EUROPEAN
ACADEMIC
RESEARCH

Food Intake Patterns and Nutritional Status of Toddler (1-3 years) in Sundarpur Union of Chapai Nawabgonj District of Bangladesh

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Abstract

Background: The "toddler" period of human life from one to three years is the dependency on breast milk weaning and others food feeding on others people. The dietary culture and balanced food have

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been contributing substantially in the ongoing epidemic of non-communicable diseases (NCDs) related to metabolic syndrome, formation of immune competence and long-term health.

Objectives: To assess the food intake pattern and nutritional status of toddlers in rural areas of Bangladesh.

Methods: A cross-sectional descriptive study was conducted from November 2018 to April 2019 with pre-tested semi-structured questionnaire and data entry, analysis done by SPSS 16.

Results: Maximum (69.71%) participant was in the age group of 12 to 24 months and close to hundred percent (97%) was Muslims, 55.8% was boys and 44.2% girl. 33.17% immature mother delivered first baby (bellow 18.7 years of age), This study reveals that most of the toddlers were with normal weight (76.7%) and 23.3% was moderate to severe underweight (<-2Z). The results also showed, 83.7% was in normal height/length and moderate to severe stunted were 16.3%. But considering the wasting, 91.6% was normal and only 8.4% was moderate to severe wasting. 96.15% mother fed their breast milk to the children and 91.35% mother had sufficient breast milk. 74.04% had eaten seasonal fruits and vegetables. The study found a positive weak correlation (r = 0.145, p = 0.04) between the breast feeding and height of toddlers and there was no relation between the breast feeding and weight (r = 00, p = 0.99) by a Pearson product-moment correlation coefficient.

Conclusion: Food intake was sufficient but not in balanced.

Keywords: Toddler, Malnutrition, NCD's, Breast milk weaning, Food intake patterns.

INTRODUCTION:

The term "toddler" is used for a period of 1-3 years of human life. It makes a transition from dependent milk-fed infancy to independent feeding and a typical omnivorous diet. This stage of human life is an important time for physicians to monitor growth, using growth charts and body mass index to make recommendations for healthy eating. This period is a crucial life stage regarding the nutrition, as the child

undergoes significant social, cognitive and emotional growth (Lucas et al 2012), during which food preferences and feeding behaviors are established and which, in turn, affects future eating habits, as well as general long-term health (Addessi et al 2005 and Agvei 2015). Nutrition is the major part of the most essential factors that determine the relationship between people and the environment and is crucial for health, efficiency, and resistance to negative surrounding impacts. Of particular importance for the health of a child is a full and regular supply with all the necessary macro- and micronutrients, vitamins and minerals (Michaelsen et al 2003 and Gidding et al 2006). The adequate and balanced food for child's further development and health, especially for the first 3 years of life are very important. On the other hand, inadequate or poor nutrition during the first years of life may lead to significant negative consequences for health, including delayed psychomotor and mental development, behavioral problems, lack of social skills, disorders of attention, learning problems, etc. (Haschke et al 2013). Malnutrition is associated with about half of child deaths worldwide due to frequent illness; their nutritional status saps down which lead to vicious cycle of recurring sickness and faltering growth (WHO, 2004). The World Health Organization (WHO) estimates that some 3 billion people suffer from malnutrition of one kind or other. One out of five people suffer from the worst of variants of malnutrition hunger (www.who.int/nutrition, cited on January 25, 2020). All forms of malnutrition are associated with significant morbidity, mortality, and economic costs, particularly in countries where both under and over-nutrition co-exist as is the case in developing countries undergoing epidemiological transition (Park, 2007). It has been proven today that features of early life nutrition not only play an important role in the formation of optimal physical health and intellectual development of a child, but may even determine a substantially higher risk of chronic disease in adulthood (Agostoni et al. 2011, Hayman et al. 2007, American Diabetic Association 2008, Koletzko et al. 2009). During the toddler phase a diet rich in energy and nutrients from a variety of food sources should be provided in order to ensure optimum nutritional status, growth and development (Addesssi et al. 2005, Chaudhury 1984). However, many researchers reveals that millions of toddlers across the globe, in both developed and developing countries like South

Africa (SA), suffer from malnutrition, which includes both under nutrition, as reflected by underweight, wasting and stunted linear growth, as well as over nutrition, as reflected by overweight/obesity (Dietary guidelines for Americans (DGA), 2010 and Agvei, 2015). It affects almost 800 million people, with most of them in the developing countries. The proportions are 70% in Asia, 26% in Africa and 4% in Latin America and Caribbean (Ergin et al. 2007). Malnutrition in toddlers are related to diets of poor nutritional quality and limited variety, often characterized by high intakes of saturated fatty acids, refined carbohydrates and sugar-sweetened beverages, and/or inadequate fruit and vegetable consumption (Altman et al. 2009, Daly et al. 1996). In addition, there is evidence that iron stores decline during the second year of life (Virtnen et al. 2001, Stevens et al. 1995, AAP 2001). Iron deficiency (ID) is the most commonly reported nutritional disorder during early childhood in the UK and other countries (Butte et al. 2010, HMSO-UK, 1994). Young children are at increased risk due to their high physiological demands during this period of rapid growth and development. Malnutrition of toddlers is one of the comprehensive spread public health problems. India is facing a great threat on it presently. Among the highly susceptible groups are infants and toddlers (0-3 years old), who constitute nearly 10% of Indian's population (De-Maeyer et al. 1985). Unfortunately, they are largely ignored from a nutritional standpoint (Scientific opinion, 2010). Bangladesh is the most fast growing and densely populated country in the world. Half of the children who die worldwide are related to mild and moderate degree of malnutrition but there is very scanty information about children who live in remote areas in Bangladesh. The objective of the study was to assess the food intake patterns and nutritional status of toddlers in rural areas of Bangladesh.

MATERIALS AND METHODS:

A descriptive cross-sectional study was conducted from November 2018 to April 2019. Data were collected with pre tested, modified and semi-structured questionnaire. Study subjects were toddlers (1-3 years of age), sample size was 208 from the ten villages in selected rural area Sundarpur Union of Chapai Nawabgonj District of Bangladesh were

selected purposively. Data were entered and analyzed using SPSS software 16 version. Results were expressed in number, percentage, mean ± SD in table and figures.

RESULTS:

Table 1: Distribution of the toddler's age, sex and religion (n=208)

Relation with child who answered the questions	Number	Percentage
Age group		
12 to 24 months	145	69.71
25 to 36 months	63	30.29
Mean±SD=21.72±6.88		
Gender		
Son	116	55.8
Daughter	92	44.2
Religion		
Islam	202	97
Hindu	4	2
Christian	2	1
Total	**208**	**100**

Table 1 showed, maximum (69.71%) toddler's age was the age group of 12 to 24 months and only 30.29% was of 25 to 36 months of age group. Among the subjects 55.8% was boys and 44.2% girl. Besides, nearly hundred percentage (97%) was Muslims, 2% Hindus and 1% was Christian.

**Figure 1: Distribution the income per month of toddler's mother (n=208)**
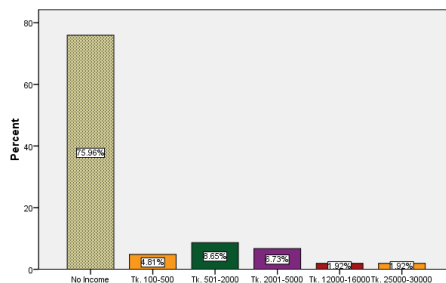
Figure: Income category of the mothers of the study subjects

The study revealed that among the study population (their mothers) maximum (75.96%) had no income. Income was between BDT 100 to

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500 per month for 4.8% mother, between BDT 501 to 2000 for 8.65%
mother, BDT 2001 to 5000 for 6.73% mother, both BDT 12000 to 16000
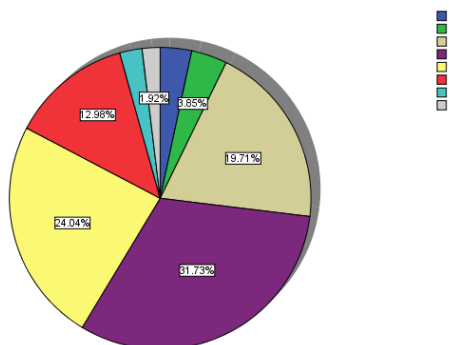and BDT 25000 to 30000 income groups were occupied for 1.92%
mother.

**Figure 2: Distribution the income per month of the father of toddlers
(n=208)**
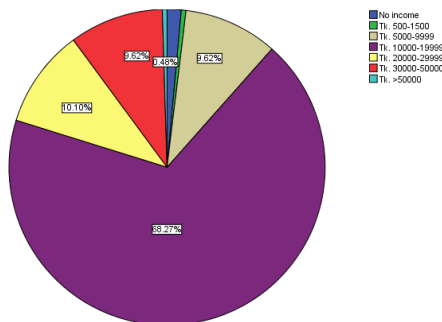
Figure: Income category of fathers of the toddlers

The study found among the study population (their fathers) maximum
(68.27%) had the income between BDT 10000-19999. Income was
between BDT 500 to 1500 and more than BDT 50000 per month for
4.8% father individually, income level between BDT 5000 to 9999and
BDT 30000 to 50000 for 8.65% father individually. Income level BDT
20000 to 29999 was for 10.10% father but 1.92% had no income at all.

Figure 3: Frequency of taking food in a day of the children (n=208)

Figure: Frequency of taking food in a day

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The study presents the frequency of having food per day of the toddlers. Among the participants maximum 31.73% received food four times per day, 24.04% received five times, 19.71% three times, 12.98% six times, 3.85% two times, 1.92% received food once a day. There were some small percentage like 0.96% and 0.48% study population taking foods seven and eight times a day respectively.

Table 2: Breast milk and feeding status of the toddler's mother (n=208)

Feeding breast milk	Frequency	Percentage
Yes	200	96.15
No	8	3.85
Sufficient breast milk		
Yes	190	91.35
No	18	8.65

This study found 91.35% mother had sufficient and 8.65% had scarcity of breast milk but 96.15% mother breast fed their babies and only 3.85% did not feed.

Table 3: List of nutritional foods given per week to the children (n=208)

Days in a week children got meat, milk, eggs, fish, fruits, vegetables and sweets							
	Meat	Milk	Eggs	Fish	Fruits	Vegetables	Sweets
	%	%	%	%	%	%	%
1 day	46.15	6.73	5.77	8.65	21.63	5.77	18.27
2 days	37.5	14.9	20.67	28.85	22.6	5.77	27.4
3 days	8.17	9.62	30.29	33.17	27.4	9.62	22.6
4 days	0.96	12.02	10.1	19.71	8.65	14.43	16.83
5 days	0.48	9.13	11.06	6.73	5.77	12.99	5.29
6 days	0.96	4.33	6.25	2.4	4.33	16.83	2.89
7 days	0.85	37.5	12.5	0.48	5.29	32.69	5.29
Not given	4.93	5.77	3.37	0	3.37	1.92	1.44
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

This study found, highest 46.15% consumed meat for one day and not at all for 4.93%, highest (cows, formula, got) 37.5% child drunk milk for seven days and 5.77% not at all. Regarding eggs 30.29%% gotten three days but 3.37% not at all, 33.17% eaten fish three days, 27.4% eaten fruits three days and 3.37% not at all, 32.69% habituated to vegetables every day and 1.92% eat, more than 27% eaten sweets minimum two days.

Table 4: Nutritional status of toddlers showing normal and moderate to severe in percentage (n=208)

Anthropometric indicators	Normal (±2SD)%	Moderate to Severe (<-2SD)%
Underweight (WAZ)	76.7%	23.3%
Stunting (HAZ)	83.7%	16.3%
Wasting (WHZ)	91.6%	8.4%

This study reveals that most of the toddlers were with normal weight (76.7%) and 23.3% was moderate to severe underweight (<-2Z). The results also showed, 83.7% of study subjects was in normal height/length and moderate to severe stunted were 16.3%. But considering the wasting, 91.6% was normal and only 8.4% was moderate to severe wasting.

DISCUSSION:

Dietary habits which play major role in toddler age under the influence of parents. This study found Maximum (69.71%) participant was in the age group of 12 to 24 months and 30.29% was of 25 to 36 months, close to hundred percent (97%) was Muslims but another study (Yesmin F 2019) showed 83% Muslim and 16.67% Hindu. This study found 55.8% was boys and 44.2% girl. The study revealed 75.96% mother had no income and led poor lives similar as Chindime et al 2006 study. The study also found 68.27% father's income was between BDT 10000-19999 similar SARS 2015: Online. They got (Cows, Formula, Goat) highest meat 46.15%, milk 37.5%, eggs 30.29%%, fish 33.17%, fruits 27.4%, vegetables 32.69%, and sweets 27.4% that similar to Ntab et al. 2004. Juice and sweetened beverages have been found to displace milk in children's diets when they are as young as 15 to 24 months of age (Skinner et al. 2004). But the level of protein consumption in children aged 13–18 months exceeds the recommended one by 254% in France, 150% in Italy, 186% in Luxembourg (Lambert et al. 2004). The average protein intake in European countries is 40 g/day at the age of 2 years and 60 g/day at the age of 3 years (about 3 g/kg/day), which determines the consumption of more than 16% of energy from protein (Lambert et al. 2004). This study found most of the toddlers with normal weight (76.7%) and 23.3% was moderate to severe underweight (<-2Z). The results also showed, 83.7% was normal height/length and moderate to

severe stunted were 16.3%. But considering the wasting, 91.6% was normal and only 8.4% was moderate to severe wasting. Another study (Haque MM 2014) showed the similar results. 96.15% mother feeding their breast milk to the children and 91.35% mother had sufficient breast milk. Indeed, prolonged breast-feeding was associated with faster linear growth, as was shown previously (Marquis et al. 1997, Onvango et al. 1999 and Simondon et al. 2001). Another study showed breastfed children had lower mean height-for-age (Simodon et al. 1998 and Simondon et al. 2001). Present study found a positive weak correlation ($r = 0.145$, $p = 0.04$) between the breast feeding and height of toddlers and there was no relation between the breast feeding and weight ($r = 00$, $p = 0.99$) by a Pearson product-moment correlation coefficient.

CONCLUSION:

Although this study presents the economic conditions of the parents of the toddlers are maximum not sound, the malnutrition among toddlers in Bangladesh is on a decreasing trend. Still in present era malnutrition is a severe public health problem in rural area. This study reveals that most of the toddlers were with normal weight (76.7%) and 23.3% was moderate to severe underweight (<-2Z) that is higher than moderate to severe stunted and wasting. Most of the study subjects took eggs, milk, and processed sweetened food. The positive weak correlation ($r = 0.145$, $p = 0.04$) found between the breast feeding and height but no relation found between the breast feeding and weight ($r = 00$, $p = 0.99$).

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