Assessment of Nutritional Status of Children between 6 Months and 6 Years of Age in Anganwadi Centers of an Urban Area in Tumkur, Karnataka, India

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Abstract

Objectives: Nutritional status is the sensitive indicator of a child’s health, and they constitute the most vulnerable segment of any community. Undernutrition causes a great deal of physical, mental, and emotional suffering. Anganwadi is a part of the Integrated Child Development Services program started to combat child hunger and child malnutrition. This study was undertaken to assess the nutritional status of the children (6 months–6 years) in Anganwadis and determine the sociodemographic factors associated with malnutrition and to assess their dietary intake. Materials and Methods: This cross-sectional study was undertaken among 580 children in Anganwadis in the urban field practice area of a Medical college in Tumkur. Results: In this study, the overall prevalence of underweight, stunting, and wasting was found to be 34.14%, 45.52%, and 35.52%, respectively. Age, socioeconomic status, immunization status, religion, and mother’s education was associated with undernutrition. The deficient intake of calorie and protein was seen in 90% and 64.8% of the study participants. Conclusion: The present study showed that there is still a high prevalence of undernutrition among the Anganwadi children aged 6–72 months. Socioeconomic factors have a significant role in child nutrition, which manifests itself as poor development.

Keywords: Anganwadi, nutritional assessment, sociodemographic factors, undernutrition

INTRODUCTION

A better-nourished world is a better world. The global community is grappling with multiple burdens of malnutrition. Eighty-eight percent of countries face a serious burden of either two or three forms of malnutrition.[1] The World Bank estimates that India is one of the highest-ranking countries in the world for the number of children suffering from malnutrition. The prevalence of underweight children in India is among the highest in the world and is nearly double that of Sub Saharan Africa with dire consequences for mobility, mortality, productivity, and economic growth.[2] 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.[3] Freedom from hunger and malnutrition is a basic human right, and their alleviation is a fundamental prerequisite for human and national development.[4]

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.[5] 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.[6]

Nutritional status is the sensitive indicator of a child’s health, and under-five children constitute the most vulnerable segment of any community. The global community is grappling with multiple burdens of malnutrition. Eighty-eight percent of countries face a serious burden of either two or three forms of malnutrition. The World Bank estimates that India is one of the highest-ranking countries in the world for the number of children suffering from malnutrition. The prevalence of underweight children in India is among the highest in the world and is nearly double that of Sub-Saharan Africa with dire consequences for mobility, mortality, productivity, and economic growth. 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. Freedom from hunger and malnutrition is a basic human right, and their alleviation is a fundamental prerequisite for human and national development. (Access this article online)

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Systematic random sampling was the sampling method used. 6 months–6 years in Anganwadis were the study subjects. This cross-sectional study was conducted between November 2016 and May 2018 in the urban localities in the urban field practice area of a medical college, which have a total population of 18,000. Twelve Anganwadi centers located in the area were included for the data collection. Children aged 6 months–6 years in Anganwadis were the study subjects. Systematic random sampling was the sampling method used.

Objectives of the study
1. To assess the nutritional status of the children (6 months-6 years) in Anganwadis and to find out the prevalence of malnutrition
2. To determine the socio-demographic factors associated with underweight, stunting, and wasting in children attending Anganwadis
3. To assess the dietary intake of children attending the Anganwadis.

Materials and Methods
This cross-sectional study was conducted between November 2016 and May 2018 in the urban localities in the urban field practice area of a medical college, which have a total population of 18,000. Twelve Anganwadi centers located in the area were included for the data collection. Children aged 6 months–6 years in Anganwadis were the study subjects. Systematic random sampling was the sampling method used.

Methods

Sample size

\[ n = \frac{Z^2 \left(1 - \alpha/2\right) \times p \times (1-p)}{d^2} \]

With the prevalence of 40% (NFHS-3 data) and relative precision of 10%, the sample size obtained was 580.

Results
In the study, 38.62% belonged to age group 6–36 months and 61.38% belonged to age group 37–42 months. 50.34% were male and 49.66% were female children. 284 (48.97%) mothers studied till high school, 135 (23.28%) till middle school, and only 15 (2.59%) were illiterates. 80.52% belonged to nuclear families and only 3.10% to joint families. About 66.72% belonged to the Muslim religion and remaining belonged to Hindu religion. According to Modified Kuppuswamy Scale 2017, 23 (3.97%) belonged to the lower middle class, 436 (75.17%) belonged to the upper lower class, and 121 (20.86%) belonged to lower class. 465 (80.17%) had birth weight of 2.5–3.5 kg, 91.21% of children were completely immunized and 46.21% were exclusively breastfed for 6 months.

In our study, the overall prevalence of underweight, stunting, and wasting were found to be was 34.14%, 45.52% and 35.52%, respectively.
There was a statistically significant association between underweight and mother’s education, family type, religion, and birth weight; between stunting and family type, socioeconomic status, and immunization status; between wasting and age, mother’s education, religion, birth weight, and immunization status [Table 1].

In the age group of 6–36 months, most of the children (89.29%) had a deficiency of calories and 64.73% were deficient in terms of protein intake. In the age group of 37–72 months, about 90.45% had a deficiency of calories, and about 64.89% had a deficiency in proteins.

**Table 1: Association between various sociodemographic factors and malnutrition**

| Characteristics | Underweight | Stunted | Wasted |
|-----------------|-------------|---------|--------|
| **Age (months)** |             |         |        |
| 6 - 36 (224)    | n = 79 (35.27) | P = 0.6489 | n = 101 (45.09) | P = 0.88 | n = 99 (44.20) | P < 0.001 |
| 37-72 (356)     | n = 119 (33.43) |     | n = 163 (45.79) |     | n = 107 (30.06) |     |
| **Sex**         |             |         |        |
| Male (292)      | n = 108 (36.99) | P = 0.145 | n = 141 (48.29) | P = 0.17 | n = 102 (34.93) | P = 0.766 |
| Female (288)    | n = 90 (31.25) |     | n = 123 (42.71) |     | n = 104 (36.11) |     |
| **Mother’s education** |     |         |        |
| Illiterate (15) | n = 9 (60.00) |     | n = 6 (40.00) |     | n = 10 (66.67) |     |
| Primary school (49) | n = 19 (38.78) |     | n = 27 (55.10) |     | n = 19 (38.78) |     |
| Middle school (135) | n = 80 (59.26) | P < 0.001 | n = 51 (37.78) | P = 0.29 | n = 72 (35.33) | P < 0.001 |
| High school (284) | n = 72 (25.35) |     | n = 136 (47.89) |     | n = 88 (30.99) |     |
| Post High school/ diploma (77) | n = 16 (20.78) |     | n = 34 (44.16) |     | n = 16 (20.78) |     |
| Graduate/ postgraduate (20) | n = 2 (10.00) |     | n = 10 (50.00) |     | n = 1 (5.00) |     |
| **Family type** |             |         |        |
| Nuclear (467)   | n = 171 (36.62) | P = 0.013 | n = 203 (43.47) |     | n = 162 (34.69) |     |
| Joint (18)      | n = 7 (38.89) |     | n = 3 (16.67) | P < 0.001 | n = 10 (55.56) | P = 0.19 |
| Three generation (95) | n = 20 (21.05) |     | n = 58 (61.05) |     | n = 34 (37.59) |     |
| **Socioeconomic status** |     |         |        |
| Lower middle (23) | n = 9 (39.13) |     | n = 9 (39.13) |     | n = 8 (34.78) |     |
| Upper lower (436) | n = 150 (34.40) | P = 0.79 | n = 184 (42.20) | P = 0.004 | n = 160 (36.70) | P = 0.55 |
| Lower (121)     | n = 39 (32.23) |     | n = 71 (58.68) |     | n = 38 (31.40) |     |
| **Religion**    |             |         |        |
| Hindu (193)     | n = 35 (18.13) | P < 0.001 | n = 86 (44.56) | P = 0.74 | n = 45 (23.32) | P < 0.001 |
| Muslim (387)    | n = 163 (42.12) |     | n = 178 (45.99) |     | n = 161 (41.60) |     |
| **Birth weight (kg)** |     |         |        |
| <2.5 (111)      | n = 51 (45.95) |     | n = 58 (52.25) |     | n = 57 (51.35) | P < 0.001 |
| 2.5-3.5 (465)   | n = 147 (31.61) | P = 0.013 | n = 58 (25.25) | P = 0.28 | n = 149 (32.04) |     |
| >3.5 (4)        | n = 206 (44.30) |     | n = 206 (44.30) |     | n = 206 (44.30) |     |
| **Immunization status** |     |         |        |
| Not immunized (2) | n = 1 (50.00) |     | n = 1 (50.00) |     | n = 31 (63.27) | P < 0.001 |
| Partially immunized (49) | n = 34 (69.39) | P < 0.001 | n = 34 (69.39) | P < 0.001 | n = 175 (33.08) |     |
| Completely immunized (529) | n = 181 (34.22) |     | n = 1 (18.18) |     | n = 31 (63.27) | P < 0.001 |
| **Duration of breastfeeding (months)** |     |         |        |
| 6 (268)         | n = 94 (35.07) |     | n = 118 (44.03) |     | n = 88 (32.48) | P = 0.21 |
| >6 (312)        | n = 104 (33.33) | P = 0.65 | n = 146 (46.79) | P = 0.504 | n = 118 (37.82) |     |

**Discussion**

In our study, 356 (61.38%) children belonged to age group 37–72 months and 224 (38.62%) children belonged to age group 6–36 months. A study conducted in Goa (2015) showed 64% belonged to age group 6–36 months, and only 36% belonged to 37–72 months. In the study, 45.52% of children were stunted, 35.52% were wasted, and 34.14% were underweight. In studies in Gadag and Mangalore, stunting varied from 35% to 55%, underweight varied from 24% to 60%, and wasting varied from 11% to 60%.
In our study, age was not associated with stunting and underweight, which was similar to the study in other parts of the country. In the present study, the age of the child had a significant association with wasting, which was in agreement with various other studies and in contrast with the study in Jaipur. In our study, gender was not associated with undernutrition (stunting, underweight, and wasting), which correlates with similar studies carried out in various parts of India but in contrary to study done in Jaipur. In our study, mother’s education was significantly associated with underweight and wasting, which was identical to other studies and in contrast with a few other studies. In this study, stunting was not associated with the education of mother, which is similar to studies done in other parts of India and disagrees with few studies done. In this study, the family type was associated with stunting and underweight in agreement with studies conducted in Mumbai and contrary to studies. Socioeconomic status was found to be associated with stunting, which correlated with various studies done in India and not in agreement with a few other studies. In the present study, religion was associated with underweight and wasting in agreement with a study carried out in the urban area in India. In the present study, birth weight was associated with underweight, which correlated with various other studies but contrast to a study conducted in Mumbai. Birth weight was also found to be associated with wasting contrast to studies in Mumbai and Pune.

**CONCLUSION**

The present study shows that there is still a high prevalence of undernutrition among the Anganwadi children aged 6–72 months. About 34.14% were underweight, 45.52% of children were stunted, and 35.52% of children were wasted. Socioeconomic factors such as mother’s education, type of family, socioeconomic status, religion, birth weight, and immunization status had a significant association with undernutrition. Improving mothers’ education, improved socioeconomic status, proper antenatal care, immunization of children under UIP should be focused on to prevent malnutrition.

**Recommendations**

Enhancement of education of mothers and caretakers regarding increased nutritional intake with increasing age, proper child-rearing and feeding practices, and improving hygiene and sanitation forms the basis of child’s good health.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Development Initiatives. Global Nutrition Report 2017: Nourishing the SDGs. Bristol, UK: Development Initiatives; 2017.
2. World Bank. World Bank Annual Report 2017. Washington, DC: World Bank; 2017.
3. Von Grehmer K, Bernstein J, Hossain N, Brown T, Prasai N, Yohannes Y, et al. Global hunger index: The Inequalities of Hunger. Washington, DC: International Food Policy Research Institute; Bonn: Welthungerhilfe; and Dublin: Concern Worldwide; 2017.
4. WHO. Nutrition for Health and Development. Available from: http://www.who.int/nutrition/nhd/en/. [Last accessed on 2018 Aug 08].
5. Pada G. Putting the Smallest First. The Economist; 23 September, 2010. Available from: https://www.economist.com/briefing/2010/09/23/putting-the-smallest-first. [Last accessed on 2018 Aug 08].
6. Navya N, Udayakiran N. A comparative study of anthropometric measurements of children attending urban and rural Anganwadi centres of a coastal district in Karnataka, India. Int J Community Med Public Health 2017;4:91-5.
7. Renuka M, Jagadish K, Praveen K, Khyrunissa B, Gangadhar MR. Malnutrition among under-five children of Kadukuruba tribe: Need to reach the unreached. J Clin Diagn Res 2014;8:1-4.
8. Shivaprakash NC, Joseph RB. Nutritional Status of Rural School-Going Children (6-12 Years) of Mandya District, Karnataka. Int J Sci Stud 2014;2:39-43.
9. Roopadevi V, Aravind K. Nutritional status assessment of under five children in urban field practice area of Mysore. J Prev Med Holistic Health 2016;2:1-3.
10. Srivinasa SB, Deyaneshwar B, Ajay U. Anthropometric measurement of weight for assessment of nutritional status of Anganwadi Children in Urban Mangalore – A cross sectional study. Anat Physiol 2017;7:259.
11. Shanawaz M, Nasir AA, Sunder S, Khan M, Rani S, Padmanabha BV. An evaluation of nutritional status of children in Anganwadi Centre of Hyderabad district of Andhra Pradesh stateusing WHO z- score technique. Glob J Med Public Health 2013;2:1-6.
12. Ministry of Women and Child Development. National Nutrition Mission: Administrative Guidelines 2017. Available from: http://wcd.nic.in/sites/default/files/Administrative_Guidelines_NNM-26022018.pdf. [Last accessed on 2018 Aug 12].
13. International Institute for Population Sciences. National Family Health Survey (NFHS-4), 2015–16: India. Vol. 1. Mumbai, India: International Institute for Population Sciences; 2017. Available from: http://www.rchiips.org/nfhs/report.shtml. [Last accessed on 2018 Jul 05].
14. Silva VG, Silva SG. Nutritional Status of Anganwadi Children under the Integrated child development services scheme in a rural area in Goa. Int J Sci Stud 2015;3:217-21.
15. Kotabai R, Dasar P, Sonavane R. Study on prevalence and determinants of malnutrition among Anganwadi children of Nagavi Primary Health Centre area, Gadag. Natl J Res Community Med 2018;7:32-5.
16. Yadav A, Dixit A. A study to assess the prevalence of malnutrition among under 5 year children at selected Anganwadi centres of Jaipur district with a view to develop an information booklet for parents. Int J Med Health Res 2017;3:78-9.
17. Sahoo DP, Dehmubed A, Jajulwar MB. An epidemiological study of acute malnutrition in children of age 6 months to 5 years in an Urban Slum of Mumbai, Maharashtra. J Datta Meghe Inst Med Sci Univ 2017;12:181-6.
18. Ahmed MA, Yadav SK, Reddy A. Prevalence and epidemiology of under nutrition among preschool children in a selected area. Int J Contemp Med Res 2016;3:1797-802.
19. Gautam SK, Yerna M, Barman SK, Arya AK. Nutritional status and its correlates in under five slum children of Kanpur Nagar, India. Int J Contemp Pediatr 2018;5:584-90.
20. Meena S, Kaushal R, Saxena DM. Nutritional status of children under five year of age in Anganwadi Centres in Kolar area of Madhya Pradesh. Natl J Community Med 2015;6:114-9.
21. Mamulwar MS, Rathan HD, Jethani S, Dhone A, Bakshi T, Lanjewar B, et al. Nutritional status of under-five children in urban slums of Pune. Int J Med Public Health 2014;4:247-52.
22. Priyanka R, Vincent V, Jini MP, Saju CR. An assessment of the nutritional status of underfive children in a rural area of Thrissur district, Kerala, India. Int J Community Med Public Health 2016;3:3479-86.