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**Jyotirmayee Sahoo**  
 Ph.D. Research Scholar,  
 Department of Food and  
 Nutrition, College of  
 Community Science, Dr.  
 Rajendra Prasad Central  
 Agricultural University,  
 Samastipur, Bihar, India

**Usha Singh**  
 Professor and Head,  
 Department of Food and  
 Nutrition, College of  
 Community Science, Dr.  
 Rajendra Prasad Central  
 Agricultural University, Pusa,  
 Samastipur, Bihar, India

**Gitanjali Chaudhary**  
 Assistant Professor,  
 Department of Foods and  
 Nutrition, College of  
 Community Science, Dr.  
 Rajendra Prasad Central  
 Agricultural University, Pusa,  
 Samastipur, Bihar, India

**Pallavi Kumari**  
 Program Consultant, UNICEF  
 CF Project, Dr. Rajendra  
 Prasad Central Agricultural  
 University, Pusa, Samastipur,  
 Bihar, India

**Corresponding Author:**  
**Jyotirmayee Sahoo**  
 Ph.D. Research Scholar,  
 Department of Food and  
 Nutrition, College of  
 Community Science, Dr.  
 Rajendra Prasad Central  
 Agricultural University,  
 Samastipur, Bihar, India

## Assessment of nutritional status of infants and young children in Dumra block, Sitamarhi District, Bihar

**Jyotirmayee Sahoo, Usha Singh, Gitanjali Chaudhary and Pallavi Kumari**

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### Abstract

**Introduction:** Addressing malnutrition is a critical public health challenge in India, particularly impacting infants and young children, leading to severe health issues. So, to combat this, our focussed on the identification of malnourished children in the study area.

**Methods:** A study was carried out on 30 infants and young children of age group 6-24 months from Dumra block in Sitamarhi District, Bihar. A pre-structured standard questionnaire was used and both general and anthropometric information were collected. Nutritional status of infants and young children was determined by processing the data on excel sheet, using descriptive statistics.

**Results:** The prevalence of severe acute malnutrition was 53.33 percent severely wasted, 56.67 percent severely stunted, and 63.33 percent severely underweight. Moderate malnutrition was also prevalent, affecting 40 percent, 33.33 percent, and 33.33 percent of children in the categories of moderate wasting, stunting, and underweight, respectively. Simultaneously, 6.67 percent, 3.33 percent, and 6.67 percent of children experience mild wasting, stunting, and underweight conditions.

**Conclusions:** Considering the high prevalence of malnutrition in the study area, it was suggested that proper preventive measures ought to be taken as soon as possible.

**Keywords:** Malnutrition, wasting, stunting, underweight, infants and young children

### Introduction

Studies indicated that the first 1000 days of life right from conception till first two years of life is regarded as a critical window for boosting optimum growth, behavioural development and health. It provides opportunity for boosting the health and protecting the body from diseases among infants and young children which ultimately lay a strong foundation for physical and mental performance in their coming years and better quality of life (FAO, 2018) [1].

Severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) are the two categories into which acute malnutrition is further divided based on severity (SAM). When the weight-for-height Z-score (WHZ) is between  $-3SD$  and  $-2SD$ , it is considered moderate acute malnutrition; when it is less than  $-3SD$ , the mid-upper arm circumference (MUAC) is less than 115 mm, or both are present, it is considered severe acute malnutrition. SAM is marked by poor mental development, low IQ, behavioural issues, and poor academic accomplishment in later childhood. It is also linked to greater mortality rates and other chronic health consequences (Lenters, *et al.*, 2020) [2].

Its prevalence is also high in India, according to the NFHS-4 study at 7.5%. Stunting is the result of chronic malnutrition, which is caused by prolonged undernutrition and complicated interaction between environmental and intergenerational variables. Height-for-age Z-score (HAZ) falls below  $-2$  SD in cases of stunting (WHO, 2017). Protein-energy malnutrition weakens the immune system, increasing the risk of future heart disease, prolonging or worsening illness, increasing the negative effects of toxic substances, resulting in short stature, and decreased physical work ability, and making malnourished children more susceptible to common diseases. Even if chronic malnutrition throughout childhood is not always associated with later-life high blood pressure, increased glucose concentrations, and altered blood lipid profiles.

## Materials and Methods

The methodology for systematic investigation of the research title had been decided as under

- **Selection of Area:** A community-based, cross-sectional study was performed in the Dumra block, Sitamarhi district, Bihar. Total eight anganwadi centres of Dumra block in Sitamarhi District were covered under this investigation.
- **Selection of subjects:** 30 infants and young children of 6 to 23 months were selected for the study.
- **Selection of research tools:** The tool selected for the study included an interview schedule.
- **Data collection:** A questionnaire was prepared for easy collection of data and necessary general information like age, gender, socio-economic information like education and occupation of parents, family income, family type, and family size of infants and young children were collected with the help of their mothers. Anthropometric parameters like weight, length or height of the subjects were taken using instruments like a digital salter weighing machine, infantometer and

flexible tri-colour measuring tape with standard criteria and minimum error. After that nutritional status of infants and young children was determined based on WHO cut-off criteria (Table 3).

- **Analysis of data:** The data were entered on Excel sheet and processed using descriptive statistics and expressed in terms of frequency, percentage, mean and standard deviation.

## Results and Discussion

### General information of infants and young children

Among the total 30 infants and young children, the data indicated that the majority (40%) of the subjects were in the age group of 19-24 months followed by 33.33 percent under 6-12 months and 26.67 percent between 13-18 months. It was seen that among all subjects, the majority (60%) were boys while the remaining 40 percent were girls. Besides, it was reported that general category comprised 40 percent, OBC at 26.67 percent, and SC/ST at 33.33 percent. However, there were no individuals from the Muslim community as all participants identified as Hindu.

**Table 1:** Personal Information of Infants and Young Children

Particulars	Subjects (N=30)	
	Frequency	%
<b>Age (months)</b>		
6-12	10	33.33
13-18	8	26.67
19-24	12	40
<b>Gender</b>		
Male	18	60
Female	12	40
<b>Caste</b>		
General	12	40
OBC	8	26.67
SC/ST	10	33.33
<b>Religion Code</b>		
Hindu	30	100
Muslim	0	0

### Socio-economic information of Infants and Young Children

Regarding family size, the majority of had large families (8-10 members) with 60 percent, respectively. Medium-sized families (5-7 members) were represented by 40 percent, while no participants belonged to small families (1-4 members). In terms of family structure, nuclear families were predominant 60 percent while joint families comprised 40 percent. The mean monthly family income distribution was uniform across all participants, with 100 percent reporting an income of less than 10,000, indicating a homogeneity in the economic background of the studied population.

Fathers of all children in-fare-ried solely on labour work as their primary source of income, constituting 100 percent in each category. No individuals reported income from business, agriculture, government jobs, or any other sources. Additionally, when considering the occupation of mothers, the entirety identified as homemakers, with 100 percent reporting this role. No mothers were engaged in labour or any other occupation. On the other hand, 53.33 percent of infants were primarily cared by a paternal/maternal grandmother, followed by 43.67 percent by a mother and 3 percent by the aunt. While concerning the educational level of mother, all of them (66.67%) only could write their names while 33.33 percent were illiterate.

**Table 2:** Details of Family Information of Infants and Young Children

Particulars	Subjects (N=30)	
	Frequency	%
<b>Family size</b>		
Small (1-4)	0	0
Medium (5-7)	12	40.00
Large (8-10)	18	60.00
<b>Tyes of family</b>		
Nuclear family	18	60.00
Joint	12	40.00
<b>Monthly family income</b>		
< 10,000	30	100

10,000- 20,000	0	0
>20,000	0	0
<b>Income sources</b>		
Labour work	30	100
Business	0	0
Agriculture	0	0
Govt. job	0	0
Other	0	0
<b>Mother's occupation</b>		
Homemaker	30	100
Labor	0	0
<b>The first caregiver of Severely Malnourished infant/ young</b>		
Paternal/Maternal grandmother	16	53.33
Aunt	1	3.00
Mother	13	43.67
other sibling (brother/ sister)	0	0.00
<b>Educational qualification of the first care-giver</b>		
Illiterate	10	33.33
Only can write name	20	66.67
Primary level	0	0
Middle level	0	0
Secondary level	0	0

### Assessment of nutritional status of infants and young children

The data presented in table 3 revealed alarming rates of malnutrition among the surveyed children, with 53.33 percent severely wasted, 56.67 percent severely stunted, and 63.33 percent severely underweight. Moderate malnutrition was also prevalent, affecting 40 percent, 33.33 percent, and 33.33 percent of children in the categories of moderate wasting, stunting, and underweight, respectively. Simultaneously, 6.67 percent, 3.33 percent, and 6.67 percent of children experience mild wasting, stunting, and underweight conditions. As per NFHS-5, Bihar has every 2nd child affected by some form of malnutrition - stunting (42.90%), wasting (22.90%), severe wasting (8.80%),

underweight (41%) and 69.70 percent children under 5 years are anaemic. Approximately 6 lakhs 70 thousand children are suffering from severe wasting and need urgent treatment and care to prevent the risk of death and morbidity. Houghton *et al.* (2018) [5] observed that 39 percent of children aged 1 to 2 years in a South Delhi slum were affected by stunting, 31 percent by underweight, and 10 percent by wasting. Sailaja *et al.* (2016) [6] reported that among infants and young children aged 6 to 24 months, the prevalence of underweight, stunting, and wasting was 44.60%, 37.70%, and 20.78%, respectively. Dhanalakshmi and Selvaraj (2019) [7] found that the prevalence of underweight, wasting, and stunting in their study was 31.65%, 15.00%, and 45.60%, respectively.

**Table 3:** Anthropometric information of infants and young children

Anthropometric index	Nutritional status	Z-score (WHO, 2008, 2019)	%
W/H	Severe wasting	< -3	53.33
	Moderate wasting	-3 to -2	40.00
	Mild wasting	-2 to -1	6.67
	Normal	-1 to +1	0
W/A	Severe underweight	< -3	63.33
	Moderate underweight	-3 to -2	33.33
	Mild underweight	-2 to -1	6.67
	Normal	-1 to +1	0
H/A	Severe stunting	< -3	56.67
	Moderate stunting	-3 to -2	33.33
	Mild stunting	-2 to -1	3.33
	Normal	-1 to +1	6.67

### Conclusion

From the study, it was found that the majority of the families were large size families as well as lower income (< 10,000) which are more prone to undernutrition. Also, it was found that 53.33 percent were severely wasted, 56.67 percent were severely stunted, and 63.33 percent were severely underweight. Moderate malnutrition was also prevalent, affecting 40 percent, 33.33 percent, and 33.33 percent of children in the categories of moderate wasting, stunting, and underweight, respectively. Although about 10 percent of children are of adequate nutrition, the rest children are malnourished requiring utmost consideration.

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