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Original Research Article.

A Study on Under Nutrition among 3-6 Year Children

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ABSTRACT

Background: Nutritional status of children is an indicator of nutritional profile of entire community. It is a major public health problem and accounts for about half of all child deaths worldwide. Since childhood is the most vulnerable phase in the life of human being, nutritional inadequacies will result in the hampering of the development of the body. Future of the country is determined by the growing generation of the country.
Objective: To assess the nutritional status of children aged 3-6 years.
Methods: This was a cross-sectional study conducted among school children between the age group of 3-6 years. The data were collected from the school children between the age group of 3 to 6 years. The data were analysed on parameters of age, sex, weight, height and mid-arm upper circumference (MUAC).
Results: There present study showed a higher prevalence of under nutrition among the age group of 61-72 months of children. The difference was statistically significant (p-value <0.000). The prevalence was more among male child than the female child contrary to Indian context.

Conclusions: Under nutrition remains a major problem in our country. The present study concludes a higher level of under nutrition (63.5%) in the age group of 3-6 years and more in male child than in female child.

Key words: Age Group, Under Nutriion, Weight, Height, MUAC.

INTRODUCTION

Malnutrition continues to be a primary cause of ill health and mortality among children in developing countries. It is a major public health problem and accounts for about half of all child deaths worldwide.

About 150 million children in developing countries are still malnourished and more than half of underweight children live in South East Asia Region (SEAR). The high levels of under nutrition in children in South Asia pose a major challenge for child survival and development. Besides poverty, there are other factors that directly or indirectly affect the nutritional status of children. The magnitude of the problem of malnutrition among children under five years of age is high throughout in India.[1]

A child's entire life is determined in large measures by the food given to him during his first five years. Childhood is a period of rapid growth and development, and nutrition is one of the influencing factors in this period.[2]

A number of anthropometric indices have been used successfully for many years to estimate the prevalence of under-nutrition among pre-school children. These include height-for-age, weight-for-age and weight-for-height. Height-for-age is an index of cumulative effect of under-nutrition during the life of the child.

Weight-for-age is the combined effects of both, the recent and the long-term levels of nutrition, whereas weight-for-height reflects the recent nutritional experiences of the child. These indices are reasonably sensitive indicators of the immediate and underlying general causes of nutrition.[3]

METHODOLOGY

Study Design: Observational study

The present study was conducted involving 400 students studying in a school from Nursery to Standard I of age group between 3 years to 6 years in urban area of Jamshedpur. The data was obtained for weight, height and mid upper arm circumference (MUAC). An optimum sample size for study was calculated by an estimated PEM prevalence of 50% in children between 3-6 years age group with 10% relative precision and 95% confidence interval, the minimum sample size calculated out was 400 children.

Evaluation of Nutritional Status

Nutritional status among 3-6 y old children was assessed by computing weight for age (standard used- WHO standards for weight for age and grading of nutritional status of the children was

done using the Indian Academy of Paediatrics (IAP) classification. Grade I to Grade IV nutritional grade is taken as undernourished.[4]

IAP Classification

Nutritional grade Percentage of standard weight for age

Normal > 80%

Grade I 71-80%

Grade II 61-70%

Grade III 51-60%

Grade IV < 50%

Statistical Analysis

Data were entered and analyzed using statistical software SPSS. Prevalence was expressed in percentage and Chi-square test was used to find association with factors.

RESULTS

The mean age of children was 51.10 (±9.884) months. The minimum age of children was 37 months and maximum age was 69 months. The mean weight of children was 14.37 (±1.726) kg. The minimum weight of children was 11 kg and maximum weight was 21 kg. The mean height of children was 98.67 (±6.184) centimeters. The minimum height of children was 86 centimeters and maximum height was 117 centimeters. The mean MUAC of children was 98.67 (±6.184) centimeters. The minimum MUAC of children was 86 centimeters and maximum MUAC was 117 centimeters. Table 1 shows the different levels of under nutrition. Most of the children (49.5%) were in grade 1 or mild level of under nutrition. None of them were suffering from very severe under nutrition. Only two (0.5%) were having severe degree of under nutrition.

Table 2 shows the prevalence of under nutrition on various parameters of anthropometric measurement in relation to age group. The age groups were further divided into three sub groups of 37-48 months, 49-60 months and 61-72 months. MUAC were not considered above the age of 60 months. The prevalence of under nutrition by weight and height was more common in the age group of 62-72 months whereas on MUAC measurement the under nutrition was more among 37-48 months of age. Overall prevalence of malnutrition by weight was 63% whereas on height parameter it was approximately 84%. All the parameters of under nutrition was statistically significant with age (p-value 0.000)

Table 3 shows the prevalence of under nutrition on various parameters of anthropometric measurement in relation to gender. The prevalence of under nutrition by weight and height was more common in the male study subjects then females whereas on MUAC measurement the under nutrition was more among female study subjects. There was no significant difference statistically in relation with sex (p-value>0.05).

Table 1: IAP Classification of nutritional status

Percentage of standard weight for age	Nutritional Grade	Nutritional Status	Frequency	Percentage
>80%	Normal	Normal	146	36.5%
71-80%	Grade 1	Mild Undernutrition	198	49.5%
61-70%	Grade 2	Moderate Undernutrition	54	13.5%
51-60%	Grade 3	Severe Undernutrition	2	0.5%
<50%	Grade 3	Very Severe Undernutrition	0	0%
Total			400	100%

Table 2: Age with nutritional status

Age in months	Nutritional status			
	Undernourished by Weight n (%)	Undernourished by Height n (%)	Undernourished by MUAC n (%)	Total n (%)
37-48	40+32=72 (54.1%)	54+56=110 (82.7%)	25+28=53 (39.8%)	133
49-60	43+32=75 (56%)	57+42=109 (81.3%)	6+10=16 (11.9%)	134
61-72	62+45=107 (80.5%)	64+52=116 (87.2%)	Not taken	133
Total n(%)	254 (63.5%)	335 (83.75%)	69 (25.84%)	400

Chi-square value for Age*weight: 136.225 p-value 0.000

Age*Height: 259.708 p-value 0.000

Age*MUAC: 66.902 p-value 0.000

Table 3: Sex with nutritional status

Age in months	Nutritional status			
	Undernourished by Weight n (%)	Undernourished by Height n (%)	Undernourished by MUAC n (%)	Total n (%)
Male	145 (70.0%)	175 (84.5%)	31* (22.3%)	207
Female	109 (56.5%)	150 (77.7%)	38* (29.0%)	193
Total n(%)				400

*Age above five years was not considered. 135 children were male in age group 36 months to 59 months and 131 female students were in the same group.

Chi-square value for Sex*weight: 0.098 p-value 0.754

Sex*Height: 1.249 p-value 0.264

Sex*MUAC: 0.576 p-value 0.448

DISCUSSION

The prevalence of under-nutrition (≤ 80 percentage of standard weight for age) was 63.5%. In a study conducted in a rural area the prevalence of protein energy malnutrition among children aged 1-5 y was found to be 56.4%.[5] In a dietary survey conducted by Vinod et al., it was found that 52.23 %children were suffering from of malnutrition.[6]

The present study showed a higher prevalence of under nutrition in the age group of 61-72 months in comparison to the other age group. The difference was statistically significant. Kavitha et al., in a study reported that Children in the age group 49-60 months were more undernourished than other age group children and the difference was found to be statistically significant ($p < 0.05$).[7]

Prevalence of under nourishment was higher among male children (76.9%) than female children (56.3%) and it was observed in the present study. This finding is unique in Indian context where females are prone to get neglected and sex wise prevalence of under nutrition was usually higher in females as compared to males.[6,8] Singh JP et al., in his study similarly found that prevalence of malnutrition was higher among male children (54.82%) than female children (45.18%).[9]

MUAC was more common among the female child (29.0%) than the male child (23%).

CONCLUSION

The present study showed that under nutrition remains to be a major public health problem in our country. The present study reports an overall prevalence of under nutrition of 63.5% which is similar to other studies in the country. The prevalence was more among the age group of 61-72 months and more among male child. Community based preventive measures should be taken to alleviate malnutrition. Health education to the parents, especially to the mothers on dietary practices like feeding their children with healthy food in terms of quality and quantity should be given.

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