

Study of Clinical Profile of Malnutrition and Risk Factors among Children Admitted in A Tertiary Care Centre

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Abstract

Background: Malnutrition remains a major public health problem among under-five children in developing countries. It contributes significantly to morbidity, mortality, and impaired growth and development. Identification of the clinical profile and associated risk factors is essential for effective prevention and management strategies.

Objectives: To study the clinical profile of malnutrition and to identify socio-demographic, feeding, and health-related risk factors associated with malnutrition among children aged 6 months to 5 years.

Methodology: A hospital-based cross-sectional study was conducted in the Department of Pediatrics at CPR Hospital, Kolhapur from September 2025 to February 2026. A total of 150 children aged 6 months–5 years were enrolled. Data were collected using a structured

questionnaire and anthropometric measurements. Nutritional status was assessed using WHO growth standards.

Results: Among 150 children studied, stunting was the most common form of malnutrition observed in 36.7% of children, followed by underweight in 28.0% and wasting in 16.0%. The highest proportion of children belonged to the 25–36 months age group (26.7%). Females constituted 51.3% and males 48.7% of the study population. Most mothers had primary or middle-school education (52.0%), while 19.3% were illiterate. A majority of fathers (54.7%) had education up to primary or middle school. Most children belonged to socio-economic class IV (44.7%). Low birth weight was observed in 24.0% of children. Exclusive breastfeeding was practiced in 74.7% of children, while 25.3% were not exclusively breastfed. Complementary feeding was

initiated after six months in 52.0% of children. Most children were fully immunized (72.0%). A recent history of illness was present in 25.3% of children.

Conclusion (40 words): Malnutrition among under-five children remains a significant health concern. Stunting was the most prevalent form observed. Socio-economic status, parental education, birth weight, feeding practices, and illness history were important contributing factors highlighting the need for early nutritional interventions.

Keywords: Malnutrition, Underweight, Stunting, Wasting, Under-five children.

Introduction

Malnutrition remains one of the most significant public health challenges affecting children under five years of age in developing countries. It is defined as a pathological condition resulting from deficiency, excess, or imbalance of essential nutrients required for normal growth and development.¹ Among children, undernutrition—manifested as underweight, stunting, and wasting—continues to contribute substantially to morbidity, mortality, and impaired physical and cognitive development. Globally, an estimated millions of children under five suffer from some form of malnutrition, with a large proportion residing in low- and middle-income countries.² Malnutrition during early childhood not only increases susceptibility to infections but also adversely affects intellectual capacity, school performance, and productivity in adulthood.³

India carries a considerable burden of childhood malnutrition due to factors such as poverty, inadequate dietary intake, poor maternal education, infections, and suboptimal child-feeding practices.⁴ According to recent national surveys, a significant proportion of children below five years are underweight, stunted, or wasted,

reflecting persistent nutritional deprivation and chronic illness. These conditions are particularly common in socioeconomically disadvantaged populations and are influenced by multiple determinants including birth weight, breastfeeding practices, immunization status, and environmental conditions.⁵

Malnutrition is widely recognized as a multifactorial problem influenced by socioeconomic, demographic, and health-related factors. Maternal education, household income, family size, and access to health services play important roles in determining the nutritional status of children.⁶ These factors highlight the complex interaction between biological, social, and environmental determinants affecting child nutrition.⁷

Despite various national nutrition programs and public health initiatives, malnutrition continues to remain prevalent among children admitted to hospitals and health facilities. Hospital-based studies provide valuable insights into the clinical profile, severity, and associated risk factors among affected children.⁸

Therefore, studying the clinical profile and associated risk factors among malnourished children can help identify vulnerable groups and guide preventive and therapeutic strategies. The present study was undertaken to assess the clinical profile of malnutrition and associated risk factors among children aged 6 months to 5 years admitted to a tertiary care hospital.

Material and Methods

This hospital-based descriptive cross-sectional study was conducted in the Department of Pediatrics at Chhatrapati Pramila Raje (CPR) Hospital, Kolhapur, a tertiary care teaching hospital that caters to both urban and rural populations of western Maharashtra. The study was carried out over a six-month period from September 2025 to February 2026.

The study population included children aged 6 months to 5 years who were admitted to the pediatric wards of CPR Hospital during the study period and were diagnosed with malnutrition based on anthropometric assessment. A total of 150 children meeting the inclusion criteria were enrolled in the study after obtaining informed consent from parents or caregivers.

Children between 6 months and 5 years of age admitted with features of malnutrition or identified as malnourished during hospital admission were included in the study. Children with congenital anomalies, genetic disorders affecting growth, chronic systemic illnesses such as congenital heart disease or chronic renal disease, and those whose parents were unwilling to participate were excluded from the study.

Data were collected using a pre-designed and pre-tested structured questionnaire. Information regarding socio-demographic characteristics such as age, sex, parental education, and socioeconomic status was recorded. Additional information on birth history, birth weight, breastfeeding practices, age of initiation of complementary feeding, immunization status, and recent history of illness was also obtained from caregivers.

Results

Table 1: Distribution of Underweight (weight for age), Stunting (height for age) and Wasting (weight for height) among patients:

Nutritional Index	Moderately undernourished (-2 to -3 SD)	Severely undernourished (< -3 SD)	Total N (%)
Underweight (Weight for age)	32 (21.3%)	10 (6.7%)	42 (28.0%)
Stunting (Height for age)	40 (26.7%)	15 (10.0%)	55 (36.7%)
Wasting (Weight for height)	18 (12.0%)	6 (4.0%)	24 (16.0%)

Underweight (weight-for-age) was observed in 42 children (28.0%). Among them, 32 children (21.3%) were moderately undernourished, while 10 children (6.7%) were severely undernourished. Stunting (height-for-age), which reflects chronic malnutrition, was the most common form observed in the study. A total of 55 children (36.7%) were stunted, of which 40 children (26.7%) were moderately stunted and 15 children (10.0%) were severely stunted.

Anthropometric measurements were performed using standard procedures. Weight was measured using a calibrated digital weighing scale with minimal clothing, and length or height was measured using an infantometer or stadiometer depending on the age of the child. Nutritional status was assessed using WHO Child Growth Standards (2006). Children with weight-for-age, height-for-age, or weight-for-height below -2 standard deviations (SD) from the reference median were considered underweight, stunted, or wasted respectively, while those below -3 SD were classified as severely malnourished.

All collected data were entered into Microsoft Excel and analyzed using SPSS statistical software. Descriptive statistics such as frequency and percentage were used to summarize the findings. Associations between risk factors and malnutrition were evaluated using appropriate statistical tests, and a p-value less than 0.05 was considered statistically significant.

Prior approval for the study was obtained from the Institutional Ethics Committee, and confidentiality of participants was strictly maintained throughout the study.

Wasting (weight-for-height), was present in 24 children (16.0%). Among these, 18 children (12.0%) had moderate wasting and 6 children (4.0%) had severe wasting.

Table 2: Age and Sex distribution of all patients:

Age and Sex distribution		Number	Percentage
Age Group (Months)	6–12	22	14.7%
	13–24	34	22.7%
	25–36	40	26.7%
	37–48	31	20.7%
	49–59	23	15.3%
Sex	Male	73	48.7%
	Female	77	51.3%
Total			

The majority of children belonged to age group 25–36 months, 40 (26.7%), followed by age group 13–24 months with 34 children (22.7%) and 37–48 months with 31 children (20.7%). Children aged 49–59 months constituted 23 cases (15.3%), while the least number of children were in the 6–12 months age group with 22 cases (14.7%). With respect to sex distribution, 73 children (48.7%) were males and 77 children (51.3%) were females, indicating a nearly equal distribution between male and female children in the study population.

Table 3: Risk Factors of Malnutrition among Children

Age and Sex distribution		Number	Percentage
Mother’s literacy status	Illiterate	29	19.3%
	Primary / up to middle school	78	52.0%
	High school and above	43	28.7%
Father’s literacy status	Illiterate	18	12.0%
	Primary / up to middle school	82	54.7%
	High school and above	50	33.3%
Socio-economic status (Modified BG Prasad)	Class I	6	4.0%
	Class II	14	9.3%
	Class III	32	21.3%
	Class IV	67	44.7%
	Class V	31	20.7%
Birth weight of the patients	< 2.5 kg (Low birth weight)	36	24.0%
	≥ 2.5 kg	114	76.0%

Age and Sex distribution		Number	Percentage
Exclusive breast-feeding status	Yes	112	74.7%
	No	38	25.3%
Age of initiation of complementary feeding	Before 6 months	17	11.3%
	At 6 months	55	36.7%
	After 6 months	78	52.0%
Immunization status	Fully immunized (as per age)	108	72.0%
	Partially immunized	32	21.3%
	Unimmunized	10	6.7%
History of illness within last month	Yes	38	25.3%
	No	112	74.7%
Total			

Regarding maternal literacy, the majority of mothers had education up to primary or middle school (52.0%), while 28.7% had education up to high school or above and 19.3% were illiterate. In terms of paternal literacy, more than half of the fathers (54.7%) had education up to primary or middle school level, 33.3% had education up to high school or above, and 12.0% were illiterate.

Assessment of socio-economic status based on the Modified BG Prasad classification showed that the largest proportion of children belonged to Class IV (44.7%), followed by Class V (20.7%) and Class III (21.3%). Only a small proportion belonged to Class I (4.0%) and Class II (9.3%). Low birth weight (<2.5 kg) was present in 36 children (24.0%), while the majority of children (76.0%) had normal birth weight.

Exclusive breastfeeding was practiced in 112 children (74.7%), whereas 38 children (25.3%) were not exclusively breastfed. Regarding the age of initiation of complementary feeding, most children (52.0%) started complementary feeding after six months, 36.7% started at six months, and 11.3% started before six months.

Most children were fully immunized according to age (72.0%), while 21.3% were partially immunized and 6.7% were unimmunized. A history of illness within the last month was reported in 38 children (25.3%), whereas 112 children (74.7%) had no such history.

Discussion

Nutritional status (Underweight, stunting and wasting)

In the present study, the prevalence of underweight, stunting, and wasting among children aged 6 months to 5 years was 28.0%, 36.7%, and 16.0% respectively. Stunting was the most common form of malnutrition in our study population. Similar findings were reported by Murarkar et al.⁹, who observed 35.4% underweight, 45.9% stunting, and 17.1% wasting among under-five children in India indicating that chronic malnutrition remains a major concern. Likewise, a recent community-based study by Sharma P et al.¹⁰, reported the prevalence of 23.23% stunting, 22.95% wasting, and 23.23% underweight, demonstrating comparable levels of undernutrition in different regions of the country. National data from the NFHS-5³ survey also show that

32.1% of children are underweight, 35.5% are stunted, and 19.3% are wasted, which is close to the pattern observed in the present study. The slightly lower prevalence of wasting in our study compared to some reports may be due to the hospital-based sample and better access to healthcare services in an urban tertiary care setting.

Age and sex distribution

In our study, the highest proportion of children belonged to the 25–36 months age group (26.7%), followed by 13–24 months (22.7%). This age pattern is similar to findings reported by several studies where malnutrition was more common during the second and third year of life, when children transition from breastfeeding to complementary feeding. Singh et al.¹¹ reported that nutritional deficiencies were more common among children aged 12–36 months, largely due to inadequate complementary feeding and increased susceptibility to infections. Similarly, another cross-sectional study by Naresh S. et al.¹² reported a higher burden of undernutrition among children aged 1–3 years, which coincides with the critical growth period.

Regarding sex distribution, our study showed a nearly equal distribution with 48.7% males and 51.3% females. Similar observations were made by Chakravarty et al.¹³, who reported that malnutrition affected both sexes without significant difference, despite a slightly higher proportion of males in their hospital population. Minor differences between studies may be explained by regional sociocultural practices, gender-based care differences, and variations in health-seeking behavior.

Risk factors of malnutrition

Maternal education plays an important role in determining child nutritional status. In the present study, 19.3% of mothers were illiterate, while the majority had

primary or middle-school education (52.0%). Similar findings were observed in other studies where lower maternal education was associated with higher malnutrition rates. Singh et al.¹¹ reported that children of mothers with lower education levels had a higher risk of underweight and poor feeding practices. Socioeconomic factors also play a crucial role. In our study, 44.7% of children belonged to Class IV socioeconomic status, which is consistent with findings from several Indian studies reporting higher malnutrition among children from lower socioeconomic groups.

Low birth weight was present in 24.0% of children in the present study. Previous research has also demonstrated a strong association between low birth weight and malnutrition during early childhood. Murarkar et al.⁹ reported that children born with low birth weight had a significantly higher prevalence of undernutrition compared to those with normal birth weight.

Exclusive breastfeeding was practiced in 74.7% of children in our study. This proportion is slightly higher than some studies where exclusive breastfeeding prevalence ranged from 47% to 77%.¹⁴ Differences may be explained by regional awareness programs and hospital-based counselling practices. Early or delayed complementary feeding was also noted among a proportion of children in our study, which is a recognized risk factor for malnutrition. Studies have shown that inappropriate feeding practices and recurrent infections significantly increase the risk of undernutrition among under-five children.¹¹

Overall, the findings of the present study are consistent with previous research demonstrating that childhood malnutrition is influenced by a complex interplay of socioeconomic conditions, maternal education, feeding practices, and birth-related factors.

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