

Health and Nutritional Status of Children Visiting a Tertiary Care Hospital in Bangladesh

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Abstract

Background: For optimum growth and development of children we must ensure adequate nutrition for the children. There is a negative correlation between malnutrition & academic achievement of children. Nutritional assessment is mandatory to detect nutritional status of a child. **Objective:** To detect nutritional status of children, to find out the associated factors affecting nutritional status and to make awareness among the population to prevent the dreadful effects of malnutrition in children as well as in society. **Materials and methods:** This cross-sectional study was conducted in the outpatient department of Delta Medical College and Hospital over 6 months. Children aged 2–18 years attending the hospital outdoor for illness, including both nutritionally normal and malnourished children, were included. **Results:** Among 600 children, 51.33% were female and 50% presented with respiratory tract infection. Normal nutritional status, underweight, overweight, obesity and stunting were found in 61.6%, 16.66%, 11.3%, 10.33% and 1.2% respectively. Daily sunlight exposure for more than 20 minutes was reported in 36.5%. Most children were term-born (83.5%), had normal birth weight (81%) and were exclusively breastfed (74%). Normal development, regular deworming and complete vaccination were present in 88%, 52% and 98% respectively. Most children belonged to upper middle-class families (62%). About 40% had one sibling, and low birth spacing was found in 17%. Most mothers were educated (99.67%), though 76% were homemakers, while all fathers were engaged in job or business. **Conclusion:** The nutritional status of Bangladeshi children is changing, with decreasing stunting, underweight and wasting, but increasing overweight and obesity. Proper screening, public awareness and preventive measures can help address this dual health burden and reduce social impact.

Keywords: Malnutrition, obesity, nutritional status, Bangladesh.

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Introduction

Good nutrition is a key need for achieving normal growth and development. Nutritional assessment

therefore should be an important part of the care for every pediatric patient.¹ Inhabitants, wealth status, parent's education, sanitation, maternal and child health, food and dietary practice all affect the

nutritional status of children.² Besides protein energy malnutrition overweight and obesity are also an emerging but significant problem in Bangladesh. In 2009, 9.5% of children aged 6–15 years were overweight, and 3.5% were obese.³ There is a significant and negative correlation between malnutrition and academic achievement.⁴ Overweight or obesity have a serious impact on health. Carrying extra fat leads to serious health issues such as cardiovascular disease, type 2 diabetes, musculoskeletal disorders depression, and some cancers that are not restricted within the age and socio-economic background of human beings. These conditions cause premature death and substantial disabilities that costs for the health care system is extremely high.^{5,9} Malnutrition, in all its forms, includes undernutrition (wasting, stunting, underweight), inadequate vitamins or minerals, overweight and obesity resulting in diet related non communicable diseases. Globally in 2022, 149 million children under 5 were estimated to be stunted, 45 million were estimated to be wasted, and 37 million were overweight or obese. Nearly half of deaths among children under 5 years of age are related to undernutrition.⁶ Underweight is an anthropometric components of malnutrition and is a major public health problem in Bangladesh.⁷ Female gender, low birth weight, more birth order, diarrheal disease all are related to underweight.⁸ The “World Health Organization” (WHO) has stated that 30% of global death will be caused by lifestyle diseases by 2030. Being overweight is one of the major lifestyle diseases. Physical inactivity, improper diet, family history, and the environmental factors are linked to being overweight. Underweight mother, parents with a lower level of education and poorer households were the key risk factors for stunting and underweight.¹⁰ Malnutrition leads to various physiologic adaptations, biochemical changes, impaired cellular immunity, villous atrophy, electrolyte imbalance.¹¹ Delayed global function, motor function, and memory have been associated with malnutrition as the brain is not properly developed in malnutrition.¹² The effects of

malnutrition on the developing brain may be irreversible after the age of 3–4 years.¹³ Obese children exert domain-specific working memory deficits.¹⁴ One study shows that childhood obesity does not have a statistically significant influence on cognitive function.¹⁵ Overweight and obesity are largely preventable. The key to success is to achieve an energy balance between calories intake & expenditure.⁵ Nutrition sensitive interventions at the national or community level, including ensuring household food security, safe water, proper hygiene, female education, creating proper livelihoods, social protection schemes etc. will prevent underweight.¹³ Growth monitoring should be implemented at the community level.¹⁰ Culturally appropriate nutrition education package based on the nutrition triangle (food- health- care) effectively prevent growth retardation and malnutrition among young children.¹⁶

This study was aimed to detect nutritional status of Bangladeshi children and to detect contributory factors affecting nutritional status and to make awareness in the society so that the deleterious effects of it in children that can be prevented and social burden can be reduced.

Materials & Methods

A cross-sectional study was carried out at outpatient department of Delta Medical College and Hospital over a period of 6 months from 15th November 2024 to 14th May 2025. Children aged from two years up to eighteen years who visited hospital outdoor due to any problem were included in this study. Children who were suffering from malignancy, heart disease, chronic liver disease & chronic kidney disease that are associated with secondary malnutrition were excluded from this study. After enrolment detailed case history and thorough physical examination were performed and recorded on the standard case recording form. Detailed history was taken including chief complaints, gestational age, birth weight, feeding history, residence, daily sun exposure, physical activity, socioeconomic condition. Presenting

weight, height was taken for all patients. Socioeconomic condition was classified according to income as follows: low income—\$1,025 or less; lower middle income—\$1,026 to \$4035; upper middle income—\$4036 to \$12,475; and high income—\$12,476 or more per capita.¹⁷ Ethical permission was taken from ethical committee of Delta medical college. Informed written consent was obtained from primary caregivers of the children before enrolment. Advice about preventive measures of malnutrition was given to the caregiver.

Results

Table 1: Age and sex distribution

Age	Male 292(48.67%)	Female 308(51.33%)
2-5 year	123(42.12%)	137(44.48%)
5-10 year	127(43.49%)	120(38.96%)
10-18 year	42(14.38%)	51(16.55%)

Table II: Clinical presentation

System involvement	No of cases
Respiratory (cough, runny nose, throat pain & respiratory distress)	301(50.16%)
Gastrointestinal (diarrhea, vomiting anorexia, warm infestation & abdominal pain)	175(29.16%)
Musculoskeletal & skin problems (limb pain, skin rash)	94(15.66%)
Neurological & psychological (behavioral problems and convulsion)	24(4%)
Genitourinary (dysuria, increased frequency and lower abdominal pain)	20(3.33%)
Cardiovascular (generalized weakness, bluish discoloration- congenital heart diseases)	6(1%)
Hematological (generalized weakness, pallor, anorexia-thalassemia)	4(0.66%)

Table III: Distribution of Residential condition regarding sunlight & daily sunlight exposure

Residential condition regarding sunlight	Proper sunlight	Improper sunlight	Daily sunlight exposure	>20 minutes	< 20 minutes
	340	260		219(36.5%)	381(63.5%)
	(56.67%)	(43.33%)			

Table IV: Distribution of gestational age & birth weight of babies

Gestational age	Term	Preterm	Post term	Birth weight	Normal	Low birth weight	Macrosomia
	501(83.5%)	93(15.5%)	6(1%)		486(81%)	100(16.7%)	14 (2.3%)

Table V: Distribution of exclusive breast feeding and weaning time

Exclusive breast feeding	Up to 6 mo	< 6 mo	> 6 mo	absent	Weaning time	After completion of 6 mo	early	late
	444(74%)	107(18%)	39 (6%)	10(2%)		528 (88%)	32(5%)	40(7%)

Table VI: Distribution of dietary habit

Carbohydrate		Protein		Fast food	
Appropriate	Excessive	Sufficient	Insufficient	Infrequent	Frequent
575(96%)	25(4%)	416 (69%)	184(31%)	526(88%)	74(12%)

Table VII: Distribution of deworming status & drug history

Deworming status	Regular	irregular	Prolong intake of drugs causing weight gain	Yes	No
	311(52%)	289(48%)		44 (7%)	556(93%)

Table VIII: Vaccination status & developmental status

Vaccination according to EPI schedule				Developmental status		
Complete	Incomplete	Extra vaccination	Normal	Delayed 54(9%)		
				Speech	Cognitive	Motor
588(98%)	12(2%)	57(9.5%)	546(91%)	44(7.3%)	5(0.83%)	5(0.83%)

Table IX: Distribution of physical activity & sleep duration

Physical activity(exercise)		Sleep duration				
>30 min	< 30 min	<6 hr	6-8 hr	9-10 hr	11-12 hr	>12 HR
470(78%)	130(22%)	14(2%)	229(38%)	257(43%)	96 (16%)	9 (1%)

Table X: Number of siblings and birth spacing

None	1	No of sibling	2	3	≥4	<1 yr	Birth spacing	1-2 yr	2-3yr	>3 yr
206(34%)	237(39.5%)	123(20.5%)	29(5%)	4 (3 %)	14(3%)	73(14%)	103(20%)	328(63%)		

Table XI: Parents education status

Parents	School	College	Diploma	Degree	Honors	Masters	No
Father	74(12 %)	87(14.5%)	2(0.33%)	8(1.33%)	148(25%)	275(46%)	6(1%)
Mother	111(18.5%)	121(20.16%)	11(1.83%)	14(2.33%)	138(23%)	203(33.83%)	2(0.33%)

Table XII: Parents occupation

Parents	Teacher	Engineer	Doctor	Banker	Business	Other	Homemaker
Father	26(4.33%)	48(8%)	13(2.16%)	46(7.66%)	158(26.33%)	309 (51.5%)	
mother	28(4.6%)	11(1.8%)	15(2.5%)	13(2.2%)	6(1%)	71(11.8%)	456(76%)

Table XIII: Health hygiene status

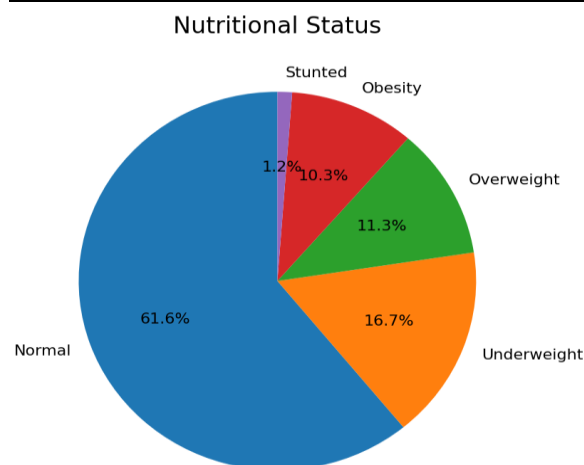
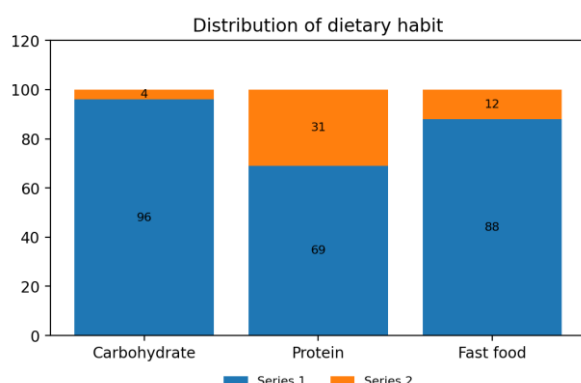
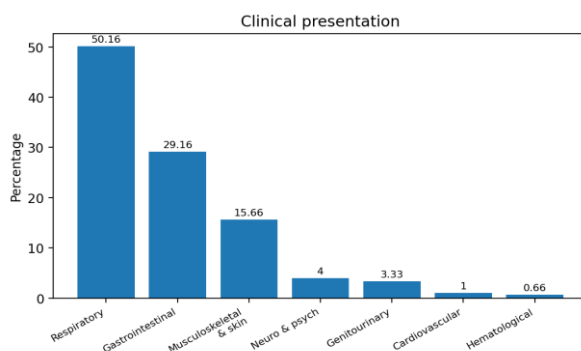
Proper waste disposal		Pure drinking water		Hand washing	
Yes	No	Yes	No	Yes	No
578(96.3%)	22(3.7%)	588 (98%)	12(2%)	480(80%)	120(20%)

Table XIV: Socioeconomic status

Lower	Lower middle	Upper middle	Upper
17(3%)	120(20%)	373(62%)	90(15%)

Table XV: Nutritional status

Normal	Underweight	Overweight	Obesity	Stunted
370(61.6%)	100(16.66%)	68 (11.3%)	62(10.33%)	7 (1.2%)

**Figure I: Nutritional status****Figure II: Distribution of dietary habit****Figure III: Clinical presentation**

Discussion

We have done the study on Bangladeshi children aged between 2-year to 18-year-old who visited outdoor for their illness to detect the nutritional status of children and to detect the factors affecting it. In this study obese and overweight children were more (21.63%) in number than underweight (16.66%) children. Maximum number of children was nutritionally normal. A study done by Hakim MA et al revealed that maximum children were nutritionally underweight.¹⁸ A study done by Sarker AR revealed that the prevalence of childhood obesity of Bangladeshi children was 10.89 %. Which supports our study result.¹⁹ In our study 1.2 % children were stunted. A study done by Begum G et al showed that the rate was 4.9 %.²⁰ So, there is a decreasing trend of stunting. This also supported by a study done by Das S. et al.²¹ In our study female children were more in number than male children. The 2022 Bangladeshi census supports this result. Another study done by Hidayat et al showed same result.²² Under 5 –year age group were more in number. As illness and nutritional problems are common in this age group. Most common illness of children was respiratory tract infection. Saikia D et al shows same result.²³ About one third children had history of more than 20 minute/day sunlight exposure. In our study the rate of preterm delivery and low birth weight were 15.5% and 16.7 % respectively. A study done by Hossain AM revealed that the prevalence of preterm delivery was 14.6%.²⁴ A study done by Shaikh et al showed that the prevalence of LBW at urban area was 15.2%.²⁵ Most of the children (74%) were on exclusive breast feeding and started weaning timely (88%). Islam M et al showed the same result.²⁶ Excessive carbohydrate, fast food and insufficient protein intake were 4 % ,12% & 31% respectively. About half of the children (52%) were on regular anthelmintic drugs. A study done by Jolly et al shows almost same (51%) result.²⁷ Our study reveals that 98% children had completed vaccination according to EPI schedule. According to the 2022 Bangladesh Demographic and Health Survey (BDHS) data 86% of children were fully

immunized. In our study most of the children were on regular physical activity and had normal sleep habit. Regarding development 7.3% children had speech delay. There is no statistical data on the prevalence of speech delay at national level. Most of the children (39.5%) had one sibling with appropriate birth spacing. The rate of short birth spacing (<2 year) was 16%. A study done by Islam MZ et al disclosed that the prevalence rate was 26%.²⁸ So there is reduction of rate of short birth spacing. Regarding health hygiene Children with history of proper waste disposal, pure drinking water and proper hand washing were 96.4 %, 98% & 80% respectively. A study done by Bhattacharyya H revealed that the rate of personal hygiene was 60.3%.²⁹ Our study shows that more than half of the parents were highly educated. Mothers were more educated than fathers. Maternal education has an important role in child nutrition. As they have proper knowledge about how to feed and take care of their children. This also supported by a study done by Islam B et al.³⁰ Our study exhibits that 76% mother were home maker and all fathers were engaged in either job or business. Most of the children (62%) were from upper middle-class families. Urbanization improved socioeconomic conditions, less physical activity, excess carbohydrate and fast-food intake may have positive effect on overweight and obesity. On the contrary improved wealth status, parental education status, well hygienic status, high vaccine coverage may be responsible for lower trend of underweight and stunting in Bangladeshi children than before.

Conclusion

In Bangladesh overweight and obesity are newly emerging health problem besides underweight. So we are suffering from dual problem of malnutrition. Public awareness through mass media will be helpful to overcome the situation.

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