COMPLEMENTARY FEEDING PRACTICES AND THEIR DETERMINANTS AMONG CHILDREN AGED 6-23 MONTH IN URBAN POOR AREA BANGLADESH

A PROJECT REPORT

BY

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfilment of

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APPROVAL

This Project titled "**Complementary feeding practice and their determinants among children aged 6-23 month in urban area Bangladesh**, submitted by **Md Shahazin Rhaman Mayen** to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents. The presentation has been held on __/__/____ .
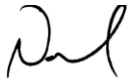
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DECLARATION

This internship report has been completed by the undersigned individuals under the guidance of Md. Nawal Sarwer, a faculty member in the Department of Nutrition and Food Engineering at Daffodil International University. We also declare that neither this internship report nor any part of this internship report has been submitted elsewhere for the award of any degree or diploma.
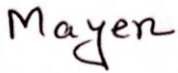
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ABSTRACT

Recommended complementary feeding methods are vital for the development, growth, and nutrition of an infant. The purpose of this study is to examine the current practices of complementary feeding and the factors influencing different sociodemographic variables among infants aged 6-23 months who stay in poor urban regions of Bangladesh., following updated guidelines for complementary feeding from WHO and UNICEF.

A total of 112 mothers and their children are chosen from the slum area. Indicators for assessing infant and young child feeding practices according to UNICEF and WHO guidelines were used when assessing each of the seven complementary feeding practice indicators. In addition to this, we investigated the impact of factors at the household, mother and child.

89.5% of children are being introduced to solid, semi-solid, or soft foods that is a significant number but on time 46.4% had zero vegetables or fruits consumption. Majority number of children had Minimum dietary diversity and 77.7% of children practiced Minimum meal frequency. On the other hand, the minimum acceptable diet reflected 62.7%. Egg and/or flesh food 70.5% but the alarming prevalence 78.6% of children consume sweet and beverage product. The study revealed that the results indicated that, based on the WHO's recommendation guideline, the practices of complementary feeding among mothers and children in the chosen slum areas were commendable.

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CHAPTER 1
INTRODUCTION

1.1. Introduction

Sufficient nourishment during the early stages of life is vital to guarantee children's optimal growth, well-being, and development.Providing appropriate complementary feeding (CF) throughout the early stages of infancy is of most importance in facilitating infants' growth, development, and overall survival (Saha et al., 2008). Exclusive breastfeeding is a vital practice that supplies essential nutrition and energy to infants, particularly during the initial six months of their lives (Kramer & Kakuma, 2012). As the child continues to develop, exclusive breastfeeding becomes inadequate for meeting their energy and mineral needs. Consequently, the World Health Organization (WHO) recommends starting supplemental meals with receiving after six months after delivery. (Dewey, 2003). After six months, a kid requires solid and partially solid, or soft nutrition, as well as breastfeeding milk in order to develop normally.(Onyango, 1998).

Frequent, nutrient-dense, high-energy meals close the children's nutritional gaps and prevent stunting and under-five child mortality (Black et al., 2003). Developing initiatives and regulations that support the balanced development and growth of children requires careful measurement and observation of changes in suitable IYCF.(World Health Organization, 2013) In addition, the WHO advises consuming a varied diet including meals high in iron at the least possible frequency. When supplementary food is used in place of breastfeeding, it can cause micronutrient imbalances and a higher frequency of diarrhea if the nutritional density is insufficient and There is a strong correlation between micronutrient difficulties and childhood illness and death. Increased micronutrient density of foods ingested is linked to higher levels of diversity in diets, particularly in children between the ages of a period of 6-12 months. (Roberts & Stein, 2017). The World Health Organization's guidelines are important for all nations but especially critical for nations with low revenues with significant malnutrition and inadequate nourishment rates.

In countries with low incomes, implementing the WHO's guidelines for the initial 2 years of life might nearly 20% lower the child death rate. (Jones et al., 2003). As developed in 2021 by the WHO (World Health Organization) and other institutions, the two national surveys that have integrated the state of IYCF practices at the population level are the MICS (Multiple Indicator Cluster Survey) and the Survey of Demographics and Health (DHS), which are conducted in a number of countries with low or middle incomes.

In Bangladesh, which the scientific research on additional feeding techniques has followed the current IYCF standard. The current research only included children aged between the ages of 6 and 23 months who had information that was relevant linked to CF practice. A different dataset was used to assess the "the beginning of solid, a semi-solid, or soft food" (ISSSF) indicator, which is only pertinent for babies between the ages of 6 and 8 months.So, this study will conduct a systematic review to analyze current information on Commentary feeding practice to determine child health and growth among 6-23 months of age Dhaka in Bangladesh.

1.2 Overall and Specific Objective

The objective of the current endeavor is to investigate determinants of complementary feeding habits and their impact on urban poor Bangladeshi children aged 6-23 months, in adherence to the most recent WHO and UNICEF guidelines for complementary feeding.

1.2.1 Specific objectives

- To characterize the complementary feeding practice.
- Determine child nutrition growth and development.
- In order to assess the nutritional value of a complementary diet.
- Provide recommendation and intervention for improved complementary feeding practice.
- To explore the socio-economic factors influencing complementary feeding.

CHAPTER 2
LITERATURE REVIEW

Complementary feeding is essential to child nutrition and development, as it ensures that newborns and young children obtain the nutrients they need for optimal growth and well-being (Safety, 2017). It aids in the development of cognition by providing essential micronutrients—such as the fatty acids omega-3 and iron—which are critical for cognitive function and mental development. (Georgieff, 2007). By strengthening the body's defenses, nutritional supplements decrease the likelihood of contracting infections and diseases (Prentice, 2019). By eating a complementary diet, common nutritional deficiencies such as anemia caused by iron shortage and a lack of vitamin A can be prevented. (L. H., & Peerson, J. M, 2009).

During complementary feeding, introducing a variety of meals can help develop a child's taste and promote better eating practices (Ventura, A. K. ,2011).Social and emotional development is enhanced by complementary feeding interactions between guardians and children. By lowering health problems associated with malnutrition, promoting suitable supplemental food intake at the community level significantly improves public health (Bhutta et al., 2013). The WHO advises exclusive breastfeeding to begin at six months of age and last for at least 24 months. (Organization, 2003).

Typically, exclusive breastfeeding tends to stop before the six-month mark, while continued breastfeeding often extends beyond the child's second year of life. During the additional dietary intake period, there is a crucial opportunity to prevent stunted development and support children in their growth, health, as well as behavioral development. (*1,000 Days to Change the Future Event Highlights Importance of Nutrition | Feed the Future*, 2012) (Black et al., 2013)

Recognizing the importance and urgency, it is widely acknowledged that implementing right feeding methods for infants and young children (IYCF) practices is a crucial strategy to address child undernutrition. The method of introducing meals and fluids to a baby in addition to milk from the mother complementary feeding occurs when an infant's nourishing demands cannot be met by breastfeeding only.(Safety, 2021). For the purpose of creating initiatives and regulations that support the development of healthy children, it is imperative that we track and measure trends in suitable the IYCF. (Roy et al., 2022).

Bangladesh's economy has grown quickly in the last several years. By 2026, the country, having a net national income per person around $1470, will begin to join the developing world (Mirdha, 2021). According to the survey of household income and expenditures (HIES)-2022, the prevalence of poverty is notably greater in rural areas, standing at 20.5% in proportion compared to 14.7% in urban areas. (*Bangladesh Bureau of Statistics (BBS).*, 2023).

The Bangladeshi government has made eliminating undernourished children a top priority as well as has adopted many national nutrition initiatives and legislation alongside its economic advancements. Despite developments in law and socioeconomic situations, undernutrition among children remains a serious problem.

Stunting and underweight are prevalent among children under the age of five, affecting twenty-eight percent and ten percent of them, respectively. Additionally, 23% of children continue to experience degenerative disorders.(*Progotir Pathey, Multiple Indicator Cluster Survey 2019*, 2019).

However, the most significant stunting rates are in slum regions, rural areas, and the lowest socioeconomic categories (*Bangladesh Demographic and Health Survey 2017-18*, 2020). As was previously said, Bangladesh's socioeconomic status has improved over the last ten years, but the CF procedures have showed a steady approach. MICS and BDHS, there are differences in the ideal rate of CF practice between rural and urban locations.Understanding the determinants of poor feeding patterns would aid in the identification of factors impacting CF, the development of strategies for intervention in addition to the implementation of plans and regulations. (Na et al., 2018).

Among Bangladeshi kids, inadequate CF methods were independently predicted by age of a kid parental learning, area, and wealth. In a similar vein, different CF strengthens were linked to family economic status, maternal level of education, place of residence, birth sequence, and children sex. (Sheikh et al., 2019).

In 2008, the World Health Organization (WHO) developed a set of Identifying suitable indicators among kids between 6-23 months to assist in evaluating proper eating habits and infant and young child feeding (IYCF) (Safety, 2021). It was advised that all 17 indications be evaluated in a people, and the new set of indicators didn't involve any sorting, such as essential and not required, as the before recommendation had. Another four Complementary feeding signs are included, which are related to the use of drinks, food that is unhealthy, and meat and poultry. (Roy et al., 2022).

When reviewing the research on CF in the nation of Bangladesh, the previous IYCF standard has been followed. Except for the study undertaken by Roy et al. (2022), no other study has analyzed the new CF indicators for 2021.In addition, DHS/MICS survey data is used to calculate child food poverty using the MDD method in the UNICEF IYCF global database (*Infant and Young Child Feeding - UNICEF DATA*, 2023).We adhered to the Complementary feeding practice indicators outlined by WHO/UNICEF in 2021. They did, however, only analyze MDD using the most recent guidelines. Furthermore, using data from the DHS/MICS survey, The United Nations Children' and the IYCF global database uses MDD to determine the prevalence of child hunger. Supplemental feeding methods for young infants in Bangladesh that adhere to all CF requirements are lacking in information due to the revised recommendation. Designing new intervention programs requires thoroughly assessing all CF domains based on the most relevant and reliable indicators. This study evaluated CF methods to fill this knowledge divide and adhere to the latest WHO and UNICEF guidelines for all significant parameters among young children residing in Bangladeshi urban areas. However, we could not examine the differences between rural and urban Bangladesh on these particular topics since our data was restricted to urban areas.

The indicators applied to evaluate the extent of complementary feeding were: This study examines the introduction of solid, semi-solid, or soft foods (ISSSF). The concept of minimum dietary diversity (MDD). Minimum meal frequency (MMF) was measured by the minimum acceptable

diet (MAD), the consumption of eggs and flesh foods (EFF), the intake of sweet beverages (SWB) and the zero of vegetable or fruit consumption (ZVF).

Introduction of solid, semi-solid, or soft foods (ISSSF), WHO recommends introducing solid, semi-solid, or soft foods to children and young children at the age of six months. For ISSSF indicator here measure 6-8 months of infant who take solid, semi-solid, or soft foods during the previous day.

Minimum dietary diversity (MDD) for 6-23 months children WHO guiding for feeding variety food to insure the proper nutrients. Diverse food groups are linked to better linear development in early children. In one research, between the ages of 6 -23 months stunting was associated with insufficient or no consumption of foods high in nutrients, such as poultry eggs milk and yoghurt, fruits and vegetables. young children (6 - 23 months old) who, on the previous day, consumed at least five items from each of the eight specified food groups. The following eight dietary groups were tabulated to determine this indicator:

1. Breast milk;
2. Grains, roots, tubers and plantains;
3. Pulses (beans, peas, lentils), nuts and seeds;
4. Dairy products (milk, infant formula, yogurt, cheese);
5. Flesh foods (meat, fish, poultry, organ meats);
6. Eggs;
7. Vitamin-A rich fruits and vegetables; and
8. Other fruits and vegetables.

For determining Minimum meal frequency (MMF) according to WHO guidelines for breastfeeding children, supplemental foods should be given to breastfed infants between 6 and 8 months. 2-3 times daily and give supplemental foods to breastfed children who are 9 - 23 month age a few times a day with extra wholesome snacks provided once or twice daily. This indicator is defined as the proportion among kids between the ages of 6 - 23 months who had a minimum of the appropriate amount of solid and partially solid, or soft meal consumption the day before (including milk feeds for kids who aren't breastfeeding). For better analysis the time period of MMF is required by children within the ages of 6 - 23 months who consumed the minimum quantity of solid, semi-solid, or soft food the day before. The smallest possible amount of times is defined as:

- Breastfed young children between the ages of six and eight months old should have two feedings of soft, semi-solid, or solid food;
- the children who are breastfed by 3 meals of solid, semi-solid, or soft items between the ages of 9 and 23 months;
- For children who are not breastfed, 4 feedings of solid, semi-solid, or soft meals or milk feeds
- 6 - 23 months of age, with a minimum of one substantial, semi-solid, or soft meal per four.

The required amount milk daily intake for non-breastfed children aged 6 to 23 months (MMFF) is established by considering this age group of infants and toddlers who ingested a minimum of two milk intakes on the before day.Minimum acceptable diet (MAD) is defined by the percentage of children 6–23 months of age who consumed a minimum acceptable diet during the previous day. minimum frequency of meals and variety of diets for their age the day before; non-breastfed children are required to have consumed at least two milk intakes and the minimum meal diversity and meal frequency for their age the day before. There is scientific proof showing that children who introduce eggs and animal-based items into their diets have higher levels of essential nutrients that play playing an essential function in facilitating optimal linear development (Mihrshahi et al., 2010). Eggs and flesh foods (EFF) indicator is defined by proportion of kids aged 6 -23 month who consumed eggs and meat the day before.

Sweet beverages (SWB) parameter is determined by the proportion of kids aged between the ages of 6 and 23 who drank beverages with sugar the day before. The WHO guidelines for complementary feeding discourage consuming sweet beverages like soft drinks due to their lack of nutritional value beyond providing energy. Additionally, the consumption of these drinks may lead to the displacement of more nutritious meal options. There is a direct relationship among increased intake of sweetened drinks (SSBs) and a higher risk of childhood obesity in all age categories.

In many countries with low or middle incomes, there is a significant trend towards increased consumption of sugar-added foods, harmful fats, salt, and refined carbs in dietary patterns. Commercially manufactured food products frequently exhibit characteristics of being energy-dense, lacking in essential nutrients, and containing high levels of Concerning ingredients, it's important to be mindful of the presence of sugar, salt, and both saturated as well as trans fatty acids. Children between the ages of 6 to 23 months who absorbed certain unsafe foods within the last day are considered to have engaged in eating foods that are unhealthy. These foods are usually eaten by individuals during childhood and are known for their high levels of sugar, salt, and unhealthy fats. The chosen sentinel foods that are deemed to be detrimental to health include:

- Various types of sweets, a piece of chocolate and various other sweets desserts, including those that incorporate real fruit or vegetable elements like fruit that is candied or fruits rolled-ups.
- Snack items products are mostly composed of fat and carbohydrates. These snacks typically incorporate refined grains or tubers as a significant composition component. Furthermore, it is worth noting that these particular dietary items frequently exhibit elevated sodium levels.

Zero percent of fruits or vegetables taken (ZVF)) is defined by the proportion of children aged between ages of 6 and 23 who did not ingest any vegetables or fruits the day before. This sign is derived from the consumption of food groups above. The WHO, or World Health Organization, found an association between low consumption of vegetables and fruits and an elevated risk of noncommunicable illnesses. The link between consuming insufficient amounts of vegetables and fruits of deaths reaching 3.9 million in the year 2017, placing this dietary deficiency as one of the foremost contributors to worldwide mortality, ranking among the top 10 risk factors.

Amount of complementary feeding needed by the energy required according to the guideline when starting when solid meals are given to kids at the age of 6 initially in small portions, and gradually increasing the quantity as the infant ages. It is important to maintain regular breastfeeding throughout this period continuously.

Transitioning from exclusive breastfeeding or formula feeding to complementary feeding is a critical step in a child's nutritional journey. It requires careful attention to make sure babies are fed the right proportions of nutrients (such as vitamins and mineral), macro nutrients (carbs, amino acids, and fat), and other necessary elements of a nutritious meal. Proper practice of complementary feeding with appropriate nutrients for children can decrease the chances of being affected by different diseases, such as malnutrition, vitamin D deficiency, vitamin A deficiency, growth faltering, Noncommunicable diseases and obesity, cognitive development delays, gastrointestinal infection, iron deficiency anemia and so many diseases are found as a risk factor without proper complementary feeding practice (Mokomane et al., 2017).

CHAPTER 3
METHODOLOGY

3.1 Methodology

In the urban slum of Dhaka, Bangladesh, data collection at households took place between March 13 and March 24, 2023. Quantitative methods were applied in the cross sectional study. A series targeted questions used for home interview to gather data on the dietary categories, health of mothers factors, and socioeconomic background of children receiving supplemental feeding who are between the ages of 6 - 23 months of age. This research's information came from the Bangladesh Demography and Health Survey (BDHS).Complementary feeding practice questionnaire using indicators outlined by WHO/UNICEF in 2021.The questionnaire are arranged by the eight food groups. Data was collected using by the KOBO Toolbox platform, where in interviewers conducted tablet-based surveys. SPSS software was used for data analysis.

3.1.1 Study Population and Design

The present investigation was carried out in two specific locations within Dhaka, Bangladesh, which are the Zakir Hossain Road Town Hall Camp Basti and Geneva Camp (1) among 6-23 month children with complementary feeding practice.

3.1. 2 Sample Size Determination

The selection of a sufficient number of samples is critical in every research project. The sample size for the study must be determined in order to produce a valid assessment of these indicators with the appropriate precision. The most common limitations are time and money. Most statisticians agree that a sample size of at least 100 is required for any kind of valid conclusion. The total sample size of supplemental feeding techniques in babies between the ages of 6 - 23 months old is 112.Determination of the sampling size was conducted using a widely recognized statistical formula. This formula takes into account estimates assuming a two-tailed hypothesis, which permits both positive and undesirable shifts to occur in the target indicators. The calculation was performed to ascertain the presence of a significant difference in compliance between the two components, with a significance level set at 7.5%. The following equation was utilized for this purpose.

$$n = \frac{Z^2 PQN}{Ne^2 + Z^2 PQ} \times deff$$

Where, n = Estimated Sample Size, P = proportion of different target indicators=0.5, Q = 1-P, Z= Standard normal variate value at 95% confidence level, e = Precision level, deff = Design effect, N = Total number of populations in two slums=1500.

3.2 Sample Design

The study's goal was to look on complementary feeding methods and associated factors among kids around the ages of 6 - 23 month who lived in urban Bangladesh. A total of 112 children ages between the ages of 6 and 23 were selected to participate in the survey to assure the study's success.The survey was done in two specific location in Dhaka, Bangladesh, that is, Zakir Hossain Road Town Hall Camp and Geneva Camp (1). We made use of the percentage information from the 2017–2018 Bangladesh Demography and Health Survey which is representative urban areas of country. Total 114 children were found for interview and two parents declined to participant the interview during the survey. The rate of attrition is remained 4 %.

3.3 Questionnaire

We adhered to the Complementary feeding practice indicators outlined by WHO/UNICEF in 2021.By this guideline we collect data regarding complementary feeding practice among 6-23 month of ages for open recall and list based questionnaire food groups. The BDHS used for household characteristics.

3.4 Assessing the Socio-demographic and Characteristics of Socioeconomic Status

Assessing socioeconomic and sociodemographic aspects, the respondents were asked several inquiries from the (BDHS)2017-18. The requested information includes the district of residence, the name of the slum area, the enumerators' names, ages, religions, marital statuses, occupations, and levels of education. The household head's name, relation to the household, and occupation are also required. Furthermore, regarding socio-demographic and household socio-economic conditions, the monthly income and monthly costs, maternal health condition, WASH, sanitation facilities and water sources are asked. The socioeconomic position of the household was determined by considering parameters such as women's educational backgrounds, the profession of the household head, and the monthly income and costs.

3.5 Complementary feeding indicators

In 2021, we followed the World Health Organization also called the WHO and (UNICEF) complementary feeding methods guidelines.The indicators utilized to assess the status of complementary feeding. This study investigates the dietary patterns and consumption behaviors of individuals about several indicators, including the consumption of solid, semi-solid, or soft foods (ISSSF), adherence to minimum dietary diversity (MDD), minimum meal frequency (MMF),adherence to minimum acceptable diet (MAD), consumption of eggs and flesh foods (EFF), consumption of sweet beverages (SWB) and absence of Consumption of fruits and vegetables.

3.6 Analysis Plan

3.6.1 Socio-Demographic Characteristics Analysis

The latest investigation looked at a variety of variables, including the children's, their mother's, and the family or community level characteristics.Socioeconomic and demographic characteristics are linked to several different factors. Those factors are age, faith, job, marital status, education, relationship with the household head, occupation of the household head, income, and spending. The child's gender, age in months and birth order were all recorded. The characteristics of the mothers were their age, level of schooling, number of children under five, and whether they were getting antenatal care (ANC) or paternal care (PNC).

The age distribution of children survey was categorized based on age ranges, including 6 to 11 months of age, 12 to 17 months of age, and 18 to 23 months of age. Within parental age, the proportion of children survey was categorized into three distinct category : 15-24, 25-35, between the ages of 36 and 49. The religious affiliation of the enumerators was identified by categorizing them into various groups, including Islam, Hinduism, Christianity, Buddhism, and other religious categories. The occupation factor covered a diverse range of work types. Each category included individuals engaged in various occupations: homemakers, garment workers, construction workers, hotel employees, business professionals, cottage industry workers, marketplace sellers, daily laborer, housekeepers, beggars, and sanitation workers. As part of the analysis of the marital status factor, the proportion of married, single, widowed, or divorced respondents was computed. In order to determine the level of education attained by individuals, they were categorized into nine distinct groups: individuals known to be literate, individuals belonging to First, second, third, fourth, fifth, sixth, seventh, eighth, and ninth grades. Additionally, individuals were categorized based on their completion of SSC/equivalent, HSC/equivalent, hons/equivalent, master's/equivalent, individuals with unknown educational backgrounds, and individuals without formal education. Interpersonal connections inside a home are structured around many relationships, including spouses, parents and children, siblings, in-laws, aunts, uncles, and other familial connections. Several of the enumerators were found to have a personal connection with a household head.

The occupation factor for the household head was determined based on the responses provided by enumerators. Enumerators were asked to choose the occupation of the household head from a list of options, which included occupations such as rickshaw or van driver, transport worker, construction worker, hotel worker, business or cottage industry worker, hawker, day laborer, housekeeper or maid, store employee, beggar, clean worker, or other. The percentage of enumerators who selected each occupation category was utilized for analysis. The income and expenditure factor proportion of the enumerator's household income and expenditure was assessed using various categories, including those with incomes less than 10000, between 10,001 and 20,000, between 20,001 and 30,000, and 30,001 and above. The study also included the measurement of the mean household income and expenditure.

3.6.2 Complementary feeding practice analysis

The concept of minimum dietary diversity is derived from the WHO guidelines, which advocate requires the intake of at least 4 of the 7 dietary categories. This nutritional approach aims to guarantee that children receive the critical nutrients and energy required for healthy physical and mental growth. The curriculum of BDHS incorporates a module focused on the (IYCF) Infant and young child feeding is a twenty-four-hour recording technique used by mothers to evaluate the kinds of meals that their children are eating. According to the guidelines of IYCF, Kids from six to twenty-three months should eat from 7 dietary categories. The dietary categories incorporated within this classification comprise cereal grains, the roots, and potatoes; legumes and nuts; and dairy foods, including milk and the yoghurt. Such as milk and yogurt; flesh foods containing meat, fish, poultry, and liver/organ meats, eggs; and fruits and vegetables abundant in vitamin A, among other fruits and vegetables The IYCF considers any amount consumed sufficient for counting; individuals are not required to record the amount consumed from each food group.

The percentage of 6 to 23 month-old kids (breastfeeding or not) who have had solid and a semi-solid, or soft food for at least the minimum amount of times recommended by the World Health Organization (WHO) is known to be the required a meal frequencies. In determining minimal food frequency, milk is considered for children who are not breastfed. The interpretation of the term "minimum" is subject to variation based on age. Infants who are breastfed and fall between the age range of 6 to 8 months, as well as those between 9 and 23 months, are recommended to include solid or semi-solid foods into their diet a minimum of two times per day and three times per day, respectively.

It is advised that non-breastfeeding infants between the ages of six and twenty-three months should get semi solid or solid meals at least four times a day in addition to formula or dairy milk. The minimum recommended diet for a six month old breastfed kid is determined by the number of meals and variety. In particular, if a child has fulfilled the requirements for minimal.They are deemed to have had a minimal tolerated diet if they have had a variety of foods and frequent a meal throughout the day. Similar to this, if a child who is not breastfed and is between the ages of 6 and 23 months has had They are considered to be receiving a minimum acceptable diet if they have had at least a couple breastmilk feedings, a certain level of variety in their diet and a particular frequency of meals within the previous day.

Personal level variables consist of the children's age, gender, and newborn weight the receipt of an age-appropriate vaccination, the taking of a vitamin A supplement, the occurrence of diarrhea, fever, or cough recently, and the subject's birth order.

3.7 Implementation Plan

Figure 3.1 Implementation Plan

Social economics Issues

-Age
-Religion
-Occupation
- Status of married and study
-Relation with the household head
-Household head's occupation
-Income & expenditure

Complementary feeding practice

Determine the complementary feeding practice according to IYCF guideline indicator.

Examine child health and growth development by age group 6-23 month according to food consume practice.

Enhance knowledge and practice regarding feeding practice and health issues..

Make learning tools and workshops for caregivers about how important it is to use complementary feeding, choose the food selection, and appropriate feeding practices.

Questionnaire Development

Demographic factor

Child characteristics

Feeding practices

Tab Based Application

Data Collection

Data Cleaning

Analysis Plan Development

Data Analysis

Final Result

3.8 Statistical Analysis Plan

Inductive and descriptive data were calculated, considering the complex questionnaire structure of the Bangladesh Demographic and Health Survey (BDHS) to prepare for sampling weights. The data was inputted and processed via IBM SPSS Statistics software version 29.0. To evaluate possible differences in distribution, the coding of feeding practices as "yes" or "no" was based on adherence to the guidelines. Practices that matched the guidelines were classified as "yes," indicating good feeding practices, while practices that deviated from the guidelines were classified as "no," showing poor feeding habits. To analyze socio-demographic information, descriptive statistics are used.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Result

4.1.1 Socio-Demographic and Socio- Economic Characteristics

The study included 112 number of children from the urban area. A higher percentage of mothers or care givers shown at table 1.1, 53.6%, are 15-24 years old of the total number. 45.5% were found between 25-35 years old while only 0.9% of participate were between the ages of 36-49 years old.

Figure 4.1 Percentage distribution age of mother and caregivers
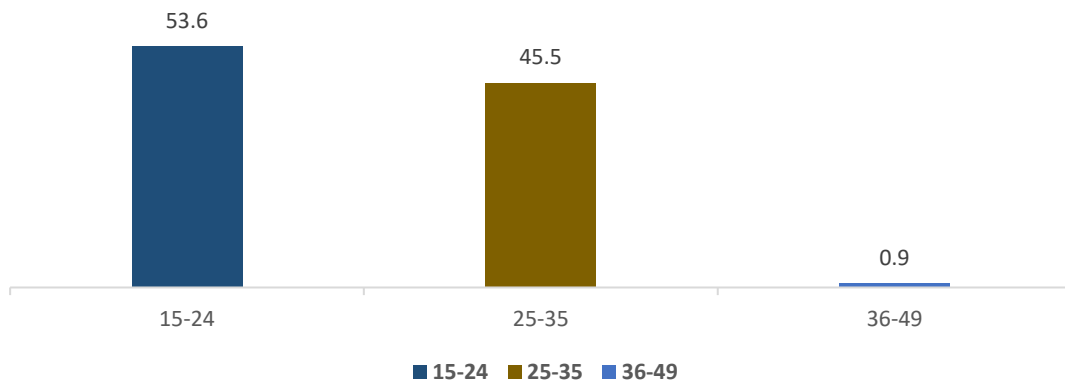
Most of the caregivers or mothers are housewife 68.8% as shown as figure 1.2, 19.6% are maid or house keepers, 7.1% are not doing any work,1.8 % are working as a day Laboure and rest of all 0.9 % they are doing small business, driving, student.

Figure 4.2 Percentage distribution of mother and caregivers occupation.
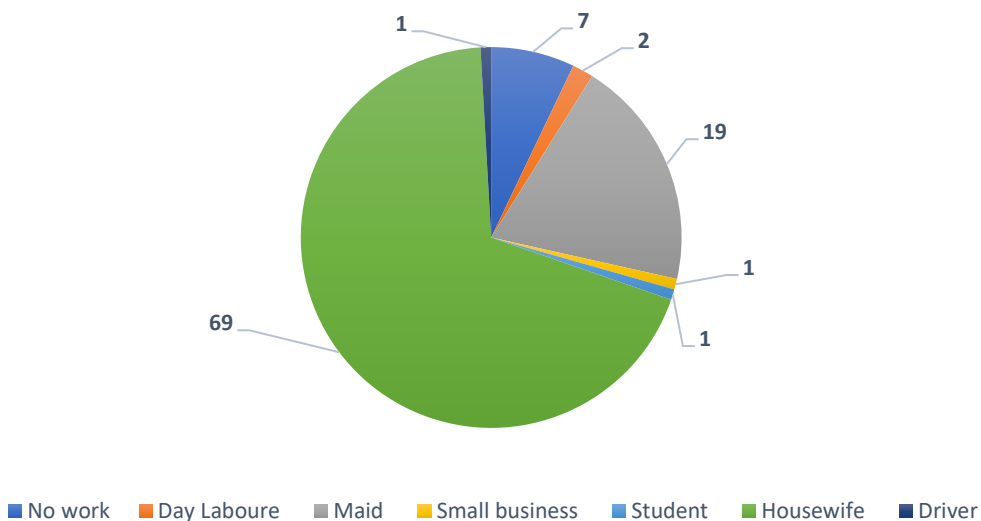
According to figure 1.3 here we can see most of the caregivers and mothers 94.6% are married, only 0.9% are unmarried,3.6% widow while 0.9% are divorced.

Figure 4. 3 Percentage distribution of marital status of care giver and mother
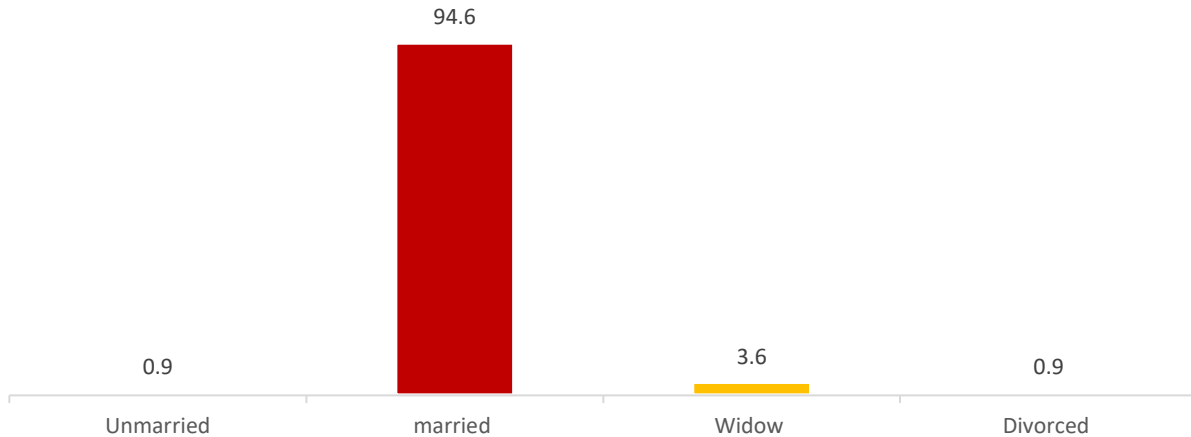
As shown in 1.4 table educational status of mother/caregiver's, 49.2 % participant had finished primary level,35.7 % had completed secondary education level,3.6% completed higher secondary level, only 1.8% participant had completed their education level in madrasah and rest of all 9.8% had no education level they can just signature.

Table 4.1 Percentage distribution of education level of mother/caregiver's

Variables	Category		Percentage (%)
Educational Status	n	112	
	Don't go to school		9.8%
	Primary School		49.2%
	Secondary Education		35.7%
	Higher Secondary and above		3.6%
	Madrasah		1.8%

Table 4.2 Percentage distribution of ANC and PNC visit of mother and care givers.

Variable	Category	Percentage
Received any ANC	No one	20.5
	1	3.6
	2	12.5
	3	23.2
	4	40.2
	n	112

According to table 1.5 the ANC visit of mothers or caregivers are shown here 40.2% visit 4 times,23.2% are visit 3 times for ANC while 20.5 % number of mother and caregivers are not visit any ANC, rest of all 3.6 % and 12.5% are visit 1 or 2 times for ANC.

Table 4.3 Percent distribution of income & expenditure of household

Variables	Category (in BDT)	Percentage
Household Monthly Income	Less than 10,000	8.0
	10,001 -20,000	59.8
	20,001 -30,000	28.6
	30,001 to above	3.6
Household Monthly expenditure	Less than 10,000	29.5
	10,001 -20,000	65.2
	20,001 -30,000	3.6
	30,001 to above	1.8

The monthly income and costs of the household are shown in Table 1.5, which is dependent upon many categories. 59.8% of participants said their monthly family income fell between 10,001 and 20,000 BDT. The next 28.6% were between 20,001 and 30,000 BDT, while the 3.6% were over 30000 BDT. The remaining 8.0% earns less than 10,000 BDT a month.

Again majority of participant of 65.2 % monthly expenditure were 10,001 BDT -20,000 BDT while 29.5% were in Less than 10,000 BDT per month, while 3.6% were Less than 10,000 BDT, 1.8 % participant monthly expenditure had 30,001 BDT to above.

As per the preliminary report of the Household Income and Expenditure Survey HIES-2022 by the Bangladesh Bureau of Statistics (BBS), 2023, the average monthly household income and expenditure in urban areas are 45,757 and 41,424 BDT, respectively. The country's average monthly household income and expenditure were 31,500 BDT and 32,422 BDT, respectively.

4.1.2 Child Characteristic

The general highlights of the investigation individuals age group the higher percentage of children 53.6% are shown in Table 2.1, 45.5% are 12-17 months while 18-23 month children are only .9%.

Figure 4.4 Percentage of age group of 6-23 month children in urban poor area Bangladesh.
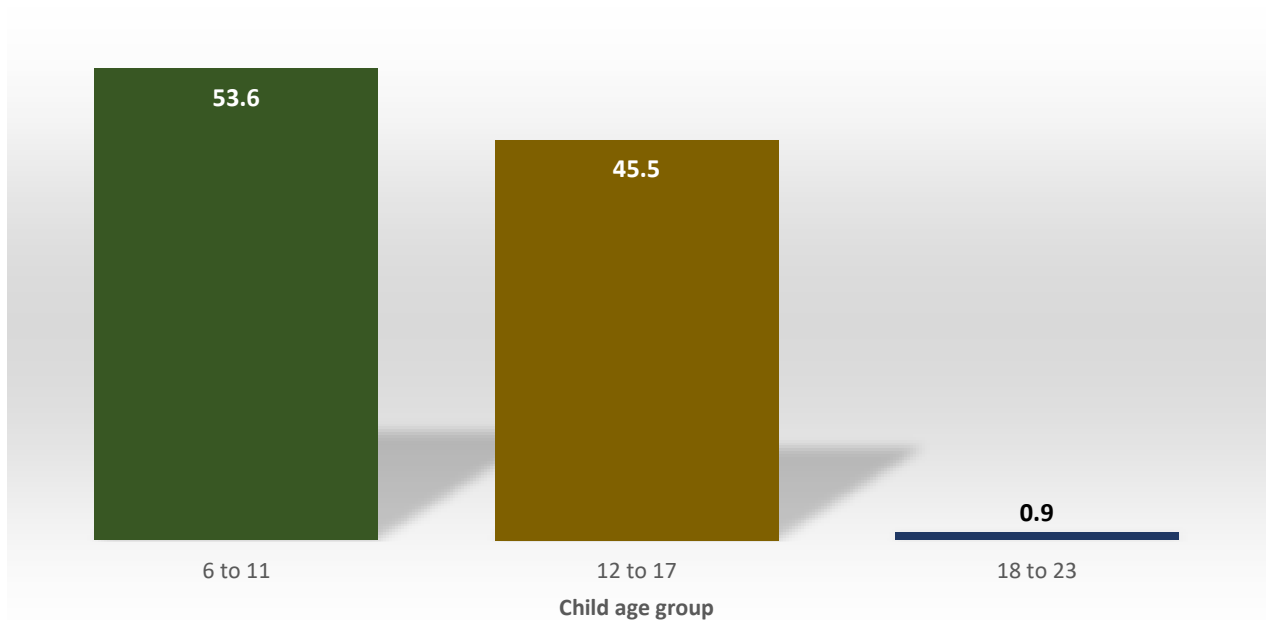
Table 4.4 Percentage of child birth weight and vaccinated among 6-23 month

Variables	Category	Frequency	Percentage
Child birth weight	Large	2	1.8
	Average	108	97.3
	small	1	.9
Vaccinated by age	6-11	60	53.6
	12-17	51	45.5
	18-23	1	.9

4.1.3 Complementary Feeding Practices Among Children 6–23 Months of Age

Introduction of solid, semi-solid, or soft foods (ISSSF)

This section presents the percentage findings of the study on the Introduction of foods that are solid, semi-solid, or soft for the kids between the ages of 6 and 23 months of age is 89.5% in urban poor area in Bangladesh, while 10.7% mother and the care givers are not introducing their children about (ISSSF) timely.

Figure 4.5 Percentage distribution of Introduction of solid, semi-solid, or soft foods (ISSSF) among 6-23 month age children in urban poor area Bangladesh

10.70

89.50

■ Yes   ■ No
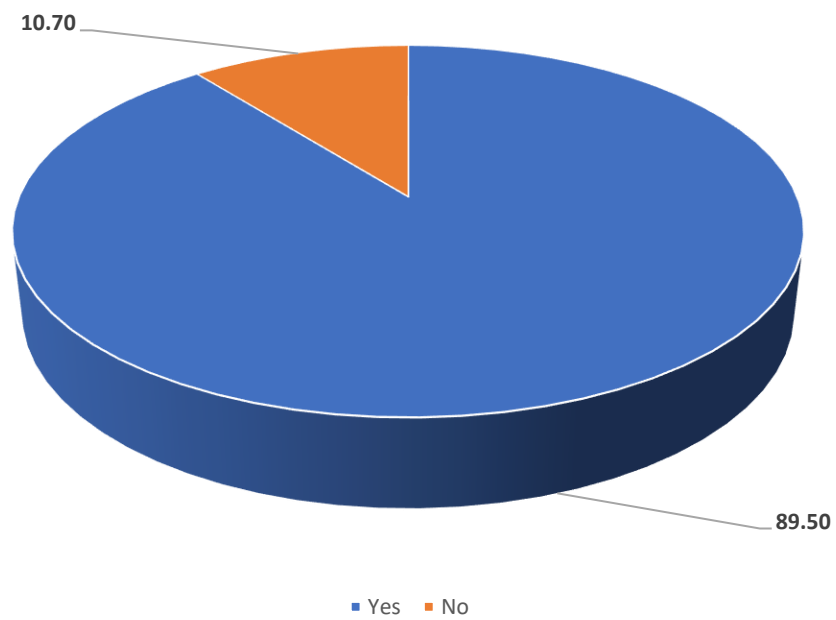
4.1.4 Minimum Dietary Diversity (MDD)

According to individuals age group the higher percentage of children 6-11 months were found 90.6% among the number of children were 32, while 100% were found 12-17 month of age group total number of children were 25 and the rest of all 55 children whom were 18-23 month age group 98.2% The overall count kids between the ages of 6 and 23 months was 112.

Figure 4.6 Percentage distribution of Minimum dietary diversity (MDD)
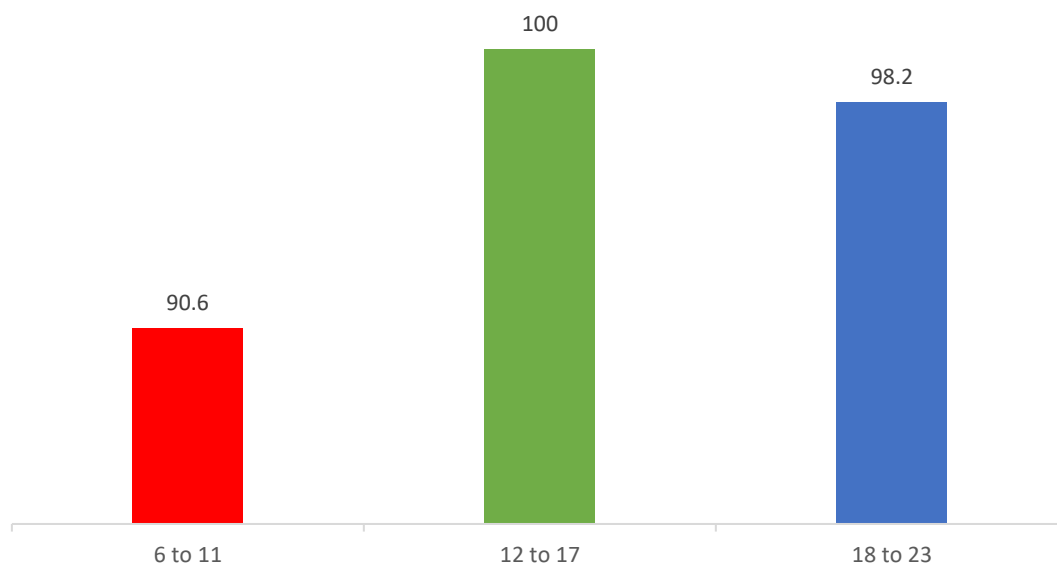
4.1.5 Minimum Meal Frequency (MMF)

In Table 3.2 shown Most of the caregivers (77.7%) chose to offer the kids meals in addition to breastfeeding milk on a limited number of times each day. There is a positive correlation between the age of children and MMF; As kids grow older, MMF is moving to increase.

Table 4.5 Percentage distribution of Minimum meal frequency (MMF)

Category	Frequency	Percentage
6-11	32	62.5
12-17	25	72.0
18-23	55	89.1
All	112	77.7

4.1.5 Minimum Acceptable Diet (MAD)

Approximately 62.5% of the the kids had been determined to have a diet that met the minimum acceptable requirements prior to the survey period.
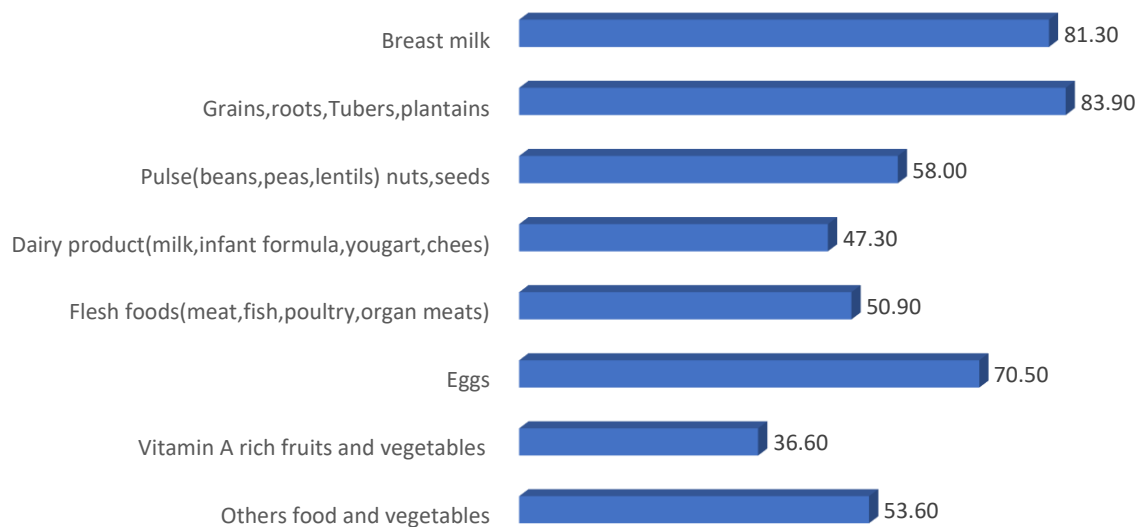
Table 4.6 Percentage distribution Children with minimum Acceptable diet by age

Age group	Frequency	Percentage %
6-11 months	32	43.8
12-17 months	25	56.0
18-23 months	55	76.4
All	112	62.5

4.1.6 Consumption of Eight Food Group According to 6-23 Months Children

Figure 4.7 Proportion of infants age from 6 to 23 months based on their intake of the 8 food categories in percentage terms

Food group	Percentage
Breast milk	81.30
Grains,roots,Tubers,plantains	83.90
Pulse(beans,peas,lentils) nuts,seeds	58.00
Dairy product(milk,infant formula,yougart,chees)	47.30
Flesh foods(meat,fish,poultry,organ meats)	50.90
Eggs	70.50
Vitamin A rich fruits and vegetables	36.60
Others food and vegetables	53.60

In the 3.4 shown the food group consume among 6 to 23 month kids aged. Majority children consume 83.90% grain, root, tubers, plantains. While 81.30% children continue breastfeeding. Here shown 58% children taking pules (beans, peas, lentils) nuts, seeds according to 6-23 month of age. 47.30% were found Dairy product (milk, infant, formula, yogurt). Here is notice that most of the mother and caregivers giving their child 70.50% eggs during their daily food consume list.

only 30.60% It is interesting to note that a significant percentage of children, specifically 53.60%, consume vegetables and other foods other than those that contain vitamin A.

4.1.7 Zero vegetables and fruits consumption (ZVF)

Approximately 62.5% of Prior to the survey moment, it was noticed that kids were following a diet that satisfied the minimum accepted diet.

4.1.8 Sweet Beverage Consumption (SWB)

A significant portion of 78.6 % of the kids 6 to 23 month of old ingested a sugary beverage in the day before.

Figure 4.8 The condition of the complementary food system indicator in Bangladesh's urban regions.
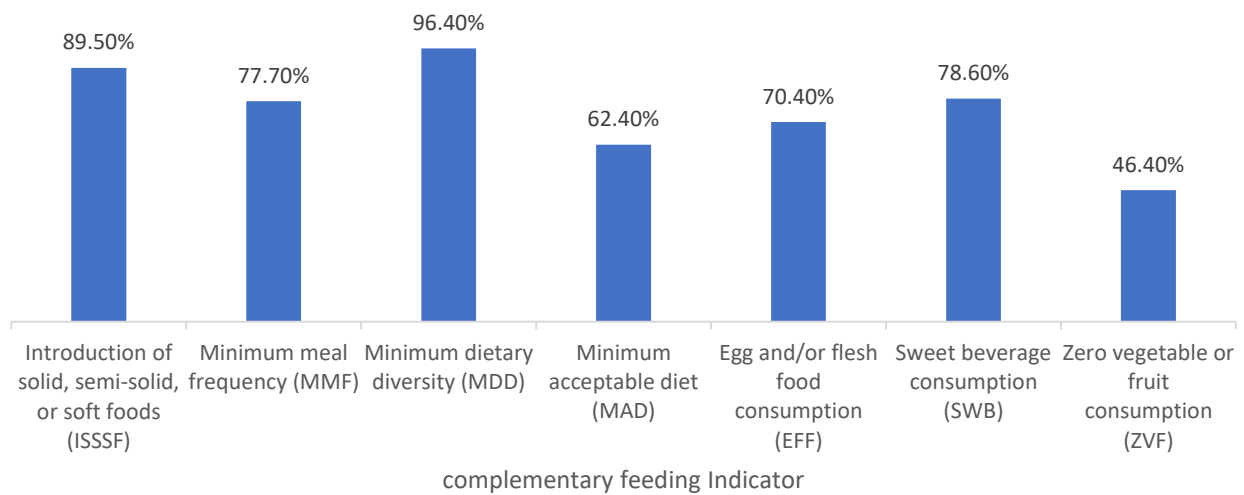
4.2 Discussion

Even though Bangladesh has improved moms' and children's well-being recently, undernutrition in these populations is poses a serious threat to the health of the public. A recent study indicated that supplemental feeding practices among younger infants were either static or declining despite the country's significant socioeconomic improvement.

Using a nationally representative dataset, a recent analysis examined CF methods among kids under the age of two years old in accordance with the new the World Health Organization and UNICEF guidelines. Lower risk of stunting (low height for age) and underweight (low weight for age) is linked between the ages of 6 to 8 a period of time to the consumption of foods that are solid, semi-solid, or soft (ISSSF) (Saha et al., 2008).

We determined that 89.5% of urban poor area Bangladeshi children eaten meals that were soft, partially solid, or solid the day before. giving kids a range of things to eat between six and twenty-three a month of age will help them acquire all the nutrients they require. Micronutrient deficits may become more likely as a result of a diet lacking in variety (Prado & Dewey, 2014) This may be detrimental to the development of the body and mind (Kathryn, 2003)

In addition, compared to the older age group, children between the ages of six and eleven months were 90.6% likely to meet MDD, kids between 12 and 17 periods were 100% likely, and children aged 18-23 months were 98.2%. Comparable findings were found in investigations undertaken in Malawi, Ethiopia (Aemro et al., 2013) and India (Patel et al., 2011).

Among children aged between six and eleven months,75% likely to meet MDD, and Infants age twelve to seventeen months had been 48% Probably. Similar to a recent study in Malawi (Nkoka et al., 2018). Our findings indicate that kids representing poorer backgrounds had a lower likelihood of consuming a varied range of foods in comparison to their other people from wealthier families. Households with higher Individuals with higher earnings are more probable to have access. to a wider variety of foods and to be food secure. MMF was found to be present in 77.7% of the children. The most likely reason for this discrepancy is because our study's definition of this indicator was altered. According to the most current BDHS survey, this number is much lower than what was previously reported because the updated guideline's definition of MMF has altered. Findings from studies conducted in Ethiopia, (Tegegne et al., 2017) Ghana, (Saaka et al., 2016) and Sri Lanka (Senarath et al., 2011) Consistent with other research done in Bangladesh, our data revealed that kids from homes with low monthly family incomes and those experiencing food insecurity were less likely to get MMF.

Only 62% of children were provided a a minimum acceptable diet(MAD), which is less than another indicator. Because the indicator definition, like MMF, was somewhat updated with updated guideline the findings and those of Bangladesh Demography Health Survey (BDHS) could not be properly matched.. Although the child's mother had academic knowledge, they probably needed to grasp appropriate complementary feeding practices.

"The meat, fish, poultry, and the eggs must be taken daily, or as regularly as they can," as to the The World Health Organization recommendations for children who receive breastfeeding and those who are not. (*Guiding Principles for Complementary Feeding of the Breastfed Child*, 2003) Improved egg consumption is associated with increased higher intakes of carbohydrates, protein, phosphorus, selenium, vitamin B12, vitamin D, calcium, and important omega-3 fatty acids (Papanikolaou & Fulgoni, 2018).

Additionally, research indicates that including meat as a supplementary food early on enhances the consumption of zinc and protein (Tang & Krebs, 2014).

Sweet beverages do not offer any extra nourishment; they give us energy. Drinking more sugar-sweetened beverages increases the risk of obesity in children of all ages. Obesity at age six is linked to the the consumption of drinks with added sugar early in childhood around the age of one year (*Bangladesh Demographic and Health Survey 2017-18*, 2020).

The consumption of free sugars, which encompasses It has been discovered that only juice from fruits and drinks with sugar included increase the risk of tooth decay. (Pan et al., 2014) The new CF indicator, SWB, was predicted to be 78.7% for Bangladeshi infants born in urban areas. Offspring of moms who have completed less than primary school quantity were more probable than those with a secondary or higher education level to drink beverages sweetened with sugar. Because education increases moms' concern for their children's health and increases their likelihood of avoiding unhealthy meals, it may have a favorable effect on eating choices. In addition, children from families with low earnings were less likely to consume beverages that had added sugar. The comparatively more excellent price of sweetened beverages, such as fruit juices and candies, could be the cause. Additionally, Eating and drinking harmful snacks and beverages has been linked to a lower life expectancy and a higher chance of nutritional deficiencies. (*Sugars and Dental Caries*, 2017).

CHAPTER 5
CONCLUSION

5.1 Conclusion

As suggested by the previous guideline, 4 of the 9 complementary feeding indicators (MDD, MAD, MMF, and ISSF) were discovered in a range of national surveys and papers that were published. Implementing the updated guideline can be blamed for the poor feeding practices for these four components of CF.

We observed 46.4% had zero vegetables or fruits consumption and 78.6% of children consume sweet and beverage product. Comperativly higher portion of 89.5% children are introducing to introduction to meal that's solid, partially solid, or soft. Of the children, 77.7% followed the Minimum Meal Frequency (MMF), which is practice, 96.4% had Minimum Dietary Diversity (MDD), and 70.5% received Eggs and meat Food. On the other hand the minimum acceptable diet reflected 62.7% but the alarming determine are 46.7% children had zero vegetables or fruits consumption practices.

A mother's educational background, her eligibility for ANC participation, her monthly household income, her residence location, and her child's age were all shown to be significantly correlated with various elements of the practice of supplemental feeding. The provision of high-quality counseling to pregnant women or primary carers, in conjunction with convincing advocacy for behavioral change among extended family members and community leaders, with a particular focus on younger children, maybe an efficient technique for improving supplementary feeding practices.

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