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Assessment of the Prevalence of Malnutrition in Under 5 Aged Children of Slums in Dhaka City, Bangladesh

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Abstract	Original Research Article

Background: The uncontrollable rapid growth of urban slum population, accompanied by poor nutritional status is a devastating problem. This study was aimed to assess the prevalence of protein energy malnutrition (PEM) in slum areas of Dhaka city. *Methodology*: This cross sectional study was conducted among 500 randomly selected children aged 6 months to 5 years of Agargaon and Beribadh slum of Dhaka city, Bangladesh. After taking consents from parents anthropometric measurements were done using standard methods. These are weight, height, MUAC and age. Data were entered onto a questionnaire and analyzed using SPSS windows 21 programs. *Results:* Amongst the 500 under 5 aged children male to female ratio was equal (1.08:1). Majority (125) children were 13 months to 24 months aged. According to weight for height Z-score, 16% of the children had mild to moderate wasting and 07% had severe wasting. According to height for age Z-score about 36% of children were stunted (mild/moderate) and 05% children were severely stunted. About 31% of children were under weight (mild/moderate) and 04% children were severely underweight. According to MUAC classification 32% of children had mild/ moderate malnutrition and 08% had severe malnutrition. *Conclusions:* Overall, nutritional status of the under 5 children of slums of Agargaon and Beribadh were below acceptance.
Keywords: Under 5 slum children, Nutritional status, Anthropometry.

INTRODUCTION

Human health, disease, productivity, socio economic development, quality of life index etc. are directly related and dependent on nutrition. Malnutrition is a serious public health problem that has been linked to increase risk of morbidity and mortality. Many factors can cause malnutrition, most of which relate to immunization, socio economic condition and repeated infections, particularly in underprivileged population. Overpopulation, too, is a breakdown of the ecological balance in which the population may exceed the carrying of the environment. This then undermines food production, which leads to inadequate food intake and/or the consumption of non-nutritious food and thus to malnutrition. On the other hand, malnutrition itself can have far-reaching impacts on the environment and can induce a cycle leading to additional health problems and deprivation. A good percentage of the population of Dhaka city is living in the slums [1]. In slum areas of Dhaka city there is a very high prevalence of malnutrition. The prevalence of wasting, stunting and underweight were 23%, 41% and 35%, respectively. The prevalence of malnutrition is average in Dhaka slums than the national average which is 49% for stunting, 17.5% for wasting and 56% for underweight [2]. Malnutrition is increasing rapidly among socio-economically deprived sectors of the developing countries where poverty, unemployment, illiteracy and ignorance are rampant [3]. It was found that more than a third of the world's children are affected by protein energy malnutrition (PEM), and the highest frequency of the indicators are wasting, stunting, and underweight among which 80% of the affected children are from Asia [4]. The nutritional problem in Bangladesh is well known where 69% of children are victim of any form of PEM and 12% children are severely undernourished [5].

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PEM is a major cause for childhood mortality and morbidity in underdeveloped countries. Eighty percent of children below 5 years of age suffer from 2nd and 3rd degree of PEM. PEM may be regarded as a generalized disorder affecting the structure and function of the entire body, biochemical changes like serum total protein, albumin, globulin and iron are invariable accompaniment in PEM [6]. As a large population in slum areas of Dhaka City are children this descriptive cross sectional study was conducted with a view to determine the nutritional status of under five children of Agargaon and Beribadh slums.

METHODOLOGY
This is a descriptive cross sectional study. It was carried out during February-2016 to July-2018 at Agargaon and Beribadh slums of Dhaka city. A total of 500 under-5 aged children constituted the study population. Seriously ill, mentally retarded children and parents unwilling to participate in the study were excluded from the study. Those children living in slum for at least 6 months, age ranged from 06 months to 5 years and parents willing to participate in this study were included. To determine the nutritional status following parameters were studied: (1) Length was determined in 06 months to 2 years of age by infantometer in lying position and height after 2 years up to 5 years in standing position by stadiometer. Technique of height measurement: height was recorded in standing position without footwear, foot together, knees straight and heels, buttocks and shoulder in contact with the vertical wall. The child was held firmly with eyes looking straight up and the body held as straight as possible with the knees pressed straight. The height was measured to the nearest millimeter. (2) Weight: Weight was taken by electronic weighing machine. The child was asked to stand on the weighing machine with minimum clothing and without shoes and any weight in hands or touching or catching other things. Weight was recorded to the nearest grams. (3) Age: Asking with parents or any records. (4) Mid Upper Arm Circumference (MUAC): MUAC is an easy and useful measurement. It was recorded by measuring tape. The middle of the left arm was detected by the midpoint of a line between the tip of the acromion process of scapula and olecranon process of ulna. Then at the midpoint the measuring tape was wrapped round gently but firmly avoiding compression of soft tissue keeping the arm in hanging and extended position at the side of the body, then the reading was taken to the nearest 0.1 cm. Severe malnutrition is defined when MUAC is less than 115 mm. Severe wasted is defined when weight for height Z score <-3 SD. Severe stunted is defined height for age Z score <-3SD. Severe underweight is defined weight for age Z score <-3 SD. Data was collected through a structured questionnaire by questioning mother and measuring height, weight and MUAC. After completion of data collection all the data were compiled, tabulated, recorded, processed and edited to reduce the errors and analyzed with the help of SPSS

(Statistical package for social science) windows programs 21.

RESULTS
A total of 500 under 5 aged children were studied. In the study area, 260 (52%) of the study samples were boys and 240 (48%) were girls (Fig-1).
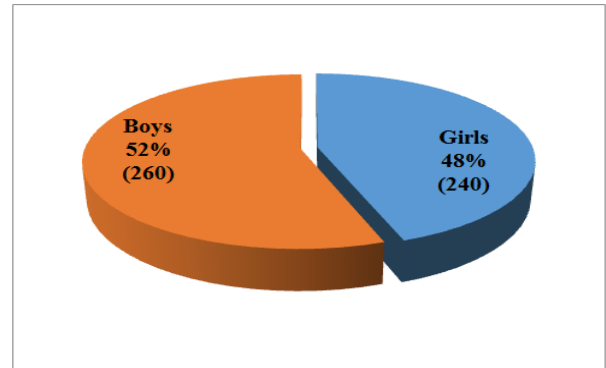

Fig.-1: Distribution of the children by gender

In slums distribution, 302 (60%) children were from Agargaon slum and 198 (40%) were from of Beribadh slum (Fig-2).
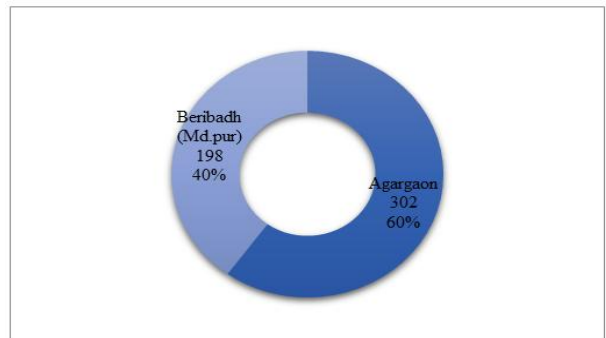

Fig-2: Distribution of children by slums

1.
2. In distribution of malnutrition, 8% were severely malnourished, 36% were mild/moderately malnourished and 56% suffers from no malnutrition (Fig-3).
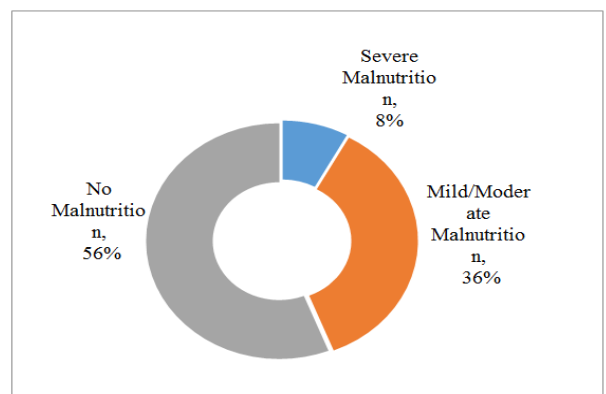

Fig-3: Distribution of the children by severity of malnutrition

The study children were categorized into 5 groups based on age. The 6-12 months age group consisted of 90 children (male: female=47:43). The 13 to 24 months aged group consisted of 125 children (male: female=67:58). The 25 to 36 months aged group consisted of 105 children (male: female=52:53). The 37 to 48 months aged group consisted of 98 children (male: female=41:57). The 49 to 60 months aged group consisted of 82 children (male: female=43:39) female (Fig-4).
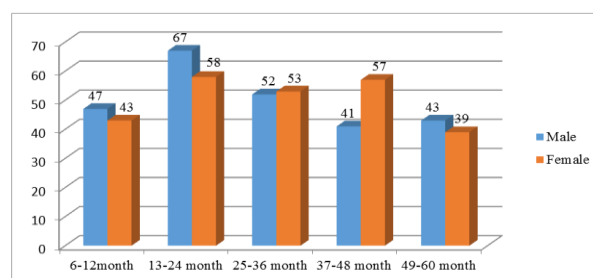

Fig-4: Distribution of children by age & sex

Table-1: Grading of malnutrition.

	Indicator	Frequency	Percentage
MUAC*	Severe malnutrition	40	08
	Mild/Moderate malnutrition	160	32
	No Malnutrition	300	60
	Total	500	100
Wasting**	Severe wasted	35	07
	Mild/moderate wasted	95	19
	Not wasted	370	74
	Total	500	100
Stunting***	Severe stunted	25	05
	Mild/moderate stunted	195	39
	Not stunted	280	56
	Total	500	100
Underweight****	Severe under weight	22	04
	Mild/moderate under weight	190	38
	Not under weight	288	58
	Total	500	100

*MUAC –mid upper arm circumference classification, ** Weight for height Z score, *** Height for age Z score, ****Weight for age Z score.

Table-1 According to MUAC classification, 08% of study children were severely malnourished, 32% mild/moderately malnourished and 60% had no malnutrition. According to weight for Height Z-score, it was found that 07% of children were severely wasted, 19% were mild/moderately wasted and 74% were not wasted. According to Height for Age Z-score, it was found that 05% of children were severely stunted, 39% of children mild/moderately stunted and 56% children were not stunted. According to Weight for Age Z-score, it was found that 04%of the study children were severely underweight, 38% children were mild/moderately stunted and 58% were not under weight

DISCUSSION

This descriptive cross sectional study was conducted with a view to determine the nutritional status of under five children of Agargaon and Beribadh slums. Children are considered as the leader of tomorrow. But they are the most victimized group of society regrettably**.** Chaudhary and Agrawal's [7] community based cross-sectional study was conducted in year 2016 to 2017 in a slum area of Jaipur city, Rajasthan they reported the prevalence of wasting, stunting and underweight was 10.5, 43.0 and 35.75%.Gebre et al., [8] assessed a community-based

cross-sectional study on 840 children aged 6–59 months to assess the prevalence of malnutrition and associated factors among under-five children in pastoral communities of Northeast Ethiopia, the study found the prevalence of wasting, stunting, and underweight was 16.2, 43.1 and 24.8%, respectively. Dasgupta et al., [9] assessed anthropometric indices on 100 under-5 children and found prevalence of malnutrition were 42% (underweight), 30% (wasting), 28% (stunting), and 48% (under nutrition), respectively. Zaman SU et al., [10] conducted a study on malnutrition on children of 18 months. The prevalence of underweight, stunting and wasting was 24%, 36% and 8% respectively. Popat et al., [11] conducted a cross sectional study and found prevalence of underweight, stunting and wasting was 32.4%, 46.1% and 17.2% respectively. Mamulwar et al., [12] conducted a study on malnutrition. The prevalence of underweight was 34.3%, stunting was 58.7% and wasting was 16.9%.The study considered with the National Center for health Statistics (NCHS) of USA standard for classification of malnutrition. According to Statistical Pocket Book of Bangladesh-2004 [13], the male and female ratio was 51.2% and 48.0%, which was almost similar to male and female ratio of the present study. But in the study of Yasmeen S [14], conducted in Bangladesh male and female ratio found 44% and 56%. According to Z-scores in the

present study19% children were wasted (mild/moderate), 07% children were severely wasted, 39% were stunted (mild/moderate) and 05% severely stunted, 38% underweight (mild/moderate) and 04% severely underweight. Child Nutrition SURVEY-2000 (ages 6-71 months) [15] found in their survey that 51% of the children were moderately underweight and 13% severely underweight, 49% moderately stunted and 19% severely stunted and 12% moderately wasted and 1%severely wasted. According to Demographic and Health Survey-1990-2000 (ages 0-59 months [16, 17]. It was found that 48% of the children were moderately underweight and 13% severely underweight, 35% moderately stunted and 08% severely and 10% moderately wasted and 1% severely wasted. In case of wasting similar findings were stated by Gebre et al., Dasgupta et al., Popat et al., Mamulwar et al., For stunting similar findings were observed by Chaudhary and Agrawal, Gebre et al., Zaman SU et al., Demographic and Health Survey-1990-2000 (ages 0-59 months), In case of underweight simillar studies were reported by Chaudhary and Agrawal, Dasgupta et al., Mamulwar et al., Child Nutrition SURVEY-2000 (ages 6-71 months), Demographic and Health Survey-1990-2000 (ages 0-59 months).It was observed from the study that, the nutritional status of the study children was almost similar to the national nutritional status of similar age found in different studies [10, 12-15].

CONCLUSION

The nutritional status of children in slums of Dhaka is a sensitive indicator of health, economy and the sustainable development of Bangladesh. Children are the wealth and assets of a nation. Unless, the children are properly grown and developed they will be the future burden of the nation. To make a healthy and prosperous nation, the future generation of this country should be protected from ill health and malnutrition by strengthening nationwide nutritional support programs.

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