

Original Article**Determinants of Bottle-Feeding: Experience in a Tertiary Care Hospital**

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ABSTRACT

Feeding practice is crucial in a child's life. Many women don't know that giving infants bottle-feeding has consequences. Though bottle-feeding practice is discouraged among mothers, the use of bottles in infant feeding practice is still high. The objective of this study was to assess the determining factors for bottle-feeding in one- to twelve-month-old infants admitted to the paediatric ward at Jalalabad Ragib-Rabeya Medical College Hospital between the periods of January 2018 to June 2018. For this purpose, 128 mothers were purposively interviewed. A pre-formed questionnaire was used for data collection. Infants' and mothers' demographic variables and feeding practices were documented and analysed. Bottle-feeding is more common in older infants (10-12 months). Infants born in private clinics and with caesarean sections were more likely to feed bottles ($p < 0.05$). Older, educated, and working mothers had more tendencies to use the bottle with their infants. Birth order and family income had an influence on feeding practices. We also found the influence of dwelling place and maternal BMI on infant feeding. Mothers mentioned that the main reason for giving the bottle to their infants was insufficient breast milk and being influenced by other people. This study reveals bottle-feeding user profiles. The study can be used to plan strategies for child health promotion and prevention of the use of breast milk substitutes.

Keywords: Bottle-feeding, Exclusive breast feeding, Child health, Feeding practice.

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INTRODUCTION

Breastfeeding is the most traditional, physiological, and natural way to feed newborns and young children. It is also the most widely accepted method for preventing early malnutrition¹. Due to its immunological, nutritional, developmental, socioeconomic, and

environmental benefits, breastfeeding is advantageous for mothers, babies, families, and society as a whole². Breastfeeding has many advantages for overall health, including a decrease in morbidity, infectious diseases, and low birth weight in neonates³. The World Health Organization (WHO) recommends breastfeeding exclusively until the child is six months old and breastfeeding in addition to food consumption until the child is two years old⁴. The improper preparation and incorrect feeding of breast milk substitutes provide a basic risk for their use¹. It is not recommended to feed a child from a bottle with a nipple since it compromises nursing practices and endangers the infant's health and

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life through infection².

Complementary feeding means starting feeding with solid or semisolid food at the age of six months and increasing the volume, variety, and frequency of feeding as the child gets older, while maintaining frequent breastfeeding⁵. Giving a child additional liquid before starting breastfeeding is known as prelacteal feeding. Prelacteal feeding is discouraged since it reduces the infant's frequency of sucking and increases the risk of gastrointestinal infections⁶. Because of a lack of access to clean water and unhealthy conditions, bottle-feeding practices' negative consequences are more severe in developing countries. Additionally, the poor quality and inappropriate bottles and teats make the condition worse². Diarrhoea, ear infections, dental caries, and allergic tendencies are associated with bottle-feeding^{3,7-9}. One of the main factors contributing to an infant's diarrhoea is bottle-feeding. The prevalence of bottle-feeding among mothers of infants older than four months continues to rise. Inadequate amounts of breast milk, the need to return to work, and the use of contraceptive pills are the main excuses for bottle-feeding¹⁰. Many women are ignorant of the negative effects of giving babies bottles. Despite being aware of the adverse effects, some moms nevertheless give their babies bottle-feeding.

Many researchers in other countries have tried to identify the reasons behind bottle-feeding practices¹¹. However, from the perspective of Bangladesh, such are not well documented. Therefore, the objective of this research was to assess the determining factors for bottle-feeding in one- to twelve-month-old infants attending a tertiary care hospital.

MATERIALS AND METHODS

Between January 2018 and June 2018, this cross-sectional study was carried out in the paediatrics department at Jalalabad Ragib-Rabeya Medical College, Sylhet. Purposive sampling methods were implied for data collection from 128 mothers whose children were admitted to the paediatric ward, ranging from 1 month to 12 months of age. Children who were neonates or aged more than 12 months and admitted to the paediatric intensive care unit were excluded from the study. Interviews with mothers were conducted in succession. Following their verbally informed permission, all mothers were queried. Through the use of pre-made questionnaires, the age of the mother and child at admission, the mother's education, occupation, parity, BMI, type of family, monthly family income, and place

of residence were documented. Additionally, data regarding the infants' gender, level of maturation at birth, mode of delivery, and place of delivery were obtained. Mothers were also questioned regarding the reason behind bottle-feeding. Any solid or liquid food delivered in a bottle with a nipple is considered bottle-feeding in this study. Examples include powder milk (Formula), cow milk, rice powder, suji, and others (Cereal, sagu). Information on bottle-feeding was recorded for babies of different ages. The Statistical Package for Social Sciences (SPSS) version 23 was used to analyse the data. Results were presented as frequency and percentage. A Chi-squared test was performed, and a p-value of <0.05 was considered statistically significant.

RESULTS

In this study, 84 infants out of 128 received bottles as a feeding method. Table-I shows there were 22 infants who were 1 to 3 months of age, 45 in the 4 to 6 month group, 43 in the 7 to 9 month group and 18 belonged to the 10 to 12 month age group. Among them, the lowest rate of bottle-feeding was in the 1 to 3 month group (59.1%), whereas in other groups it was more than 65% ($p<0.05$). There were 60 male infants (Out of 90), who were given bottle-feeding (66.7%) and similarly, 63.2% of female children underwent bottle-feeding. There was no statistically significant gender discrimination in the case of bottle-feeding. When considering gestational maturity, 62.6% of term infants and 75.9% of preterm infants were offered bottle-feeding ($p<0.05$). Infants born in hospitals had a higher tendency to bottle-feed than those born at home ($p<0.05$). Similarly, a higher incidence of bottle-feeding was present among infants born by caesarean section (CS) than those who were born by normal vaginal delivery (NVD), and it was statistically significant.

Table-II lists maternal factors associated with bottle-feeding. The majority of mothers were 20-30 years of age. Mothers older than 30 years (12 out of 14 mothers) preferred to bottle-feed their child ($p<0.05$). In our study, the prevalence of bottle use among mothers with higher education levels was higher ($p<0.05$). Eight out of ten working mothers preferred to feed bottles to their infants ($p<0.05$). Women who had five or more children were less likely to bottle-feed their children. Approximately 62% of the bottle-feeding population had family income above twenty thousand taka or more. Mothers in urban areas tended to feed bottles to infants more frequently ($p<0.05$). According to our findings,

mothers with a BMI of ≥ 25 kg/m² fed bottles more frequently to their children. Family type and size did not affect the feeding practice ($p>0.05$). Figure-1 showed

the reasons for bottle-feeding. Multiple responses were given by mothers. Maximum (74) mothers bottle-fed their infants due to not getting enough breast milk, and they thought the child was hungry.

Table-I: Factors of index children associated with bottle-feeding, N= 128

Characteristics of the children		Total N, %	Bottle-feeding n, %	Not bottle-feeding n, %	p-value
Age (Months)	Up to 3	22 (17.2)	13 (15.5)	9 (20.5)	0.000
	4-6	45 (35.2)	31 (36.9)	14 (31.8)	
	7-9	43 (33.6)	28 (33.3)	15 (34.1)	
	10-12	18 (14)	12 (14.3)	6 (13.6)	
Gender	Male	90 (70.3)	60 (71.4)	30 (68.2)	0.529
	Female	38 (29.7)	24 (28.6)	14 (31.8)	
Gestational maturity	Term	99 (77.3)	62 (73.8)	37 (84.1)	0.000
	Preterm	29 (22.7)	22 (26.2)	7 (15.9)	
Place of birth	Home	53 (41.4)	29 (34.5)	24 (54.5)	0.000
	Government hospital	45 (35.2)	32 (38.1)	13 (29.6)	
	Private hospital	30 (23.4)	23 (27.4)	7 (15.9)	
Mode of delivery	NVD	83 (64.8)	46 (54.8)	37 (84.1)	0.000
	CS	45 (35.2)	38 (45.2)	7 (15.9)	

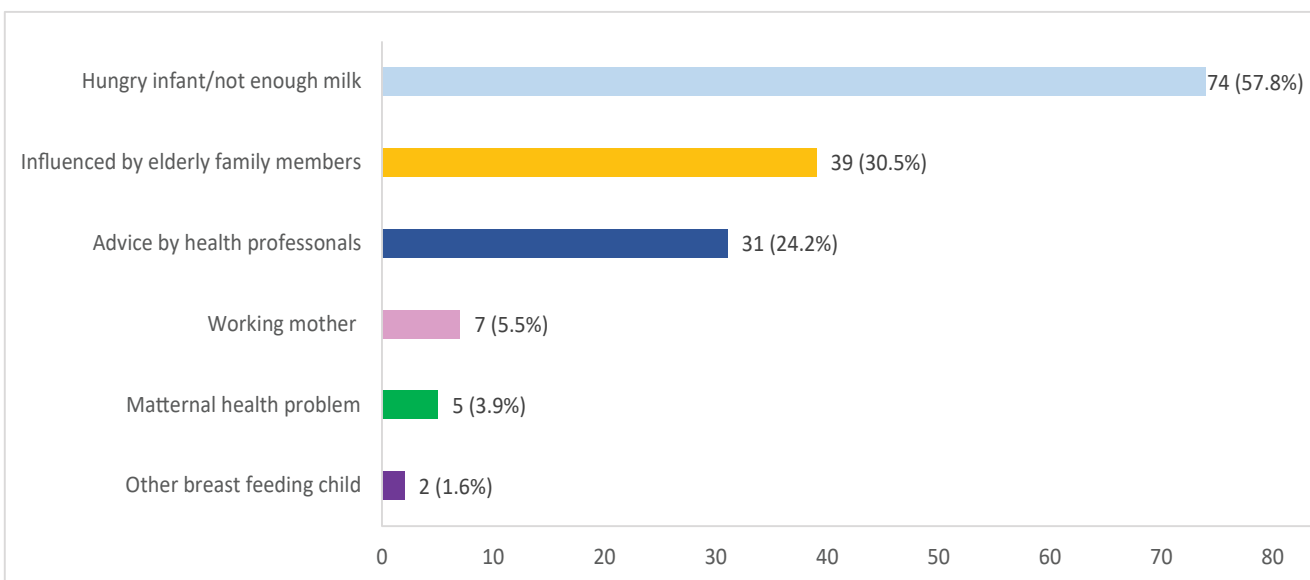


Figure-1: Reasons for bottle-feeding (Mothers gave multiple responses)

Table-II: Socioeconomic and demographic characteristics of mother, N= 128

Characteristics of the mother and family		Total N, %	Bottle -feeding n, %	Not bottle -feeding n, %	p-value
Age (Years)	< 20 years	23 (18)	12 (14.3)	11 (25)	0.000
	20-30 years	91 (71.1)	60 (71.4)	31 (70.5)	
	>30 years	14 (10.9)	12 (14.3)	2 (4.5)	
Education	Illiterate	17 (13.3)	08 (9.5)	9 (20.4)	0.000
	Up to class V	30 (23.4)	18 (21.4)	12 (27.3)	
	Up to class VIII	25 (19.5)	13 (15.5)	12 (27.3)	
	SSC or equivalent	34 (26.6)	26 (31)	8 (18.2)	
	HSC or higher or equivalent	22 (17.2)	19 (22.6)	3 (6.8)	
Occupation	Home maker	118 (92.2)	76 (90.5)	42 (95.5)	0.000
	Working mother	10 (7.8)	08 (9.5)	2 (4.5)	
Parity	<3	84 (65.6)	55 (65.5)	29 (65.9)	0.000
	3-4	38 (29.7)	27 (32.1)	11 (25)	
	≥5	6 (4.7)	2 (2.4)	4 (9.1)	
Family income (Taka)	<10,000	15 (11.7)	7 (8.3)	8 (18.2)	0.000
	10,000-20,000	41 (32)	25 (29.8)	16 (36.4)	
	>20,000	72 (56.3)	52 (61.9)	20 (45.4)	
Family members	<5	31 (24.2)	22 (26.2)	9 (20.5)	0.349
	≥5	97 (75.8)	62 (73.8)	54 (79.5)	
Types of family	Nuclear or single	65 (50.8)	43 (51.2)	22 (50)	0.184
	Joint family	63 (49.2)	41 (48.8)	22 (50)	
Dwelling place	Urban	27 (21.1)	22 (26.2)	5 (11.4)	0.000
	Rural	101 (78.9)	62 (73.8)	39 (88.6)	
Maternal BMI (kg/m ²)	<18.5	45 (35.1)	21 (25)	24 (54.6)	0.000
	18.5-24.9	71 (55.5)	53 (63.1)	18 (40.9)	
	≥25	12 (9.4)	10 (11.9)	2 (4.5)	

DISCUSSION

In our study, the rate of bottle-feeding was lowest in the 1 to 3 month group; it was more than 65% in other groups. Kebebe et al.⁷ found that the prevalence of bottle-feeding was 8.1% in 0-5 month's children and 22.1% in 6-11 month's children. Hazir et al.¹² found a similar increasing trend of bottle-feeding in older children. Although gender was not statistically significant with regards to bottle-feeding, the gestational maturity of the babies was statistically significant. Buccini, Benício and Venancio found a significant correlation between bottle-feeding among male babies¹³. They also showed that low birth weight (LBW) babies were given more bottle-feeding. In our

study, it was prevalent in premature babies who were usually LBW. The rate of bottle-feeding was significantly greater among women who gave birth in medical facilities; that was 32 mothers out of 45 in government hospitals, and 23 mothers out of 30 in private clinics. Hazir et al.¹² also found that exclusive breastfeeding was less prevalent among women who had better access to the healthcare system. This trend may be explained by healthcare personnel's possible lack of adequate training in breastfeeding counselling. Women who gave birth via caesarean section had a greater rate of bottle-feeding (38 vs. 7), which was consistent with the findings of Hazir et al., Buccini et al. and Ogbo et al.¹²⁻¹⁴. Our investigation discovered that the breastfeeding rate dramatically decreased as the age of

the mother increased. Mothers over 30 years old practiced breastfeeding less frequently. Ogbo, Agho and Page's findings are entirely at odds with this outcome. Their results demonstrated that the mid-reproductive age (25-34 years) of the mother was associated with exclusive breastfeeding compared to younger mothers, indicating that younger mothers may be less experienced with conventional infant feeding practices¹⁴. Buccini et al. did not find any association between feeding practice and maternal age¹³. Higher socioeconomic class and educational levels were substantially associated with higher rates of bottle-feeding among mothers in the study, demonstrating that awareness of the value of EBF is not always correlated with educational status. A similar finding was observed by Berde AS, who found relatively highly educated mothers fed bottles more frequently to their children². Ogbo et al. showed that mothers with greater levels of education were more likely to bottle-feed their children than mothers with no education¹⁴. Our research observed that families with incomes over taka 20,000/month were more likely to feed their infants via bottle. It was implied that women with better socioeconomic standing had the financial means to buy formula milk. This conclusion might be explained by the possibility that mothers in the higher wealth quintile had easy access to expensive nursing alternatives, which might advertently affect their decision to bottle-feed. These results were consistent with those of Hazir et al.¹²; but Ogbo, Agho and Page¹⁴ found that subjects with lower household wealth in their study were more prone to bottle-feeding practices. The current study revealed that working women practiced breastfeeding at much lower rates than other mothers. Berde AS reported that, compared to non-working mothers, employed mothers were more likely to bottle-feed their children². In our study, bottle-feeding is linked to a lower birth order. But a study found that bottle-feeding is substantially associated with greater birth order¹⁴. In this study, bottle-feeding was influenced by maternal BMI. Women with a BMI ≥ 25 had a significantly higher rate of bottle-feeding. These results agree with previous researches^{15,16}. Oddy et al. stated that, compared to mothers of average weight, those who were obese or overweight before becoming pregnant had shorter breastfeeding durations¹⁵. Amir and Donath found in their study that, compared to women of average weight, overweight and obese women were less likely to breastfeed. The researchers hypothesised that the causes might be biological, cultural, behavioural, or psychological¹⁶.

In our research, we found no evidence that the type of family or the number of family members affected bottle-feeding. Approximately 51% of bottle-feeding children belonged to the nuclear family, whereas the rest of them (49%) belonged to the joint family. Saizuddin et al. observed that the majority of respondents (50%) are from nuclear families, followed by joint families (40.4%) and extended families (9.6%)¹⁷. The rates of formula feeding among children in urban areas were found to be higher in our study. In their study, Berde AS² and Hazir et al.¹² noted similar results. Hazir et al. found that bottle-fed infants made up 28% of the population in rural areas and 40% of the population in urban areas¹². According to Berde AS, bottle-fed infants comprised 49% and 25% in urban and rural areas, respectively². When the mothers were asked why they chose to bottle-feed their children, the majority (57.8%) responded that they did so because they felt their children were hungry and were not receiving enough milk. Other reasons for bottle-feeding were influenced by elderly family members (30.5%), advice by health professionals (24.2%), maternal health problems (3.9%), and another breastfeeding child in the family (1.6%). In this study, eighty percent of working mothers had to bottle-feed their infants. This research closely resembles that of Zhang et al.¹¹. In that study, 74% of participants fed their infants formula since there wasn't enough breast milk supply. A quite different finding was made by another study⁷. The reasons for their participants to feed bottles to their infants were feeding the baby with ease (87%) and ideas about good for fostering growth with formula (19%).

CONCLUSION

This study found that bottle-feeding practice was higher among elderly mothers, educated mothers, and those from wealthier families, residing in urban areas and working outside the home. Babies born prematurely or delivered at a health facility with a caesarean section were associated with a higher rate of bottle-feeding. Maternal perception of insufficient breast milk, influence from family members, and advice from health professionals were found to be major reasons for starting bottle-feeding the babies. The results enhance our understanding of mothers' perceptions and attitudes towards bottle-feeding.

LIMITATIONS

There were certain limitations to this study. We did not assess how much or how frequently mothers fed their infants' formula milk or bottle-feeding. Additionally, we did not assess the knowledge of mothers about the correct preparation of formula milk or the manner in which they prepare formula.

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