

# **Nutritional status and dietary intake of the orphans: A case study in the ICH (Intervida Children Home) in Dhaka city in Bangladesh.**

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## **Abstract:**

The study was conducted among Intervida beneficiaries (Students) on October 2010. Total number of students was 46. The purpose of the study was to assess the nutritional status and dietary intake of the orphan children. All of the children were abandoned and got admitted to the ICH within one year of age. Among them 89.1% were Muslim, 2.2% were Christian and 8.7% were Hindu. 8.70 % students got enrolled in special education as they were either physically or mentally disabled. The mean±Sd of age, height and weight were 104.65±16.51 months, 126.37±6.98cm and 26.87±6.98kg respectively. While BMI was considered, it was found that 60.87% (28) students were normal, 21.74% (10) student were overweight, 6.5% (3) students were and 10.87% (5) students were underweight. Considering HAZ (Height for age Z-score), 89.1% (41) were normal, 8.7% (4) Stunted and 2.2% (1) tall. While WAZ (Weight for age Z-score) was considered, 84.8% (39) were normal, 2.2% (1) was overweight and 13% (6) were underweight. On the other hand, when, WHZ(Weight for Height Z-score) was used, it was found that 83.8% (31) students were normal, 8.1% (3) student were overweight , 5.4% (2) students were obese and 2.7% (1) student was Wasted. The mean calorie, protein, carbohydrate and fat intake were 2270 kcal, 65 gram, 335 gram and 73 gram respectively. Carbohydrate, protein and fat provided 59%, 12% and 29% of total calorie respectively. Average intake of calcium, iron, vitamin A, carotene, vitamin B1, vitamin B2, niacin, vitamin C and zinc intake was 826 mg, 31 mg, 6462 IU, 10508 µg, 1.60 mg , 1.64 mg, 19 mg , 111 mg and 10.2 mg respectively.

**Key words:** Orphans, Nutritional status and Food intake.

## **Introduction:**

Malnutrition is still a devastating problem in certain parts of the world although proportion and absolute number of chronically under-nourished people have declined. Under-nutrition remains as a serious problem among poor families of under-developed nations, resulting from consumption of poor diet over a long

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period of time (1). Protein energy malnutrition has been a common health problem of the third world. It is of much serious concern among children of school-going age who are deprived of good and ample nutrition due to their poor socio-economic status, ignorance and lack of health promotional facilities (2). An orphan is deprived of parental care, one that lacks support, supervision or care and who lost his/her home or address. Children belonging to poor socioeconomic status are observed to be malnourished in rural Bangladesh<sup>3</sup>. The nutritional status of orphans and destitute are perhaps still worse. Besides food they are deprived of the warmth of parents' affections which is an important factor for overall development of the children<sup>2</sup>. In recent years, destitute have started receiving attention of the government as well as of the NGO's, as revealed by the proliferation of orphanages and pathakali trust etc. in our country. The orphanages attempt to give the destitute orphans a better life and provide them with all possible facilities for their better food, housing, medication, education and facilities of sports and games compared to their earlier situation. Thus they are brought up under an organized and controlled situation, everyone being exposed to more or less similar dietary and environmental situations<sup>2</sup>. In the present context it is more important to study the impact of organized institutional feeding and better hygienic condition by assessing the nutritional status of the orphans who were consistently reported to be initially malnourished before they were brought to the orphanage.

### **Methods and Materials:**

#### **Subject and data collection method:**

In order to study the nutrition profile of the orphans, a cross-sectional study was carried out in ICH of Dhaka city in October 2010. This orphanage provides shelter, education and other facilities to 46 orphans (male-16, Female-30) about 6-15 years of age belonging specially to Muslim community. Information was collected regarding socioeconomic condition, dietary intake, anthropometry and some clinical history. Food intake was obtained by 24 hour food weighing method for seven consecutive days. The average food intake were calculated by using food values table prepared by the Institute of Nutrition and Food Science<sup>4</sup>. In order to assess the nutritional status of the orphans, anthropometric measurement of height and weight were obtained from all the children. Till now there has been no study focusing the nutrition profile of the orphan destitute. The present findings were as such compared with those of the corresponding findings of 1995-96 nutrition survey and the subject belong to similar age and sex groups. Requirement of energy and protein has been calculated based on 1995-1996 national Nutrition Survey of the similar age and sex group<sup>5</sup>.

#### **Data analysis:**

SPSS-12, Epi- info were used to analyze anthropometric, socio-economic, clinical and dietary data. Data are analyzed to obtain mean and standard deviation.

**Results:****a. Socio-economic data:**

All the children were abandoned and got admitted to the ICH within one year of age. None of the children were taken care by their father or mother. Among them most of were Muslim . Half (50%) of the students studies in class one and 30.44% studies in class two. Besides this 8.70 % students get enrolled in special education as they are either physically or mentally disabled(Table-1)

**Table1: Distribution of Orphans by their Age and Education:**

Age		Education		
Age in year	No of orphans	Class	No. of orphans	%
6	1	Baby	1	2.2
7	8	Class-1	23	50.00
8	12	Class-2	14	30.44
9	15	Class-3	2	4.4
10	5	Class-4	1	2.2
11	3	Class-5	1	2.2
12	2	Special School	4	8.70
		<b>Total =</b>	<b>46</b>	<b>100</b>

**b. Dietary data:****Table-2: Compared with Daily Food intake (gm/person/day) of the Intervida orphans and 1995-1996 nutrition survey in urban population of the same group (6-15 years).**

Food intake /person/day	Taken by Orphan child	1995-1996 survey in Urban location (6-15 year of age)
Cereals (gram)	260	350.20
Roots & Tubers (gram)	60	64.40
Pulse & Nuts (gram)	42	16.10
Leafy Vegetables (gram)	92	91.03
Non leafy Vegetables (gram)	155	
Meat (gram)	50	18.73
Egg (gram)	43	
Fish (gram)	55	28.60
Milk and milk product (gram)	250	19.97
Fruits (gram)	50	14.80
Sugar (gram)	51	6.23
Oil (gram)	50	9.83
<b>Total (grams)</b>	<b>1247</b>	<b>619.90</b>

Table-2 shows that the total food intake of the orphans was 1247 gram which is about double in compared to similar children of nutritional survey (1995-96). The intake of cereals and root & tubers were lower in the study population as compared to 1995-96 survey.

**Table-3: Percent Distribution of energy from different Nutrient and 1995-1996 survey of the urban location of same group (6-15 year age):**

Nutrient	Amount (grams)	Energy (Kcal)	Calorie percentage	Nutrient intake of urban children ;1995-1996	Requirement (6-15 year age)
Carbohydrate	335	1340	59		
Protein	65	273	12	43.63	43.40
Fat	73	657	29		
Total Energy		2270	100	1594.00	1903.17

Table-3 shows that mean energy, protein, carbohydrate and fat intake were found to be 2270 kcal, 65 gram, 335 gram and 73 gram respectively. Carbohydrate, protein and fat provide 59%,12% and 29% of total calorie respectively. Protein intake was 65 gram, that are about 50% higher than the requirement (43.40 gram) and also 1995-96 nutrition survey. In consider to energy intake it was found that about 20% more intake than requirement and about 42% higher intake compared to 1995-96 nutrition survey of the urban location of the same group.

**Tables-4 Compared of Micro nutrient intake between orphans child and 1995-1996 national Nutrition survey in urban location of the same group (6-15 year age).**

Nutrient	Intake by Study population	1995-1996 urban micronutrient intake of same group (6-15 year age)
Calcium (mg)	826	316.67
Iron (mg)	31	11.73
Vitamin A (IU)	6462	1686.67
Carotene (µg)	10508	
Vitamin B <sub>1</sub> (mg)	1.60	0.47
Vitamin B <sub>2</sub> (mg)	1.64	0.48
Niacin (mg)	19	15.97
Vitamin C (mg)	111	32.63
Zinc (mg)	10.2	

Table-4 shows that mean calcium, iron, vitamin A, carotene, vitamin B1, vitamin B2, niacin, vitamin C and zinc intake were 826 mg, 31 mg , 6462 IU, 10508 µg , 1.60 mg, 1.64 mg, 19 mg, 111 mg and 10.2 mg respectively. Compared to 1995-96 the entire micronutrient intake was significantly higher in orphan's child.

**c. Anthropometric data:****Table-5: Mean Height, Weight, Age and different Nutritional status indicator of the Intervida orphans children:**

Indicator	Male	Female	Both
Age in month	97.87±10.77	108.27±18.01	104.65±16.51
Height in centimeter	123.5±7.61	127.88±10.72	126.37±6.98
Weight in kg	24.8±6.48	27.97±7.09	26.87±6.98
Height for age (HAZ)	-0.78±1.08	-0.75±1.0	-0.76±1.02
Weight for age (WAZ)	-0.515±1.23	-0.318±1.22	-0.39±1.22
Weight for height (WHZ)	0.04±1.04	0.646±1.53	0.38±1.36

Table-5 shows that mean age, height and weight were 104.65±16.51 months (Male =97.87±10.77 months and female=108.27±18.01 months), 126.37±6.98 cm(male=123.5±7.61cm, female= 127.88 ± 10.72cm) and 26.87±6.98 (male=24.8±6.48kg ,female=27.97±7.09kg)respectively.

**Table-6: Nutritional status of the study children according to different Anthropometric indicator:**

Anthropometric Indicator	Nutritional Status	Male	Female	Both
Height for age (HAZ)	Normal	14 (87.5%)	27 (90%)	41 (89.1%)
	Stunted	2 (12.5%)	2 (6.7%)	4 (8.7%)
	Tall		1 (3.3%)	1 (2.2%)
Weight for age (WAZ)	Normal	13 (81.3%)	26 (86.7%)	39 (84.8%)
	Overweight	1 (6.3%)		1 (2.2%)
	Underweight	2 (12.5%)	4 (13.3%)	6 (13%)
Weight for height (WHZ)	Normal	15 (93.7%)	16 (76.2%)	31 (83.8%)
	Overweight		3 (14.3%)	3 (8.1%)
	Obese		2 (9.5%)	2 (5.4%)
	Wasted	1 (6.3%)		1 (2.7%)

Table -6 shows that based on HAZ, 89.1% were normal, 8.7% Stunted and 2.2%(1) was tall. While we considered WAZ, 84.8% were found to be normal, 2.2%(1) overweight and 13%(6) were found to be underweight. While we considered WHZ, 83.8% were found to be normal, 8.1% were found to be overweight , 5.4% were found to be obese and 2.7% were found to be Wasted.

**Table-7: Percent distribution of Nutritional Status based on BMI percentile:**

Nutritional status	Percent
Underweight	10.87%(5)
Normal	60.87%(28)
Overweight	21.74%(10)
Obese	6.5%(3)

Table- 7 shows that 60.87%(28) students were normal, 21.74%(10) student were overweight , 6.5%(3) students were obese and 10.87%(5) students were underweight.

#### **d. Clinical data:**

EPI coverage is 100%. There was 8 mentally and 4 physically disabled child.

#### **Discussion:**

Total number of orphans was 46. All children were abandoned and got admitted to the ICH within their one-year of their age. In this study 8.70 % (4) of the total students got enrolled in special education as they were either physically or mentally disabled. In one study of Dhaka city total 179 female resident orphans aged 6-15 years from 2 orphanages named Alnahian Shishu Paribar and Ahsania Mission of Dhaka city, basis of BMI, the malnourished orphans were 63.2% in Ahsania Mission and 58.3% were in Alnahian Shishu Paribar<sup>6</sup>. In a similar study, Begum et al. found 23.89% girls and 21.21% boys had normal nutritional status<sup>7</sup>. But in this study, considering BMI percentile, 60.87% were normal, 21.74% were overweight, 6.5% were obese and 10.87% were underweight, which is better compared to the previous two studies.

Another study was conducted in an orphanage in Tamale, Ghana, West Africa of forty children, 22 boys and 18 girls, aged 2-18 years and the nutritional status indicated that, 10% and 15% of the children were stunted and wasted respectively (<-2) Z score<sup>8</sup>. Another study of Dhaka city by Hassan & Barua in Dhammarajika orphanage among 5-15 years of ages were found that 16 % of children were 3<sup>rd</sup> degree malnourished at the age of 14 according to Gomez classification and also 16% were severely stunted at the same age group and 14% at the age of 5<sup>9</sup> but in the present study it was found to be only 8.7% Stunted, 2.7% Wasted and 13% was found to be underweight according to Weight for age Z-score. In Tamale, Ghana study dietary intake data showed energy intakes for the children aged 1-3 years as 963 kcal, 7-10 years as 1627.4 kcal and 11-14 years as 1547.53 kcal and 15-18 years as 1540.6 kcal. Protein intake for the same age groups was 33, 52.1, 50.6 and 49.3 g respectively, with fat 27 g, 33.9 g, 31.9 g, 31.9 g and carbohydrate 150 g, 284.3 g, 269.1 g and 296.1 g respectively<sup>8</sup>. Hassan & Barua<sup>9</sup> was found that energy and protein intake were 2376 kcal and 67.7 g respectively, and total food intake was 1078.6 gm. It also found that 1851.6kcal, 393.4 kcal and 131.3 kcal comes from cereals, vegetables and animal respectively<sup>9</sup> but present study we found that mean energy, protein, carbohydrate and fat intake were found to be 2270

kcal, 65 gram, 335 gram and 73 gram respectively, that are lower in energy and protein compared to Dhammarajika orphanage study<sup>9</sup>. In present study carbohydrate, protein and fat provide 59%,12% and 29% of total calorie respectively. In present study the total food intake was 1247 gram that is about double compared to 1995-1996 nutrition survey<sup>5</sup> of the urban location of the same age and sex group and also higher than Hassan & Barua study<sup>9</sup>. The cereals and root & tubers intake were lower in the present study compared to 1995-96<sup>5</sup> and also Hassan et al<sup>9</sup>, meat, fish, egg and milk & milk product consumption were considerably higher than previous study<sup>5,9</sup>.

The finding of the present study is quite encouraging. Average intake of the orphans are far higher than the national intake but in term of calorie it was lower than the study Hassan et al<sup>9</sup>.The nutritional status of the orphans was also found to be better than the national average by any nutritional criteria<sup>5</sup>.This might be attributed to a great extent to better health and care system prevailing in the orphanage apart provision of high calorie and protein rich food. This suggests that the nutritional status of the orphans, who are considerably to be nutritionally disadvantageous, can be improved through organized feeding and exposure to better hygienic condition.

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