

Assessment of Nutritional Status of Under-five Rural Children in Some Selected Villages of Rupgonj Upazila, Narayangonj

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Abstract

Introduction: The best indicator of the global well-being depends on child nutritional status. Malnutrition among children in rural areas in most developing countries therefore considered a major health problem.

Objective: This study was carried out to assess the nutritional status of the under five children in some selected villages of Rupgonj Upazila, Narayangonj.

Methods: This descriptive type of cross sectional study was conducted for the period of six months (from January to June 2017). A convenient sampling technique was used to select 215 samples from the children (1-5 years of age) population. Data were collected from the mother of selected children by face to face interview through a pretested questionnaire. A checklist duly pre-tested was used for collecting anthropometric data of the children and the applied techniques were: (a) Measurement of Mid Upper Arm Circumference (MUAC) by measuring tape (b) Weight was measured by weighing machine and (c) Height was measured by meter stick. The data were analyzed manually & by computer and presented in the form of tables and graphs in line with stated objectives.

Results: The study revealed that most (83.73%) of the children were more than 1 year age and there were 50.23% male and 49.77% female. Most (76.27%) of the mothers of the children were within the age group of 18-30 years. It was also found that majority (62.33%) mothers were illiterate and most (48.84%) of the families had monthly income within taka 10001-20000 only. In this study majority (59.53%) of the mothers practiced exclusive breast feeding for 5 months and 81.86% children were immunized. Severe malnutrition was observed in 6.98% under five children by weight for age, 8.37% height for age, and 7.92% by weight for height. However 22.32% of the children of under five years of age was found to had mid upper arm circumference (MUAC) below 12.5 cm.

Conclusion: There is need for improvement in the nutritional status of the rural children. There should be some training or any other education concerning about nutritional knowledge, breast-feeding, weaning practices, nutritional value of food and dietary practices that increase the awareness of rural parents to take care of their children.

Keywords: Assessment, Nutritional Status, Under- five Children, Rural.

Introduction

Bangladesh is a developing and most densely populated country in the world, with about 163 million people living

in a land mass of 147,570 square Square Kilometer. Child malnutrition remains one of the major public health problems in many parts of the world especially in a developing country like Bangladesh. Malnutrition of under five children is not also an important public health problem but which is also one of the major killer of children in developing countries.¹ About 35% of under five deaths in the world are associated with malnutrition.² There is a perception that situation of malnutrition among children is worst in Africa. The problem of malnutrition is actually much higher in South Asia for instance, the prevalence of underweight among preschool children is almost double in Bangladesh, compared to Somalia or Mozambique and equal to that of Etopia.^{3,4} Although the proportion of under five children with malnutrition decline from 27% in 1990 to 20% in 2005⁵ but progress is not enough in developing countries and continues to be serious problem. Half of the world malnourished children are to be found in just three countries Bangladesh, India and Pakistan.⁶ Studies showed that malnutrition of children is the worst in Bangladesh for instance, the prevalence of child malnutrition in Bangladesh is among the highest in the world.⁷

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Around two million children of Bangladesh suffer from malnutrition, and of these, half a million suffer from severe acute malnutrition which was observed by a survey conducted by World Food Programme (WFP), the UN children's fund (UNICEF) and the Governments institute of public Health and nutrition (IPHN).⁸

Children under 5 years group is about 17.1% but almost 50% of total death occur among this group. This high mortality is associated with malnutrition, diarrheal diseases, acute respiratory infection (ARI), measles & other infectious diseases. Malnutrition sometimes results in serious consequences for the physical growth and mental development of children.⁹

Anthropometry has become a practical tool for evaluating the nutritional status of population particularly of children in developing countries and nutritional status is the best indicator of the global well-being of children.¹⁰ One of the major global health problem faced by the developing countries today is malnutrition.¹¹ Bangladesh is a South Asian developing country. The economic improvements in South Asian countries over the past decade not been adequately reflected in improvement in child nutrition.¹²⁻¹⁴

Malnutrition not only makes the child more vulnerable to morbidity & mortality¹⁵ but has been linked to poorer educational attainment, delayed mental development and lower intellectual and physical abilities in adult life.^{16,17}

Poor fetal growth and or under nourishment in early child years lead to irreversible damage causing shorter adult height as well as lower weight.¹⁸ Height for age thus measure child growth relative to its potential, reflecting Chronic and acute nutritional deprivation.¹⁹ Study shows that in Bangladesh, malnutrition is one of the major causes of childhood illness & mortality.²⁰

Nutrients are organic & inorganic complexes contain in food that must be supplied to the body in a suitable amount. Two types of nutrients of which protein, fat and carbohydrate are taken in the form of macronutrient and vitamins and minerals are taken in the form of micronutrients. Nutrition is a dynamic process concerned with digestion, absorption and assimilation of food substances by which growth, repair and maintenance of the body are accomplished. Nutritional status is the end result of utilization of the nutrients by the body and is assessed by three common employed methods.²¹ They are:

- Clinical assessment, when one looks for sign of malnutrition.
- Nutritional anthropometry- When physical measurements of various kinds of weight, height, mid upper arm circumference (MUAC), skin fold thickness of selected areas of the body.
- Determination of certain bio-chemical parameters of which haemoglobin estimation is commonly used.

Deficiency or imbalance of nutrients may cause some

nutritional problems such as protein energy malnutrition (PEM), nutritional anaemia, nutritional blindness, angular stomatitis and dental carries etc. Nutritional survey in Bangladesh 1975-1976 shows that 70% of children below 5 years are suffering from different grades of PEM. Nutritional status of our country is not so good due to poverty, ignorance, inadequate availability of food, early or late weaning, recurrent infection etc. Overcrowding, unhygienic living condition, and maternal malnutrition also associated cause of poor nutritional status of our country.²² In order to find out the nutritional status of children in rural areas the present study was undertaken with the following objectives:

- To find out the level of literacy & their economic status.
- To assess the knowledge of mother about nutrition of child
- To know immunization status of the children.
- To find out the proportion of children are malnourished
- To find out the percentage of various degrees of malnutrition
- To find out the proportion of children are wasted.

Material and Methods

This descriptive type of cross sectional study was conducted in selected villages of Rupgonj Upazila during the period of January, 2017 to June, 2017 to assess the nutritional status of the under-five rural children. During the study data were collected after the purpose of the study was explained to each guardian of the children. Two hundred fifteen (215) children were selected conveniently and these comprise the sample of the study. After taking verbal consent a face to face interview was conducted through a pretested questionnaire to obtain relevant information regarding nutritional status, socio-demographic status such as age, sex, income, education, immunization and clinical features of malnutrition. For anthropometric data following procedures were applied.

Mid-upper Arm Circumference (MUAC) of the children was measured by measuring tape in cm. The cut off point was 13.5 cm. Weight of the children were measured by weight machine. For too small non co-operative children, the weight was measured as follows- At first the mother was requested to take the baby at her lap and the weight of both of them was taken, then the weight of the mother only was taken. Deducing the second reading from the first reading actual weight of the children was found.

Body height of the children was measured by meter stick.

The three indices a) Weight for age b) Height for age and c) Weight for height were commonly used in assessing the nutritional status of children. These indices were obtained from the following equations:

$$\text{Weight for age (\% (W/A))} = \frac{\text{Actual weight of the child}}{\text{Weight of a normal child at same age}} \times 100$$

$$\text{Height for age (\% (H/A))} = \frac{\text{Actual height of the child}}{\text{Height of a normal child at same age}} \times 100$$

$$\text{Weight for height (\% (W/H))} = \frac{\text{Actual weight of the child}}{\text{Weight of a normal child at same height}} \times 100$$

Nutritional status	Weight for age	Weight for height (Wasting)	Height for age (Stunting)
Normal	90% to 100%	90% or above	More than 95%
Mild malnutrition	75% to 89.9%	80% to 90%	87.5% to 95%
Moderate malnutrition	60% to 74.9%	70% to 80%	80 to 87.5%
Severe malnutrition	Less than 60%	Less than 70%	Less than 80%

Interpretation:

Finally all the data were compiled on a master sheet and statistical analysis were done by computer software (SPSS). The results were presented in the form of tables, charts and diagrams.

Results

A descriptive cross sectional study was carried out among 215, under-five children selected conveniently from rural area of Rupgonj Upazila in Narayangonj district. Data relating to variables based on objectives of the study were analysed. The variables were socio-demographic and economic status such as age & sex of the children, age & level of children's mothers, father's occupation & monthly family income. Other variables were birth order of the children, nature of breast feeding & weaning, immunization status, nutritional status according to their MUAC, according to Gomez classification and waterlows classification. Then the results were presented as follows:

Table 1: Distribution of the respondents according to socio-demographic characteristics (n= 215)

Socio-demographic characteristics	Frequency	Percentage
Distribution of the children by age (In years)		
Less than 1	35	16.27
1 to 2	49	22.79
2 to 3	52	24.18
3 and above	79	36.78
Distribution of the children by sex		
Male	108	50.23
Female	107	49.77
Distribution of the children's mother by age		
Less than 18	19	8.84
18-30	164	76.27
30 and above	32	14.89
Level of maternal education		
Illiterate	134	62.33
I-V	61	28.27
VI-X	17	7.91
SSC and above	03	1.39
Distribution of the children by their father's occupation		
Farmer	111	51.64
Day labour	37	17.21
Service holder	12	5.58
Business man	28	13.02
Others	27	12.55
Distribution of the children by Monthly family income (Taka)		
<10000	53	24.65
10001-20000	105	48.84
20001-30000	45	20.93
More than 30000	12	5.58

Table 1 shows that majorities (36.76%) of the children were the age group of 3 years & above and among the children 50.23% were male 49.77% were female. Most (76.27%) of the mothers age belongs to age group of 18-30 years, and majority (62.39%) of the mothers were illiterate. It also revealed that majority (51.64%) of the children's fathers' were farmer and most (48.84%) of the parents had family income within Taka 10001- 20,000.

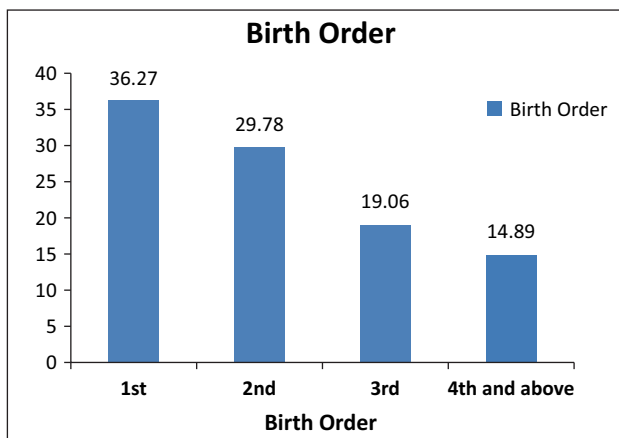


Figure 1: Distribution of the children according to birth order (n=215)

Figure 1 Shows that 36.27% children were the first issues and rest 29.78% , 19.06%, 14.89% were 2nd, 3rd and 4th and above issues respectively.

Table 2: Distribution of the children according to nature of breast feeding & weaning (n=215)

Nature of breast feeding	Frequency	Percentage
Exclusive breast feeding for 5 months	128	59.53
Early weaning	87	40.47
Total	215	100

Table 2 Shows that most of the mothers (59.53%) were practiced exclusive breast feeding for 5 months.

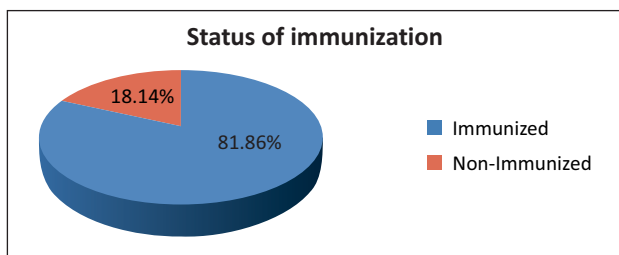


Figure 2: Distribution of children according to the status of immunization (n=215)

Figure 2 Shows that most (81.86%) of the children were properly immunized.

Table 3: Distribution of the children according to their mid upper arm circumference (n=215).

Measurement (cm)	Frequency	Percentage
>13.5	113	52.56
12-13.5	54	25.12
<12.5	48	22.32
Total	215	100

Table 3 Shows that 22.32% child were severely malnourished, whereas 52.56% were nutritionally normal. Therefore, a total of 47.44% children were malnourished.

Table 4: Nutritional status of children by Gomez classification (Weight for Age) (n=215)

Nutritional status (Weight for age)	Frequency	Percentage
90%-100% (Normal)	56	26.04
75%-89.9%(Mild malnutrition)	103	47.91
60-74.9% (Moderate malnutrition)	41	19.07
<60% (Severe malnutrition)	15	6.98
Total	215	100

Table 4 Shows that 47.91%, 19.07%, 6.98% & 26.04% were mild, moderate, severe malnourished and normal respectively. Therefore, a total of 73.96% children were wasted.

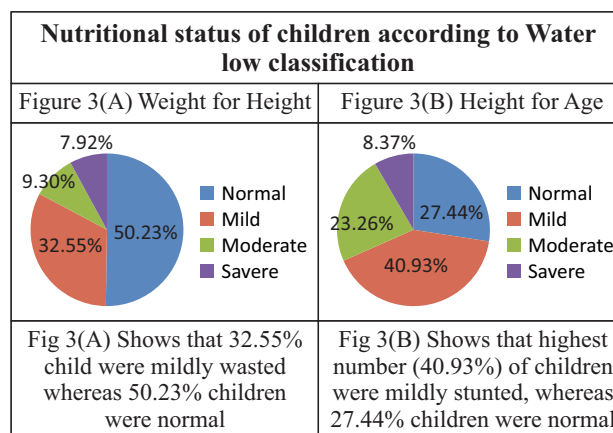


Figure 3: Distribution of the children according to nutritional status (Water low classification)

Discussion

The present study represents the nutritional status of under-five children of a rural area in Rupgonj Upozila, Narayngonj district. Special emphasis was also given to socio-demographic characteristics of the population.

The result showed that among the under five children, there were 50.23 % male and 49.77% female. Majority (36.76%) of the children were within 3 years & above. Previous Studies showed that male and under five children were more vulnerable to malnutrition.²³ After the age of six months infant had decreasing protection from natural antibodies. At this stage, nutritional deficiency also occurs as the infant is weaned.

It was revealed that most (76.27%) of the mother among age group of 18-30 years. Although malnutrition was found

higher in children of teenaged mothers regardless of the children age.²⁴

In this study, it was found that majority (62.33%) of mother had no formal education. Education of mother is important determinant of malnutrition. Children among higher educated mother have found to be less suffered from malnutrition than lower educated mother. Maternal education is known to have profound beneficial effects on child feeding, health seeking and care giving practices which is especially important for child nutritional status. Maternal education is a single most important factor in explaining differentials in child health outcomes.²⁵

Most (48.84%) of the families had monthly income were within Taka 1001- 20000 per month. Within this income it is difficult to maintain a medium size family properly. As compared with children residing in household with medium or higher economic status, children residing in very poor and poor households was found more malnourished.²⁶ The economic status of a household is one of the most important determinants of child nutritional status. Many comparative studies on child nutritional status showed that the higher the level of economic status of the household, the lower the level of the child malnutrition.

The present study showed that majority (36.27%) were the first issues and which are more vulnerable group according to child nutrition survey of Bangladesh. It was found that 47.0% children were suffered from malnutrition.²⁷ This study revealed that most (59.53%) of the mother exclusive breast feeding for five months, Breast milk is an ideal food for young infant. It contains all the essential nutrients and protective material (eg- Ig A) adequate proportion for young infants up to 5 months.²⁸ In child nutrition survey of Bangladesh was found that 47.81% children suffered from mal nutrition, who are early weaned. Immunization plays an important role against Tuberculosis, Pertusis, Diphtheria, Measles, Tetanus, Poliomyelitis, Hepatitis B and Rubella by improving body protective function. In this study it was revealed that most (81.86%) of the children were unimmunized. It is higher than the report of BBS which is 65.4%.

Mid-Upper-Arm Circumference (MUAC) is a useful age dependent indicator of malnutritional status of under-five children because a child's arm circumference does not change appreciably between 1-5 years of age. In this study it was found that a total of 48(22.32%) children were severely malnourished based on above criterion. Child nutrition survey of BBS revealed that percentage of severely malnourished children as measured by MUAC indicator was 13.20% for rural population. The finding regarding severely malnourished in the present study much higher than national value.

Weight also has a strong relationship with age. Among the widely used anthropometric indicators (Height for age, weight for age and weight for height) for assessing the nutritional health status of a population, weight for age can

be considered as a good overall index for understanding the nutritional status of children.²⁹ According to Gomez classification, this study showed that the prevalence of mild, moderate and severe malnutrition were 47.95%, 19.07% and 6.98% respectively. A child nutritional survey conducted in Bangladesh showed proportion was 39.80%, 47.2% and 6.80% respectively. However, the prevalence of mild and severe malnutrition was higher than that of national report.²⁷

Low height for age (stunting) is an indicator of past growth failure. It is also associated with a number of long term factors including chronic insufficient protein and energy intake, frequent infection, sustained in appropriate feeding practices and poverty. In this study according to Waterlow classification, it was revealed that majority (72.56%) under five children were Stunted, against 46.0% reported by child Nutrition survey in Bangladesh.²⁷

Low weight for age (wasting) is an indicator which describes current nutritional status or short term changes in nutritional status. This index helps to identify children suffering from current or acute malnutrition. Under weight, based on weight for age, is a composite mixture of stunting and wasting and is remembered as the indicator to assess changes in the magnitude of malnutrition over time.³⁰ All the findings in the present study were higher than national level, which indicate most of study children were malnourished.

Conclusion

From the findings of the study, it is concluded that malnutrition is an important problem among under five rural children in Rupgonj Upazila of Narayangonj District. As the quality of future human resource depends on the present day children, the improvement of the nutritional level of todays children should be given top priority. The low values for anthropometry and socio-economic condition obtained from the study propose that there is need for improvement in the nutritional status of these rural children. There be minimum education concerning about nutritional knowledge, breast feeding and weaning practices, immunization, nutritional deficiency disease, nutritional value of food and dietary practice that increase the awareness of rural parents to take care their children. Moreover effective and efficient program should be designed to reduce child malnutrition.

References

1. Gulati, J.K. "Child malnutrition: Trends and issue", *Anthropologist* 2010; 12(2): 130-40
2. World Health Organization (WHO). "Child and adolescent Health Development, progress Report Highlights 2008" World Health Organization (WHO), 2009 a: Geneva, Switzerland.
3. Helen Keller international, Bangladesh "Trend in child malnutrition, 1990 to 2005: Declining rates at national level mask inter-regional and socioeconomic

- differences” : Nutritional Surveillance Project Bulletin 2006; No. 19
04. World Bank. “Repositioning nutrition as central to development: A strategy for large scale action”, 2006; World Bank, Washington DC., USA.
 05. World Health Organization (WHO). World Health statistics 2009, World Health Organization (WHO).2009 b, Geneva, Switzerland.
 06. Raltan, V. Woman and child Development: Sustainable Human Development. 1997;Vol. 1.New Delhi: S. Chand and Co.
 07. Das, S, Hossain, MZ and Islam, MA. Predictor of child chronic malnutrition in Bangladesh. Proceedings of Pakistan Academy of Science 2008; 45(3): 137-55.
 08. Integrated Regional Information Networks (IRIN) 2009. “Bangladesh : Two million Children suffer from malnutrition”, available at: <http://refworld/docid/49ddfa681c.html>.
 09. Rice, A.L., Sacco.L., Hrder,A. and Black, R.E. “Malnutrition as an underlying cause of childhood deaths associated with infectious disease in developing countries”, Bulletin of the World Health Organization,200;78(10) : 1207-21.PMCid: 11100616 PMCid: 2560622.
 10. Hakeem R, Shaikh AH, Asar F 2004; Assessment of linear growth of affluent.
 11. UNICEF Policy Review 1990: Strategy for improved nutrition of children and woman in developing countries. UNICEF, New york.
 12. Amogo H et.al. 2005: Growth defects in chilean school children . Journal of nutrition 135: 251-254.
 13. Das Gupta M 1990: Death clustering, mothers education and the determinants of child mortality in rural Punjab, India popul stud; 44(3)489-505.
 14. Glewwe P. 1999: Why does mothers schooling raise child health in developing countries? Evidence from Morocco, Human Resour; (35)1: 124-159.
 15. Mendez MA, Adair L.S. 1999: Severity and timing of stunting in the first two years of life affect performance on cognitive tests in late childhood, J nutr. ; 129 (8): 1555-62.
 16. Muestue H, Huttly S. 2008; Adult education and child nutrition: the role of family and community. J Epidemiol Community Health. 62 (2) :153-9.
 17. Siddiqi MN, Haque MN, Blossnar M 2000 : Is malnutrition declining? An analysis of change in levels of child malnutrition since 1980. Bull World Health Organ, 10: 1222-1223.
 18. Unger A. 2011 : Children's health in slum settings, archives of disease in childhood; 2013. DOI : 10.1136/archdischild-301621.
 19. Lanjou WP, Ravallian M. 1995: Poverty and household size. Econ J. ; 105 (433): 1415-1434.
 20. World Bank (WB) 2006: “Repositioning nutrition as central to development: A Strategy for large scale action”, 2006; World Bank Nutrition Strategy Paper. Washington, DS: World Bank.
 21. Park's Textbook of Preventive and Social Medicine, K Park 19th ed. 2010 Jabalpur : 376-77.
 22. Rashid KM, Khabir K, Hyder S, Textbook of Community Medicine and Public Health 2nded, RKH publishers, Dhaka 1995. 112-113.
 23. Tupasi TE, Tan S.A, Sanial, MC : Determinants of mortality & morbidity due to ARI.
 24. Selwyn, BJ. The epidemiology of ARI in young children.Comparison of findings from several developing countries. Rev Infect Dis; 1990 Nov-Dec 12 Suppl 8: 5870-88.
 25. Caldwell, JC. Education as a factor in mortality decline: An examination of Nigerian data. Population Studies, 1979; 33(3): 395-413.
 26. Siddiqui MNA, Haque MN, Goni MA: Malnutrition of under five children: Evidence from Bangladesh, Asian journal of Medical Sciences (2) 2111: 113-119.
 27. BBS(1992) Child Nutrition Survey of Bangladesh, Dhaka.
 28. Khan, MR. Essence of Paediatrics, Child health in Bangladesh, Nutritional problem: 85-95.
 29. Nutritional institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International. Bangladesh Demographic and health Survey 2014. Dhaka: NIPORT, Mitra and Associates and ICF International; NIPORT; Ekhaspur, Bangladesh, 2016.
 30. Cogill, B. Anthropometric Indicators measurement Guide. Food and Nutrition Technical Assistance project (FANTA), 2003; Academy for educational Development, Washington, D.C.