Nutritional status of Children under Five Years of Age in a Rural Area of Pondicherry

Kavita Vasudevan[1], Carounanidy Udayashankar[2]

ABSTRACT

Introduction: Malnutrition among children below 5 years has serious long-term consequences. Three out of every 10 stunted children in the world are in India. The objective of the study was to assess malnutrition among under five years children in a rural community.

Material and Methods: A community based cross-sectional study was undertaken to assess the nutritional status of children below 5 years by anthropometry. Weight for age, height for age and weight for height was calculated using WHO growth standards.

Results: The prevalence of underweight, stunting and wasting in the study population 18.3%, 31.6% and 20.1% respectively. Proportion of moderate and severe underweight and wasting was highest in the age group of 11-23 months while proportion of moderate and severe stunting was highest in the age group of 48-59 months.

Conclusions: Malnutrition is a common problem in children below 5 years of age, especially chronic malnutrition

Keywords: Malnutrition, Wasting, Stunting, Under-Nutrition, WHO Growth Standards

INTRODUCTION

Nutritional status of children under 5 years of age is very important, since the foundation of healthy life is laid during that period. Malnutrition in early childhood has serious, long-term consequences because it impedes motor, sensory, cognitive, social and emotional development. Each year malnutrition is implicated in about 40% of 11 million deaths of under-five children in developing countries. Data from UNICEF states that the highest level of underweight children is found in South Asia, involving 46% of all under-fives in the region.[1] Three out of every 10 stunted children in the world are in India. Goal 2 of the 2030 Sustainable Development agenda seeks to end hunger and all forms of malnutrition, and double agricultural productivity in the next 15 years.[2,3]

Various classifications have been used to grade the degrees of malnutrition, namely Gomez, IAP, McLaren, Waterlow's and many more. Each of these classifications use a different set of reference data and different cut-offs to decide who is normal and who falls under mild, moderate or severe under nutrition. The World Health Organization (WHO) published the Child Growth Standard for infants and children up to the age of 5 years based on a multi-country study (Brazil, Ghana, India, Norway, Oman and USA) on growth of healthy breast-fed children under optimal conditions in April 2006.[4] Child's weight, height/length and age data were used to calculate three indices: height-for-age, weight-for-height, and weight-for-age. Each of these indices provides different information about growth and body composition for assessing nutritional status. Stunting, or low height-for-age, is a sign of chronic under-nutrition that reflects failure to receive adequate nutrition over a long period. Stunting can also be affected by recurrent and chronic illness. Wasting, or low weight-for-height, is a measure of acute under-nutrition and represents the failure to receive adequate nutrition in the period immediately before the survey. Wasting may result from inadequate food intake or from a recent episode of illness causing weight loss. Weight-for-age is a composite index that takes into account both acute and chronic under-nutrition.[5,6]

The National Family Health Survey IV has also used the same criteria to assess the nutritional status of children under 5 years of age throughout the country. It was found that 38 percent of children under age five years are stunted which is a sign of chronic under-nutrition. Twenty-one percent of children under age five years are wasted, a sign of acute under-nutrition, while 36 percent of children under age five years are underweight.[6] A huge variation has been noted between states, within states, between both sexes and in rural and urban areas.[7-12] The present study aimed to assess malnutrition among under-five children in a rural community.

MATERIAL AND METHODS

This study was conducted in the rural field practice area of a medical college in Pondicherry. There are 5 villages in the field practice area of which Manapet village was chosen randomly. All children less than 5 years of age living in that village were included in the study. Children who had come visiting or who have been residing for less than one month were not included. Informed consent was taken from the parents of all children. The date of birth the child was used to calculate the exact age of the child. When the exact date of birth was not known, the age as told by the mother was used corrected to the nearest month. A regional local events

[1]Department of Community Medicine, Indira Gandhi Medical College and Research Institute, Pondicherry, [2]Department of Dermatology, Indira Gandhi Medical College and Research Institute, Pondicherry, India

Corresponding author: Dr. Carounanidy Udayashankar, Department of Dermatology, Indira Gandhi Medical College and Research Institute, Pondicherry, India

calendar was used to assist the mother for better recall. After collecting socio-demographic data like age, sex, monthly income, type of family, nutritional status was assessed by anthropometry. Children were weighed and measured as per the WHO guidelines on anthropometry. Data collection was done over a period of one month.

Weight was measured with minimal clothing using an electronic weighing machine which measures up to 100 kg to a precision of 0.1 kg (100g). For children less than 2 years, recumbent length was measured to the nearest 0.1 cm with an infantometer with the children lying down. For children more than 2 years height was measured to the nearest 0.1cm using a stadiometer with the child standing, with the occiput, buttocks and heel touching the vertical board and head in the Frankfurt line.

STATISTICAL ANALYSIS

Data was entered in MS excel and analysed using the SPSS software v18. The z scores for the different nutritional indices –weight for age, height for age, and weight for height were calculated based on the WHO child growth standards.

RESULTS

A total of 224 children under five years of age were included in the study. About 58.9% of the families were nuclear families with 62.5% of them belonging to socio-economic class IV or lower as per Prasad's classification. Breastfeeding was initiated in 90.2% of the children within 2 hours of delivery but 13.4% of the children were given prelacteal feeds. Exclusive breastfeeding for 6 months was practiced in 83.5% of children.

Table 1 shows the age and sex distribution of the children studied. Female children constituted 49.1% of the study subjects. Maximum number of children were in the age group of 0-11 months.

Figure 1 shows the prevalence of malnutrition in the study population. The prevalence of underweight, stunting and wasting in the study population 18.3%, 31.6% and 20.1% respectively.

Table 2 and Figure 2 reveals the age-wise prevalence of moderate malnutrition and severe malnutrition in the study population. As can be seen from the table, 4.9% of the study population are severely underweight, 9.8% are severely stunted and 4.9% have severe wasting. Proportion of moderate and severe underweight and wasting was highest in the age group of 11-23 months while proportion of moderate and severe stunting was highest in the age group of 48-59 months.
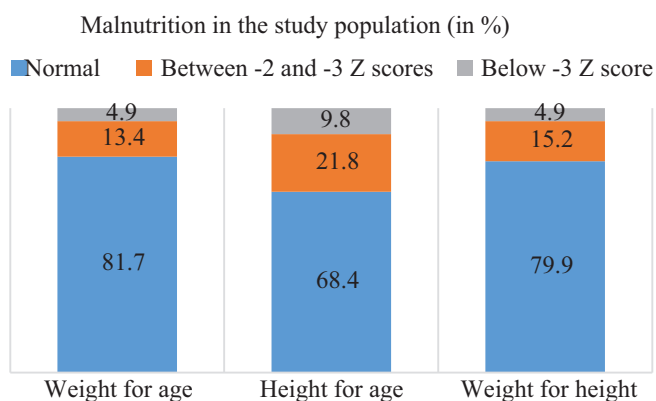
DISCUSSION

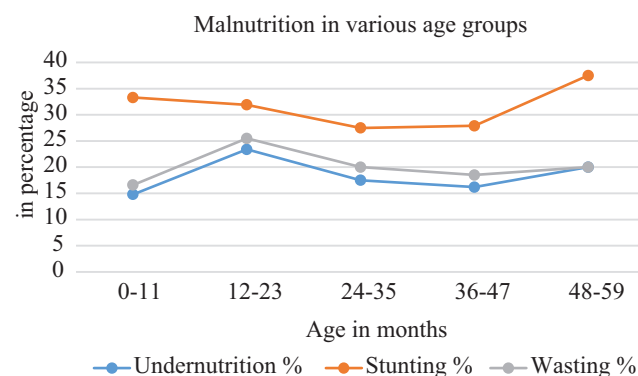**Figure-1:** Nutrition status in the study population

Figure-2: Prevalence of undernutrition in relation to age

Age group in months	Males	Females	Total
0-11	27 (23.5)	27 (24.7)	54 (24.1)
12-23	24 (21.2)	23 (20.5)	47 (20.9)
24-35	20 (17.3)	20 (18.3)	40 (17.9)
36-47	22 (19.2)	21 (19.2)	43 (19.2)
48-59	21 (18.3)	19 (17.2)	40 (17.9)
Total	114 (100.0)	110 (100.0)	224 (100.0)
Table-1: Age and sex distribution of the study population			

Age grp	No.	Underweight % below		Stunting % below		Wasting % below	
		-2SD	-3SD	-2SD	-3SD	-2SD	-3SD
0-11	54	11.1	3.7	24.1	9.2	12.9	3.7
12-23	47	17.0	6.4	21.3	10.6	19.1	6.4
24-35	40	12.5	5.0	20.0	7.5	15.0	5.0
36-47	43	11.6	4.6	18.6	9.3	13.9	4.6
48-59	40	15.0	5.0	25.0	12.5	15.0	5.0
Total	224	13.4	4.9	21.8	9.8	15.2	4.9
Table-2: Age-wise prevalence of malnutrition in the study population							

This study has reported an overall prevalence of underweight, stunting and wasting in the study population 18.3%, 31.6% and 20.1% respectively. This finding is similar to the findings of reported in the National family health survey factsheet for the state of Puducherry though much lower than the national average. This maybe attributed to the fact that the maternal and child care indicators, female literacy for the state of Puducherry is better than the national statistics. NFHS data has revealed that fifty-one percent of children born to mothers with no schooling are stunted, compared with 24 percent of children born to mothers with 12 or more years of schooling. The corresponding proportions of underweight children are 47 and 22 percent, respectively[6,7]

The prevalence of under-nutrition as reported in this study is lower than the prevalence in a rural area in the neighbouring district of Tamil Nadu as reported by Stalin et al.[9] This maybe due to differences in the classification used, sample size of the study population and female literacy.

Other studies from Pondicherry by John et, and Upadhaya et have reported a similar prevalence of under-nutrition through both these studies were done in urban areas.[10,11] John et al have used IAP classification and studied only under-nutrition and its risk factors. Upadhaya et have reported a lower prevalence of under-nutrition, stunting and wasting among children from urban slums when compared to the current study. The proportion of stunting in the under 5 children is higher than wasting indicating chronic malnutrition. This similar trend was observed in the NFHS data as well.

Shewade et al[9] have reported similar prevalence of severe wasting and under-nutrition from children in an urban area though the prevalence of moderate under-nutrition is similar. The limitations of this study are its small sample size and lack of information on underlying causative and associated factors for malnutrition. But the study does validate the findings of the NFHS 4 data for the state.

CONCLUSION

Malnutrition is a common problem in children below 5 years of age, especially chronic malnutrition. Improving awareness among mothers about feeding practices and early identification and intervention in malnourished children is the need of the hour.

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