

A Hospital Observational Study Assessing Nutritional Status and Morbidity Pattern in Children Aged 6-60 Months

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Abstract

Aim: The aim of the present study was to assess the nutritional status and morbidity pattern in children aged 6-60 months belonging to the rural area.

Methods: The study was conducted in Department of Pediatrics, SKMCH, Muzaffarpur, Bihar, India for the period of one year and Children belonging to six months of age to five years of age group in rural areas. A sample of 500 children was selected as the study population.

Results: Out of the 500 children who were involved in the study, the majority were in the age group of 48-59 months- 200 (40%); female children with 260 (52%) outnumbered the male children; 450 (90%) children belonged to the Hindu religion. All the study participants were fully immunized. Based on the nutritional status according to WHO Growth Standards Reference (2006), the prevalence of underweight, stunting, and wasting was 220 (44%), 310 (62%), and 100 (20%), respectively. According to the measurement of mid-arm circumference, the prevalence of protein-energy malnutrition was found to be 20 (4%). The association between the gender and the nutritional status of the children - underweight, stunting, and wasting - was found to be statistically not significant with the p-value of 0.0744, 0.8574 and 0.5050 respectively. The association between the age group and the stunting was found to be statistically significant with a p-value of 0.000140. It was observed that the highest prevalence of morbidity was of anemia, 190 (38%), followed by upper respiratory tract infection, 100 (20%).

Conclusion: The prevalence of stunting was found to be high compared to wasting and underweight among the study children. Nearly 1/3rd of the children had more than one morbid condition. Majority of the children presented with anemia, followed by acute respiratory tract infection. So ICDS needs to be strengthened to function more efficiently in averting malnutrition among children. A comprehensive, standardized, continuous, and intensive assessment of the nutritional status of children is recommended.

Keywords: Malnutrition, rural area, Morbidity, Parental education.

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Introduction

Malnutrition among children in India is a well-known public health problem defined

as a pathological state resulting from a relative or absolute deficiency or excess of

one or more essential nutrients. [1] Nearly half of all deaths in children under 5 are attributable to under nutrition translates into a loss of about 3 million young lives a year. Under nutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and contributes to delayed recovery. [2]

Malnutrition is often associated with high rates of mortality and morbidity and is an underlying factor in almost one-third to half of all children under five years who die each year of preventable causes. [3] Morbidity in under-five children belonging to rural areas is more than the children from the same age group from higher socioeconomic strata. Assessment of their growth is useful at both the individual and population levels. [4] The Union government in India started the Integrated Child Development Services (ICDS) Scheme; to enhance the health, nutrition, and learning opportunities of children <6 years of age especially targeted for the poor and the deprived. All children in the eligible age groups can avail of supplementary nutrition provided at the AWCs. The morbid conditions are more prevalent in rural children who are exposed to various risk factors like poor hygienic conditions, poor nutrition, etc. [5]

Almost as shocking as the prevalence of malnutrition in India is the country's failure to reduce it much, despite rapid growth. Since 1991 Gross Domestic Product has more than doubled, while malnutrition has decreased by only a few percentage points. [6] Malnutrition continues to be the biggest health problem of our country today even after a lot of efforts put in by the Government towards eradicating it. Malnutrition commonly affects all groups in a community, but infants and young children are the most vulnerable because of their high nutritional requirements for growth and development. [7] Nutritional status is the sensitive indicator of a child's health, and under-

five children constitute the most vulnerable segment of any community. [8] The assessment of the nutritional status of this segment of the population is essential for improving overall health; prime determinant of health status in an adult is their nutritional status in childhood. [9] Adequate nutrition is a necessary first step in the improvement of quality of life. Nutrition plays a key role in the physical, mental, and emotional development of children, and much emphasis has been given to provide good nutrition to growing populations, especially in the formative years of life. [10] The growth rate is maximal during the first 6 years of life; hence malnutrition has a direct impact on infant mortality rate and under-five mortality rates, which are prime indicators of the health status of a country. [11]

The aim of the present study was to assess the nutritional status and morbidity pattern in children aged 6-60months belonging to the rural area.

Materials and Methods

The study was conducted in Department of Pediatrics, SKMCH, Muzaffarpur, Bihar, India for the period of one year and Children belonging to six months of age to five years of age group in rural areas. A sample of 500 children was selected as the study population.

Inclusion criteria:

- Children of age 6 months to 5 years
- Children of the above age group whose parents consented to the study.

Exclusion criteria:

- Children above the age group of >5 years
- IUGR and small for date babies, children with organic diseases, and with any physical disability

Data collection and methodology

Every sixth house in the village was checked for the availability of children between 6 months to 59 months. A

portable weighing scale of 100 kg capacity with a sensitivity of 0.1 kg was used to record the weight of the selected children. The bodyweight was noted to the nearest 0.1 kg when the subject was standing upright on the balance with bare feet and in school uniform, The length was measured by an infantometer in the supine position for children below 2 years, and the height of the child as measured for those who can stand.

Socio-demographic information was collected by using the pretested and pre-designed structured schedule by interview technique. A modified Kuppuswamy scale was used to classify the socioeconomic class of families. History of child illness and immunization status was reported by the caretaker of the children.

The age, and date of birth, were recorded by asking the mother and confirmed by the records (MCP cards/Immunization cards). Primary data collection tools were prepared in the form of interview schedules and pre-tested in the field for appropriateness. Changes were done according to pre-test results and printed in sufficient numbers for use in the field.

The data was collected through interview by using a pre-designed questionnaire,

which was validated after a pilot study. Additional information was gathered using individual health records. A general physical examination was done. Anthropometric measurements were done using Salter's weighing scale for weight assessment and measuring tape for height measurement. The WHO Child Growth Standards, 2006¹² reference data was used for that particular age and sex to get height for age (stunting), weight for age (underweight), and weight for height (wasting).

Ethical issue: Informed consent was taken from the mothers of all the study participants and ethical issues were considered.

Statistical analysis:

Data were expressed as frequency and percentage. The Chi-square test was used to analyze the significance of the difference in the frequency distribution of the data. Binary logistic regression was used to calculate the odds ratio and is used to explain the relationship between one dependent binary variable and one or more independent variables. P-value <0.05 was considered statistical significance.

Results

Table 1: Demographic characteristics of children

| Demographic characteristics | Number n=500 | Percentage (%) | |
|-----------------------------|--------------|----------------|-----|
| Age in months | 36-47 | 160 | 32 |
| | 48-59 | 200 | 40 |
| | 60-72 | 140 | 28 |
| Gender | Male | 240 | 48 |
| | Female | 260 | 52 |
| Religion | Hindu | 450 | 90 |
| | Christian | 10 | 2 |
| | Muslim | 40 | 8 |
| Immunization status | Yes | 500 | 100 |
| | No | 000 | 0 |

Out of the 500 children who were involved in the study, the majority were in the age group of 48-59 months- 200 (40%); female children with 260 (52%) outnumbered the male children;

450 (90%) children belonged to the Hindu religion. All the study participants were fully immunized.

Table 2: Nutritional status of children

| Nutritional status | | Number (n=381) | Percentage (%) |
|------------------------------|----------------------|----------------|----------------|
| Weight for age (underweight) | Normal | 280 | 56 |
| | Moderate | 120 | 24 |
| | severe | 100 | 20 |
| Height for age (stunting) | Normal | 190 | 38 |
| | Moderate | 160 | 32 |
| | severe | 150 | 30 |
| Weight for height (wasting) | Normal | 400 | 80 |
| | Moderate | 60 | 12 |
| | severe | 40 | 8 |
| Mid-arm circumference | Normal | 480 | 96 |
| | Mild to moderate PEM | 20 | 4 |
| | Severe PEM | 0 | 0 |

Based on the nutritional status according to WHO Growth Standards Reference (2006), the prevalence of underweight, stunting, and wasting was 220 (44%), 310 (62%), and 100 (20%), respectively. According to the measurement of mid-arm circumference, the prevalence of protein-energy malnutrition was found to be 20 (4%).

Table 3: Association of gender with nutritional status

| Variable | | Gender | | | Chi-square | P value |
|--------------------|-----|--------|--------|-------|------------|---------|
| | | Male | Female | Total | | |
| Nutritional Status | | N | N | | | |
| Underweight | Yes | 100 | 125 | 225 | 3.0779 | 0.0744 |
| | No | 140 | 135 | 275 | | |
| Stunting | Yes | 160 | 165 | 325 | 0.0448 | 0.8574 |
| | No | 80 | 95 | 175 | | |
| Wasting | Yes | 48 | 52 | 100 | 0.4457 | 0.5050 |
| | No | 192 | 208 | 400 | | |

The association between the gender and the nutritional status of the children - underweight, stunting, and wasting - was found to be statistically not significant with the p-value of 0.0744, 0.8574 and 0.5050 respectively.

Table 4: Association of age group with nutritional status

| Variable | | Age in Months | | | Total | Chi-square | P value |
|--------------------|-----|---------------|-------|-------|-------|------------|----------|
| | | 36-47 | 48-59 | 60-72 | | | |
| Nutritional Status | | N | N | N | | | |
| Underweight | Yes | 75 | 80 | 70 | 225 | 1.4733 | 0.4790 |
| | No | 85 | 120 | 70 | 275 | | |
| Stunting | Yes | 120 | 120 | 85 | 325 | 17.87 | 0.000140 |
| | No | 40 | 80 | 55 | 175 | | |
| Wasting | Yes | 20 | 35 | 45 | 100 | 2.059 | 0.3580 |
| | No | 140 | 165 | 95 | 400 | | |

The association between the age group and the stunting was found to be statistically significant with a p- value of 0.000140.

Table 5: Morbidity status of the children

| | N (%) |
|-----------------|----------|
| Fever | 160 (18) |
| Anemia | 190 (38) |
| ARTI | 100 (20) |
| Diarrhea | 20 (4) |
| Skin Infections | 10 (2) |
| Dental caries | 20 (4) |

It was observed that the highest prevalence of morbidity was of anemia, 190 (38%), followed by upper respiratory tract infection, 100 (20%).

Discussion

Every country in the world is affected by one or more forms of malnutrition. Combating malnutrition in all its forms is one of the greatest global health challenges. Globally in 2020, 149 million children under 5 were estimated to be stunted (too short for age), 45 million were estimated to be wasted (too thin for height), and 38.9 million were overweight or obese. Around 45% of deaths among children under 5 years of age are linked to under nutrition. Malnourished children, particularly those with severe acute malnutrition, have a higher risk of death from common childhood illnesses such as diarrhea, pneumonia, and malaria. [12] Nutrition-related factors contribute to about 45% of deaths in children under 5 years of age. [13] The 2017 Global Hunger Index report ranked India 100 out of 119 countries with a serious hunger situation. India trails behind only a few countries such as North Korea, Bangladesh, and Iraq. The country's serious hunger level is driven by high child malnutrition and underlines the need for stronger commitment to the social sector. [14] Freedom from hunger and malnutrition is a basic human right, and their alleviation is a fundamental prerequisite for human and national development. [15]

In the present study comprising of 381 children, the majority of the children belonged to the 48-59 months age group - 200 (40%). A study conducted by Shreyaswi et al. on the prevalence and risk factors of undernutrition among under-five children in a rural community found that out of 133 children surveyed, the majority of the children (43.6%) belong to the 4-5 year age group. [16] In the present study comprising 500 children, 240 (48%) were male children and 260 (52%) were female children. A study conducted by Sangeetha and Priyadarsini on the nutritional status among under-five children in a rural area in and around VMKV Medical College and Hospital, Salem district, Tamil Nadu, has found that among 200 children, 42% were males and 58% were females. [17]

Based on the nutritional status according to WHO Growth Standards Reference (2006), the prevalence of underweight, stunting, and wasting was 220 (44%), 310 (62%), and 100 (20%) respectively. The prevalence of under nutrition among under-five children according to the National Family Health Survey 5 (NFHS 5) in India shows that 29.6% of under-five children were underweight, 31.2% were stunted, and 22.1% were wasted. [18] A study carried out by Murarkar et al. on the prevalence and determinants of under nutrition among under five children residing in urban slums and rural area found that the overall prevalence of stunting is high among children under five, 45.9%, followed by underweight, 35.4%, and wasting, 17.1%. [19]

In the present study, children in the age group of 36-47 and 48-59 months were found to be more stunted compared to the children of 60-72 months. These results were found to be in contrast to the findings of the study conducted by Popat et al., India [20] Gebre et al., Ethiopia [21] and Gebreselassie et al. [22] where children of the higher age group were at higher odds of being stunted when compared to the lower age group. In this study, it was observed that the highest prevalence of morbidity was anemia, 38%, followed by upper respiratory tract infection, 20%. A study by Kubde and Kokiwar on the morbidity pattern among children of 0-6 years in ICDS and non-ICDS urban slums of Nagpur city observed that the highest prevalence of morbidity was anemia, 48.1%, followed by respiratory infections, 11.3%, in the ICDS area. [23,24]

Conclusion

The prevalence of stunting was found to be high compared to wasting and underweight among the study children. Nearly 1/3rd of the children had more than one morbid condition. Majority of the children presented with anemia, followed by acute respiratory tract infection. So ICDS needs to be strengthened to function more efficiently in averting malnutrition among children. A comprehensive, standardized, continuous, and intensive assessment of the nutritional status of children is recommended.

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