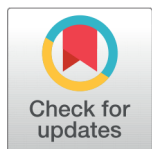


## RESEARCH ARTICLE



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## Prevalence of underweight and its risk factors among under-five children in a tertiary care hospital of Chitradurga

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## Abstract

Children constitute a large and vulnerable group, as 50% of all deaths occur during the first 5 years of life. Children below five years of age are at-risk population due to their susceptibility to malnutrition. The nutritional status of pre-school children is a sensitive indicator, ignoring which puts the long term health and development of population at risk. The level of childhood malnutrition is exceptionally high in India (45-48%). Objective of this study was to assess the status of nutritional status of under 5 children and to identify the risk factors associated with it. Methodology of the prospective cross-sectional study included 250 under-five children attending paediatric outpatient department of two tertiary care hospitals in Chitradurga from June to November, 2020. Socio demographic measures were obtained from structured questionnaire and followed by anthropometric measurements. Grading was done as per Indian Academy of Paediatrics (IAP) classification. The prevalence of underweight among under five children was 55.6%. Around 7% of children were severely malnourished. Males (52.5%) were more malnourished than females (47.5%). The sociodemographic determinants birth weight and duration of exclusive breastfeeding had statistically significant association with malnutrition. The burden of underweight was very high and some important risk factors for underweight were determinants birth weight and duration of exclusive breastfeeding. Therefore, any interventions to prevent and solve the problem of under nutrition should focus on maternal health.

**Keywords:** Underweight; Risk factors; UnderFive children; Malnourishment; IAP classification 1

## Introduction

India, in the past few decades has witnessed rapid progress in terms of industrialisation and agricultural production. Yet malnutrition, especially under nutrition continues to be a major problem of public health. It is the major contributor to high rates of childhood mortality, maternal mortality and morbidities in the community.<sup>(1)</sup>

Worldwide, the major killers of children under five years of age are pneumonia (18 percent), diarrhoeal diseases (15 percent), preterm birth complications (12 percent) and birth asphyxia (9 percent). Under nutrition is a major cause in more than half of under-five deaths.<sup>(2)</sup> Each year nearly 2.3 million deaths among 6 to 60 months age children in developing countries are associated with malnutrition.<sup>(3)</sup>

Ninety-Nine million, i.e., 15 % total under-5 children in the world are under-weight and 25 % are stunted. Prevalence of under-5 children in India is highest in the world; nearly double that of sub-Saharan Africa.<sup>3</sup> According to national family health survey-3 reports, 40% children under 3 years of age are underweight and 45% are stunted in India.<sup>(4)</sup>

About 21% of global deaths and DALYs (Disability Adjusted Life Years) in children younger than 5 years are attributed to stunting, severe wasting and intrauterine growth retardation. Long term consequences of under nutrition during the early stages of child growth and development include likelihood of short stature in adult life, low educational achievements, giving birth to smaller children, lower economic status and reduce physical work capacity and productivity in adulthood.<sup>(5)</sup>

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.<sup>(6)</sup>

There is huge interstate variation i.e. the range was from 19.7% in Sikkim to 60% in Madhya Pradesh.<sup>4</sup> Socio-demographic variables like age, gender, socio-economic status are associated with underweight.<sup>(7)</sup> Thus the type and magnitude of under nutrition may vary from district to district also, depending on geographical and agro climatic conditions and therefore, warrant region — specific interventions. In order to devise and implement area specific intervention strategies and to monitor their impact over a period, it is necessary to generate data base at district level.

In view of above, need was felt to conduct a study to assess the burden of under nutrition among children aged 1 to 5 years and associated socio demographic and feeding practices.

### Aims and Objectives

1. To assess the status of nutritional status of under 5 children.
2. To identify the risk factors associated with it.

## Materials and Methods

**Study design:** Cross sectional study

**Study sample:** All under five children coming to paediatric OPD of the two hospitals along with their mother and those who did not get admitted.

**Sampling Method:** Convenient sampling

**Study duration:** 6 months (June to December 2020)

**Sample frame:** Chitradurga district hospital and Basaveshwara Medical College Hospital

### Exclusion Criteria:

- Those who were on steroids
- Those who were suffering from chronic illnesses.
- Children below 6 months

**Data collection:** Structured questionnaire was used to collect socio-demographic and other relevant child and mother related information such as child's height, weight, MAC and mother's age at pregnancy etc. Data collectors interviewed the mothers of the children who were willing to participate using local language. Informed consent was taken from parent before taking anthropometric measurement of the child.

The questionnaire gathered information regarding personal profile of the child and mother, socioeconomic information, educational level of mother and information regarding nutritional status (breast fed within an hour, duration of breast feeding, age at weaning, Vitamin A supplementation, diet).

### Statistical Analysis

The collected data was entered into Microsoft excel and was analyzed using SPSS (statistical package for social science) software Version 20. Chi-square test was used to determine the statistical significance of the difference in prevalence of under nutrition with various risk factors. A probability of less than 0.05 was considered statistically significant.

## Results & Discussion

In our study, 55.8% of children under -five years of age were underweight. The prevalence of grade I malnourishment was 32.5%, grade II was 16.7%, grade III was 2.5% and grade IV was 4.2%. The prevalence of underweight in our study was similar to that (56.4%) of study conducted in a rural area located in Aligarh district of Uttar Pradesh.<sup>(8)</sup> 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%.<sup>(8)</sup>

In a dietary survey conducted by Vinod et al., it was found that 52.23 % children were suffering from various grades of malnutrition among which 32.18 % children were in grade I, 16.09 % in grade II, 3.46 % in grade III and 0.5 % in grade IV malnutrition.<sup>(9)</sup> Children aged more than 24 months (2 years) were more undernourished than other age group children and the difference was found to be statistically significant ( $p < 0.05$ ).

Kavitha et al.,<sup>(10)</sup> reported in her study the prevalence of protein energy malnutrition was higher in 3rd year age periods as compared to 4th and 5th year. We found that major chunk of underweight children belonged to BPL families (95.7%).

Dhakal et al.,<sup>(11)</sup> mentioned that the burden of malnourishment still haunts the poor with 82.75% children from low income group i.e. IV & V by Prasad Scale.

Children of mothers who had completed post high school/graduation were better nourished than other children. Ahmed E et al., reported a higher proportion of children suffering from PEM belongs to illiterate parents and especially that of illiterate mothers.<sup>(8)</sup>

Similarly in a study conducted by Verma et al., literacy of mother displayed a significant ( $p < 0.001$ ) inverse relationship with malnutrition being highest (70%) among children whose mothers are illiterate.<sup>(12)</sup> We found majority of underweight children had birth weight lesser than 3.5 kilograms. This was in line with Rapid Survey on Children (RSOC) 2014.<sup>(13)</sup>

**Table 1.** Prevalence of Under weight among under 5 children and IAP classification of malnutrition (N=250)

		Number	Percentage
Prevalence of Under weight	Normal Children	111	44.2
	Underweight Children	139	55.8
IAP Classification	Normal	111	44.2
	Grade I (mild)	79	32.5
	Grade II (moderate)	41	16.7
	Grade III (severe)	7	2.5
	Grade IV (very severe)	12	4.2

**Table 2.** Prevalence of Underweight among under five children in relation to socio-demographic factors (N= 250)

Variables		Normal (n=111)	Under-Weight (n=139)	Chi Square Value	Df	P value
Gender	Male	58 (52.8)	72 (52.2)	0.008	1	0.93
	Female	53 (47.2)	67 (47.8)			
Socio-economic status	APL	19 (17.1)	6 (43)	11.236	1	0.001
	BPL	92 (82.9)	133 (95.7)			
Diet	Vegetarian	5 (4.5)	10 (7.2)	0.792	1	0.374
	Non vegetarian	106 (95.5)	129 (92.8)			
Age	6-12 months	15 (13.5)	21 (15.1)	20.844	3	<0.001
	13-24 months	47 (42.3)	29 (20.9)			
	25- 36 months	13 (11.7)	45 (32.4)			
	>37 months	36 (32.4)	44 (31.7)			

**Table 3.** Prevalence of underweight among under five children in relation to selected maternal risk factors (N=250)

Selected maternal risk factors (N=250)						
Variables		Normal (n=111)	Under- Weight (n=139)	Chi Square Value	Df	P value
Education of mother	Illiterate	9 (8.1)	11 (7.9)	16.118	5	0.007
	Primary school	5 (4.5)	13 (9.4)			
	Middle school	11 (9.9)	22 (15.8)			
	High School	51 (45.9)	76 (54.7)			
	Post High School	28 (25.2)	15 (10.8)			
	Graduate	7 (6.3)	2 (1.4)			
Moth- ers BMI	16-20	22 (19.8)	54 (38.8)	12.895	2	0.002
	20-24	71 (64)	75 (54)			
	24-27	18 (16.2)	10 (7.2)			
Age of mother at pregnancy	17-25	83 (74.8)	103 (74.1)	3.053	2	0.217
	25-30	18 (16.2)	30 (21.6)			
	30-35	10 (9)	6 (4.3)			
Birth order	1 <sup>st</sup>	73 (65.8)	77 (55.4)	3.306	2	0.191
	2 <sup>ND</sup>	29 (26.1)	43 (30.9)			
	>2	9 (8.1)	19 (13.7)			
Spacing	1 <sup>st</sup> child	72 (64.9)	78 (56.1)	2.661	2	0.191
	<3yrs	20 (18)	26 (18.7)			
	≥3yrs	19 (17.1)	35 (25.2)			
Delivery	Preterm	5 (4.5)	28 (20.1)	13.199	2	0.001
	Full term	98 (88.3)	102 (73.4)			
	Post term	8 (7.2)	9 (6.5)			

## Conclusion

Under nutrition in children is a major health problem in developing countries like India. It is a basic indication of status of population's health.

At the end of analysis, overall study calls for the improvement in nutrition of child with preventive and social measures. It is the health status of children of any country that represents the health status of people of that country. Since this growing generation is going to be the future productive citizens, they should be healthy enough to make use of the full potential of their productive age.

**Table 4.** Prevalence of underweight among under five children in relation to selected risk factors related to children (N=250)

Variables		Normal	Under-Weight	Chi Square Value	Df	P value
Baby's birth weight	<2.5kg	10 (9)	62 (44.6)	38.37	2	<0.01
	2.5-3.5kg	91 (82)	71 (51.1)			
	>3.5kg	10 (9)	6 (4.3)			
Breast milk	Given within 1 hour	90 (81.1)	114 (82)	0.036	1	0.85
	Not given within 1 hour	21 (18.9)	25 (18)			
Duration of breast feeding	1-6 months	16 (14.4)	16 (11.5)	11.746	3	0.008
	7-12 months	61 (55)	77 (55.4)			
	13-24 months	15 (13.5)	37 (26.6)			
	>24 months	19 (17.1)	9 (6.5)			
Age at weaning	<6 months	22 (19.8)	28 (20.1)	5.656	2	0.05
	6 months	30 (27)	56 (40.3)			
	>6 months	59 (53.2)	55 (39.6)			
Infant feed given during first 6 Months	Yes	29 (26.1)	41 (29.5)	0.348	1	0.55
	No	82 (73.9)	98 (70.5)			

Community based preventive measures should be taken to alleviate malnutrition.

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