES. In addition, the use of BMS was higher among the mothers of middle SES than among the mothers of low SES (55.8% vs. 43.5%,  $p<0.001$ ). The majority (62.3%) of the mothers mentioned insufficiency of breastmilk as the main reason for introducing BMS. Perception on appropriate feeding practices was also significantly different between the two groups. Approximately, 90% of the mothers of low SES could not differentiate between infant formula and milk powder compared to 70% of the mothers of middle SES ( $p<0.001$ ). The findings of FGDs revealed that some middle-class mothers thought that infant formula was the best food for their infants. Programmes to impart proper knowledge on breast-feeding practices should be strengthened.

**Key words:** Breast-feeding; Milk, Human; Infant food; Knowledge, attitudes, practice; Perception; Cross-sectional studies; Bangladesh

### INTRODUCTION

Despite the high prevalence of breast-feeding to young infants (1), the breast-feeding pattern is not ideal in Bangladesh. Short duration of exclusive breast-feeding and inappropriate feeding are common in both urban and rural areas of Bangladesh (2,3). Nationwide surveillance of breast-feeding situation conducted by the Bangladesh Breastfeeding Foundation showed a continued low prevalence of exclusive breast-feeding during the first six months of age (4).

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Breastmilk is an ideal food for healthy growth and development of infants as it strengthens emotional bondage between mother and child and is the most economic way of feeding the child (5,6). Importantly, breastmilk protects against infections through specific and non-specific immune factors and has long-term consequences in the prevention of metabolic diseases in later stages of life (7). Breastfed infants have improved neuro-development (8-10) and a lower incidence of infections compared to formula-fed infants (11). Results of a study in Hungary on comparison of human milk with different types of infant food in the nutrition of full-term neonates showed higher levels of serum calcium and protein in breast-fed infants compared to those receiving infant formula (12). Breastfed infants also have better feed-tolerance and less physiological gastroesophageal reflux than formula-fed infants (13).

Regardless of evidence of the benefits of breast-feeding, many women still use breastmilk substitutes (BMS) and often acquire milk powder, infant formula, and cow's milk from the market. Several studies have shown low levels of awareness of mothers regarding appropriate breast-feeding practices in Bangladesh (3,14,15), but perceptions and practices of mothers on using BMS are not well-documented. A better understanding of the mothers' perceptions and practices of feeding BMS is needed to plan appropriate interventions to improve infant feeding. To compare the perceptions of mothers of low and middle socioeconomic groups on breast-feeding and feeding BMS, this study was undertaken in Dhaka city.

## MATERIALS AND METHODS

### Study design

This cross-sectional study was carried out among mothers of different SES groups with infants aged 6-12 months during February-April 2001 in Dhaka, the capital city of Bangladesh. Information on infant-feeding practices in their first six months of life was collected from mothers' recall to identify exclusive breast-feeding and introduction of BMS. Data on perceptions of mothers were collected through a structured questionnaire and focus-group discussions (FGDs).

### Study site and SES

Half of the subjects were randomly selected from the Clinical Research and Service Centre of ICDDR,B: Centre for Health and Population Research, Dhaka, and the other half were selected from slum and community areas of Agargaon, Sher-e-Bangla Nagar in Dhaka city. Mothers were divided into two groups according to the family income: low SES and middle SES. The SES was based on the monthly family income. The cut-off point for low SES was income below Tk 4,000 (equivalent to US\$ 75) per month.

### Sample size

The sample size was 326 with 163 mothers in each SES group. The sample size was calculated based on the prevalence of discontinuation of exclusive plus predominant breast-feeding in low SES (53.6%) and high SES (68.6%) groups in 1998 considering 80% power and 5% probability level to detect the difference with infant-feeding practices between the groups.

### Operational definitions

The following WHO definitions were used in this study (16,17):

- *Exclusively breastfed*: If given only breastmilk (no other liquid or solid) up to six months of age
- *Predominantly breastfed*: If given breastmilk plus water and/or oral rehydration solution (ORS)
- *Breastmilk substitute*: Any food being marketed or otherwise presented as a partial or total replacement for breastmilk, whether or not suitable for that purpose
- *Infant formula*: A breastmilk substitute formulated industrially in accordance with applicable Codex Alimentarius standards to satisfy the normal nutritional requirements of infants aged up to 4-6 months, and adapted to their physiological characteristics.

### Anthropometric measurements

Weight and height of mothers and weight, length and mid-upper-arm-circumference (MUAC) of children were carefully taken at the beginning of interview, using standard techniques.

*Height/length*: Height was measured using a height-scale and a length-board for mothers and children respectively with a resolution of 1 mm.

*Weight*: Weight was taken using a UNISCALE (weighing scale made for UNICEF) with a resolution of 100 g.

*MUAC*: Mid-upper-arm-circumference (MUAC) was measured using a TALC (Teaching Aid at Low Cost, St Albans, UK) tape with a resolution of 1 mm.

### Statistical analysis

Data were analyzed using the WINDOW's SPSS programme, version 7.5. Chi-square test was used for binomial data analysis.

### Focus-group discussions

Six FGDs were conducted with the mothers from both the social classes. Each group consisted of 6-8 mothers with infants aged 6-12 months and an equal number of mothers who practised exclusive or predominant breast-feeding and gave BMS. Each session was conducted for about two hours. An audio system was used for recording data besides written documentation. An anthropologist conducted the FGD sessions, and facilitators assisted the discussions. The facilitators did not influence the discussions, although they played the role of guide for

the participants by putting them on the right track of the discussion.

## RESULTS

The ages of mothers and children were comparable between the low and middle SES. The mean age of the infants and mothers was 9 months and 25 years respectively. The mothers and infants from the middle-class were better nourished than the mothers and infants of low SES. The female children were more malnourished than the male children in both the socioeconomic groups ( $p < 0.001$ ). The average years of schooling was five years in the low-class mothers compared to eight years in the middle-class mothers ( $p < 0.001$ ). The mean income per month was Tk 2,784 (US\$ 49.7) and Tk 7,365 (US\$ 131) in the low and middle SES groups respectively as selected ( $p < 0.000$ ) (Table 1).

More mothers (12.3%) of middle SES exclusively breastfed their infants compared to 3.1% of the mothers

of BMS was higher among the middle-class mothers compared to the mothers of low SES (55.8% vs 43.5%,  $p < 0.001$ ) (Fig. 1).

A declining trend of practising exclusive or predominant breast-feeding (only water/ORS besides breastmilk) was observed over the first six months in both the classes. No significant difference was observed between the two social classes in the duration of exclusive and predominant breast-feeding in the first six months. One quarter of the mothers of middle SES discontinued exclusive or predominant breast-feeding during the first month, another quarter discontinued in the second month, and the third quarter introduced BMS in the third month. The pattern was similar in the low SES group (Fig. 2).

The most common reason for introducing BMS was a perceived insufficiency of breastmilk (62.3%). Eight percent of the mothers stated that they introduced BMS due to disinterest of their children in suckling breastmilk,

**Table 1.** Comparison of background characteristics of study subjects from two SES groups

Factor	Low SES (n=126)	Middle SES (n=126)	p value
Age (mean±SD)			
Children (months)	9±2	9±2	0.253
Mothers (years)	25±5	25±5	0.049
Anthropometry of children (mean±SD)			
Male children			
Weight-for-age z-score	-2.01±0.91	-1.58±1.01	0.001
Weight-for-height z-score	-1.04±0.79	-0.86±0.94	0.127
Height-for-age z-score	-1.64±1.08	-1.25±1.14	0.009
Female children			
Weight-for-age z-score	-2.09±1.17	-1.40±0.94	0.001
Weight-for-height z-score	-0.49±1.04	-0.71±1.12	0.278
Height-for-age z-score	-1.65±1.06	-1.01±0.82	0.001
MUAC of children (cm)	12.95±1.21	13.31±1.27	0.009
Anthropometry of mothers (mean±SD)			
Body mass index	19.35±2.79	21.28±3.35	0.000
Education of mothers (mean±SD)			
Years of schooling	5±2	8±3	0.000
Income of family* (mean±SD)			
Income (Taka/month)	2784±663	7365±3275	0.000

\* US\$1.00= Tk 57.00  
SES=Socioeconomic status

of low SES ( $p < 0.001$ ). Predominant breast-feeding was higher among the mothers of low SES compared to the mothers of middle SES (53.4% vs 31.9%). About half of the mothers (49.7%) reported that they had introduced a BMS during the first six months of the child. The use

9.9% thought that their children needed extra milk, and 9.3% were influenced by grandmothers or other relatives. Other reasons were illness of mothers (5.6%), mothers working outside/studying (4.3%), intolerance of infants to breastmilk (1.2%), etc. (Fig. 3).

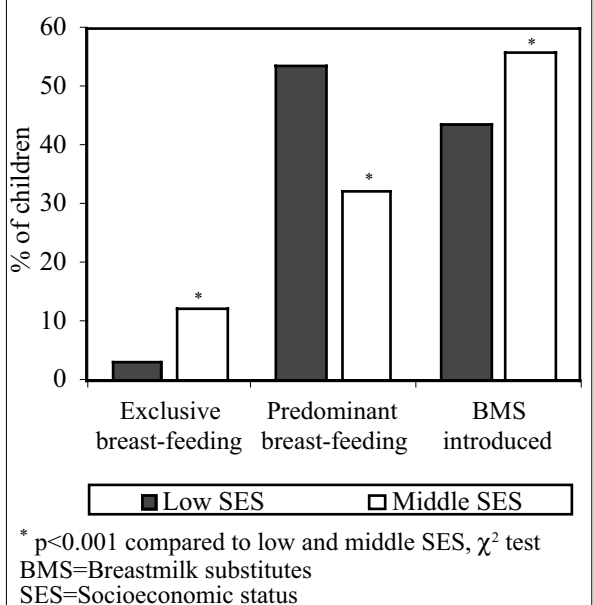
Perceptions of the mothers on different types of milk were not accurate. When the mothers were asked to express their opinion if there is any difference between

**Results of focus-group discussions**

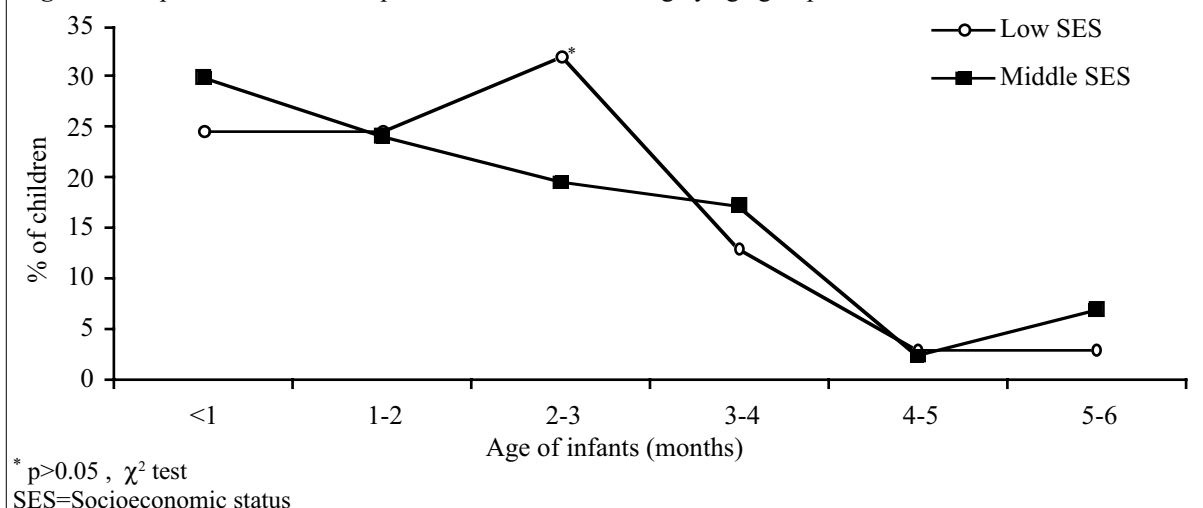
The concepts of ‘exclusive breast-feeding’ among the mothers of both the social classes were ambiguous. To the majority of the mothers, ‘exclusive breast-feeding’ meant giving breastmilk and water to the baby. They could not believe that a baby could survive on breastmilk without drinking-water. Almost everyone had given water to her baby from an early stage of life. Many mothers of low SES answered that they did not know how long a baby should be exclusively breastfed. A large proportion of them did not hear anything on ‘exclusive breast-feeding’ before.

It is interesting to note that most mothers thought that cow’s milk is as good as breastmilk. However, there was no confusion between the mothers about the fact that breastmilk was the best-quality milk for babies. Many mothers recited the slogan that is frequently broadcast on radio and television: “Nothing is comparable with breastmilk” (*Mayer dudher tulona nai*). One mother of middle SES said, “Mother’s milk is pure, nobody has touched it” (*Mayer dudh bishudyo, kono hat pore nai*). One mother of low SES had an idea that mother’s milk is suitable for babies only when the mother does not eat chilies. Most mothers of low SES preferred

**Fig. 1.** Feeding pattern by SES up to first six months of age of children



**Fig. 2.** Proportion of exclusive/predominant breast-feeding by age group



infant formula and milk powder, over 80% of them mentioned that they did not know of any differences between these two types of milk. Only 19.3% stated that there is a difference. Results of comparison between the two social classes showed that 29.4% of the middle-class mothers and 9.2% of the low-SES mothers thought that there was a difference (Fig. 4).

goat’s and cow’s milk after breastmilk. One mother mentioned, “Cow’s milk has the same quality as breastmilk, but the difference is: when the baby is given cow’s milk for the first time, ulcer occurs in any part of the body. When it cures, the baby gets no more problem with cow’s milk” (*Gai-er dudh buker dudher motoi bhala, toy gai-er dudh khawaile prothome ekta gha hoy,*

ai gha shukai gele aar kono khoti nai). Some mothers thought that goat's milk prevents babies from diseases (Chhagoler dudhe baram hoy na).

sugar, that is why it is suitable for infants, and since milk powder does not contain sugar, babies cannot take it" (Lactogen-e chini milano thake boila bachchara

Fig 3. Reasons for introducing breastmilk substitutes

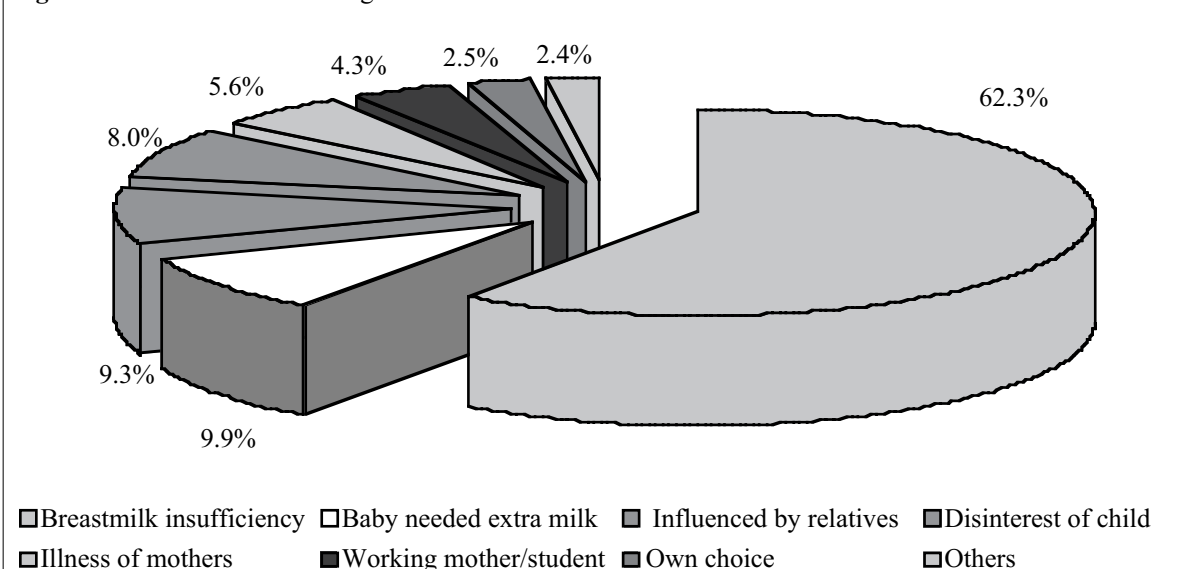
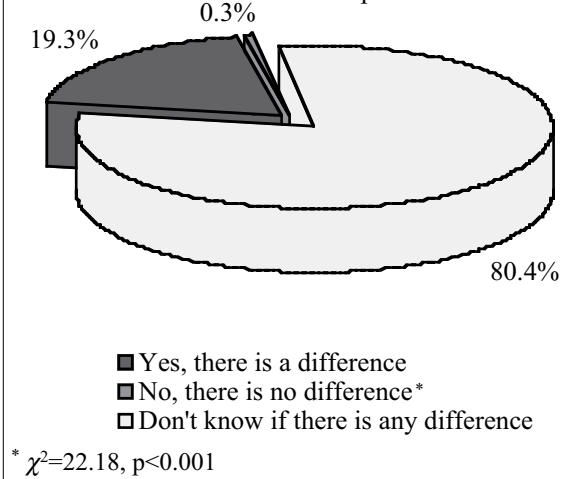


Fig. 4. Perceptions of mothers on difference between infant formula and milk powder



The majority of the middle-class mothers could differentiate between powder milk and infant formula, while many low-class mothers could not. One mother of low SES said, "I give my baby goat's milk. I don't know much about all these tinned milk" (Bachchare chhagoler dudh dei, oi tiner dudhe ki thake oto koite pari na). Although some mothers mentioned that they knew the difference, their perception was not correct. One mother stated, for example, "Infant formula contains

khaite pare kintu powder dudh bachchara khaite pare na). Many mothers said that both kinds of milk could be given to babies. The only difference was that infant formula was expensive compared to milk powder. It is interesting to note that one middle-class mother thought that infant formula is good for babies because it contains medicine. Only a few mothers from middle class said "Milk powder is for older babies" (Powder dudh boro bachchader dudh).

When opinion of the mothers was sought about the variation in quality between infant formula and cow's/goat's milk, difference in opinion was seen between the social classes. A large number of mothers of low SES stated that cow's/goat's milk is better than infant formula because it is natural, and infant formula is artificial. A common answer was: "Cow's/goat's milk is God's gift" (Eigulan to Allahr dan). The view of the middle-class mothers about infant formula was opposite. Most mothers in that group thought infant formula is 'certainly' much better than cow's/goat's milk because infant formula is prescribed by doctors (Dactar jokhon diechhe tokhon nishchoi formulai chhoto bachchar jonya bhalo). One mother thought that infant formula is better because it is more expensive (Dam jokhon beshi, infant formulai bhalo).

## DISCUSSION

The use of BMS is prevalent not only among the middle-class mothers but also among the poor mothers of urban and periurban areas. In view of this, we selected mothers of middle and low SES and excluded mothers of high SES. In Bangladesh, rates of exclusive breast-feeding remain low despite launching a nationwide breast-feeding promotion campaign since 1989. The rate of exclusive breast-feeding up to six months even without water in this study was very low in urban slums (7.7%) compared to the national practices (29%) (4). These practices are recorded from what mothers reported, and so, may differ from actual practices. Our findings have some similarities with those of a study on infant- and child-feeding practices in Dhaka slums, which showed a prevalence of only 10% exclusive breast-feeding among infants aged up to five months (18). However, in our study, this proportion is 12.3% among the mothers of middle SES and 3.1% among the mothers of low SES. Reason for this low rate of exclusive breast-feeding might be based on mothers' perceptions and practices of giving water besides breastmilk to meet thirst. Perceptions of mothers in giving extra water were reflected in the results of two other similar recent studies in urban slums of Dhaka (3,18). Consequently, the rate of predominant breast-feeding (breastmilk and water) up to six months was high in both the social classes but comparatively higher among the mothers of low SES. Peer counselling to individual mothers in low socioeconomic group has suggested effective increase in initiation and duration of exclusive breast-feeding (19).

Breastmilk is nutritionally and immunologically superior to any known substitutes. Yet, results of a study conducted in 1998 showed that the use of BMS among urban mothers has increased from 36% to 49.7% in recent years (20) which is supported by the higher prevalence of using BMS in our study. The use of BMS is high among the mothers of both middle and low SES but appears to be comparatively higher among mothers of the middle SES despite their higher educational status. A study on infant-feeding practices and attitudes of mothers in Kelantan, Malaysia, revealed that infant formula was more prevalent in the higher-income group, which has a similarity with our findings (21).

A large group of the mothers reported that insufficiency of breastmilk was the reason for introducing BMS, which supports a similar observation in urban Dhaka (22). Actually, this was the mothers'

perceptions of insufficiency, and not demonstrable failure to thrive. These mothers often worry about insufficient breastmilk, which may be a generally-acceptable excuse for introducing other milk. In fact, most mothers can produce enough breastmilk for one baby or even the twins, provided the baby suckles effectively and is breastfed as much as needed (23).

Our results revealed that perceptions of the mothers on correct feeding practices were very inaccurate. We specifically observed that most mothers could not differentiate between infant formula and milk powder. Mothers of low SES bought milk powder, as it was less expensive compared to formula milk. Many mothers of low SES thought that cow's milk was as good as breastmilk. On the other hand, some middle-class mothers thought that infant formula had similar benefit as breastmilk. Some mothers of low SES expressed their desire to buy infant formula, but they could not do so due to lack of money. As the price was high, the majority of the mothers of low SES diluted milk powder too much, resulting in enhanced malnutrition for their children.

In 2000, the World Health Organization recommended that exclusive breast-feeding be allowed for six months. Strong and persistent campaigns should focus on the practice of exclusive breast-feeding up to six months. It is recommended that mothers be encouraged to continue breast-feeding when they think they have insufficiency of breastmilk, and increased emphasis should be given to informing mothers through primary healthcare facilities. Further studies on exploring strategies to improve breast-feeding practices should be undertaken.

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