Original Article

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]

Access this article online

Quick Response Code:

Website: www.ijcm.org.in

DOI: 10.4103/ijcm.IJCM_523_19

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

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How to cite this article: Das SR, Prakash J, Krishna C, Iyengar K, Venkatesh P, Rajesh SS. 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. Indian J Community Med 2020;45:483-6.

Received: 19-12-19, **Accepted:** 15-06-20, **Published:** 28-10-20

of any community.[7] The assessment of the nutritional status of this segment of the population is essential for improving overall health; prime determinant of health status in an adult is their nutritional status in childhood.[8] Adequate nutrition is a necessary first step in the improvement of quality of life. Nutrition plays a key role in the physical, mental, and emotional development of children, and much emphasis has been given to provide good nutrition to growing populations, especially in the formative years of life.[9] The growth rate is maximal during the first 6 years of life; hence malnutrition has a direct impact on infant mortality rate and under-five mortality rates, which are prime indicators of the health status of a country.[10]

Despite several achievements that the Integrated Child Development Services scheme has witnessed during its three decades of implementation, there remain some major challenges with regard to the high burden of child malnutrition in the country.[11]

National Nutrition Mission also called as Poshan Abhiyaan, is a flagship under Ministry of Women and Child Development was commenced from 2017 to 2018. The Mission targets reduction in the level of under-nutrition and other related problems by ensuring the convergence of various nutrition-related schemes. The Mission will address malnourishment through the life cycle concept by adopting a synergized and result oriented approach.[12]

Despite all these efforts, malnutrition is still prevalent in our country. There are many studies in the burden of malnutrition, but a comprehensive study is lacking, which takes into consideration the sociodemographic factors, dietary intake, physical and systemic examination, and anthropometric measurements of children.

Taking the above facts into consideration, the present study was taken up to assess the nutritional status of children of 6 months to 6 years of age in Anganwadi centers of this region.

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.

Sample size

$$n = \frac{Z\,2(1-\alpha/2) \times p \times q}{(d)^2}$$

With the prevalence of 40% (NFHS-3 data)[13] and relative precision of 10%, the sample size obtained was 580.

Methodology

Systematic random sampling was used to select a total of 580 children from 12 Anganwadis. All the children enrolled in all the 12 Anganwadis were line-listed, and every 3rd child in the list was selected for the study. Selected children were examined and mothers were interviewed using a pre-tested questionnaire to collect data regarding sociodemographic factors, dietary practice, and the health status of the children. Anthropometric measures were recorded in the Anganwadis. The standard measuring tape was used to measure height, and Salter's scale was used to record the weight of the children. Infantometer was used to measure the length of infants. After collecting the data, mothers were educated regarding the healthy food habits, hygiene, and factors affecting malnutrition. WHO Anthro and Anthro-plus software were used to calculate the weight for age, weight for height and height for age. WHO Z-scores were used. 24-h recall method was used to collect the diet history. Calculation of both the calories and proteins was done using two software applications "Healthify Me" and "Nutrify India Now" which follows the "National Institute of Nutrition" guidelines.

Data collected were entered on MS Excel spreadsheet (version 2010, Mahalaksmi computers, Tumkur, Karnataka, India). The data collected were analyzed and interpreted using the Epi Info version 7. Descriptive statistics (mean and proportions) and Chi-square test were employed. $P < 0.05$ was considered statistically significant.

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.

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.[14] In the study, 45.52% of children were stunted, 35.52% were wasted, and 34.14% were underweight. In studies in Gadag[15] and Mangalore[10] stunting varied from 35% to 55%, underweight varied from 24% to 60%, and wasting varied from 11% to 60%.

Table 1: Association between various sociodemographic factors and malnutrition

Characteristics (*n*)	Underweight		Stunted		Wasted	
	n(%)	*P*	*n*(%)	*P*	*n*(%)	*P*
Age (months)						
6 - 36 (224)	79 (35.27)	0.6489	101 (45.09)	0.88	99 (44.20)	<0.001
37-72 (356)	119 (33.43)		163 (45.79)		107 (30.06)	
Sex						
Male (292)	108 (36.99)	0.145	141 (48.29)	0.17	102 (34.93)	0.766
Female (288)	90 (31.25)		123 (42.71)		104 (36.11)	
Mother's education						
Illiterate (15)	9 (60.00)		6 (40.00)		10 (66.67)	
Primary school(49)	19 (38.78)		27 (55.10)		19 (38.78)	
Middle school (135)	80 (59.26)	<0.001	51 (37.78)	0.29	72 (53.33)	<0.001
High school (284)	72 (25.35)		136 (47.89)		88 (30.99)	
Post High school/ diploma (77)	16 (20.78)		34 (44.16)		16 (20.78)	
Graduate/ postgraduate(20)	2 (10.00)		10 (50.00)	2 (10.00)	1 (5.00)	
Family type						
Nuclear (467)	171 (36.62)		203 (43.47)		162 (34.69)	
Joint (18)	7 (38.89)	0.013	3 (16.67)	<0.001	10 (55.56)	0.19
Three generation (95)	20 (21.05)		58 (61.05)		34 (35.79)	
Socioeconomic status						
Lower middle(23)	9 (39.13)		9 (39.13)		8 (34.78)	
Upper lower(436)	150 (34.40)	0.79	184 (42.20)	0.004	160 (36.70)	0.55
Lower(121)	39 (32.23)		71 (58.68)		38 (31.40)	
Religion						
Hindu(193)	35 (18.13)		86 (44.56)	0.74	45 (23.32)	<0.001
Muslim(387)	163 (42.12)	<0.001	178 (45.99)		161 (41.60)	
Birth weight (kg)						
<2.5(111)	51 (45.95)		58 (52.25)		57 (51.35)	<0.001
2.5-3.5(465)	147 (31.61)	0.013		0.28	149 (32.04)	
>3.5(4)	-	-	206 (44.30)	-		
Immunization status						
Not immunized(2)	-	-	1 (50.00)	-	31 (63.27)	<0.001
Partially immunized(49)	17 (34.69)		34 (69.39)	<0.001	175 (33.08)	
Completely immunized(529)	181 (34.22)	1	229 (43.29)			
Duration of breastfeeding (months)						
6(268)	94 (35.07)		118 (44.03)		88 (32.48)	0.21
>6(312)	104 (33.33)	0.65	146 (46.79)	0.504	118 (37.82)	

In our study, age was not associated with stunting and underweight, which was similar to the study in other parts of the country.[16-19] In the present study, the age of the child had a significant association with wasting, which was in agreement with various other studies[17-19] and in contrast with the study in Jaipur.[16] 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[17-19] but in contrary to study done in Jaipur.[16] In our study, mother's education was significantly associated with underweight and wasting, which was identical to other studies[17,19,20] and in contrast with a few other studies.[18,21] In this study, stunting was not associated with the education of mother, which is similar to studies done in other parts of India[15,21,22] and disagrees with few studies done.[17,19,20] In this study, the family type was associated with stunting and underweight in agreement with studies conducted in Mumbai[17] and contrary to studies.[18,19,22]

Socioeconomic status was found to be associated with stunting, which correlated with various studies done in India[16,17,19] and not in agreement with a few other studies.[18,22] In the present study, religion was associated with underweight and wasting in agreement with a study carried out in the urban area in India.[18] In the present study, birth weight was associated with underweight, which correlated with various other studies[21,22] but contrast to a study conducted in Mumbai.[17] Birth weight was also found to be associated with wasting contrast to studies in Mumbai and Pune.[17,21]

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.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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