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Complementary Feeding Practices and Related Factors among Mothers of 6-23 Months Aged Children at Dhaka in Bangladesh

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Abstract
Malnutrition refers to inadequate dietary intake, infectious disease, or a combination of both. Worldwide about 2.3 million children's deaths are attributed to malnutrition which is nearly one-half of all child deathsper year. Malnutrition affects cognitive and educational development of children, which cuts future earning and reduces global economy substantially. Proper feeding practicesand early childhood are fundamental for normal growth, development and survival of infants and children,The objective of this study was to find out the pattern of complementary feeding practices and related factors among mothers of 6-23 months aged children. A cross-sectionalstudy was conducted at Dhaka Medical College Hospital and Maternal and Child Health TrainingInstitute,Azimpur,Dhaka. 187respondents were selectedby using purposive sampling method. The data were collected by face to face interview using semi-structure questionnaire. 79.7% timely introduced semi-solid and solid food, 95.2% the minimum meal frequency, 60.4% the minimum dietary diversity, 58.2% children received minimum acceptable diet, 89.3% continuation of breastfeeding, 47.1% appropriate feeding, 52.9% inappropriate feeding. Complementary feeding practices was significantly related to the education of mother ($p<0.001$), age of the children ($p<0.01$), the education of father ($p<0.05$), restriction of food items to the child ($p<0.05$), place of child delivery ($p<0.05$), pre-lacteal feeding ($p<0.005$), exclusive breast feeding ($p<0.001$), source of learning of complementary feeding ($p<0.01$). < 2 years children are at riskin Bangladesh. Appropriate feeding practice is essential for the nutrition, growth, development and survival of infant and young children. Knowledge about appropriate complementary feeding practices should be given to the parents of child during ANC and PNC visit and during the discharge from hospital after delivery.

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I. Introduction

Bangladesh has made substantial progress in reduced maternal and child mortality rate, immunization coverage, increased contraceptive use and greater life expectancy at birth. The persistence of malnutrition and nutrition-related health problems remain serious concerns. The number of children under five with severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) is estimated to be 600,000 and 1.8 million. The prevalence of chronic malnutrition among under five children is 41% (Kabir and Maitrot,2017).

Around 45% of deaths among <5 children are linked to under-nutrition which mostly occur in low and middle-income countries and rates of childhood overweight and obesity are rising in Bangladesh. According to Bangladesh Demographic and Health Survey in 2017-2018, 34% fed according to the recommended infant and young child feeding (IYCF) practices where the proportion has increased substantially from 23% in 2014.Suboptimal and inappropriate complementary feeding practices are one of the major cause of undernutrition among 6-23 months children in Bangladesh. That is why, it is important to find out current situation of complementary feeding practices and related factors among mothers which will help to take necessary steps that can significantly reduce undernutrition among children aged 6-23 months(BDHS,2017-18).

In Bangladesh, 155 million people with an annual birth cohort of 3.1 million, has made dramatic health advances over the last 2 decades. Although rapid improvements in infant, child, and maternal mortality; immunization coverage; infectious disease treatment coverage; fertility rates; life expectancy; and other indicators of societal development, undernutrition remains a challenge. In 2014, an estimated 36% of <5 children were stunted, reflecting a 4 point decline since 2011, and a 15 pp decline since 2004 (mean rate of decline of 1.5 pp/y). Over the same period of time, there were minimal change in the prevalence of wasting, with an estimated prevalence of 14% in 2014, reflecting a decline only 1 pp in the last 10 y.

Appropriate infant and young child feeding (IYCF) practice includes exclusive breastfeeding until 6 months of age and the provision of safe and nutritionally rich foods in sufficient quantity in addition to breastmilk from 6 to 23 months of age, are a critical component of optimal child growth and development. In Bangladesh, the rates of exclusive breastfeeding have increased in the last 10 y to an estimated 55% in 2014, there has been little to no progress in improving the quality of children's diets, as measured by indicators such as minimum diet diversity and minimum acceptable diet.

An estimated 26% of children 6–23 months of age nationally consumed adequately diverse diets, with only 23% consuming a minimally acceptable diet. Traditional complementary foods in Bangladesh, as in many other parts of the developing world, have low energy and micro-nutrient density and poor protein quality. Interventions to improve child feeding at scale are imperative because the inadequacy of complementary feeding (CF) in Bangladesh and other similar contexts remains a substantial and somewhat intractable challenge.

Several studies have reviewed the strategies commonly used for improving CF knowledge and behaviors and their impact on child growth, morbidity, and survival and the provision of nutrition education and/or complementary foods. Pooled results from food-secure and insecure populations show that education alone increased linear growth by a height-for-age *z* score (HAZ) of 0.23, resulting in a 29% reduction in stunting, as well as a 62% improvement in the uptake of recommended foods. The studies conducted in food insecure settings, complementary food supplements provided with or without education had a larger impact, with an increase of 0.39 HAZ, although stunting rates were not significantly different between the intervention and comparison groups.

A recent study reported a small 0.07–0.10 HAZ increase when complementary foods were provided with nutrition education compared alone with nutrition education. The studies focused primarily on child growth outcomes and generally fail to carefully analyze or report the impacts of CF promotion interventions on learning and adoption of optimal practices by mothers. Moreover, evidence derived predominantly from efficacy studies or small-scale or pilot effectiveness interventions. As a result, evidence is scant on what works to improve maternal knowledge and practices related to CF practices, how these changes in turn lead to positive child outcomes, and what factors enable successful scale-up of these interventions.

In Bangladesh, a cluster-randomized impact evaluation of an at scale program. The objectives of the evaluation were to compare the impact of 2 Alive & Thrive (A&T) intervention packages on CF practices and anthropometric outcomes. This study were able to find few examples of large scale programs to improve CF practices which were rigorously evaluated. This study makes a substantial contribution to the literature on improving CF practices through a proof-of-concept rigorous evaluation of a set of interventions delivered at scale.

Worldwide about 2.3 million children's deaths are attributed to malnutrition per year, which is nearly one-half of all child deaths. Malnutrition refers to inadequate dietary intake, infectious disease, or a combination of both. The malnourished children are die from common childhood illnesses, such as, diarrhea, pneumonia, malaria, measles, and AIDS. Malnutrition affects cognitive and educational development of millions of children which cuts future earning by at least 20% and reduces global economy substantially.

The major causes of malnutrition include a lack of quality food, poor infant and child feeding and care practices, deficiencies of micronutrients such as vitamin A or zinc, and recurrent attack of infections, often intensified by intestinal parasites. Adequate complimentary feeding practice (CFP) can prevent up to 19 % of all childhood deaths in low-income countries. Although Bangladesh has made magnificent progress in health and human development since its independence in 1971, this country still shows limited success in addressing the odds of child malnutrition. For instance, prevalence of under-five child malnutrition is nearly 40 %, which causes nearly 60 % of under-five deaths. Inappropriate feeding practice could be considered as one of the profound causes of high under-five mortality in this country.

The World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) have articulated a global strategy and formulated guidelines for complementary feeding (CF) of breastfed children. Although appropriate CF among children aged 6–23 months brings numerous health benefits, inappropriate introduction of CF may increase risk of malnutrition among under-five children. Levels of CF can be affected by numerous individual, household and community level factors. Undernourished children are develop severe health hazards that impede body's metabolism and retard utilization of immunity resulting from deficiencies in immune competence.

Proper feeding practices during infancy and early childhood are fundamental for normal growth, development and survival of infants and children, particularly in developing countries. South Asian countries including Bangladesh reveal the highest burden of childhood under nutrition due to unimproved feeding of children that causes faltered growth and development, and illness. According to various studies, 6-23 months of age of a child is a "critical window" for transition of body and cognitive development. After 6 months of age, children need food because breast milk or infant formula alone is no longer sufficient to maintain child's growth. At this stage, children should be fed small quantities of nutritional solid and semisolid foods in addition to breast-feeding. Considering the limited number of studies in Bangladesh, the aim of this study was to find out

the pattern of complementary feeding practices and related factors among mothers of 6-23 months aged children focusing on individual, household and community level factors.

Research Question

What is the pattern of complementary feeding practices and related factors among mothers of 6-23 months aged children?

Conceptual Framework

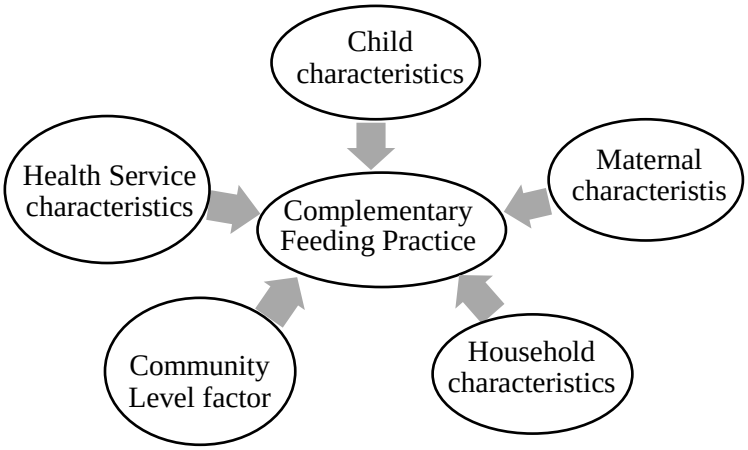


Figure 1:Conceptual Framework

II. Methodology

Study Design: The study design was a Cross Sectional Study

Study Period: The study was conducted for the one year during the period of 1st January,2020 to 31st December, 2020

Study Place: Paediatric medicine outdoor of Dhaka Medical College Hospital and Azimpur Maternity hospital

Study population: The data were collected from mothers of children aged 6-23 months

Inclusion Criteria:

- Mothers having children of 6-23 months of age willing to participate

Exclusion Criteria:

- Mothers of cerebral palsy children aged 6-23 months
- Mothers of severely ill children aged 6-23 months

Sample size:

$$n = \frac{z^2 pq}{d^2}$$

"[n=sample size, z= Reliability of coefficient at 95% with confidence level where z= 1.96, p=proportion of appropriate complementary feeding practice among respondent where p=0.34 (BDHS, 2017-18), q=1-p and d=allowable error accuracy required, usual value set at 5%(.05)]"

So, n= $(1.96)^2 \times \frac{0.34 \times 0.66}{(0.05)^2}$ $or\ n = 345$

The estimated sample size was 345, it was noted 345 were the required number of sample size if simple random sampling technique was used. But as this study purposive sampling techniques were used and due to the fixed time duration 187 sample were taken purposively.

Sampling method: Purposive sampling method used to collect data.

DataCollectionTechnique**:** Data were collected by Face to face interview

DataCollectionInstrument**:** Semi-structured Questionnaire used as a data collection instrument

Data Processing: Data were checked for consistency, relevancy and quality control. Data were compiled, coded, cleared, categorized, and edited according to objectives and variables.

Data Analysis:

Data were analyzed by descriptive and inferential statistics with the help of IBM software that is SPSS (statistical package for the social science) 25 version. For descriptive statistics, frequency and percentage were shown in the tables. Bar and pie charts were also made. In the tables, proportion was presented for categorical

variables and mean, SD was presented for continuous variables. The inferential statistics were carried out to see any association between independent and dependent variables. For the test of significance, Chi-square was used.

III. Result

A cross-sectional study was carried out on 187 mothers of 6-23 months children in Dhaka Medical College Hospital & Maternal and Child Health Training Institute, Azimpur, Dhaka. A semi-structured questionnaire used to collect and compiled by checked, edited and analyzed by using SPSS software using appropriate statistical procedures. The findings are presented through tables and figures.

Maternal Characteristics of the sample

Distribution of the age of the Mother

Table shows that the number of respondents aged (<20) were 14, age (20-30) were 151, age (>30) were 22, mean ± SD = 25.79±4.58 respectively. Periodically their maximum age was 43 and Minimum 17.

Age in years	Frequency	Percentage(%)
Less than 20 years	14	7.5
20 to 30 years	151	80.7
More than 30	22	11.8
Total	187	100.0
mean ± SD 25.79±4.58, Minimum17, Maximum 43		

Distribution of Respondent by educational qualification

In this study shows that among 187 respondents, 3.7% of them illiterate, 30.5% studied up to Primary, 36.9% studied up to SSC, 16.0% of them had been completed HSC and 12.8% had been completed Graduation and above.

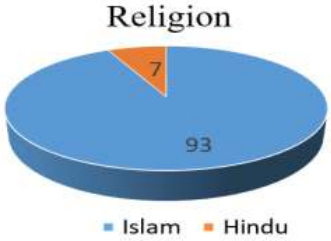
Education	Frequency	Percentage (%)
Illiterate	7	3.7
Primary	57	30.5
SSC	69	36.9
HSC	30	16.0
Graduation and above	24	12.8
Total	187	100.0

Distribution of Respondent by Occupation (N=187)

The pie chart shows that 93.6% house-wives, 4.8% service holder 1.6% maid servant.

Distribution of Respondent by Religion

The pie chart shows that 93% Muslim 7% Hindu.



Household Characteristics

Distribution of Respondent by husband's educational qualification

The table shows that 5.9% illiterate, 21.9% Primary, 34.2% SSC, 13.9% HSC, and 24.1% completed Graduation and above.

Qualification	Frequency	Percentage (%)
Illiterate	11	5.9
Primary	41	21.9
SSC	64	34.2
HSC	26	13.9
Graduation and above	45	24.1
Total	187	100.0

Distribution of Respondent by her husband's occupation

The pie chart shows that 44.9% Service holder, 42.2% Businessman, 9.6% Labour on daily basis, 2.1% Agricultural worker, and 1.1% were Unemployed.

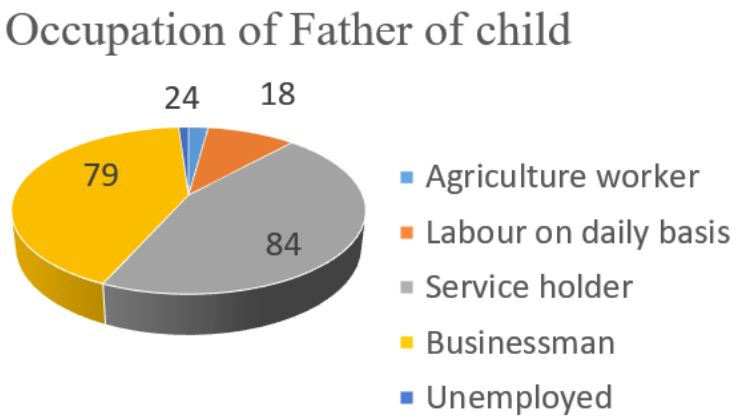


Figure 6: Distribution of Respondents by the occupation of the father of child

Distribution of Respondent by monthly family income

The table shows that monthly income 40.1% between 10000-20000, 25.1% between 20000-30000, 19.3% have above 30000, and 15.5% have income less than 10000. The maximum family income was 10000 while the minimum income was found to be 5000. The mean income was 24770.05 with the standard deviation of 14732.94 out of 187 respondents.

Monthly family income Range	Frequency	Percentage(%)
10000 or less	29	15.5
10001-20000	75	40.1
20001-30000	47	25.1
30001and above	36	19.3
Total	187	100.0
Mean ± SD = 24770.05 ± 14732.94Maximum=100,000; Minimum=5,000		

Distribution of Respondent by keeping newspaper in home

The table shows that 91.4% do not keep news paper at all, 7% keep daily newspaper, and 1.6% keep monthly newspaper.

Keeping Newspaper	Frequency	Percentage
Not at all	171	91.4
Monthly	3	1.6
Daily	13	7.0
Total	187	100.0

Distribution of Respondent by having electronic media in home

The table shows that 85.6% respondents have electronic media and only 14.4% do not have electronic media.

Having Electronic Media	Frequency	Percentage(%)
No	27	14.4
Yes	160	85.6

Total	187	100.0

Distribution of Respondent by source of drinking water

The table shows that 55.6% respondents use the supply of water from the WASA, 40.1% use water-pump, and 4.3% use tube-well as the source of supply of water.

Source	Frequency	Percentage(%)
Tube well	8	4.3
WASA	104	55.6
Water-pump	75	40.1
Total	187	100.0

Distribution of Respondent by safety of drinking water

The table shows that 57.8% respondents ensure the safety of water through either boiling or filter, 27.8% do not take any procedures whereas 14.4% ensure the safety of water through both boiling and filtering.

Procedure of safety	Frequency	Percentage(%)
No procedure use	52	27.8
Boil/Filter	108	57.8
Boil and Filter	27	14.4
Total	187	100.0

Distribution of Respondent by any food restriction in family

The table shows that 93.6% respondents do not have any food restrictions from the family while on the other hand 6.4% have food restrictions from the family.

Food restriction	Frequency	Percentage(%)
No	175	93.6
Yes	12	6.4
Total	187	100.0

Distribution of Respondent by restricted food items

The table shows that 93.6% respondents do not have any food restrictions from the family while on the other hand 6.4% have food restrictions from the family. Among the 12 respondents who have restrictions of food from the family have restriction on late weaning (9 among 12) and egg (3 among 12).

Food items	Frequency	Percentage(%)
No	175	93.6
Egg	3	1.6
Late weaning	9	4.8
Total	187	100.0

Health service characteristics

Distribution of Respondent by vaccination of child

The table shows that majority 96.8% respondents provided proper vaccination to the child while only 3.2% did not provide proper vaccination to the child.

Vaccination	Frequency	Percentage(%)
No	6	3.2
Yes	181	96.8
Total	187	100.0

Distribution of Respondent by number of ANC visit

The table shows that 48.7% respondents visited 1-5 times for ANC, 48.1% visted 6-10 times, 2.1% visited more than 10 times, and only 1.1% did not visit at all for ANC checkup.

ANC	Frequency	Percentage(%)
No visit	2	1.1

1-5 visit	91	48.7
6-10 visit	90	48.1
11 or more	4	2.1
Total	187	100.0

Distribution of Respondent by place of delivery

The table shows that 86.6% respondents had their delivery at the hospital while 13.4% had their delivery at home.

Place of delivery	Frequency	Percentage (%)
Home	25	13.4
Hospital	162	86.6
Total	187	100.0

Distribution of Respondent by PNC visit

The table shows that 89.9% respondents visited 1-5 times, 2.1% visited 6-10 times, and 8% did not visit at all for PNC checkup.

PNC	Frequency	Percentage(%)
No visit	15	8
1-5 visit	168	89.9
6-10 visit	4	2.1
Total	187	100.0

Information about breastfeeding

Distribution of Respondent by Prelacteal feeding of her child

The table shows that 80.7% respondents did not provide any Prelacteal feeding to the child where 19.3% provided Prelacteal feeding to the child.

Prelacteal feeding	Frequency	Percentage (%)
No	151	80.7
Yes	36	19.3
Total	187	100.0

Distribution of Respondent by name of Prelacteal feeding of her child

The table shows that 80.7% respondents did not provide any Prelacteal feeding to the child where 19.3% provided Prelacteal feeding to the child. Among the 36 respondents provided Prelacteal feeding, 18 Formula Milk, 9 honey, 6 sugar and only 3 provided water as the Prelacteal feed to the child.

Name of Prelacteal feeding	Frequency	Percentage (%)
No Prelacteal feeding	151	80.7
Water	3	1.6
Honey	9	4.8
Sugar	6	3.2
Formula Milk	18	9.7
Total	187	100.0

Distribution of respondent by initiation of first breastfeeding

The table shows that 56.1% respondents initiated breastfeeding within 1 hour, 39.1% between 1 to 72 hours, and only 4.8% did not initiate breastfeeding to the child.

Initiation of first breastfeeding	Frequency	Percentage (%)
Not initiation breastfeeding	9	4.8
Within 1 hour	105	56.1
1-72 hour	73	39.1
Total	187	100.0

Distribution of Respondent by exclusive breastfeeding
The table shows that 108 (57.8%) among the 187 respondents provided exclusive breastfeeding, and 79 (42.2%) did not provide exclusive breastfeeding

Exclusive breastfeeding	Frequency	Percentage (%)
No	79	42.2
Yes	108	57.8
Total	187	100.0

Distribution of Respondent by frequency of her child's breastfeeding
The table shows that 40.1% respondents breastfed their child 1-5 times a day, 37.5% 6-10 times a day, 11.7% 11-15 times a day, and 10.7% did not breastfeed at all.

Frequency of breastfeeding	Frequency	Percentage (%)
No	20	10.7
1-5 times	75	40.1
6-10 times	70	37.5
11-15 times	22	11.7
Total	187	100.0

Information about complementary feeding practices
Distribution of Respondent by having information about complementary feeding
The table shows that 99.5% respondents informed while 0.5% were not informed about complementary feeding.

Information about complementary feeding	Frequency	Percentage (%)
No	1	0.5
Yes	186	99.5
Total	187	100.0

Distribution of Respondent by whom she learns
The table shows that 50.2% from doctors or Nurses or Health workers, 28.3% from relatives, 13.4% from Media, and 8.1% from neighbors received learning.

Source of Information	Frequency	Percentage (%)
Relatives	53	28.3
Neighbour	15	8.1
Doctor/Nurse/Health worker	94	50.2
Media	25	13.4
Total	187	100.0

Distribution of Respondent by timing of introduction of complementary feeding
The table shows that 79.7% introduced complementary feeding at the age of 6 months, 10.2% at the age between 1 to 5 months, 9.6% at the age of 7 months or more, and only 1 did not introduce complementary feeding.

Timing of complementary feeding	Frequency	Percentage (%)
0	1	0.5
1-5 months	19	10.2
At 6 months	149	79.7
7 months or more	18	9.6
Total	187	100.0

Distribution of Respondent by minimum meal frequency to her child
The table shows that 95.2% minimum meal frequency while 4.8% did not provided minimum meal frequency.

Having Minimum Meal Frequency	Frequency	Percentage (%)

No	9	4.8
Yes	178	95.2
Total	187	100.0

Distribution of Respondent by type of food taken by her child

The table shows that the respondents provided variety of foods to their child as complementary feeding where 99.5% provided rice, roti, bread, Suji, Sagu and noodles as the complementary feeding.

Name of Food group	Frequency	Percentage (%)
Rice, Roti, Bread, Suji, Sagu, Noodles	186	99.5
Meat, Fish, Egg, Liver	122	65.2
Milk and Dairy product	120	64.2
Ghee/Oil/Fat	160	85.6
Legumes, Pulses, Nuts	160	85.6
Vegetable and Fruits	108	57.8
Vitamin A rich fruits and vegetable	120	64.2

Distribution of Respondent by Minimum Dietary Diversity to her child

The table shows that 60.4% had minimum dietary diversity while 39.6% did not have minimum dietary diversity.

Minimum Dietary Diversity	Frequency	Percentage (%)
Not having MDD	74	39.6
Having MDD	113	60.4
Total	187	100.0

Distribution of Respondent by timely introduction of semisolid, solid foods

The table represents 79.7% introduced semisolid or solid foods timely while 20.3% did not introduce semisolid or solid foods timely.

Timely introduction of semisolid, solid food	Frequency	Percentage (%)
No	38	20.3
Yes	149	79.7
Total	187	100.0

Distribution of Respondent by Minimum Acceptable Diet

The table shows that 58.2% had minimum acceptable diet while 40.7% did not have minimum acceptable diet.

Minimum Acceptable Diet (MAD)	Frequency	Percentage (%)
Not having MAD	77	40.7
Having MAD	110	58.2
Total	187	100.0

Distribution of Respondent by continuation of breastfeeding of child

In this study, 10.7% not continuation of breastfeeding and 89.3% provided continuation of breastfeeding to their child.

Continuation of breastfeeding	Frequency	Percentage (%)
No	20	10.7
Yes	167	89.3
Total	187	100.0

4.6.11 Distribution of Respondent by complementary feeding practices

In this study shows that Among 187 respondents, 99 (52.9%) of them provided inappropriate complementary feeding and 88 (47.1%) provided appropriate complementary feeding to their child.

Complementary feeding practices	Frequency	Percentage(%)
Inappropriate	99	52.9

Appropriate	88	47.1
Total	187	100.0

4.7 Analysis of Complementary Feeding Practices

4.7.1 Relation of complementary feeding practices with educational status of mother

The complementary feeding practices were statistically significant with the educational status of the mother. In my study, maximum inappropriate feeding occurred by illiterate mothers and the percentage was 85.7%. On the other hand, the maximum appropriate feeding occurred by mothers with SSC and the percentage was 62.3%. The significance value was p=0.000 which was p<0.001. The significance depicts that the complementary feeding practices are related to the educational status of the mother.

Education	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Illiterate	6 (85.7)	1 (14.3)	20.27	1	0.000
Primary	42 (73.7)	15 (26.3)			
SSC	26 (37.7)	43 (62.3)			
HSC	14 (46.7)	16 (53.3)			
Graduation and above	11 (45.8)	13 (54.2)			

Relation of complementary feeding practices with age of child

In this study, maximum76.5% inappropriate feeding occurred between 6-8 months. On the other hand, the maximum 56.2% appropriate feeding occurred between 12-23 months. The significance value p=0.002 which was p<0.05. The significance depicts that the complementary feeding practices are related to the age of the child.

Child Age	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
6-8	26 (76.5)	8 (23.5)	12.786	2	0.002
9-11	20 (62.5)	12 (37.5)			
12-23	53 (43.8)	68 (56.2)			

Relation of complimentary feeding practices with Father's educational status

The maximum 90.9% inappropriate feeding occurred by illiterate fathers. On the other hand, the maximum 60.0% appropriate feeding occurred by fathers with Graduation. The significance value p=0.015 which was p<0.05. The significance depicts that the complementary feeding practices are related to the educational status of the father.

Father's Education	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Illiterate	10 (90.9)	1 (9.1)	12.376	4	0.015
Primary	26 (63.4)	15 (36.6)			
SSC	34 (53.1)	30 (46.9)			
HSC	11 (42.3)	15 (15.7)			
Graduation and above	18 (40.0)	27 (60.0)			

Relation of complementary feeding practices with restriction of food items

The maximum 66.7% inappropriate feeding occurred to the child for the food restriction with egg. On the other hand, the maximum 47.1% appropriate feeding occurred to the child for the food restriction with late weaning. The significance value p=0.013 which was p<0.05. The significance depicts that the complementary feeding practices are related to the food restriction to the child.

Restricted food item	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Egg	2 (66.7)	1 (33.3)	8.722	2	0.013
Late weaning	9 (52.9)	0 (47.1)			

Relation of complementary feeding practices with place of delivery

The maximum 72.0% inappropriate feeding occurred with delivery at home. On the other hand, the maximum 50.0% appropriate feeding occurred with delivery at hospital. The significance value p=0.04 which was p<0.05. The significance depicts that the complementary feeding practices are related to the place of delivery of the mother.

Place of delivery	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Home	18 (72.0)	7 (28.0)	4.207	1	0.040
Hospital	81 (50.0)	88 (50.0)			

Relation of complementary feeding practices with Prelacteal feeding

The maximum 77.8% inappropriate feeding and, the maximum 53.0% appropriate feeding occurred to the child without the Prelacteal feeding. The significance value p=0.001 which was p<0.05. The significance depicts that the complementary feeding practices are related to the Prelacteal feeding of the child.

Prelacteal feeding	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
No	71 (47.0)	80 (53.0)	11.039	1	0.001
Yes	28 (77.8)	8 (22.2)			

Relation of complementary feeding practices with exclusive breastfeeding

The maximum 100% inappropriate feeding and the maximum 50.0% appropriate feeding occurred to the child with exclusive breast feeding. The significance value was p=0.000 which was p<0.001. The significance depicts that the complementary feeding practices are related to the exclusive breast feeding of the child.

Child Age	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Less than 6 months	8 (50.0)	8 (50.0)	40.2	9	0.000
Up to 6 months	14 (70.0)	6 (30.0)			
More than 6 months	2 (100)	0 (0.00)			

Relation of complementary feeding practices with source of information

The maximum 69.8% inappropriate feeding and the maximum 91.9% appropriate feeding occurred to the child with the source of information provided by the media. The significance value was p=0.000 which was p<0.001. The significance depicts that the complementary feeding practices are related to the exclusive breast feeding of the child.

Source of information	Inappropriate Feeding f (%)	Appropriate Feeding f (%)	χ^2	df	p value
Doctor/Health worker/Nurse	37 (23.5)	57 (76.5)	23.234	7	0.002
Relatives	37 (69.8)	16 (30.2)			
Neighbour	13 (52.9)	2 (47.1)			
Media	12 (8.81)	13 (91.19)			

IV. Discussion

A Hospital based cross sectional study was conducted from January to December 2020 to find out complementary feeding practices and its related factors among mothers of 6-23 months aged children in Dhaka.

The number of respondents aged 147.5% <20yrs, 80.7%, 20-30yrs, 11.8% >30yrs, mean ± SD = 25.79±4.58 respectively. However, another study showed that 60% mothers of the slums area of Khulna city were 19-25 yrs(Mahmood R et al.,2015). This is consistent with the present study. According to Abukari et al 2014 it was found that 49.7% mothers age of Ghana were 25-34 which is less than present study. Another study showed that 71.01% mothers age of Bangladesh were 20-34 years. (Sheikh N et al.,2019). This is consistent with present study.

In this study shows that among 187 respondents, 7 (3.7%) of them illiterate, 57 (30.5%) studied up to Primary, 69 (36.9%) studied up to SSC, 30 (16.0%) of them had been completed HSC and 24(12.8%) had been

completed Graduation and above. However, another study showed that 70% of mother were illiterate (Mahmood R et al.,2015). This is not consistent with the present study.

175 out of 187 respondents were house-wives which was 93.6% and the number of service holder and maid servant was 9 (4.8%) and 3 (1.6%) respectively. However, another study in Pakistan showed that most of the mothers (75.8%) were house-wives (Pakistan's Demographic and Health Survey 2012-13) which is near similar with present study.

The study shows that 15.5% out of 187 respondents have a monthly family income of 10000 BDT or less, 40.1% have between 10000-20000 BDT, 25.1% have between 20000-30000 BDT, 19.3%have above 30000 BDT. The maximum family income was 100000 BDT, while the minimum income was found to be 5000 BDT. The mean income was 24770.05 BDT with the standard deviation of 14732.94. Another study showed that 70% respondent's family income was 7001-10000 BDT (Mahmood et al.,2015). This is less consistent with present study.

93% of the respondents were Muslims and 7% of the respondents were Hindus. There was no respondent to follow any other religion. Another study showed that 91.8% respondents were Muslim and 8.2% respondents were others religion (IqbalKabir et al.,2011). This is consistent with present study.

18.18% of the respondents each has a child of 6-8 months of age, 23.53% of the respondents each has a child of 9-12 months of age where as 58.29% respondents each has a child of 13-23 months of age. Another study in Srilanka showed that 15.3% of the respondents each has a child of 6-8 months of age, 19% of the respondents each has a child of 9-12 months of age where as 65.7% of the respondents each has a child of 13-23 months (Senarath et al.,2012). This is consistent with present study.

Child sex among 187 respondents, 46.0% were female and 54.0%were male children. Another study in Bangladesh showed that 46.90% were female and 53.10% were male (Sheikh N et al.,2019). This is consistent with present study.

The child of the respondents with 1st order birth was 45.5%, 2nd order 35.3%, 3rd order 15%, 4th order 3.7%, and the 5th order was 0.5%only among 187 respondents. Another Study in Bangladesh showed that 1st order birth was 41.06%, 2nd to 3rd order birth was 46.57%,4th order or more was 12.37%. This is consistent with present study(Sheikh N et al.,2019).

In this study shows that among husbands of 187 respondents, 5.9% of them illiterate, 21.9% studied up to Primary, 34.2% studied up to SSC, 13.9%of them had been completed HSC and 24.1% had been completed Graduation and above. Another Study in Bangladesh showed that 29.3% of husbands were illiterate,32.7% studied up to Primary, 44.8% husbands had been completed SSC and above(Kabir et al.,2011).

44.9% among husbands of 187 respondents were Service holder,42.2% were Businessman, 9.6% were Labour on daily basis, 2.1% were Agricultural worker, and 21.1% were Unemployed. Another Study in Bangladesh showed that 70.2% were labours(Chowdhury et al.,2011). This is not consistent with present study.

171 (91.4%) among the 187 respondents do not keep newspaper at all, 13 (7%) keep daily newspaper, and 3 (1.6%) keep monthly newspaper. This shows that majority of the respondents do not keep any newspaper. Another Study showed in Bangladesh that 83% of respondents did not keep newspaper at all(Mohammad Rocky Khan Chowdhury et al.,2011). This is consistent with present study.

160 (85.6%) among the 187 respondents have electronic media and only 27 (14.4%) do not have electronic media. Another Study showed in Bangladesh that 60.8% had electronic media(Mohammad Rocky Khan Chowdhury et al.,2011). This is consistent with present study.

55.6% among the 187 respondents use the supply of water from the WASA, 40.1% use water-pump, and 4.3% use tube-well as the source of supply of water. Another Study showed in Bangladesh that only 2.8% respondents used unimproved source of drinking water(Muzi Na et al.,2017).This is consistent with present study.

57.8% among the 187 respondents ensure the safety of water through either boiling or filter, 27.8% do not take any procedures whereas 14.4% ensure the safety of water through both boiling and filtering. Another Study in Ghana showed that 25.8% respondents received protected water (Issaka,et al.,2014).

93.6% among the 187 respondents do not have any food restrictions from the family while on the other hand 6.4% have food restrictions from the family. Among the 12 respondents who have restrictions of food from the family have restriction on late weaning (9 among 12) and egg (3 among 12).

96.8% among the 187 respondents provided proper vaccination to the child while only 3.2% did not provide proper vaccination to the child. This shows that majority of the respondents were conscious for providing proper vaccination to the child. Another study showed in Bangladesh that 69.2% respondents provided vaccination to the child (Na, et al.,2018). This is consistent with present study.

48.7% among the 187 respondents visited 1-5 times for ANC, 48.1% visited 6-10 times, 2.1% visited more than 10 times, and only 1.1% did not visit at all for ANC checkup. Another study in Tanzania showed that 55.4% respondents visited 1-2 times for ANC and 42.3% visited 3 or more times for ANC (Victor,et al.,2012).

86.6% among the 187 respondents had their delivery at the hospital while only 13.4% had their delivery at home. This shows that the number of deliveries in the hospital is increasing. Another study in Ghana

showed that 57.9% respondents had their delivery at the health facility while 42.1% had their delivery at home (Issaka,et al.,2014).

89.9% among the 187 respondents visited 1-5 times for PNC checkup, 2.1% visited 6-10 times, and 8% did not visit at all for PNC checkup. Another study in Tanzania showed that 67.6% respondents did not visit for PNC checkup (Victor,et al.,2012). This is not consistent with the present study.

151 (80.7%) among the 187 respondents did not provide any Prelacteal feeding to the child where 36 (19.3%) provided Prelacteal feeding to the child.

Among the 36 respondents who provided Prelacteal feeding to the child, 18 provided Formula Milk, 9 provided honey, 6 provided sugar and only 3 provided water as the Prelacteal feed.

105 (56.1%) among the 187 respondents initiated breastfeeding within 1 hour to the child, 73 (39.1%) between 1 to 72 hours, and only 9 (4.8%) did not initiate breastfeeding to the child.

108 (57.8%) among the 187 respondents provided exclusive breastfeeding, and 79 (42.2%) did not provide exclusive breastfeeding.

75 (40.1%) among the 187 respondents breastfed their child with frequency of 1-5 times a day, 70 (37.5%) with frequency of 6-10 times a day, 22 (11.7%) with frequency of 11-15 times a day, and 20 (10.7%) did not breastfeed at all.

186 (99.5%) among the 187 respondents were informed about the complementary feeding while only 1 (0.5%) were not informed about complementary feeding.

94 (50.2%) among the 187 respondents received learning from either Doctors or Nurses or Health workers, 53 (28.3%) from relatives, 25 (13.4%) from Media, and 15 (8.1%) from neighbors.

All the respondents provided complementary feeding to the baby. This means that all the child of the respondents was being fed with complementary feeding. 149 (79.7%) among the 187 respondents introduced complementary feeding at the age of 6 months, 19 (10.2%) at the age between 1 to 5 months, 18 (9.6%) at the age of 7 months or more, and only 1 did not introduce complementary feeding.

178 (95.2%) among the 187 respondents provided minimum meal frequency while 9 (4.8%) did not provide minimum meal frequency. Another study in Bangladesh showed that 81.1% respondents had minimum meal frequency (Kabir, et al., 2011). This is consistent with present study.

The respondents provided variety of foods to their child as complementary feeding where 186 (99.5%) among the 187 respondents provided rice, roti, bread, suji, sagu and noodles as the complementary feeding.

113 (60.4%) among the 187 respondents had minimum dietary diversity while 74 (39.6%) did not have minimum dietary diversity. Another study in Bangladesh showed that 41.9% respondents had minimum dietary diversity (Kabir, et al., 2011). This is less consistent with present study.

149 (79.7%) among the 187 respondents introduced semisolid or solid foods timely while 38 (20.3%) did not introduce semisolid or solid foods timely. Another Study in Bangladesh showed that 71.09% respondents introduced appropriate complementary feeding practices timely (Kabir, et al.,2011). This is consistent with present study.

110 (58.2%) among the 187 respondents had minimum acceptable diet while 77 (40.7%) did not have minimum acceptable diet. Another Study showed in Bangladesh that 39.6% respondents had minimum acceptable diet (Kabir, et al.,2011). This is not consistent with present study.

In this study shows that Among 187 respondents, 20 (10.7%) of them not provided continuation of breastfeeding and 167 (89.3%) provided continuation of breastfeeding to their child.

Present study shows that among 187 respondents, 99 (52.9%) of them provided inappropriate complementary feeding practices and 88 (47.1%) provided appropriate complementary feeding practices to their child. Another Study in Northern Ethiopia showed that 85% of respondents provided inappropriate complementary feeding practices (Belete,et al.,2017). This is not consistent with the present study.

The complementary feeding practices were statistically significant with the food restriction of the child. In my study, maximum inappropriate feeding occurred to the child for the food restriction with egg and the percentage was 66.7%. On the other hand, the maximum appropriate feeding occurred to the child for the food restriction with late weaning and the percentage was 47.1%. The significance value ($p=0.013$) which depicts that the complementary feeding practices are related to the food restriction to the child. The study is consistent with 95% confidence level.

The complementary feeding practices were statistically significant with the place of delivery of the mother. In my study, maximum inappropriate feeding occurred to the child for the place of delivery of the mother with home and the percentage was 72.0%. On the other hand, the maximum appropriate feeding occurred to the child for the place of delivery of the mother with hospital and the percentage was 50.0%. The significance value ($p=0.04$) which depicts that the complementary feeding practices are related to the place of delivery of the child. The study is consistent with 95% confidence level.

The complementary feeding practices were statistically significant with the Prelacteal feeding of the child. In this study, maximum inappropriate feeding occurred to the child with Prelacteal feeding and the percentage was 77.8%. On the other hand, the maximum appropriate feeding occurred to the child without the

Prelacteal feeding and the percentage was 53.0%. The significance value (p=0.001) of complementary feeding practices andPrelacteal feeding of the child with 95% confidence level.

Alongside, the significance value (p=0.000) of complementary feeding practices and exclusive breastfeeding of the childwith 99% confidence level.

V. Conclusion

Appropriate feeding practice is essential for the nutrition, growth, development and survival of infant and young children. This study shows that the positive association between complementary feeding practices with education of mother, age of children, education of father, restriction of food items to their child, place of child, Prelacteal feeding, exclusive breastfeeding, frequency of breastfeeding, source of learning of complementary feeding and other variables were not significant.

VI. Recommendation

- Appropriate complementary feeding practices and harmful effect of Prelacteal feeding programme should be established in the community to change behavior of the parents.
- A guideline for mothers would be developed on complementary feeding practices and appropriate nutrition for the children concerning availability of domestic foods.

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