ORIGINAL ARTICLE

Nutritional Status of Under-5 Children in a Slum of Dhaka City and Influence of Immunization and Socio-economic Condition on Malnutrition

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Abstract

Background: In slum area there is a very high prevalence of malnutrition. Many factors can cause malnutrition, most of which relate to immunization, socio economic condition and repeated infections, particularly in underprivileged population.

Objectives: To observe the nutritional status and effect of immunization and socio economic condition on malnutrition among under-5 children in a selected slum of Dhaka city.

Methods: This cross sectional study was conducted among 384 under-5 children randomly selected from PWD slum in Dhaka city. It was carried out during January-2013 to December-2014. Anthropometric measurements like wasting was determined from weight for height Z-score, stunting was determined from height for age Z-score, underweight was determined from weight for age Z-score and malnutrition also assessed by Mid Upper Arm Circumference (MUAC). Data were analyzed using SPSS version 21.

Results: In this study in slum 40.36% were found malnourished according to MUAC, according to weight for height Z-score wasting was present in 29.43% children, according to height for age Z-score stunting was found in 28.39% and according to weight for age Z-score underweight was found in 46.89% children. There is a decreased number of malnutrition cases when family income rise. Out of the 384 study children 68% were completely immunized, 16.9% were incompletely immunized and rest 15.1% were not immunized. Number of MUAC malnutrition, wasting, stunting and underweight cases increases in cases of incomplete immunization and no immunization.

Conclusions: Overall, nutritional status of the under-5 child of slum of PWD is not satisfactory. Family income and immunization status plays role in malnutrition. So socioeconomic condition should improve and mass immunization programshould be implemented in urban slum areas.

Keywords: Under 5 slum children, nutritional status, anthropometry, Z-score, MUAC.

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Introduction

Malnutrition is a serious public health problem that has been linked to increase risk of morbidity and mortality.[1] Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Overpopulation undermines food production, which leads to inadequate food intake, incomplete and no immunization causes 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.[2] Uncontrollable rapid growth of urban slum population, accompanied by poor nutritional status is a devastating problem. In slum areas of Dhaka city there is a very high prevalence of malnutrition. The prevalence of malnutrition is higher in Dhaka slums than the national average which is 49% for stunting, 17.5% for wasting and 56% for underweight, and indicates exceptionally high levels of malnutrition as judged against World Health Organization criteria.[1] Malnutrition is increasing rapidly among socio-economically deprived sectors of the developing countries where poverty, unemployment, literacy 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] PEM is a major cause for childhood mortality and morbidity in underdeveloped countries. Socio-economic condition, maternal age and education status, immunization status, weaning practices, family size, housing etc. were significantly associated with severe PEM.[6] So this study was conducted with a view to determine the nutritional status of under five children of urban slum and effect of immunization and socio economic condition on malnutrition.

Materials and Methods

This cross sectional study was carried out during January 2013 to December 2014 at PWD slum of Dhaka city. A total 384 under-5 children constituted study population. Children living in PWD slum at least 6 months, willing to participate and 2 months to 5 years of age were included. Seriously ill, mentally retarded and unwilling to participate in the study were excluded from the study. Nutritional status like wasting was determined from weight for height Z-score, stunting was determined from height for age Z-score, underweight was determined from weight for age Z-score and malnutrition also assessed by MUAC.

For children 6 months to 2 years of age length was measured by infantometer in lying position and after 2 years up to 5 years height was measured in standing position by stadiometer 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. 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 were recorded to the nearest grams. Age was determined by asking parents and verified from birth certificate/hospital records. MUAC was recorded by measuring tape. The middle of the left arm will be 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. A questionnaire was ready for data collection. Immunization and socioeconomic condition were taken by asking with the parent. Each questionnaire was minutely checked, verified and corrected on the spot following the interview. After completion of data collection, the data were consolidated, processed and edited to reduce the errors. The data were enter into the computer and analyzed with the help of SPSS (Statistical package for social science) windows programs.

Results

A total 384 under-5 children were studied among them 155(40.4%) were found malnourished according to MUAC. Wasting was present in 113(29.4%)

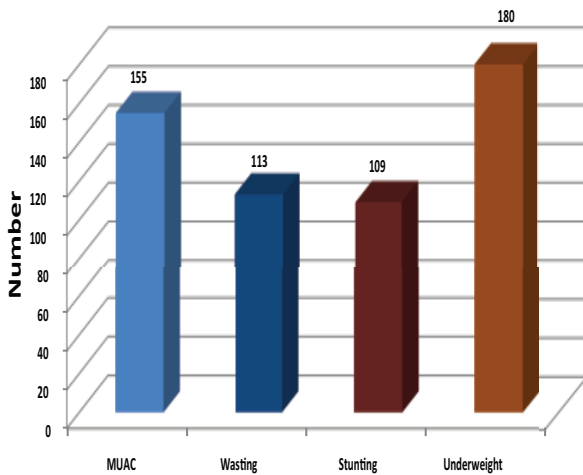children, stunting in 109(28.4%) and underweight in 180(46.9%) children (Fig.-1).

Fig 1 *Pattern of malnutrition*

It was found that, in 160 children, monthly income of the parent were up to 10,000 Tk and malnutrition was present in 73 (55.73%) cases; in 140 children, monthly income of the parent were within 10001-15000 Tk and malnutrition was present in 67(47.86%); in 60 children, monthly income of the parent were within 15001-20000Tk and malnutrition was present in 9(15%); in 53 children income of the parent were more than 20000Tk and malnutrition were found in 8(15%). There is a decreased number of malnutrition cases when family income rise (Table I).

Table I
Distribution of children by family income

Family income	Normal	Malnutrition	%	Total
Up to 10000Tk	58	73	55.7	131.0
10001-15000Tk	73	67	47.8	140.0
15001-20000Tk	51	9	15	60.0
Above 20000Tk	45	8	15	53.0

Out of the 384 study children, 261(68%) were completely immunized, 65(16.9%) were incompletely immunized and rest 58(15.1%) were not immunized (Fig. 2).
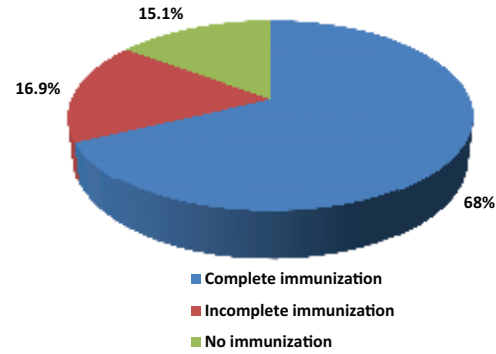

Fig 2 *Distribution of children by immunization status*

Among MUAC malnourished children 35(22.6%) completed immunization, 52(33.6%) incompletely immunized, 68(43.8%) got no immunization;among wasting children 30(26.6%) completed immuni-zation, 36(31.8%) incompletely immunization, 47(41.6%) got no immunization; among stunting children 17(15.6%) completed immunization, 40(36.7%) incompletely immunized, 52(47.7%) got no immunization; among underweight children 48(26.7%) completed immunization, 55(30.5%) incompletely immunized and 77(42.8%) got no immunization. Number of MUAC malnutrition, wasting, stunting and underweight cases increases in cases of incomplete immunization and no immunization (Fig.-3).
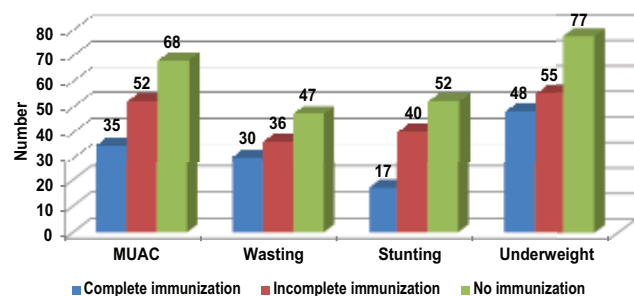

Fig 3 *Distribution of malnourished children by immunization*

Discussion
In this study in an urban slum 40.4% under-5 children were found malnourished according to MUAC, wasting was present in 29.4% children, stunting in 28.4% and underweight in 46.9%. There is a decreased number of malnutrition cases when family

income rise. Out of the 384 study children 68% were completely immunized, 16.9% were incompletely immunized and rest 15.1% were not immunized. Among MUAC malnourished children 22.6% completed immunization, 33.6% incompletely immunized, 43.8%got no immunization; among wasting children26.6% completed immunization, 31.8% incompletely immunized, 41.6% got no immunization; among stunting children 15.6% completed immunization, 36.7% incompletely immunized, 47.7% got no immunization; among underweight children 26.7% completed immunization, 30.5% incompletely immunized and 42.8% got no immunization. Number of MUAC malnutrition, wasting, stunting and underweight cases increases when there is incomplete immunization or no immunization.

Dasgupta et al[7] assessed anthropometric indices on 100 under-5 children with standard anthropometric indices such as weight for age, weight for height, height for age, and mid upper arm circumference and found wasting in 30%, stunting in 28%, underweight in 42% and under nutrition in 48% children. Zaman et al[8] conducted a study on malnutrition on children of 18 months. The prevalence of wasting, stunting and underweight was 24%, 36% and 8% respectively. Popat et al[9] conducted a cross sectional study and found prevalence of wasting, stunting and underweight was 17.2%, 46.1% and 32.4% respectively. Child Nutrition SURVEY-2000 (ages 6-71 months)[10,11] 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)[12,13] it was found that 48% of the children were moderately underweight and 13% severely underweight, 45% moderately stunted and 18% severely and 10% moderately wasted and 1% severely wasted. According to Z-scores, it was found in the present study that, 29.4% children were wasted, 28.4% stunted and 46.9% underweight which is higher than other studies. Though the prevalence of malnutrition sharply decline in Bangladesh but still the prevalence of malnutrition is higher in Dhaka slums than the national average according to BDHS 2017-18, where the prevalence of stunting is 31%, wasting in 8% and underweight in 22%.[14]

In this study there is a decreased number of malnutrition cases when family income rises and number of MUAC malnutrition, wasting, stunting and underweight cases increases in cases of incomplete immunization and no immunization. Hossain et al[6] conducted a study to find out the Nutritional and Immunization status, weaning practices and socio-economic conditions of under-5 children and found that low household income and absence of BCG vaccination were significantly associated with severe PEM. Ayaya et al[15] conducted a prospective case control study on socio-economic factors predisposing under-5 year old children to severe protein energy malnutrition in Kenya. The social risk factors for PEM were low socioeconomic status and incomplete immunization. Baranwal et al[16] also showed similar result. Chaudhary et al[17] in a community based cross-sectional study conducted in year 2016 to 2017 in slum area of Jaipur city found that malnutrition was associated with low economic status of family.

Conclusion

Overall, nutritional status of the under-5 child of slum of PWD is not satisfactory. Family income and immunization status plays role in malnutrition. So socioeconomic condition should improve and mass immunization programshould be implemented in urban slum areas.

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