NUTRITIONAL STATUS OF RURAL AND URBAN PRE-SCHOOL CHILDREN; A COMPARATIVE STUDY

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Abstract

Background of the Study: Stunting, wasting, and underweight are the important nutritional status indicators for children. "While stunting is caused by long-term insufficient nutrient intake and repeated infections, wasting is a result of acute food shortage and illness. Wasting, on the other hand, is a strong predictor of mortality and requires urgent response. Underweight combines information about linear growth obstruction and weight for length/height" [7]. Understanding differences in the determinants of childhood malnutrition between urban and rural areas is important to design appropriate, relevant program and policy implementation. Aims & Objectives: The aim of the study is to assess and compare the prevalence of underweight, stunting and wasting among pre-school children in rural and urban area. Methodology: Convenient random sampling technique was used to gather data in 100 samples, 50 each from rural and urban population. Data was collected by using structured interview and anthropometric assessment. The questionnaire consisted of two parts, i.e., demographic data and questions regarding anthropometric assessment, age, height, weight etc. The three nutritional status indicators, HAZ - z-score for height-for-age, (Stunting), WAZ - z-score for weight for age (Underweight), WHZ- z – score weight for height (Wasting) were calculated using WHO Anthro survey application. Results: This study revealed that Prevalence of acute malnutrition (stunting) among rural pre-school children is 28% which was higher than the prevalence of acute malnutrition in urban pre-school children which was only 18 %. Prevalence of Underweight among rural pre-school children is 36% which was higher than the prevalence of underweight in urban pre-school children which was only 34 %. Prevalence of chronic malnutrition (wasting) among rural pre-school children is 32% which was lower than the prevalence of chronic malnutrition in urban pre-school children in which it was 46%. There is no significant association between the nutritional status of the rural and urban pre-school children with the selected demographic variables. This indicates even though there was a significant difference between the rural and urban pre-school children, both group of children are at the risk of one or other malnutrition related problems. Conclusion: This study suggests that even though there was a significant difference between the rural and urban pre-school children, both group of children are at the risk of one or other malnutrition problem.

Introduction

India is home to the largest number of children in the world. "It is estimated that nineteen per cent of the world's children live in India. Every 5th child in the world lives in India. Pre-school children in India constitute about 29% of the total population as against 7% in the technologically advanced countries." [1]. Under-nutrition among pre-school children is an important health problem in developing countries.

Estimate shows that globally, at least 53 percent of under-five deaths in less developed countries can be attributed to undernutrition [2] and that deficiency of micronutrients contributes to problems of reduced immunity, intellectual development and work capacity in children. In India, around 43% of its children under the age of five are malnourished or undernourished. It is estimated that one in every three malnourished children in the world live in India. Malnutrition is considered to be a leading cause of child mortality in India [3].

"Malnutrition was the predominant risk factor for death in children younger than five years of age in every state of India in 2017, accounting for 68·2% of the total under-five deaths, and the leading risk factor for health loss for all ages, responsible for 17·3% of the total disability

adjusted life years". [4],[5]. Prevalence of nutritional problems in rural and urban populations remains varying. Child malnutrition along the state /province, rural/ urban, and Female/male divides. India's recent National Family Health Survey (NFHS-4), conducted during 2015–2016, shows a very high prevalence of stunting, wasting, and underweight among under five children. Their prevalence is 38.4%, 21%, and 35.7%, respectively. This is precisely less than the previous NFHS survey (NFHS-3), conducted during 2005–2006, so far as stunting and underweight are concerned [6]. Stunting, wasting, and underweight are the important nutritional status indicators for children. "While stunting is caused by long-term insufficient nutrient intake and repeated infections, wasting is a result of acute food shortage and illness. Effects of stunting are delayed motor development and impaired cognitive development and are largely irreversible. Wasting, on the other hand, is a strong predictor of mortality and requires urgent response" [7]. Underweight combines information about linear growth obstruction and weight for length/height. Children are considered stunted when they have height-for-age z-score below two compared with the WHO Child Growth standards median of same age and sex. Wasting is defined by a weight for height z-score (WHZ) below − 2 and suggests acute undernutrition or rapid weight loss. Underweight is defined by a weight for age z-score (WAZ) below − 2 [8]. Understanding differences in the determinants of childhood malnutrition between urban and rural areas is important to design appropriate, relevant program and policy implementation [9]. The aim of the study is to assess and compare the prevalence of underweight, stunting and wasting among pre-school children in rural and urban area of Kolar district, India.

Materials & Methodology

In order to achieve the objectives of the study, descriptive design was adopted. Convenient random sampling technique was used to gather data in 100 samples, 50 each from rural and urban population. Data was collected by using structured interview and anthropometric assessment. The questionnaire consisted of two parts, i.e., demographic data and questions regarding anthropometric assessment, age, height, weight etc. The three nutritional status indicators, "HAZ - z-score for height-for-age" (Stunting), "WAZ - z-score for weight for age" (Underweight), "WHZ- z – score weight for height" (Wasting) were calculated using WHO Anthro survey application. The findings of the study have been discussed with the reference to the objectives and hypothesis and with the findings of the other studies. Descriptive and inferential data were used for data analysis.

Results

Stunting (HAZ) z-score height for age in rural pre-school children

Findings revealed that majority (50 %) of the rural pre-school children height for age z-score (stunting/acute malnutrition) is within the WHO cut of point 0-2 z score. Mild acute malnutrition (stunting) was present in 22% of the population. 26 % of them were moderately stunted and 2% of them were severely stunted.28 % (moderate+ severe) of pre-school children height for age Z value is < -2, which is the cut off value set by WHO in determining stunting. It reveals that 28% of rural pre-school children is stunted.[10], [11].

Underweight (WAZ) z - Score weight for age in rural pre-school children

The 24% of the rural pre-school children weight for age z-score (underweight) is within the WHO cut of point 0-2 z score. Mild underweight was present in 40% of the population. 32 % of them were moderately underweight and 4% of them were severely underweight.36 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining underweight [10], [11]. It reveals that 36% of rural pre-school children weight was below the standard set by world health organization.

Wasting (WHZ) z –Score weight for height in rural children

22% of the rural pre-school children weight for height z-score (wasting) is within the WHO cut of point 0-2 z score. Mild chronic malnutrition (wasting) < -1 to > -2 Z-score was present in 46% of the population. 24 % of them were moderately wasted < -2 to > -3 Z-score and 08% (< -3 Z-score) of them were severely wasted.32 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining weight in under five children [10], [11]. It reveals that 32% of rural pre-school children were below the growth standard set by the world health organization.

Stunting (HAZ) z-score height for age in urban pre-school children

62 % of the urban pre-school children height for age z-score (stunting/acute malnutrition) is within the WHO cut of point 0-2 z score. Mild acute malnutrition (stunting) was present in 20% of the population. 12 % of them were moderately stunted and 06% of them were severely stunted.

18 % (moderate+ severe) of pre-school children height for age Z value is < -2, which is the cut off value set by WHO in determining stunting [10],[11]. It reveals that 18% of urban preschool children is stunted.

Underweight (WAZ) – z - Score weight for age in urban pre-school children

32% of the urban pre-school children weight for age z-score (underweight) is within the WHO cut of point 0-2 z score. Mild underweight was present in 34% of the population. 26 % of them were moderately underweight and 8% of them were severely underweight. 34 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining underweight. It reveals that 36% of urban pre-school children weight was below the standard set by world health organization.

Wasting – WHZ z –Score weight for height in urban pre-school children

The 20% of the urban pre-school children weight for height z-score (wasting) is within the WHO cut of point 0-2 z score. Mild chronic malnutrition (wasting) < -1 to > -2 Z-score was present in 34% of the population. 34 % of them were moderately wasted < -2 to > -3 Z-score and 12 % (< -3 Z-score) of them were severely wasted.46 % (moderate+ severe) of pre-school children weight for height Z value is < -2, which is the cut off value set by WHO in determining weight in under five children [10], [11]. It reveals that 46% of urban pre-school children were below the growth standard set by the world health organization.

Discussion

Malnutrition is the major public health problem in developing countries and in early stage of life affects growth and development of the child. The incidence and prevalence of malnutrition may differ among rural and urban population, due to a variety of factors [12]. Purpose of this present study is to assess and compare the nutritional status of rural and urban pre - schoolchildren

using the three nutritional indicators stunting, wasting and undernutrition.

Nutritional status of rural pre-school children

28 % (moderate+ severe) of pre-school children height for age Z value is < -2, which is the cut off value set by WHO in determining stunting. It reveals that 28% of rural pre-school children is stunted.

36 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining underweight. It reveals that 36% of rural pre-school children weight was below the standard set by world health organization.

32 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining weight in under five children [10], [11]. It reveals that 32% of rural pre-school children were below the growth standard set by the world health organization. This result was comparable to the research done by Roopadevi and Karinagannanavar, showed a higher prevalence of underweight, stunting, and wasting as 24.8%, 55%, and 23.1%, respectively in rural pre-school children [13].

Nutritional status of Urban Preschool children

18 % (moderate+ severe) of pre-school children height for age Z value is < -2, which is the cut off value set by WHO in determining stunting. It reveals that 18% of urban preschool children is stunted.

36 % (moderate+ severe) of pre-school children weight for age Z value is < -2, which is the cut off value set by WHO in determining underweight. It reveals that 36% of urban pre-school children weight was below the standard set by world health organization. This was supported by a similar study in urban preschool children in Karnataka, in which the prevalence of undernutrition, which constitutes underweight and stunting among 3–5-year-old preschool children was 25.4%, and 23.5% respectively [14].

46 % (moderate+ severe) of pre-school children weight for height Z value is < -2, which is the cut off value set by WHO in determining weight in under five children. It reveals that 46% of urban pre-school children were below the growth standard set by the world health organization. In a study conducted by Surwade [15] it was found that the high prevalence of wasting 46.6% was present in urban preschool children. Similar studies conducted independently in urban areas by Avachat [16] found the prevalence to be 50.46%.

Table 1 - Comparison of nutritional status of rural and urban pre-school children.

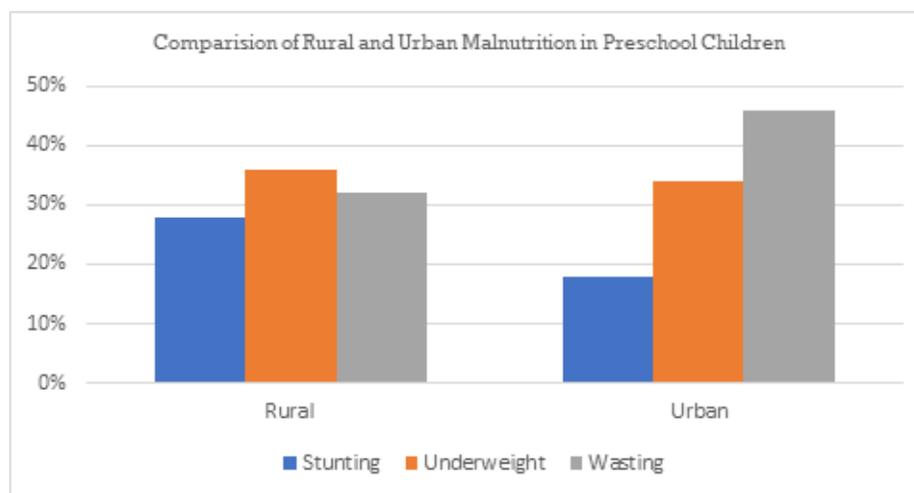| Measurements	Rural pre-school children		Urban pre-school children		't' test
	Mean	Standard deviation	Mean	Standard deviation	
Weight For age Z-score	-0.8106	1.3989	-1.5802	0.9836	t=3.1822 p=0.0020 s*
Height For age Z-score	-0.8178	1.4179	0.0328	1.8144	t = 2.6120 p= 0.0104 s*
Weight For height Z-score	-1.5430	0.8673	-2.2432	1.0003	t = 3.7397 p= 0.0003 s*

S=Statistically significant *p<0.05

With regard to Weight For age Z-score (underweight) the t-value 3.1822 was greater than the table value at 0.05 level of significance. By conventional criteria, this difference was considered to be very statistically significant. Hence it was concluded that there was a significant difference between weight for age z-score of the rural and urban pre-school children.

As concerned with Height for age Z-score (stunting) the t-value 2.6120 was greater than the table value at 0.05 level of significance. This difference was considered to be very statistically significant. Hence it was concluded that there was a significant difference between Height for age Z-score (stunting) of the rural and urban pre-school children.

As concerned with Weight for height Z-score (wasting) the t-value 3.7397 was greater than the table value at 0.05 level of significance. This difference was considered to be extremely statistically significant. Hence it was concluded that there was a significant difference between Weight For height Z-score (wasting) of the rural and urban pre-school children.

Hence it was statistically concluded that t-value of Weight for age Z-score, Weight for height Z-score, Weight For height Z-score, respectively of rural and urban preschool children was greater than the table value at 0.05 level of significance. This difference is considered to be extremely statistically significant. It depicts that there was a significant difference in the nutritional status of rural and urban pre-school children. The result of this study is consistent with other study conducted by Gurijinder Kour, which states that there is significant difference between nutritional status of urban and rural preschool children [17]

Figure 1 Comparision of Rural and Urban Malnutrition in Pre-school Children

Conclusion

This study revealed that Prevalence of acute malnutrition (stunting) among rural pre-school children is 28% which was higher than the prevalence of acute malnutrition in urban pre-school children which was only 18 %. Prevalence of Underweight among rural pre-school children is 36% which was higher than the prevalence of underweight in urban pre-school children which was only 34%. Prevalence of chronic malnutrition (wasting) among rural pre-school children was 32% which was lower than the prevalence of chronic malnutrition in urban pre-school children which 46%. This suggests that even though there was a significant difference between the rural and urban pre-school children, both group of children are at the risk of one or other malnutrition problem.

Recommendations

A similar study may be replicated using large sample, there by findings can be generalized.

Conflicts of Interest

There is no conflict of interest

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