

Nutritional Status of Anganwadi Children under the Integrated Child Development Services Scheme in a Rural Area in Goa

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Abstract

Background: Childhood malnutrition is a leading cause of child morbidity and mortality.

Objective: Of the study was to estimate the prevalence of malnutrition in terms of underweight, stunting, and wasting in children aged 6 months-6 years (72 months) registered in Anganwadi Centers (AWCs) in a rural area of Goa.

Methods: A cross-sectional study was conducted from January 2015 to June 2015 in rural area in Goa. A total of 782 registered beneficiary children aged 6 months-6 years (72 months) from AWCs were selected by simple random sampling.

Results: The overall prevalence of underweight, wasting, and stunting in the study population was found to be 33.4%, 24%, and 31.5%, respectively. Severe malnutrition (below -3 standard deviation cut-off) was found in the study population, with 9.2% of children severely underweight, 10.4% severely wasted, and 8.7% severely stunted. It was observed that the proportion of underweight children in the age group of 6-36 months was higher (38.1%) than the proportion of underweight children (24.9%) in the age group of 37-72 months, and this difference was found to be statistically significant ($\chi^2 = 14.13$, $P = 0.0001$). The proportion of underweight children was found to be the highest (51.3%) in lower class, and lowest (17.1%) in upper class and a statistically significant association between socio-economic class and nutritional status ($\chi^2 = 37.02$, $P = 0.000$) was found.

Conclusion: Malnutrition continues to be a major problem in children below 6 years of age. Though the Integrated Child Development Services Scheme is taking measures to combat this problem, India's progress in reducing child malnutrition has been slow. However, continuous monitoring and surveillance of AWCs could help in the planning of preventive strategies.

Key words: Anthropometry, Child, Nutritional status, Preschool, Protein - energy malnutrition

INTRODUCTION

Malnutrition in children is a silent emergency leading to almost seven million child deaths (approximately 55% of all child deaths) annually.¹ Globally, 26% of children are moderately to severely underweight, 10% are moderately to severely wasted, and 31% are moderately to severely stunted.¹

In India, 48% of children under 5 years are stunted and 43% are underweight and 20% of children under 5 years in the country are wasted.² Failing to deal effectively with the malnutrition problem in India has dire consequences for children's development. Through precipitating disease and speeding its progression, malnutrition is a leading contributor of infant and child mortality and morbidity. More than half (54%) of all deaths before the age of 5 years in India are related to malnutrition. Due to the extensive prevalence in India, mild to moderate malnutrition contributes to more deaths (43%) than severe malnutrition (11%).²

Recognizing the extensive prevalence of malnutrition and the consequent drain on the country's human resource, the Government of India started the Integrated Child

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Development Services (ICDS) Scheme; to respond to the child's needs in a comprehensive and holistic perspective. The ICDS Scheme adopts integrated approaches that incorporate nutrition and health together with early opportunities for cognitive and social stimulation. Food supplements are given to beneficiary children to meet their part calorie requirements and to supplement their dietary intake.

The nutritional status of children can be evaluated by their growth. Children with undernutrition as one form of malnutrition, are being recognized as a vulnerable category for focused action. Undernutrition has been measured by anthropometric indicators in terms of stunting, wasting, and underweight. Stunting (low height for age) and wasting (low weight for height) are respectively associated with chronic malnutrition and current nutritional status. Underweight (low weight for age) represents both chronic and acute malnutrition.

Program Description

The Government of India started ICDS Scheme, a centrally sponsored scheme to enhance the health, nutrition, and learning opportunities of children <6 years of age especially targeted for the poor and the deprived. Under the ICDS Scheme, Anganwadi Centers (AWCs) are the focal point for the delivery of services and are run by the local community woman, the Anganwadi Worker (AWW) and a helper. Freshly, cooked food supplements are provided at all AWCs to children aged 3-6 years while take-home-rations of food grains are provided every month to children aged 6 months until 3 years (36 months). All children in the eligible age groups can avail of supplementary nutrition provided at the AWCs.

Weighing of each child is carried out by the AWW every month and plotted on the growth chart which is a graphical presentation of weight-for-age. Through the strategy of Nutrition and Health Education, ICDS Scheme aims at bringing about an attitudinal change in health and nutrition habits of the mothers and children and improve their nutritional status. Despite the expansion of the ICDS Scheme to cover to cover most of the children in the country, progress in reducing child malnutrition has been slow.³

Objective of the Study

To assess the prevalence of malnutrition in terms of underweight, wasting, and stunting in children aged 6 months-6 years (72 months) of age registered in AWCs in rural area in Goa.

METHODS

Study Design

A cross-sectional study was conducted from January 2015 to June 2015.

Study Setting and Period

The study was conducted from January 2015 to June 2015, in rural areas of Rural Health and Training Centre, Mandur, which is the rural field practice area of Goa Medical College, a tertiary care hospital in Goa.

Study Participants

The study participants consisted of registered beneficiary children aged 6 months-6 years (72 months) of age from AWCs, which were selected by simple random sampling.

Sample Size and Sampling Technique

Sample size³ was calculated as follows

$$\begin{aligned} \text{Sample size} = n &= \frac{1.96^2 p(1-p)(DEFF)}{d^2} \\ &= \frac{1.96^2 \times .5 \times .5(2)}{.05^2} = 768.32 \end{aligned}$$

Wherein assuming estimate of the expected proportion (p) = 0.5, desired level of absolute precision (d) = 0.05, and estimated design effect ($DEFF$) = 2: Hence, minimum sample required for the study was calculated.

A list of AWCs and the number of registered beneficiary children aged 6 months-6 years (72 months) attending them was obtained from the Department of Women and Child Development, Goa. From this list, 16 AWCs were selected by simple random sampling, based on calculated sample size; and all registered beneficiary children aged 6 months-6 years (72 months) of age from these selected AWCs were recruited in the study giving a sample size of 782.

Inclusion Criteria

Registered beneficiary children aged 6 months-6 years (72 months) of age from selected AWCs.

Exclusion Criteria

Registered beneficiary children aged 6 months-6 years (72 months) of age whose parents did not consent to being part of the study, and/or who were very sick or those who were unavailable at 2 consecutive visits were excluded from the study.

Data Collection

Data regarding selected variables and anthropometric measurements were collected using a predesigned structured questionnaire, Mother of the child was chosen as the preferred responder, if the mother was not available then the father or grandparent was chosen as a responder. The exact age in months was computed from the child's date of birth as per birth certificate, or as told by the respondent. The respondents were asked for information regarding family income. The Socioeconomic status was determined by using modified Prasad's scale.⁴

Anthropometry

Anthropometric measurements were carried out following standard methods.⁵ The data included weight, recumbent length (for children <24 months of age), and height (for children more than 24 months of age). Weight was measured to the nearest 0.1 kg and Salter weighing machine was used for weight measurement. Height was measured against a nonstretchable tape fixed to a vertical wall, with the participant standing on a firm/level surface and it was measured to the nearest 0.5 cm. Recumbent length (for children <24 months of age) was measured with a wooden length board.

Assessment of Nutritional Status

The nutritional status of children was assessed by plotting weight and height of the children on WHO 2006 Growth Standards growth charts using z-scores.^{6,7} Undernutrition, as one form of malnutrition, has been measured by anthropometric indicators - Underweight (low weight for age, W/A), Stunting (low height for age, H/A), and Wasting (low weight for height, W/H).^{3,4} Children falling below -2 standard deviation (SD) cutoff were considered as follows; underweight - weight for age, W/A < -2 SD; stunting - height for age, H/A < -2 SD; wasting - weight for height, W/H < -2 SD. Severe underweight, W/A < -3 (SD); severe stunting, H/A < -3 SD; severe wasting, W/H < -3 SD.

Statistical Analysis

Data were analyzed using Epi-Info 7 software, and appropriate statistical tests were applied.

Ethical Consideration

Informed verbal consent was taken from the parents of the study subjects.

RESULTS

A total of 782 children aged 6 months-72 months registered in 16 AWCs were recruited in the study. It can be seen in Table 1, that 64% of the study population comprised of children aged 6-36 months, and 36% were between the ages of 37 and 72 months. The study population comprised of 50.4% boys and 49.6% girls.

Table 1: Age and gender distribution of the study population

Age group (months)	n (%)		Total
	Male	Female	
6-36	252 (50.3)	249 (49.7)	501 (64)
37-72	142 (50.5)	139 (49.5)	281 (36)
Total	394 (50.4)	388 (49.6)	782 (100)

In Table 2, it is observed that the overall prevalence of underweight, wasting, and stunting in the study population was found to be 33.4%, 24%, and 31.5% respectively. The prevalence of mild to moderate underweight, mild to moderate wasting, and mild to moderate stunting in the study population was found to be 24.2%, 13.6%, and 22.8%, respectively. Severe malnutrition (below -3SD cut off) was found in the study population, with 9.2% of children found to be severely underweight, 10.4% were found to have severe wasting, and 8.7% of children were found to be severely stunted.

In Table 3, it was observed that the proportion of underweight children in the age group of 6 months to 36 months was higher (38.1%) than the proportion of underweight children (24.9%) in the age group of 37-72 months, and this difference was found to be statistically significant ($\chi^2 = 14.1373$, $P = 0.0001$). It was observed that 35.1% of girls were underweight, and 31.7% of boys were underweight, but this difference was not found to be statistically significant. It was observed that the proportion of underweight children was found to be the highest (51.3%) in lower class; followed by 30.6% in upper lower; 28% and 32.8% in lower middle and upper middle class, respectively; and lowest (17.1%) in upper class, and this difference was found to be statistically significant ($\chi^2 = 37.02$, $P = 0.000$).

DISCUSSION

In the present study, it was observed that the overall prevalence of underweight, wasting, and stunting in the study population was found to be 33.4%, 24%, and 31.5%, respectively. Severe malnutrition (below -3 SD cutoff) was found in the study population, with 9.2% of children were found to be severely underweight, 10.4% were found to have severe wasting and 8.7% of children were found to be severely stunted. Several studies in various states of India have reported different rates of malnutrition which depends on various developmental conditions of that region. A study conducted in Assam⁸ found that the overall prevalence of underweight, stunting, and wasting was found to be 29%, 30.4%, and 21.6%, respectively. Severe underweight, stunting, and wasting (<-3 SD) was found in 10.6%, 7.0%, and 8.6%, respectively. A study conducted in Bareilly, Uttar Pradesh; reported that 53.86% children were underweight, 43.22% children were stunted, and 60.67% were wasted.⁹ As per a survey of the nutritional status of preschool children, in a rural population of Lucknow,¹⁰ 53.86% children were underweight, 43.22% children were stunted, and 60.67% were wasted. Some of the studies cited above^{9,10} have higher rates of malnutrition as compared to the present study. Lower rates of malnutrition in the present

Table 2: Prevalence of underweight, stunting and wasting in study population based on the WHO child growth standards

WHO 2006 growth standards	Indicators of nutritional status								
	Underweight			Wasting			Stunting		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Severe (below - 3 SD)	34 (8.6)	38 (9.8)	72 (9.2)	38 (9.7)	43 (11)	81 (10.4)	32 (8.2)	36 (9.3)	68 (8.7)
Mild to moderate (below - 2 SD)	91 (23.1)	98 (25.3)	189 (24.2)	52 (13.1)	55 (14.2)	107 (13.6)	88 (22.3)	90 (23.2)	178 (22.8)
Normal (>median to -2SD)	269 (68.3)	252 (64.9)	521 (66.6)	304 (77.2)	290 (74.8)	594 (76)	274 (69.5)	262 (67.5)	536 (68.5)
Total	394 (100)	388 (100)	782 (100)	394 (100)	388 (100)	782 (100)	394 (100)	388 (100)	782 (100)

(Numbers in parenthesis indicate percentages), SD: Standard deviation

Table 3: Association of socio-demographic variables with nutritional status

Socio demographic variables	Nutritional status		OR (95%CI)	P value
	Number	Underweight		
Age group (months)				
6-36	501	191 (38.1)	310 (61.9)	1.85 (1.34-2.57)
37-72	281	70 (24.9)	211 (75.1)	1 (ref)
Gender				
Male	394	125 (31.7)	269 (68.3)	0.86 (0.63-1.16)
Female	388	136 (35.1)	252 (64.9)	1 (ref)
Socioeconomic class				
Class I (upper)	82	14 (17.1)	68 (82.9)	1 (ref)
Class II (upper middle)	204	67 (32.8)	137 (67.2)	2.37 (1.24-4.52)
Class III (middle)	189	53 (28)	136 (72)	1.89 (0.98-3.65)
Class IV (lower middle)	147	45 (30.6)	102 (69.4)	2.14 (1.09-4.20)
Class V (lower)	160	82 (51.3)	78 (48.7)	5.10 (2.65-9.81)

SD: Standard deviation, OR: Odd ratio, CI: Confidence interval

study could probably be due to high female literacy rate and higher per capita expenditure on health in the State of Goa.¹¹

The present study reports that there was no statistically significant difference in proportions of underweight boys and girls. Similar findings were reported in a study conducted by Banerjee *et al.*¹² wherein malnutrition was more common in females than males, but this was not significant ($P > 0.05$). Contrary to this, other studies have found higher proportion of malnutrition in boys; wherein 67.4% boys and 61.58% girls were found to be malnourished in a study conducted by Ray *et al.*¹³ as also, in a study conducted in Andhra Pradesh,¹⁴ where 80% boys were poorly nourished as compared to 75% of girls.

In the present study, the proportion of underweight children in the age group of 6-36 months was higher (38.1%) than the proportion of underweight children (24.9%) in the age group of 37-72 months, and this difference was found to be statistically significant. Similarly, Ray *et al.*¹³ reported that the prevalence of malnutrition was highest (74.19%) in the age group 12-23 months followed by 66.18% in the age group 24-35 months and 60.47% in the age group 36-59 months.

In the present study, it was observed that the proportion of underweight children was found to be highest (51.3%) in lower class, and lowest (17.1%) in upper class. It was found that prevalence of underweight children was higher among children in lower socioeconomic class as compared to those from higher socioeconomic class and this association was found to be statistically significant. Similar findings were observed in a study conducted in Uttar Pradesh, India, where it was observed that prevalence of under-nutrition was higher among children from low-income group as compared to higher income group, however, the association was not found significant ($\chi^2 = 2.48$, $df = 4$, $P > 0.1$),⁹ as also reported by Dhakal *et al.*,¹⁵ wherein the 82.75% children with malnutrition were from the low-income group, i.e., IV and V by Prasad Scale.

CONCLUSION

The overall prevalence of under-nutrition in the study population was assessed and severe undernutrition was found to be present. Malnutrition continues to be a major problem in children below 6 years of age. Though the ICDS Scheme is taking measures to combat this problem, India's progress in reducing child malnutrition has been

slow. However, continuous monitoring and surveillance of AWCs could identify underlying factors of malnutrition, thus help in the planning of preventive strategies.

REFERENCES

1. UNICEF. The State of the World's Children Report. New York: UNICEF; 1998.
2. International Institute for Population Sciences (IIPS) and Macro International. National Family Health Survey (NFHS-3), 2005-06. Vol. I. India: International Institute for Population Sciences; 2007.
3. Salganik MJ. Variance estimation, design effects, and sample size calculations for respondent-driven sampling. *J Urban Health Bull New York Acad Med* 2006;83:98-112.
4. Sharma R. Revision of Prasad's social classification and provision of an online tool for real-time updating. *South Asian J Cancer* 2013;2:224.
5. Measuring Change in Nutritional Status. Technical Report Series No 854. WHO; 1983.
6. WHO Multicentre Growth Reference Study Group: WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva: World Health Organization; 2006. Available from: http://www.who.int/childgrowth/standards/technical_report/en/index.html. [Last accessed on 2015 Jul 12].
7. WHO. WHO Child Growth Standards and the Identification of Severe Acute Malnutrition in Infants and Children;2009.
8. Islam S, Mahanta TG, Sarma R, Hiranya S. Nutritional status of under 5 children belonging to tribal population living in riverine (Char) areas of Dibrugarh District, Assam. *Indian J Community Med* 2014;39:169-74.
9. Singh JP, Gupta SB, Shrotriya VP, Singh PN. Study of nutritional status among under five children attending out-patient department at a primary care rural hospital, Bareilly(UP). *Sch J Appl Med Sci* 2013;1:769-73.
10. Srivastava VK, Srivastava BC, Nandan D, Bhusan V. Protein energy malnutrition among pre-school children in a rural population of Lucknow. *Indian Pediatr* 1979;16:507-13.
11. Economic Survey 2007-08, Government of Goa. <http://www.goapse.gov.in/publications/e-survey0708/e-survey-2007-08.htm>. [Last accessed 2015 Jul 12].
12. Banerjee B, Mandal ON. An intervention study in malnutrition among infants in a tribal community of West Bengal. *Indian J Community Med* 2005;30:27-9.
13. Ray SK, Biswas AK, Gupta SB, Mukherjee D, Kumar S, Biswas B, *et al*. Rapid assessment of nutritional status and dietary pattern in a municipal area. *IJCM* 2000;25:14-8.
14. Devi PY, Geervani P. Determinants of nutritional status of rural preschool children in Andhra Pradesh, India. *Food Nutr Bull* 1994;15:335-42.
15. Dhakal MM, Arundhatiz R, Singh M, Mohapatra SC. Health impact assessment: A futuristic approach in under-five care. *Indian J Prev Soc Med* 2005;36:114-20.

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