

# Nutritional Status of Child labourers in Dhaka city of Bangladesh: Findings from a Cross Sectional Study

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## Abstract

**Background:** Nearly 7.9 million children are working in Bangladesh; many of which in urban areas, particularly in Dhaka city. Working during childhood impedes the children's growth potential leading to malnutrition. The objective of this study was to investigate the nutritional status and food intake pattern of child laborers of Dhaka city, Bangladesh.

**Methodology:** The study followed a cross-sectional study design and was conducted among 100 randomly selected child laborers (aged 5-17 years) from an NGO led school of Dhaka. Anthropometric measurements were taken using standard methods while socio-economic status and dietary intake were assessed through interviewing the respondents with a pretested questionnaire. Data were analyzed using SPSS, Epi info and MS excel DANS<sup>(R)</sup> software.

**Results:** Forty five percent children were fixed salary earners and 89% of them worked to support their family. Anthropometric assessment revealed that, 26%, 15% and 26% respondents were stunted, wasted and underweight respectively. According to BMI for age, 39% of the children were thinner. Overall, 52.1% and 60.8% of the calorie requirement and 77.6% and 82.2% of the protein requirement were fulfilled by boys and girls respectively. Almost all the micronutrients' requirement except that of thiamin and vitamin C were very poorly fulfilled.

**Conclusions:** Overall, nutritional status of the child laborers were below acceptance. Per capita dietary intake was poor and imbalanced containing very low amount of micronutrients leading to malnutrition. Nutrition intervention program needs to be administered especially targeting working children. Adult unemployment and underemployment should be reduced and parents need to make aware of the harmful nutritional impact of working in childhood.

**Keywords:** Child laborer, Nutritional status, Anthropometry, RDA

## Introduction

Child labor has been appeared as one of the most debilitating and ever-increasing problem of the world particularly of developing countries<sup>1,2</sup>. UNICEF reported that, at least 250 million children aged between 5 and 14 years work for living in developing countries; nearly 70% of which are engaged in agricultural sector; 22% in services and 9% in industries including mining, construction and

manufacturing<sup>3</sup>. Although, most of these working children are of age 11-14 years, nearly 60 million of them fall to the age group of 5-11 years<sup>3</sup>. It is even more regrettable that a number of these children use to work in a serious hazardous profession like mining, fishing, construction and so forth making themselves susceptible towards a severely deteriorated health and nutrition status which can continue from one generation to the next<sup>4</sup>.

International Labor Organization (ILO) defines 'child labor' as work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development<sup>5</sup>. However, all works of the children cannot be termed as 'child labor', instead it depends on the child's age, type and hours

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of work performed, the conditions under which it is performed and the objectives pursued by individual countries<sup>5</sup>. The severity of child labor problem is particularly dependent on the definition of child and minimum age limit for joining labor force. Definition of child, however, is not uniform in all countries and according to the convention on the Worst Forms of Child Labor, 1999 (No-182) individual governments may define "child" according to age or other criteria depending on its socio economic situation. In Bangladesh, permitted minimum age for starting work is not uniformly set due to the existence of almost half a dozen of labor laws defining it differently. However, in the present study, the age limit was set as 5-17 years<sup>6</sup>.

Like all other developing countries, Bangladesh is also facing intense child labor problem. According to the most recent National Child Labor Survey (NCLS), conducted in 2002-03, there were around 7.9 million working children in the age group of 5-17 years in Bangladesh<sup>7</sup>. Widespread household poverty is considered as the major cause of increased child laborers in Bangladesh<sup>8</sup>. Yet, several other factors are also closely linked with child labor problem. Illiteracy is one of them, as illiterate children and/or parents are not interested to education and therefore children join the workforce immediately. Other factors which exacerbate child labor problem of the country includes rapid population growth, adult unemployment, bad working conditions, lack of minimum wages, exploitation of workers and gender discrimination<sup>9</sup>.

Nutritional status of children is considered as a major indicator of future well being as the future physical and mental or intellectual development of children are largely affected by their childhood nutritional status<sup>10</sup>. But, unfortunately a large proportion of young children particularly those of South-Asian region are suffering from different forms of under-nutrition<sup>11</sup>. It is documented that, an excess of 10 million under-five children dies each year due to disease and malnutrition<sup>12</sup>. Developing nations are particularly susceptible to childhood under-nutrition problem, as according to UNICEF, nearly 40% under-five children of the developing countries are moderately or severely stunted<sup>12</sup>. Under-nutrition is also prominent among adolescents of the developing countries. For example, 32% and 47% adolescents were found to be stunted in India and Nepal respectively<sup>13</sup>.

Similar to other developing countries, a huge proportion of Bangladeshi children especially those of very young age are suffering from different types of under-nutrition. In fact, according to the most recent Demographic and Health Survey, 41%, 36% and 16% children are stunted, underweight and wasted respectively in Bangladesh and most of which belong to the lowest wealth quintiles<sup>14</sup>. Micronutrient malnutrition is also extremely prevalent among Bangladeshi young children. Most recent National Micronutrient Survey found very poor intake of micronutrient rich food items and reported a high prevalence of micronutrient deficiency among the young children. The report outlined the prevalence of vitamin A deficiency, zinc deficiency and anemia among preschoolers as 19%, 49% and 33% respectively<sup>15</sup>. Intake of micronutrient rich food items was also very low<sup>15</sup> which is also supported by Arsenault *et al.* (2013)<sup>16</sup>, who reported a mean prevalence of 43% as the adequacy of micronutrient intakes for Bangladeshi children.

Although majority of the child laborers work in rural areas of Bangladesh, those working in urban areas are more susceptible to unfavorable environment with higher possibilities of deteriorated health and nutrition status<sup>7</sup>. Dhaka being the capital and most populous city of the country, accompanies most of the urban child laborers of Bangladesh. Although the nutritional status of under-five children of Bangladesh is mostly known, nutritional profile of the child laborers particularly those of urban areas is still largely unexplored. Therefore, present study was undertaken with an aim to investigate the nutritional status and food intake pattern of child laborers of Dhaka city.

### Methodology

This cross sectional study was carried out in a school, specially run for child laborers in Moghbazar of Dhaka city. This school is led by a local NGO and children are allowed to stay for any two hours of the whole day depending on their convenient time.

The population of this study includes all the domestic child laborers of the Dhaka Metropolitan city aged between 5-17 years. Because of the resource and time constraints and exploratory nature of the study, 100 child laborers were included and were randomly selected from the total students of that school.

A structured questionnaire was developed to identify the socioeconomic situation of the subjects and information was gathered through interviewing the

respondents. The questionnaire was pretested several times before the actual interview to ensure that its wording, format, length and sequencing of the questions are appropriate. Feedbacks were incorporated until it was ready for data collection and content coverage, reliability and validity of the study was ensured. The age of the children were collected from the school records and respondents themselves. If it was not possible then approximate age was determined by asking some local and national incidence occurred at that period.

Anthropometric measurements were taken using standard methods. Body weight of the subject was recorded in kilograms by using standard weighing machine. During measuring the weight of each subject, they were asked to be bare footed and remove heavy cloths. For measurement of height, subjects were positioned to stand on the platform, bare footed with their head upright, looking straight forward by using standard height measurement scale. Weight and height was measured to the nearest 0.1 kg and 0.1 cm respectively. Mid Upper Arm Circumference (MUAC) was measured by using a flexible, non-stretch tape. The measurement was taken at themed-point of the upper left arm (for right handed) between the acromion process and the tip of the olecranon process.

Information about their habitual dietary intake was obtained using a 24 hour recall method. Participants were asked about their dietary habit. They were shown various standard utensils, such as measuring cups, spoons, glasses, plates and models of different foods to get nearest possible of serving sizes of the cooked food consumed. Intake of snacks or meals outside home was also recorded. From this information, weights of consumed food items were calculated. The collected data was then entered into SPSS (version-17) and checked for consistency.

Raw anthropometric data of SPSS windows (version-17) were transferred to Epi info to obtain derived indices of anthropometric measurements such as Weight for Age, Height for Age, Weight for Height and BMI for Age. The indices derived from Epi info, were then transferred again to SPSS for further analysis. Body Mass Index (BMI) is measured by 5<sup>th</sup> and 85<sup>th</sup> percentile for cut-off points of BMI-for-age for adolescent and nutritional status was categorized into three groups - normal, thin and overweight.

From the cooked food weight, equivalent raw weight was calculated in SPSS using a conversion table of Bangladeshi food items<sup>17</sup>. Dietary data were then transferred to MS Excel DANS<sup>(R)</sup> (Dietary Analysis for Nutritional Sciences), a software package developed at INFS using Bangladeshi and Indian food composition tables, for convenient analysis of food items for their respective calorie, protein, fat, carbohydrate, calcium, iron, vitamin A, thiamin, riboflavin, niacin and vitamin C values. Nutrient values were then transferred to SPSS again for comparing the mean intake with the RDA of the respective nutrients.

## Results

Table-I illustrates the relevant socioeconomic characteristics and health status of the child laborer in the study sample. Among 100 children interviewed, 17 were below the age of 11. 45% were engaged in service with fixed salary; whereas 24 were manual worker and rest of them were small traders. Majority (89%) reported they chose this profession to support their family. Around half of the children were found receiving a monthly salary of less than 500 Tk. with only 28% receiving in excess of 1000 Tk. Their fathers' occupation was mostly trading (31%) and rickshaw pulling (23%); mothers were mostly (47%) domestic workers. Nearly, six out of ten children had to live with a monthly family income of less than or equal 9000 Tk. Although, around 8 of 10 children belonged to the age range of 11-17, only one third of them were found as primary completed. Nearly 90% children found to be resided in tinned roof rented house.

Anthropometric measurements of the child laborers are depicted in table 2. While considering the Weight for Age Z-score of the children, 26% of them were underweight (Z-score < -2.00 SD). When we considered height instead of age and constructed Weight for Height Z-score, percentage of wasted (Z-score < -2.00 SD) children was found to be 15%. Meanwhile, quite a large percentage of the children were also found to be suffering from chronic under-nutrition, confirmed by the stunting rate (26%) of the children (Height for Age Z-score < -2.00 SD). Boys were more undernourished compared to their female counterparts- 40% boys were underweight compared to 12% of the girls; stunting percentage was also higher among boys (30%) in comparison to girls (22%) but wasting percentage was little bit lower (14%) among boys compared to that of girls (17%) (Table

3). According to the BMI for Age (5th and 85th percentiles as cut-off points of BMI for age for adolescents), nearly 4 out of 10 children were thin (data not shown). This is also noteworthy that, when we analyzed the anthropometric data considering the difference in age of the participants, we found very little difference in nutritional status among different age cluster (data not shown).

**Table -I**  
*Socioeconomic characteristics and health status of the child laborer*

Variable	Percentage
Age of Child	
5-11 yrs	17
11 - 12.99	25
13 - 17	31
Types of occupation	
Manual worker	24
Service (Fixed salary earner)	45
Small trader	31
Causes of doing this	
To support family	89
To support study	09
To learn work	02
Types of occupation of father	
Rickshaw puller / Thela puller	23
Small Trader	31
Others	46
Types of occupation of mother	
House wife	39
Domestic Worker	47
Others	14
Monthly income of the family (Tk.)	
d" 6000	22
6100 - 9000	36
9100 - 12000	20
≥12100	22
Education level	
Primary incomplete	33
Primary complete	67
Type of the roof of the house	
Kutch /thatched	01
Tin roofed	89
Concrete roofed	10
Disease pattern of the respondents	
Diarrhea	23
Fever	79
Body ache	08
Others	68

**Table-II**

*Nutritional status of respondent by height for age, weight for age and weight for height*

Indices	Malnourished	Well nourished
	(< -2.00 SD)	(e" -2.00 SD)
	(%)	(%)
Height for Age Z-score	26	74
Weight for Age Z-score	26	74
Weight for Height Z- score	15	85

**Table-III**

*Distribution of nutritional status of respondents by sex.*

Indices	Malnourished (≤ -2.00 SD)	
	percentage	
	Boys (%)	Girls (%)
Height for Age Z-score	30	22
Weight for Age Z-score	40	12
Weight for Height Z-score	14	17

Per capita per day calorie and other nutrients' consumption as well as percentage of requirement fulfilled by the respondents were presented in Table -IV. Mean calorie intake (per day) among boys was 1092 Kcal which was only half of the required daily calorie intake. Though not significant, calorie intake was a little bit higher (60% of the required amount are fulfilled) among girls. Although nearly 80% of the protein requirement was fulfilled, fat requirement was very poorly managed (less than 40% of the requirement) by the children. Calcium and iron intake was very poor; only around 40% of the required amount was fulfilled. Vitamin A intake was negligible as only one fourth of the required amount was satisfied. Among the water soluble vitamins, although thiamin and vitamin C intake was bit satisfactory (around 60-70% of the required amount), riboflavin intake was very poor.

Table-V shows distribution of the respondents' food frequency or preferences of food intake. Not surprisingly cereals and pulses were reported to be consumed daily by all the respondents. Only, 10% of them stated that although they did not eat vegetables daily, they took them frequently. Meat, fish and egg consumption pattern was also satisfactory; almost

**Table -IV**

*Mean calorie and nutrient intake (per capita per day) and percentage of the requirement fulfilled by sex*

Nutrients	Sex					
	Boys			Girls		
	Mean ± SD	RDA*	Requirement fulfilled (%)	Mean ± SD	RDA*	Requirement fulfilled (%)
Energy (Kcal)	1092±264	2023	52.07	1095±297	1784	60.76
Protein (g)	35±14	44	77.64	36±17	43	82.22
Fat (g)	7±5	23	30.43	8±11	23	34.78
CH (g)	219±52			218±51		
Ca (mg)	229±183	613	37.78	183±178	613	43.23
Iron (mg)	7±4	24	30.88	4±7	26	34.16
Vit.A (IU)	506± 780	1824	27.37	451± 740	1831	24.41
Thia (mg)	0.71±0.19	1.05	66.98	0.73±0.23	0.92	79.35
Ribo (mg)	0.29±0.15	1.26	23.02	0.31±0.15	1.10	28.18
Niacine (mg)	12±3	13.85	86.64	11±4	12.06	91.21
Vit.C (mg)	29±24	47.5	60.63	27±24	47.5	66.98

Source: National Nutritional Survey (1995-1996)

80% of the respondents affirmed the daily consumption of this food item. In contrast, fruit consumption pattern was unsatisfactory as 25% of them said that they usually took fruits at times, with 15% reporting rare consumption. But probably the worst situation was in the intake pattern of milk and milk products. Only 11% children agreed that, they had a daily intake of milk and milk products, whereas almost half of them took them at times and rarely.

**Table-V**

*Respondent's food frequency or preferences of food intake*

Food items	Daily	Frequently	Of time	Rarely
Meat	81	18	1	0
Fish	72	20	8	0
Egg	82	16	1	1
Milk & milk products	11	40	43	6
Fruits	38	22	25	15
Vegetables	90	10	0	0
Pulses	100	0	0	0
Cereals	100	0	0	0

**Discussion**

Children are considered as the leader of tomorrow. But they are the most victimized group of the society and regrettably, child labor is widely accepted in Bangaladesh<sup>18</sup>. In spite of the fact that child labor is an overwhelming problem of the world, very limited number of research has been conducted to investigate its impact on the health and nutrition status of the children<sup>19</sup>. Current study was deemed to assess the nutritional status and dietary intake pattern of child laborers in Dhaka city of Bangladesh.

Analysis revealed that the overall underweight, stunting and wasting percentage was 26%, 26% and 15% respectively among the child laborers. Male stunting rate (30%) was higher than that of their female counterpart (22%). Unlike to the study conducted in Orissa<sup>20</sup>, which reported wasting rate of 18% and 8.5% respectively in male and female, current study found a higher wasting rate among female (17%) compared to male (14%). Kurshed *et al.* (2010)<sup>21</sup> conducted a study among adolescents' girls in Dhaka city and found that, 19% of them were undernourished considering BMI for age as the criteria of comparison. Current study demonstrated more debilitating picture, as under-nutrition rate was found as high as 39% among child laborers.

When we compared daily required amount of calorie (RDA) with that of the original intake, we found that, only 50% and 60% were fulfilled among boys and girls respectively. Our findings signifies the poor food intake pattern of child laborers as this is significantly lower compared to the result of another study conducted among normal adolescents which reported that, 95% of the energy requirement was fulfilled (Kurshed *et al.*, 2010)<sup>21</sup>. Our dietary data suggested that, although protein requirement was substantially met through considerable intake of cereals and animal products, calorie and micronutrient requirement was very poorly satisfied which might have contributed to the poor nutritional status of the participants.

### Conclusions

The present study grossly summarized the health and nutrition situation of the children of Dhaka city who had to work to lead their life. Majority of the child laborers were hailing from poor and illiterate families. Their family income was below the acceptance level which forces them to join the work force at childhood. The study revealed that the overall nutritional status of the population were below acceptance which have been expressed through various indices. The per capita dietary intake was very poor, that compounded with imbalanced diet with poor micronutrient intake leading to malnutrition. The food intake pattern of them also supported this, as their regular diet was mostly devoid of the source of micronutrients like milk and milk products, fruits etc.

Large scale nutrition intervention program should be designed targeting this vulnerable group ensuring adequate supply of both macro and micronutrients for them. Employment opportunities and minimum wages of the adult people needs to be increased which would allow the children not to join the work force resulting improved nutritional condition of them. Strict monitoring of the existing labor laws of Bangladesh is important as it would prevent the employers in recruiting children as laborer and also would improve the health environment of the factories. Finally, parents also need to be aware of the health and nutritional impact of working in childhood to ensure effective control of this problem.

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