

*Original research article*

## **Anthropometric measurements of infants' health in a rural practice setting: A cross- sectional study**

**<sup>1</sup>Faraha Naaz, <sup>2</sup>Tagaram Ramchandra and <sup>3\*</sup>Sheldon Thompson**

<sup>1</sup> Assistant professor, Department of Community Medicine, Ayaan Institute of Medical Sciences, Hyderabad, Telangana, India

<sup>2</sup> Assistant professor, Department of Community Medicine, Government Medical College, Nalgonda, Telangana, India

<sup>3\*</sup> Associate professor, Department of Community Medicine, Ayaan Institute of Medical Sciences, Hyderabad, Telangana, India

**\*Corresponding author:**

Dr. Sheldon Thompson

### **Abstract**

**Background:** Infancy is the period of growth and development of a child. Inadequate care, malnutrition and infections in this crucial period led to high neonatal and infant deaths and also high prevalence of morbidities. Undernutrition continues to be an important public health problem in India and can affect many aspects of children's development such as retarding physical and mental development, manifesting itself in different forms in children such as stunting or wasting or underweight.

**Materials and method:** this cross- sectional study was conducted among subjects attending Rural health training centre (RHTC) attached to a tertiary teaching institute from January 2023 to June 2023, using a pre designed questionnaire.

**Results:** In the current study, which included 53% girls and 47% boys, most of whom were between 10 and 12 months old, it was shown that there was a strong relationship between an infant's nutritional health and gender. It was discovered that a higher percentage (82.8%) of infants between the ages of 10 and 12 months were malnourished. Across all age groups of the study subjects, the percentage of malnourished infants was higher than the percentage of infants who were properly nourished, and 67.1% of the malnourished study participants belonged to lower socioeconomic groups, whereas 5.7% were from upper middle class.

**Conclusion:** According to the study, malnutrition affected a large percentage of infants, mostly female infants. The health of these infants, who will be the nation's future citizens, should be our first priority, and their medical requirements should be adequately met.

**Keywords:** Anthropometry, Stunting and Wasting

## **Introduction**

Infancy is the period of growth and development of a child. Adequate nutrition is essential for children's health and development. Inadequate care, malnutrition and infections in this crucial period led to high neonatal and infant deaths and also high prevalence of morbidities. Globally under nutrition is responsible, directly or indirectly for 35% of deaths in children less than five years of age<sup>1</sup> and the infant mortality in India stands 30 per thousand live births as per 2021 data<sup>2</sup>. Despite several nutrition intervention programmes in operation over the last four decades, undernutrition continues to be an important public health problem in India<sup>3</sup> and can affect many aspects of children's development such as retarding physical and mental development, manifesting itself in different forms in children such as stunting or wasting or underweight<sup>4</sup>

The NFHS data 2021 estimates that the incidence of stunting, wasting and underweight in India for children under the age of five years was 35.5%, 19.3% and 32.1%, respectively<sup>5</sup>. Therefore, considering the present data on undernutrition this study was taken up to identify the sociodemographic and nutritional factors that are associated with undernutrition in children under the age of one year.

## **Objectives**

1. To study the socioeconomic characteristics of infants and
2. To assess the health status of infants by anthropometry.

## **Material and method**

**Study Area-** The study was conducted among subjects attending Rural health training centre (RHTC) attached to a tertiary teaching institute.

**Study Design-** Cross- sectional study.

**Study Period-** January 2023 to June 2023

**Ethical approval-** Prior to starting the study, institutional ethical committee approval was acquired.

**Study Population-** Subjects who presented for illness, general check- up and vaccination.

## **Inclusion Criteria**

1. Both the sexes between 0 to 12 months
2. Consented subjects

## **Exclusion Criteria**

1. Subjects above 12 months
2. Severely ill infants
3. Non- consented subjects

**Sample Size and sampling-** Convenient sampling method was used. All infants who reported during the study period were included which worked out to 104 subjects

**Data collection methodology-** After receiving verbal consent from the parent or legal guardian and recording sociodemographic information, the individuals were added to the research study. A digital scale was used to measure weight, and a non-stretchable tape was

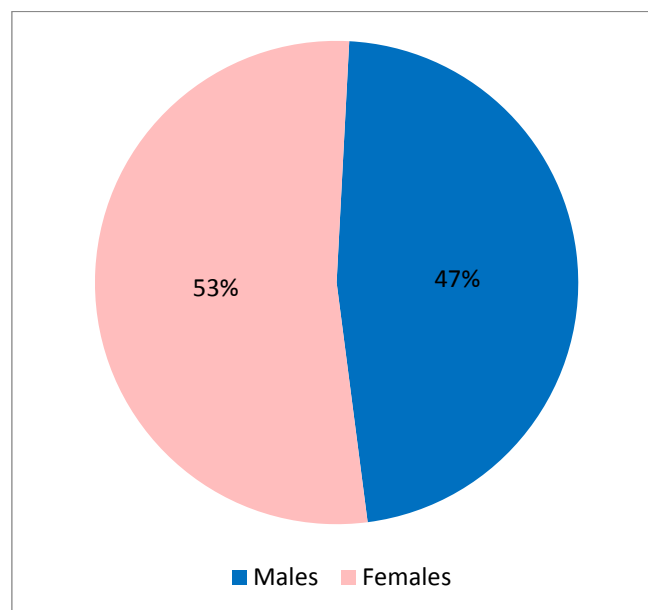
used to measure length. The Modified Kuppuswamy scale was used to determine socioeconomic level.

**Data analysis-** SPSS received the collected data and imported it. The data were analysed using SPSS version 21, a statistical tool for social sciences. After the data has been provided as percentages in categories, tables and diagrams are utilised to illustrate it. Use of the straightforward chi-square test was made for the significance test. At a p-value of 0.05, all statistical tests will be judged statistically significant.

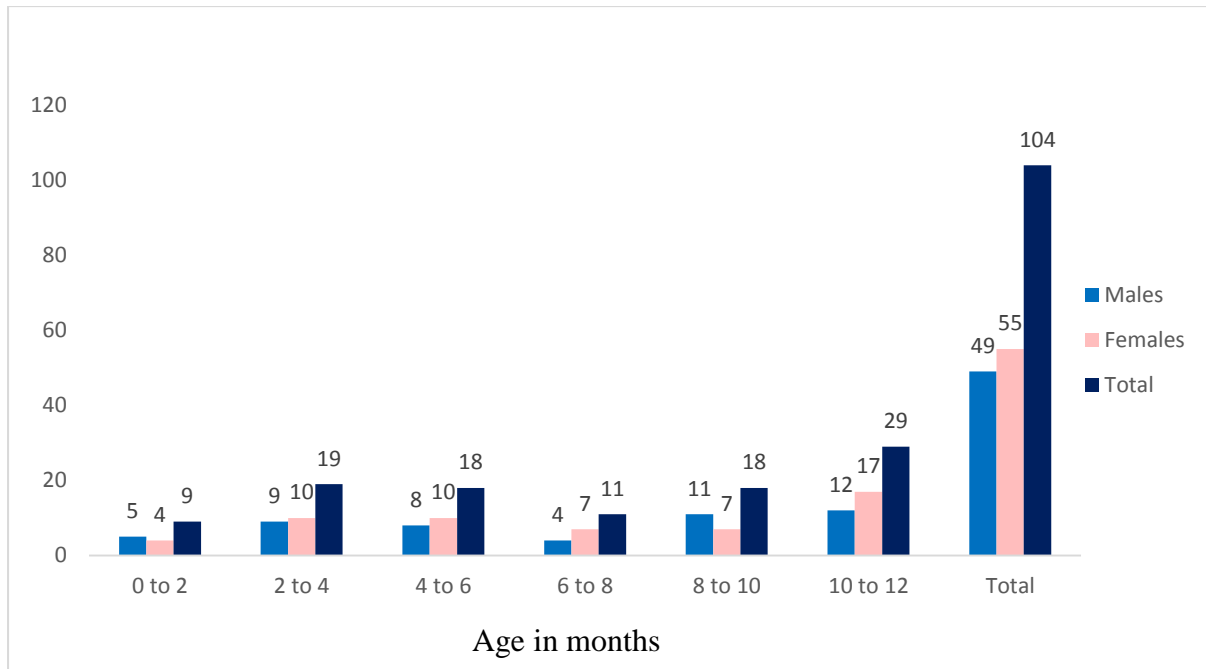
## Results

The current study comprised of 53% females and 47% males with majority of them between 10 and 12 months (**Figure 1 & 2**). The present study showed that among females 24, 16 and 22 were underweight, stunted and wasted respectively. Among males 23,05 and 23 were underweight, stunted and wasted respectively. From the above **table 1** it was evident that there was significant difference between nutritional status and gender of the infant. It was found that higher (82.8%) percentage of infants were malnourished between 10 to 12 months of age group. Also, the percentage of malnourished infants were more when compared to normally nourished infants among all the age groups of the study subjects as shown in **figure 3**. 52.9% of malnourished study subjects belonged to illiterate mothers and 47.1 % normal subjects belonged to literate mothers (**figure 4**). 67.1 % of the malnourished study subjects belonged to lower socioeconomic group whereas 5.7% malnourished were from upper middle class as seen in **table 2**.

**Figure 1:** Distribution according to gender



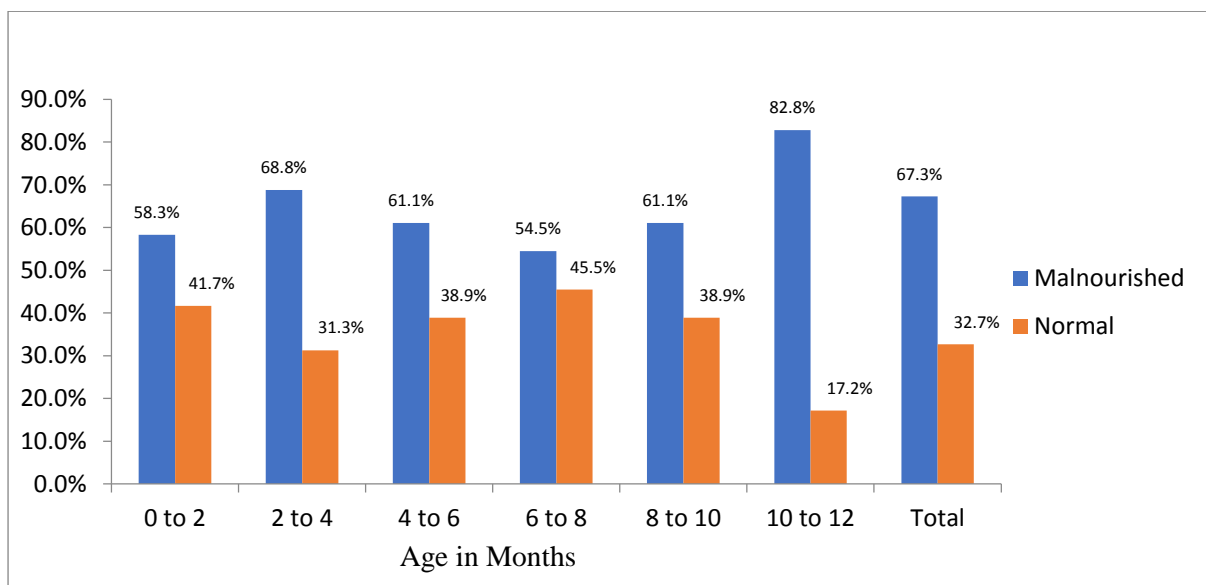
**Figure 2:** Distribution according to age and gender



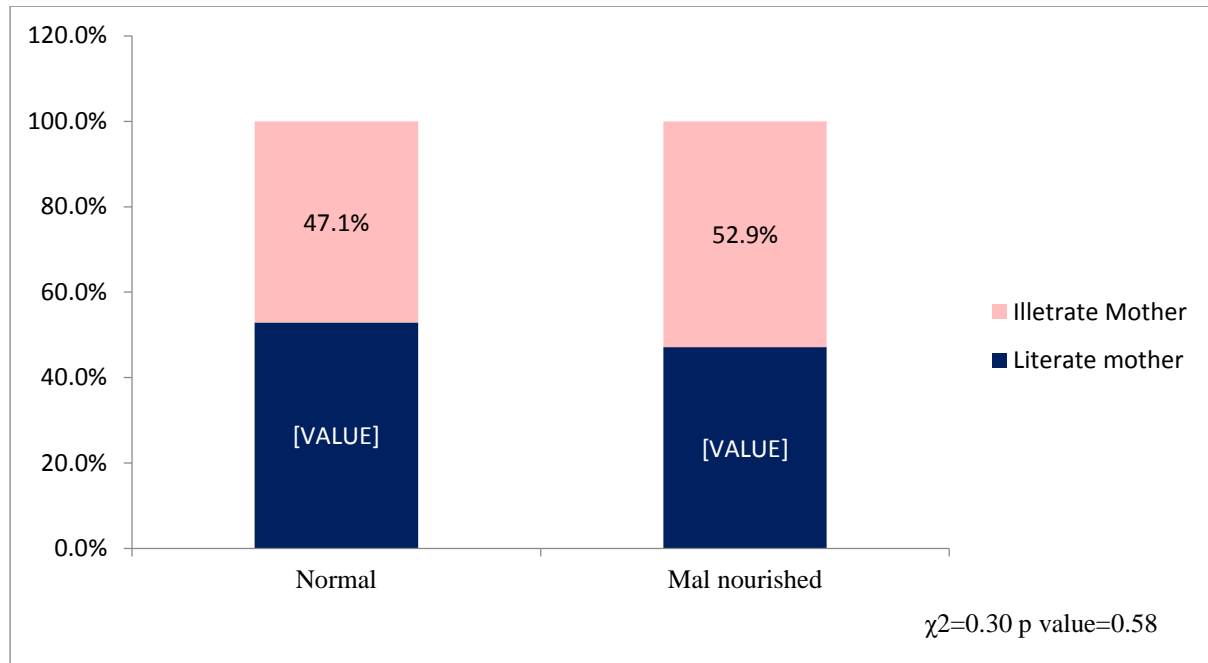
**Table 1:** Distribution of according to nutritional status and gender

Nutritional Status	Males	Females	Total	p-value
Underweight	23(48.9%)	24(51.1%)	47(100.0%)	0.91
Stunted	5(23.9%)	16(76.1%)	21(100.0%)	0.17
Wasted	23(51.2%)	22(48.8%)	45(100.0%)	0.47

**Figure 3:** Nutritional status and age



**Figure 4:** Literacy status of mothers and nutritional status of infants



**Table 2:** Socio economic status and nutritional status

Class	Malnourished	Normal	Total
Class I (Upper)	0 (0.0%)	1 (2.9%)	1 (1.0%)
Class II (Upper Middle)	4 (5.7%)	1 (2.9%)	5 (4.8%)
Class III (Middle)	10 (14.3%)	12 (35.3%)	22 (21.2%)
Class IV (Upper lower)	47 (67.1%)	17 (50.0%)	64 (61.5%)
Class V (Lower)	9 (12.9%)	3 (8.8%)	12 (11.5%)
Total	70 (100.0%)	34 (100.0%)	104 (100.0%)

## Discussion

One third of the malnourished children worldwide are from India, which has one of the worst rates of child malnutrition in the world. India has performed worse in terms of child malnutrition than neighbouring nations with comparable per capita revenues and socioeconomic structure. Child malnutrition is a recurring problem and continuous challenge for India's governmental administration. India had some of the worst ratings for child health indices among all the countries. Up to November of last year, there were reportedly 9,27,606 very acutely malnourished children nationwide, ranging in age from six months to six years. An examination of India's position regarding children's nutritional health in the 75th year of its independence on Children's Day.

In a study by Sreedhar *et al.* [6], it was discovered that 43% were female and 57% were male, which was more or less identical to the current findings. In a study by Kalyan *et al.* [1], 52.1%

were male and 47.9% were female. According to the Mohin *et al.*<sup>[7]</sup> study, most of the study's infants were between the ages of 7 and 12 months, while 74 and 26 were between 0 and 6 months.

According to Madhur Bhora *et al.*<sup>[8]</sup> study, males made up 23.6% of the underweight group, while females made up 24.4%. In a similar vein, there were more stunted and wasted female new-borns. The relationship between gender and nutritional status was found to be statistically significant. In addition, a study conducted by Jaiprakash *et al.*<sup>[9]</sup> revealed that 60.67% of children were wasted, 43.22% of children were stunted, and 53.86% of children were underweight. Malnutrition affected 178 (45.18%) females and 216 (54.82%) males. Comparatively speaking, males were less well-fed than females. However, Ranjeet's *et al.*<sup>[10]</sup> study revealed that, with the exception of the incidence of stunting, both sexes had practically comparable prevalence rates. Boys were found to be more likely to experience it than girls.

The Madhur Bhora *et al.*<sup>[8]</sup> study revealed that the age groups of 6 to 8 months (29.1%) and 10 to 12 months (30%) had the highest percentages of underweight new-borns. In contrast, Kalyan *et al.*<sup>[1]</sup> study indicated that out of 303 infants, stunting and wasting was more common in the 0-to-6-month age group (46%) than in the 7-to-12-month age group (33%).

According to a study by Indrapal *et al.*<sup>[3]</sup>, children of illiterate mothers were 217 times more likely to experience malnutrition than children of moms with at least a 9th grade education. Similarly, a substantial correlation between maternal literacy and a child's nutritional status was discovered in a study conducted by Noshaba *et al.*<sup>[11]</sup>. 204 (83.3%) of the 246 literate moms had healthy offspring, as opposed to only 16.7% of the illiterate mothers ( $p < 0.001$ ).

Additionally, it was discovered in the study by Arvind *et al.*<sup>[12]</sup> that although children of non-graduate women had slightly lower mean 'z' scores for weight for age, this difference was not statistically significant. Regarding weight for age ( $p = 0.265$ ) and height for age ( $p = 0.425$ ), there was no statistically significant variation in the nutritional health of children according to the education of their mothers.

According to Kumar *et al.*<sup>[13]</sup>, low SES categories had the highest frequency of underweight (72.5%) compared to those in the medium (66.4%) and high (43.7%) SES categories.

## **Conclusion**

According to the study, malnutrition affected a large percentage of infants, mostly female infants. The health of these infants, who will be the nation's future citizens, should be our first priority, and their medical requirements should be adequately met.

## **References**

1. Dr.Kalyan Chakravarthy, Dr Shashi J Soans, Hanumanth. Nutritional status of under three children in South India- cross sectional study. International Journal of Medical Science and Clinical Inventions. 2015;2(03):809-815.

2. Status of IMR and MMR in India. Available at <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1796436>. Accessed on 1<sup>st</sup> July, 2023.
3. M.I Indrapal, L. Mallikharjun Rao, N. Balakrishna, R. Harikumar, N. Arlappa, K. Sreeramakrishna and A. Laxmaiah. Infant and young child feeding practices, sociodemographic factors and their association with nutritional status of children aged <3 years in India: findings of the National Nutrition Monitoring Bureau survey, 2011-2012. *Journal of Public Health Nutrition*. 2019;22(1):104–114.
4. Matariya ZR, Lodhiya KK, Mahajan RG. Environmental correlates of undernutrition among children of 3- 6 years of age, Rajkot, Gujarat, India. *J Family Med Prim Care*. 2016;5:834-9.
5. Malnutrition free India. <https://pib.gov.in/PressReleasePage.aspx?PRID=1781673>. Accessed on 25<sup>th</sup> June, 2023.
6. Sreedhara MS and C.R Banapurmath, A study of nutritional status of infants in relation to their complementary feeding practices. *Curr pediatri res*. 2013;18 (1):39-41.
7. Mohin M Sakre, I A Swati, Sana Nizami, Syed Mustafa Al Hussaini. A cross sectional study on the health status of infants under the field practice area of KBNIMS, Gulbarga. *International Journal of Contemporary Medical Research*. 2016;3(5):1310-1313.
8. Borah M, Baruah R, Baruah KK. A cross sectional study on health status of infants in rural areas of Kamrup District of Assam. *Indian J Comm Health*. 2015; 27(1):161-165.
9. Jai Prakash Singh<sup>1</sup>, Shyam Bihari Gupta, Ved Prakash Shrotriya, Prabhu Nath Singh. Study of Nutritional Status Among Under Five Children Attending Out Patient Department at A Primary Care Rural Hospital, Bareilly (UP). *Scholars Journal of Applied Medical Sciences (SJAMS)*. 2013;1(6):769-773.
10. Ranjeet Kudave, Waleed Salih Rasheed<sup>1</sup>, Angeline Jeyakumar<sup>1</sup>, Anita Kar. A Survey of the Nutritional Status of Children Aged Between 12 to 23 Months Registered at Anganwaadi Centres in Pune District, Maharashtra, India. 2015;2(1):24-33.
11. Noshaba Shafqat, Saima Manzoor, Shafquat Abbasi. Relationship of Sociodemographic Factors with Malnutrition in Preschool Children: A Community Based Study. *Pakistan Journal of Medical Research*. 2013;52(4):120-125.
12. Chavan A, Dubewar S, Ahmed S, Tambe SH. Nutritional status of infant and young children at a tertiary care hospital and factors affecting the nutritional status. *Int J Contemp Pediatr*. 2018;5:595-9.
13. D. Kumar, N. K. Goel, M. Kalia, V. Mahajan. Socio-demographic Factors Affecting the Nutritional Status of the Under Three Children in Chandigarh, UT. *Healthline Journal*. 2015;6(1):46-52.