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Determinants of Malnutrition among the Children under 2 Years of Age

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Abstract: Two hundred and twenty five mothers of Dhaka medical college hospital are interviewed to investigate of determinants of malnutrition. All of our respondents were under two years of age. One hundred fourteen of them were girls and rests 111 were boys. All of the children were from different socio-economic status coming different places of Bangladesh. 28% of the respondents family monthly income were below 3001-5000, 3.6% were below 20,000-25,000 and 16.4% were 10,000-15,000, 21.3% respondents mothers were illiterate, 24.4% mothers were primary level, 32% mothers were secondary level, 11.1% mothers were higher secondary level and 11.1% were graduate. The nutritional status children were not found very from normal to 3rd degree malnourishment. Nearly 45.8% were normal, 1.8% was over nourished and 2.2% were 3rd degree malnourished. In the above context, it can be concluded that a large number of the population of Bangladeshi children are suffering from malnutrition (more than half) and are likely to grow smaller and smaller. This is implication of the fact that we are heading towards a nation that will see its children to be of small status and low weight population. So, we need to give highest priority to child health and nutrition if we hope for a brighter future of our country.

Key words: Malnutrition, gomez classification, prelacteal feed

INTRODUCTION

Malnutrition is widespread in most developing countries and it is particularly prevalent among the children, as they are the most vulnerable group of a society. The problem is more serious in Bangladesh, where poverty and illiteracy are predominating. Using the new WHO 2005 GRS, 40% of children aged < 5 years were underweight, 46% were stunted, 15% were wasted and 1.4% were overweight/obese, according to criteria of the World Health Organization (WHO, 1995). The children also have high rate of diarrhoeal infection, nutritional blindness, morbidity and mortality. These high rates of malnutrition may be attributed to poor environmental sanitation, overcrowding, lack of preventive and curative health services and other socioeconomic, educational and cultural factors. Feeding practices have long been recognized as one potentially important determinant of infant malnutrition (Dettwyler, 1987; Whitehead, 1985). It is well known that breast-feeding improves child survival by providing protection against malnutrition and infectious diseases. Under conditions in which a mother is motivated, healthy and relaxed, breast milk alone is adequate fully to support infant growth for at least 4 months and often 6 months. Additional foods are needed when the supply of breast milk is no longer sufficient to meet the energy and nutrient needs for the growing infant.

In many areas where prolonged breast-feeding is common, nutritional problems generally arise after the first year of life. Delayed supplementation and inadequate weaning foods are major factors responsible for this. In some populations, a child is

weaned so early that he is deprived of breast milk and given substitutes, which may be inadequate in nutrition (Greiner, 1997). The timing of supplementary feeding is thus critical for the infant's health and nutrition.

The general view is that additional food should be given by 4-6 months of age since breast milk alone is insufficient to sustain normal growth beyond this period. Some workers, however, believe that food should be introduced even earlier since it has been observed in some instances that growth faltering occurs by 3 months of age (WHO, 1988; 1981). It is important, therefore to examine how long breast milk alone is adequate for normal growth of infants reared under different ecological conditions. It is recommended in Bangladesh that infants should be exclusively breast-fed up to five months of age and then appropriate weaning foods must be added along with breast-feeding (Whitehead, 1985; Islam and Ali, 1983). Recent evidences show that the young children of Bangladesh are typically breast-fed for as long as two years or even more (Greiner, 1997; Whitehead, 1985; Becker *et al.*, 1986). Although this incidence of breast-feeding in Bangladesh is satisfactory, the high rate of child malnutrition signifies the operation of other important factors, such as, inadequate supplementation and delayed weaning.

Successful breast-feeding and weaning practices depend to a large extent on the knowledge and attitude of mothers regarding infant feeding. Pattern of infant feeding, as mentioned above, can have a major effect on the nutritional status, health and growth of a child. Therefore, a first step towards understanding malnutrition and infant health in a particular community

is to have a through knowledge of the beliefs and practices associated with the infant feeding in that community. In Bangladesh, several studies regarding infant and child feeding practices have been carried out, mostly in rural areas. In urban areas, such type of study has been found scant. Also some other related malnutrition came we can approach like family food frequency, Immunization, safe water, Anthropometry and also other clinical form.

Thus, the present study was undertaken to investigate the pattern of infant malnutrition as well as the principal factors associated with such feeding practices in a population of Dhaka.

MATERIALS AND METHODS

The study compared 225 mother infant pairs from different socio-economic and educational groups. The characteristics of the study population and details of the methodology are given below.

The study place: Data were collected from “Dhaka Medical College Hospital (DMCH)”. It was located in the centre of Dhaka city. The place was chosen because adequate facilities are available there and a large number of mother-infant pairs attend the centre for receiving health services.

Subject: The subjects of study belong to middle and lower socio economic classes. They came from different parts of the Dhaka city. Two hundred and twenty five infants and their mothers constituted the study population.

During the study period, approximately 600 mothers together with their infants visited the centre. Out of these, 261 mothers could be approached for interview permitting anthropometric measurements of the infants subsequently. However, some mothers were discarded from the study since they could not give complete information as required. Finally, only 225 mothers’ infant pairs were successfully interviewed in the present study.

Data collection: Direct interviewing the selected mothers collected data on a designed questionnaire. Initially a questionnaire was constructed and pre-tested in a pilot survey. The standard questionnaire was developed in which all the requisite information was recorded. Mothers who had at least one child below 2 years of age were selected for interviewing. The data collection continued from April 2004 to February 2005.

Data analysis: All the data were placed in a master sheet to obtain a particular variable readily and to compare it with others. The data were processed with the help statistical software and sometimes by scientific standard statistical methods were followed as required.

Result analysis plan: We want to display our study finding by tables as a descriptive way of presentation to this attempt proper statistical analysis will be adopted as far as this data permit.

Appropriate statistic tests will be applied to establish the linkage between malnutrition and factors under consideration.

RESULTS

Monthly Family Income and effect of family income:

The monthly family incomes of the respondents are summarized in Table 1. It shows that 19.1% of the respondent fell in the monthly income group of taka three thousand or less, 28% in three to five thousand, 24.4% in five to ten thousand, 16.4% in ten to fifteen thousand, 8.4% in fifteen to twenty thousand and only 3.6% in twenty to twenty five thousand. The lowest and highest incomes were found TK. 1,500 and 30,000 (per month) respectively (not shows in the table).

Table 1: Distribution of the respondents by monthly family income

Monthly income (T.K)	Respondent (n = 225)	
	Number	%
3,000 or less	43	19.1
3,001-5,000	63	28.0
5,000-10,000	55	24.4
10,001-15,000	37	16.4
15,001-20,000	19	8.4
20,001-25,000	8	3.6

The effect monthly family income on the duration of exclusive and total breast-feeding is given in Table 2, which shows that there was a decreasing trend of the duration of total breast-feeding as the family income increased ($p < 0.05$). The variation was found insignificant in case of exclusive breast-feeding ($p > 0.05$).

Age and sex of subject infants: The age and sex distribution of subject infant is presented in Table 3. It appears from the table that the subject infants fell within the age group of less than three months. It also appears that the proportion of female child was slightly larger than the male. Out of 225 million infants 111 (49.3%) was male against 114 (50.7%) female. It correspond the proportion of 974 male per thousand of female children.

Exclusive breast-feeding: Table 4 describes the duration of exclusive breast-feeding for male and female infants. The result shows that the duration of exclusive breast-feeding was longer for male than for female children. The mean during for males (3.63 months) was slightly higher than that for female (3.26 months). However, this difference was not significant, as found by the values of standard deviation.

Education Level of the respondents and their husbands and effect of breast feeding: Table 5 describes the result of education levels of infant’s

Table 2: Duration of exclusive and total breast-feeding as affected by family income (figures are number of cases with percentage in parenthesis)

Monthly family income (Tk.)	Duration of EXBF (month)		
	<3	3-5	>5
<5,000	19 (8.4)	29 (12.8)	25 (11.1)
5,000-10,000	25 (11.1)	34 (15.1)	22 (9.8)
>10,000	24 (10.7)	28 (12.4)	19 (8.4)
	$\chi^2 = 2.02$	$p > 0.05$	
Monthly family income (Tk.)	Duration of TBF (Month)		
	<12	12-24	>24
<5,000	13 (5.7)	33 (14.7)	31 (13.7)
5,000-10,000	17 (7.6)	42 (18.7)	37 (16.4)
>10,000	15 (6.7)	26 (11.6)	11 (4.9)
	$\chi^2 = 5.91$	$p < 0.05$	

Table 3: Distribution of infants by age and sex

Age (months)	Girl		Boy	
	Number	%	Number	%
<3	16	6.7	14	6.2
3 + to 6	13	5.8	12	5.3
6 + to 9	30	13.3	30	13.3
9 + to 12	25	11.1	23	10.2
12 + to 24	31	13.8	32	14.2
Total (n = 225)	114	50.7	111	49.3

Table 4: Duration of exclusive breast-feeding

Duration (month)	Girl		Boy	
	Number	%	Number	%
<1	12	5.3	10	4.4
1+ to 2	14	6.2	8	3.6
2 + to 3	18	8.0	19	8.4
3 + to 4	27	12.0	25	11.1
4 + to 5	31	13.8	27	12.0
5 + to 6	12	5.3	16	7.1
6 + to 7	-	-	4	1.8
7 + to 8	-	-	2	0.9
Total (n = 225)	114	50.7	111	49.3
Mean Duration	3.26±0.4		3.63±0.4	
±SD	months		months	

Table 5: Distribution of infant's parents by education

Education level	Mother (n = 225)		Father	
	Number	%	Number	%
Illiterate	48	21.3	8	3.6
Primary	55	24.4	40	17.8
Secondary	72	32.0	53	23.6
Higher secondary	25	11.1	25	11.1
Graduate	25	11.1	99	44

parents. The result shows that 21.3% and 3.6% mother and fathers respectively were illiterate. The highest percentage was observed at secondary level of education for mother and the highest percentage was observed at graduation level of education for fathers. The graduate level of education was observed only 11.1% among mothers. The rates of literacy and higher education had been found lower among mothers. Table 6 shows the effect of mother's education on the duration of exclusive and total breast-feeding. There was

a decreasing trend of both the duration of exclusive and total breast-feeding as the level of mother's education interested. The variations were significant at 5% level of both exclusive and total breast-feeding as obtained by the chi square-test.

Age of the fathers and mothers and effect of breast feeding: The age distribution of infant's mother along with their husband's is presented in Table 7. It shows that 24% of the mothers had less than 20 years of age. Majority of mothers (38.2%) was of the age group of 20-24 years, followed by the age group of 25-29 years 32% and 30-34 years (5.8%). No mother was found having more than 34 years of age. On the other hand, no father was reported table less than 20 years of age. The highest percentage of fathers was found with in the age group of 30-34 years (39.6%) followed by 35-39 years (24%). The lowest percentage of father (6.2%) was observed within 40-45 years.

Table 8 explains the effect of maternal age on the exclusive and total duration of breast-feeding. It appears that though variations in duration of both exclusive and total breast-feeding were observed among different maternal age of groups, these were statistically in significant, as reveled by the chi square - test.

Prelacteal feeds: Table 9 describes the various Prelacteal feeds given to the neonates before breast-feeding. It appears from the table that in about 70% of cases Prelacteal feed was not given. Sugar water was given in 9.3% of cases. Diluted cow-milk, powdered milk, honey, only water and other's expressed breast milk were reported as Prelacteal feeds.

Colostrums feeding: Practice and attitude of the respondent mothers regarding colostrums feeding are summarized in Table 10. The result reveals that 87.6% of the respondent mothers gave colostrums to their infants and 12.4% discarded it. About half of the respondent mothers who gave colostrums delivered that it was good for infants. Only 5.8% of the mothers gave it for immunity development in infants. Some of the mothers (19.1%) reported that they gave it according to the doctor. Rejection of colostrums was due to social custom (6.7%) or bad for infant's health (5.7%).

Total duration of breast-feeding: Table 11 describes the total duration of breast-feeding. It appears from the table that the mean duration was slightly higher for male (1.92 years) than for female children (1.89 years). The difference was, however, insignificant as observed by the values of standard deviation. About half of the mothers said that they would breast-feed for 2 years. Forty two percent mothers would like to breast-feed for 2 years-feed for as long as till the breast milk exhausted. Only 8% of the mothers would like to give breast for 1 years of less.

Table 6: Duration of exclusive and total breast-feeding as affected by mother's education (figures are number of cases with percentage in parenthesis)

Total years of schooling	Duration of EXBF (Month)			Duration of TBF (Month)		
	<3	3-5	>5	<12	12-24	>24
<6	33 (14.7)	36 (16.0)	26 (11.0)	4 (1.8)	43 (19.1)	42 (18.7)
6-10	28 (12.4)	37 (16.4)	23 (10.2)	9 (4.0)	30 (13.3)	40 (17.8)
>10	17 (7.6)	13 (5.8)	12 (5.3)	5 (2.2)	21 (9.3)	31 (13.8)
	$\chi^2 = -2.75$	$p > 0.05$		$\chi^2 = 3.74$	$p < 0.05$	

Table 7: Distribution of infant's parents by age

Age (year)	Mother (n = 225)		Father (n = 225)	
	Number	%	Number	%
15-19	54	24.0	-	-
20-24	86	38.2	16	7.1
25-29	72	32.0	52	23.1
30-34	13	5.8	89	39.6
35-39	-	-	54	24.0
40-45	-	-	14	6.2

Table 8: Duration of exclusive and total breast-feeding as affected by mother's age (figures are number of cases with percentage in parenthesis)

Mothers age (year)	Duration of EXBF (month)		
	<3	3-5	>5
<21	19 (8.5)	33 (14.7)	14 (6.2)
21-25	36 (13.3)	41 (18.2)	13 (5.8)
>25	23 (10.2)	35 (15.6)	11 (4.9)
	$\chi^2 = 3.07$	$p > 0.05$	

Mothers age (year)	Duration of TBF (Month)		
	<12	12-24	>24
<21	6 (2.7)	38 (6.9)	36 (16.0)
21-25	7 (3.1)	39 (17.3)	37 (16.5)
>25	5 (2.2)	32 (14.2)	25 (11.1)
	$\chi^2 = 0.39$	$p > 0.05$	

Infants interest towards food: It is important to consider infants' interest towards weaning food since it is intimately related to infants' nutrition and health. Table 12 summarizes the interest of infants towards breast milk and weaning food.

It is evident from Table 12 that almost all the infants were interested to breast milk. Sporadic evidence of infant's disinterest towards breast milk was observed. On the other hand, more than 50% of the infants were disinterested to their weaning food.

Cooking of weaning food: Since weaning is to accustom the infant with normal family diet, it is note worthy the type of cooking of infant's food. Distribution of the respondent mothers according to type of cooking of infant's weaning food is presented in Table 13.

It appears from the table that in (36.9%) of cases the weaning food was cooked separately and in (22.7%) of cases jointly. Mixed type of cooking (sometimes separately and jointly) was reported in (20.9%) of cases. Here "Jointly cooking" implies that infant's weaning food

Table 9: Prelacteal feeds offered to infants (n = 225)

Name of feed	Number of cases	%
Powdered	14	6.2
Cow milk	5	2.2
Sugar water	21	9.3
Honey	12	5.3
Water	9	4.0
Other's breast milk	7	3.1
Total	68	30.2
Not given	157	69.7

Table 10: Mother's practice regarding colostrums feeding

Reason for giving/ discarding colostrums	Given		Discarded	
	Number	%	Number	%
Good for health	117	52.0	-	-
Immunity	13	5.8	-	-
Doctors suggestion	43	19.1	-	-
Not know	24	10.7	-	-
Harmful	-	-	8	3.5
Causes stomach upset	-	-	5	2.2
Custom	-	-	15	6.7
Total (n = 225)	197	87.6	28	12.4

Table 11: Distribution of total duration of breast-feeding

Duration (Year)	Girl		Boy	
	Number	%	Number	%
<6	6	2.7	5	2.2
1	3	1.3	4	1.8
1-1.5	44	19.6	52	23.1
1.5-2	7	3.1	8	3.6
Till breast milk exhausts	45	20.00	51	22.6
Total (n = 225)	105	46.7	120	53.3
Mean duration±SD	1.89±0.23 years		1.92±0.24 years	

was cooked not separately but along with the adults. About one fifth of the respondent's said that they did not cook weaning food especially for infants, in such cases the children were given from normal adult's meals.

Nutritional status of the subject infants: The nutritional status of the subject infants was assessed through anthropometric measurements. The results are presented in Table 14-17.

It appears from Table 14 that, according to the Harvard standard, about half of the infant populations were under-weight and about 2% of infants were found over height. Rest of the infants would fall within the range of normal weight-for-age. The nutritional status of these

Table 12: Distribution of infants according to their Interest towards breast milk and weaning food (n = 225)

Infant's interest	Type of food			
	Breast milk		Weaning food	
	Number	%	Number	%
Positive	222	98.7	72	32.0
Negative	3	1.3	123	54.7
Not known	-	-	30	13.3

Table 13: Type of cooking of infant's food

Type of cooking	Mother (n = 225)	
	Number	%
Separately	83	36.9
Jointly	51	22.7
Separately and Jointly	47	20.9
Not specially for infant	44	19.5

Table 14: Distribution of infants by height for-age (Harvard Standard)

Standard	Infants (n = 225)	
	Number	%
100%	47	20.9
90%	56	24.9
80%	47	20.9
70%	43	19.1
60%	23	10.2
<60%	5	2.2
120%	4	1.8

Table 15: Nutritional status of infants according to Gomez classification

Gomez Classification	Nutritional status	Infants (n = 225)	
		Number	%
<60.0	3 rd grade malnutrition	5	2.2
60.0-74.9	2 nd grade malnutrition	66	29.3
75.0-89.9	1 st grade malnutrition	47	20.9
90.0-110.0	Normal	103	45.8
>110.0	Over Nourished	4	1.8

infants can easily be assessed by Gomez classification, which is presented in Table 15.

It appears from Table 13 that only 45.8% of the infants were in normal maturational state and 1.8% was over nourished. Majority (5.2%) of the infants suffered from malnutrition of which 20.9% suffered first degree 29.3% second degree and 2.2% from third-degree malnutrition. The nutritional status of infants was also assessed through measuring their Mid-Upper Arm Circumference (MUAC) and head/chest ratio. The results are shown in Table 16 and 17.

According to the measurement of infants MUAC, 40.4% of the infants found in normal nutritional status and rest of the infants was malnourished (Table 16). According to head/chest ratio only 20.9% infants were in the normal group (Table 17).

Table 16: Distribution of infants by their mid-upper arm circumference

MUAC (cm)	Nutritional status	Infants (n = 225)	
		Number	%
<12.5	Severely malnourished	47	20.9
12.5-13.5	Moderately malnourished	87	38.7
>13.5	Above normal nutritional status	91	40.4

Table 17: Distribution of infants by their head/chest ratio

Head/chest ratio	Nutritional Status	Infants (n = 225)	
		Number	%
<1	Over nourished	74	32.9
>1	Malnourished	104	46.2
1	Normal nutritional status	47	20.9

From the above results, it may be summarized that majority of infants of the study population suffered from malnutrition.

DISCUSSION

In the present study, 225 mothers of various socioeconomic and educational levels were interviewed on a pre-set questionnaire to investigate the infant feeding practices prevailing among them. Some factors, which might influence the feeding practices, such as infant's sex, mother's age and education and family income, were also studied. The important findings are discussed below.

Prelacteal feeding: Breast-feeding is rarely initiated after birth, but is usually receded by Prelacteal feeds. The period immediately following delivery is a time when many women introduce breast milk substitutes to their infants' diet. The introduction of breast-milk substitute before the milk comes in is known as prelacteal feeding. In the present investigation, majority of the mothers started breast-feeding on or after the third day of delivery. It is usual a practice in our country as observed in some studies (Talukder *et al.*, 1988). The cause of delay in putting the baby to the breast was 'lack of flow of milk' from the breast, which is a well-known observation in many other studies (Chowdery *et al.*, 1995; Das *et al.*, 1992; Faruque *et al.*, 1992; Jacobson *et al.*, 1991).

Colostrums rejection was found only in 12.4 of the cases. In most of the cases mothers accepted the matter as social custom. Although most of the mothers gave colostrums to their babies, only 5.8% of them knew its immunological significance.

Breast-feeding: Breast-feeding is the traditional and ideal form of infant feeding for meeting a child's nutritional needs during the first few months of life. It has been recognized that human milk prevents obesity of infants and has a protective effect against various infectious diseases. It represents the only of available source of the protein containing all the amino acids.

Breast milk, unlike most substitute foods, is easily digestible. Breast-feeding also has some contraceptive effects.

According to most of the investigators, breast-feeding is universal in Bangladesh. Ahamed (1986) reported that the mean duration of breast-feeding of Bangladeshi children was 27.3 months (2.27 years). In our study, the mean duration was found to be 1.89 years for female and 1.92 years for male children. The shorter mean duration of breast-feeding as observed in the present study may be because the study might be due to the fact that the population was urban. It has been found from several studies that urban women breast-feed for shorter duration than rural women (WHO, 1981; 1991).

Mother's education and breast-feeding: The educational level of mother is often found to influence breast-feeding. Educated mothers usually breast-feed their children for a shorter duration than uneducated mothers. The inverse relationship between breast-feeding duration and education was found in most studies carried out in Bangladesh (Ahamed, 1986; Ahamed and Barkat-e-Khuda, 1984). For example, Ahamed and Barkat-e-Khuda observed that the better educated a woman is the less likely she is to start breast-feeding, and if she starts, she breast-feeds for a shorter duration on the average. Our findings (Table 6) substantiate the issue.

Mother's age and breast-feeding: Ahamed (Ahamed, 1986) observed that the overall mean duration of breast-feeding increased with age of the mothers. Some other studies also found that mother's age was positively associated with longer duration of breast-feeding (Cosminsky *et al.*, 1993; Forman, 1984; Huffman *et al.*, 1980; Jackson *et al.*, 1992). In our study, however, we could not find any significant relation between mother's age and breast-feeding duration (Table 8).

Infant's sex and breast-feeding: Several studies in Bangladesh shows (Ahamed, 1986; Ahamed and Barkat-e-Khuda, 1984; Briend *et al.*, 1998) that female children are breast-fed for periods shorter than male children, and male children are reared more carefully than female children in the hope of future or old age security. Guldan *et al.* (1993) reported that if the child was a boy, the mother was more likely to be in leisure during breast-feeding, while if the child was a girl, the mother was more likely to be engaged in economic activity. It suggests different degrees of seriousness with which the mothers took breast-feeding children of different sexes. In our study, however, no significant variation in breast-feeding duration was observed between male and female children.

Family income and breast-feeding: Family income is a principal predicator of socioeconomic status of the family. In the present study it was observed that the duration of exclusive and total breast-feeding decreased with increasing family income. Similar results were also reported in many other studies (Janowitz *et al.*, 1981; Kalra *et al.*, 1982; Piwoz and Viteri, 1985; Thimmayamma *et al.*, 1980; Black *et al.*, 1982).

Supplementation and weaning: Weaning period is a crucial time in an infant's life when he shifts gradually from exclusive breast-feeding to the adult diet. This transitional period generally begins at about four months and may extend up to two years or even more. The problem of when to begin weaning and what foods are appropriate has been extensively examined (Underwood and Hof Vander, 1982; Wharton, 1989; WHO, 1988). In appropriate weaning may initiate undesirable consequences. Too early initiation of weaning carries the risk of increased morbidity due to diarrhoea and food allergies, as external challenges are introduced into the immature digestive tract (Wharton, 1989; Whitehead, 1985). It may also result in infant malnutrition due to the normal decrease in maternal milk production, as the baby is withdrawn from the breast (Wharton, 1989; Whitehead, 1985). Weaning too late can lead to faltering growth, malnutrition and decreased immune protection when exclusive breast-feeding becomes inadequate (Whitehead, 1985; Whitehead and Paul, 1984). Inappropriate choice of weaning foods can lead to protein-energy, malnutrition and micronutrient deficiencies.

During the first four months of life, breast milk alone provides optimal nutrition for rapidly growing infants (Popkin *et al.*, 1986). As physical and developmental capacities mature, solid foods are introduced. The composition and consistency of the diet are advanced so those by one year the infant can eat a variety of foods from a mixed diet (Jason *et al.*, 1984).

An important point should be considered here that our information on supplementation is limited. We only know the age at first supplementation. We do not have information on the adequacy of the supplement or how frequently it was given to infants. In our country infants seldom receive the necessary amounts of supplements to maintain normal growth. The supplements that are given to infants contain only minimal amounts of calories and the infants rely on breast milk as their major source of nourishment even into the second year of life (Islam and Ali, 1983; Malek *et al.*, 1986).

Few infants who are fed only breast milk beyond age 6 months remain healthy and grow well. In a study among poor women of India (WHO, 1981), 80% or more of the mothers were found to exclusively breast-feed their

infants without evidence of significant growth faltering for at least 6-7 months. It is noteworthy; however, that slowed growth is prevalent in 1-3 year-old Indian infants. The question here is that, among those poor women in India and among those in similar situations in which mothers rely on prolonged unsupplemented breast-feeding, is whether complementary feeding introduced earlier would have averted the subsequent malnutrition (Mitra *et al.*, 1994).

Faltering of growth after 6 months is not only a consequence of too early and insufficient provision of complementary food under unhygienic conditions, but perhaps of equal importance is the failure to stimulate the early acceptance of a varied eating pattern during the weaning process. Our finding supports the view as majority of infants was found to be disinterested to their weaning food (Table 12).

Assessment of nutritional status: We assessed of under 2 years children nutritional status using anthropometric measurements, among them height for age by Harvard standard, Gomez classification, Mid-Upper Arm Circumference (MUAC) and head/chest ratio were respectively. Nutritional anthropometry is concerned with the measurement of the variations of the physical dimensions and the gross composition of the human body at different age levels and degree of nutrition (Jelliffe and Derrick, 1966). Before the recommendations of Indian Harvard as "reference" standard for Academy of Pediatrics for adopting assessment of growth and calculating various grades of Protein Energy Malnutrition, most of the studies in India on growth have been conducted on the low or mixed socio-economic groups, but after this recommendation, a large number of workers have reported growth pattern in higher socio-economic strata of the community indicating growth potential of Indian children, who do not have nutritional and economic constraints (Bhandari and Mandowara, 1982). Although according to the Harvard standard, our data are shown that about half of the infant populations were under-weight (Table 14).

The Gomez classification has been world wide used. Generally it was introduced as a prognostic tool which one is used for hospitalized cases of protein calorie malnutrition. According to Gomez classification, 45.8% infants were normal maturational state and majority of the infants suffered from malnutrition (Table 15). According to the measurement of infants by mid upper arm circumference, most of the infants were malnourished and according to the head/chest ratio also shown that most of infants were suffered malnutrition (Table 16 and 17).

Conclusions: In finally, the present study was conducted to investigate the infant feeding practices that prevailed in a selected hospital of the Dhaka City. Two hundred and twenty five mothers were interviewed on a pre-set

questionnaire. The respondent mothers were of various socioeconomic and educational levels.

Even the most educated of the mothers could not be said to follow proper weaning practices. In addition, increased family income was not translated into improved nutritional status of children. The duration of exclusive breast-feeding was alarmingly low. In 74% of cases, the introduction of supplement food was either too early or unduly delayed.

Nevertheless, the prevalence of breast-feeding is still high in urban population but the practices of too early introduction of supplement and weaning food play an important role in initiating and sustaining the vicious cycle of malnutrition and infection. The situation demands improved infant feeding practices. To achieve the goal, following recommendations may be considered:

- The formal education system should be strengthened by an increased emphasis on nutrition and health-related components
- Although the findings of this research emphasize some relationships between formal education and feeding practice, informal education is also recommended

It is important that the medical and health personnel educate the mothers about these practices at every possible contact, so as to ensure proper infant feeding.

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