Analysis of Nutritional Status of Under Five Children in a Rural Community of Bangladesh

MOHAMMAD ABUL BASHAR[1], ABU SALEH MUSA[2], RAHNUMA RAHMAN[3], SHAILA SHARMIN[3], RAIHAN ATIQUE[3]

Abstract

Background: *Nutritional status is a positive health indicator. Malnutrition is a major health problem which is associated with high morbidity and mortality of under 5 children. Factors associated with socio-economic status, mother's education, hygiene, incidence of infectious diseases are the important determinants of malnutrition.*

Materials & Methods: *This was a cross-sectional study. Anthropometric measurements and other data of 706 under 5 children were collected purposively during the period of May 2015 to April 2016.*

Results: *In this study, mean age of the under 5 children was 34.61±5.4 months, male was 50.7% and female was 49.3%. This study revealed that 49% of children were underweight, 39% were stunted and 10.5% were wasted. The multivariate analysis found that mother's education, poor socio-economic status and associated diseases had significant association with nutritional status of under 5 children. However, occupational status of child's mother found no significant association on nutritional status.*

Conclusion: *The prevalence of malnourished children in rural community in this study was found very high. Of them, underweight children was higher than wasted and stunted children.*

Keywords: *Nutritional status, under five children, rural area.*

Introduction:

Nutritional status is a positive health indicator.[1] Severe malnutrition is a major health problem among under five children in Bangladesh and many developing countries and is associated with high morbidity and mortality.[2] Malnutrition contributes to more than one-third of all deaths of under-five children.[3] According to the report of Bangladesh Bureau of Statistics, 10.45% populations are under 5 years age group.[4] Factors associated with poor socio-economic status including food insecurity,

mother's education and high incidence of infectious diseases are the important determinants of severe malnutrition.[5] The future of a nation is linked with the wellbeing of its children, which depends to a considerable extent on their nutritional status. To develop a national policy for solving the malnutrition problems of children, it is important to have a precise knowledge of the magnitude of the problem and of related factors. Malnutrition most often affects the low-income families, because living in poverty means that people are often going without basic needs such as food, clothing, and adequate shelter. In order to have a chance at a bright future, they need to have adequate healthy foods everyday. According to FAO report of 2020, 687.8 million people of the world were undernourished in 2019.[6] It adversely affects an individual's physical and mental health, development and productivity.[7] Besides, it has more powerful impact on child mortality.[8] This significantly influencing the social behavior and economic potential

1. Associate Professor, Dept. of Community Medicine, Gonoshasthaya Samaj Vittik Medical College, Savar, Dhaka.
2. Assistant Professor, Dept. of Paediatrics, Enam Medical College, Savar, Dhaka.
3. Lecturer, Dept. of Community Medicine, Gonoshasthaya Samaj Vittik Medical College, Savar, Dhaka.
Correspondence: Dr. Mohammad Abul Bashar, Associate Professor of Community Medicine, Gonoshasthaya Samaj Vittik Medical College, Savar, Dhaka-1344. Cell: +880 1712232602, Email: drabashar@gmail.com

of man. This problem is most prevalent among the vulnerable sectors of the population particularly those residing in low income families. Malnutrition in childhood continue to exist and increase, has serious implications in many years. It may continue to be a major obstacle to national development if not corrected. However, a few studies in Bangladesh have comprehensively examined the relationship between their socio-economic and illness characteristic and nutritional status. The aim of this study, using a descriptive type of cross-sectional analysis, was to identify the nutritional status of under five children.

Materials and Methods:

This cross sectional study had been undertaken to find out nutritional status of under-5 children in Sreepur upazilla of Gazipur district in Bangladesh. A total of 706 under-5 children were selected purposively from two randomly selected villages of Sreepur upazilla. This study was carried out during the period of May 2015 to April 2016. Mothers of under-5 children were interviewed face to face using semi-structured questionnaire. Weight was taken by using a portable Salter scale with 125 kg maximum capacity. A portable Salter hanging scale with 25 kg maximum capacity was used for the children less than 2 years age who could not stand properly. Age was determined from the verification of EPI card as well as history from the child's mother. Height measuring stick was used for the measurement of height of 2-5 years' children and length measuring board was used for measuring length of less than 2 years' age children. Socio-economic status of the respondents were classified as ultra-poor, poor, lower middle class, middle class, upper middle class and rich according to the guideline of Gonoshasthaya Kendra (GK), a local NGO in Bangladesh.[9] Weight for age (underweight), weight for height (wasting) and height for age (stunting) were used as indicators for assessing nutritional status of under 5 children. Nutritional status was classified by WHO criteria and Gomez classification. WHO criteria was used in terms of wasting and stunting where Z score < 3.00 is severe malnutrition, -3.00 to <-2.00 is moderate malnutrition and -2.00 to +2.00 is normal nutritional

status.[10] Gomez classification was used in term of underweight where, weight for age <60% is severe malnutrition, 60%-75% is moderate malnutrition, 75%-90% is mild malnutrition and ≥90% is normal nutritional status.[11]

Results:

Table I
Age & sex distribution of respondents (n=706)

Age in month	Frequency(%)
0-11	108 (15.3%)
12-23	160 (22.7)%
24-35	147 (20.8)%
36-47	146 (20.7)%
48-59	145 (20.5)%
Total	706
Sex	
Female	348 (49.3%)
Male	358 (50.7%)

This table showed that maximum children (22.7%) were 0-11 month age group. Mean age 34.61±5.4 months. 49.3% children were female and 50.7% were male.

Table II
Socio-economic status of the study population (n=706)

Socio-economic status	Frequency (%)
Ultra-poor	21(3%)
Poor	297 (42%)
Lower middle class	240 (34%)
Middle class	92 (13%)
Upper middle class	42 (6%)
Rich	14 (2%)

Table II showed that majority of the children are from poor and lower middle class family.

Table III
Nutritional status by wasting and stunting (n=706)

Indicators	Severe malnutrition f (%)	Moderate malnutrition f (%)	Normal nutritional status f (%)
Wasting	12 (1.7)	62 (8.8)	632 (89.5)
Stunting	114 (16)	159 (23)	433 (61)

Table III revealed that 10.5% of the children were wasted and 39% children were stunted.

Table IV
Multivariate analysis of nutritional status (n=706)

Variable	Severe malnutrition f (%)	Moderate malnutrition f (%)	Normal nutritional status f (%)	Total	P value
Mother's education					
< Primary	57 (23.9)	160 (67.2)	21 (8.8)	238	<0.05
≥Primary	41 (8.8)	88 (18.8)	339 (72.4)	468	
Socio-economic status					
Ultra-poor to poor	82 (25.7)	172 (54.1)	64 (20.1)	318	<0.01
Lower middle class to rich	16 (4.1)	76 (19.6)	292 (75.3)	388	
Mother's occupation					
Home maker	74 (1.3)	208 (35.1)	310 (52.4)	592	0.07
Service holder	24 (21.1)	40 (35.1)	50 (43.8)	114	
Presence of disease within last 6 month					
Yes	40 (8.2)	176 (35.9)	274 (55.9)	490	<0.01
No	58 (26.9)	72 (33.3)	86 (39.8)	216	

Table VI showed maternal educational status and good socio-economic status significantly impact on nutritional status of under five rural children.
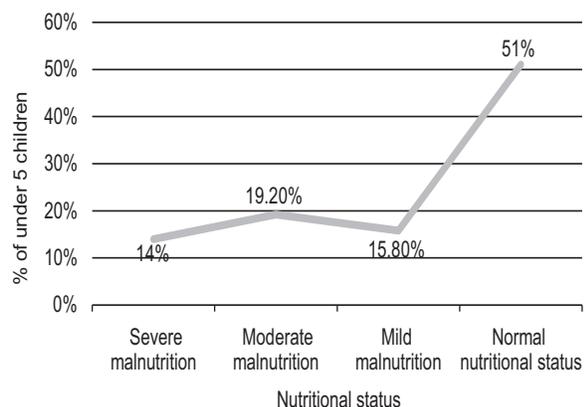

Fig.-1: *Nutritional status by underweight (n=706)*

This figure showed that 51% of the children had normal nutritional status and the remaining 49% were underweight. Of them, 14% were severely underweight.

Discussion:
This cross-sectional study had been conducted to know the nutritional status of under 5 children. Besides, an attempt was made to investigate the importance of family income in relation to some other socio-demographic factors that might affect the nutritional status of children in the rural area of Bangladesh.

The findings of this study showed that 10.5% of the children were wasted, 39% were stunted and 49% were underweight. Of them, severely wasted, stunted and underweight were 1.7%, 16% and 14% respectively. A study conducted by Dipti et al in 2008 in Gazipur district of Bangladesh found 27.9% of the children were wasted, 72.1% were stunted and 73.3% were underweight.[12] Another study conducted by Alom et al in 2012 found 17% were wasted, 41% were stunted and 39% were underweight.[13] Compared to the findings of Dipti et & Alom et al the present study showed that nutritional status was a little better in terms of wasting, stunting and underweight. Another similar study conducted by Das et al in 2017 in Bangladesh found 15%, 36.2% and 33% children were wasted, stunted and underweight respectively.[14] The findings of the present study was almost similar in terms of wasting and stunting but worse in term of underweight in comparison to findings of Das et al.[14]

The multivariate analysis found that mother's education, socio-economic status of the family and the disease within last 6 months had significant

association with nutritional status of under 5 children (P< 0.05, <0.01, P <0.01 respectively) but occupational status of mother had no significant impact on nutritional status (p= 0.07). This study showed significant association between mothers education and child nutrition. The mothers with higher level of education had children with better nutritional status (P< 0.05). A study conducted by Sharmin *et al* found significant association between mother's education and nutritional status of their children.[15] Another study conducted in 2016 by Stamenkovic et al also found the significant relationship with mother's levels of education and child nutritional status.[16]

This study also found the significant correlation of nutritional status with household's socio economic status. In this study, more prevalence of underweight children was in low income family (P < 0.01). This finding is similar with a study of Galgamua et al in Sri Lanka.[17] Another study of Arora et al. found that the nutritional status of children from lower socio economic class was poor as compared to their counter parts came from upper socio economic class.[18] In this study, it is found that the children who had been suffering from different types of diseases within last 6 months, were suffering from malnutrition. Statistically this is also significant (P < 0.01). A review article of Farhadi et al also found the relationship between malnutrition and infection.[19] Katona et al also found strong relationship between malnutrition and infection in their study.[20] In this study, statistical analysis found no significant association between nutritional status and mothers occupation (P = 0.07). A study conducted by Mittal A et al found that the difference between mother's occupation and the nutritional status of their children was insignificant.[21] Haque et al also found no association between mother's occupation and nutritional status.[22]

Conclusion:

This study found 49% of under five children were underweight which was higher than stunted (39%) and wasted (10.5%) children. The findings indicate that the prevalence of malnutrition among under five children is very high in rural area of Bangladesh. Mother's education, poor socio-economic status and disease condition are the prevailing causes of under nutrition.

References:

1. Park K. Park's Textbook of Preventive and Social Medicine. 24th Edition. 1167, Prem Nagar, Jabalpur, 482001 (MP). M/S Banarsidas Bhanot Publishers. January 2017. P-26.

2. Chisti JM, Hossain IM, Malek MA, Faruque AS, Ahmed T, Salam MA. Characteristics of severely malnourished under five children hospitalized with diarrhea and their policy implication. Acta Paediatrica. June 2007; 96: 693-6.

3. United Nations Children's Fund. The state of the world's children 2009. Special edition: celebrating 20 years of the convention on the rights of the child. New York: United Nations Children's Fund; 2009. p. 92.

4. Bangladesh Bureau of Statistics. Statistical Year Book Bangladesh (2016). 36th edition. Page no- 47.

5. Fakir AMS, Khan MWR. Determinants of malnutrition among urban slum children in Bangladesh. Health Economics Review. 2015; 5(22). DOI 10.1186/s13561-015-0059-1

6. FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

7. Kiesswetter E, Colombo MG, Meisinger C, Peters A, Thorand B, Holle R *et al*. Malnutrition and related risk factors in older adults from different health-care settings: an *enable* study. Public Health Nutr. 2020; 23: 446-56.

8. Pelletier DL, Frongillo EA, Jr, Schroeder DG, Habicht JP. The effects of malnutrition on child mortality in developing countries. Bull World Health Organ. 1995; 73: 443-48.

9. Gonoshasthaya Kendra. Unpublished data. January 2019.

10. WHO Training Course. Training course on child growth assessment: investigating causes of under nutrition and of overweight. November 2006. Geneva: WHO. http://www.who.int/childgrowth/training/jobaid_investigating _causes.pdf.

11. Gomez F, Galvan RR, Frenk S, Munoz JC, Chavez R, Vazquez J. Mortality in second and third degree malnutrition. Journal of tropical pediatrics and African child health, 1956; 2: 77-83. Available in https://doi.org/10.1093/oxfordjournals.tropej.a057419

12. Dipti SS, Tuazon AGM, Kabir AK. Nutritional status of the member of the factory worker headed households of four villages of Gazipur district. J agric rural dev. 2008;6:119-24.

13. Alom J, Quddus MA, Islam MA. Nutritional status of under-five children in Bangladesh: A multilevel analysis. Journal of Biosocial Science. 2012;44:525-35

14. Das S, Gulshan J. Different forms of malnutrition among under five children in Bangladesh: a cross sectional study on prevalence and determinants. BMC Nutrition. January 2017. https://doi.org/10.1186/s40795-016-0122-2. Accessed on April 16, 2019.

15. Sharmin S, Islam MA. Determinants of nutritional status of under five children in Bangladesh: A multivariate regression analysis. J. Sylhet Agril. Univ. 2016;3(1):89-93.

16. Stamenkovic Z, Djikanovic B, Laaser U, Mikanovic VB. The role of mother's education in the nutritional status of

children in Serbia. Public Health Nutrition. 2016;19: 2734-42.

17. Galgamuwa LS , Iddawela D , Dharmaratne SD, Galgamuwa GLS. Nutritional status and correlated socio-economic factors among preschool and school children in plantation communities, Sri Lanka. BMC Public Health. 2017; 17:377. DOI 10.1186/s12889-017-4311-y

18. Arora D, Datta S, Sau SK. An Assessment of Socio-Economic Factors on Nutritional Status in Primary School - A Cross Sectional Study in Purulia of West Bengal. International Journal of Occupational Safety and Health. 2014; 4: 15-18.

19. Farhadi S, Ovchinnikov RS. The relationship between nutrition and infectious diseases: A review. Biomed Biotechnol Res J 2018;2:168-72.

20. Katona P, Katona J. The Interaction between Nutrition and Infection. Clin Infect Dis 2018;46:1582-88.

21. Mittal A, Singh J, Ahluwalia SK. Effect of Maternal Factors on Nutritional Status of 1-5 year-Old Children in Urban Slum Population. Indian J Community Med. 2007;32:264-67.

22. Hoque MA, Afzal A, Nasrin T, A. Mafiz AI. A Study on Understanding the Relationship between Predisposing and Enabling Factors on Nutritional Status among Secondary School Students. J. Environ. Sci. & Natural Resources. 2016; 9: 47-51.