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Original Research Article

A study on health and nutritional status of children in rural and urban ICDS projects in Karimnagar

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ABSTRACT

Background: Malnutrition is a major public health problem. It continues to be a primary cause of ill health and mortality among children in developing countries. Preschool age is an important stage of life where the nutrition plays an important role and has long lasting effects in the later years of life. Hence the objective of the present study was to assess the nutritional and health status of under-five children covered under the ICDS project.
Methods: A cross-sectional study was conducted during March 2013-February 2014 among 846 children attending the rural and urban anganwadi centers of Karimnagar ICDS project. A semi-structured questionnaire was used to collect data and was analyzed using Epi info version 7 and valid inferences were drawn.
Results: It was observed in the present study that females (53.5%) were more compared to boys (46.5%), out of the total sample surveyed. In this study 87.6% were completely immunized and 12.4% were partially immunized. According to IAP classification of malnutrition, 27.7% children were mildly malnourished, 16.5% were moderately malnourished, 3.9 % were severely malnourished and 0.9 % was very severely malnourished.
Conclusions: High prevalence of malnutrition was observed among children in both urban and rural area warrants urgent attention. ICDS projects should be periodically studied to evaluate the impact of interventions. Further exploratory studies are required to find of several risk factors of malnutrition.

Keywords: Malnutrition, Nutritional status, Rural, Urban, ICDS

INTRODUCTION

Malnutrition continues to be a primary cause of ill health and mortality among children in developing countries. It is a major public health problem and accounts for about half of all child deaths worldwide, about 150 million children in developing countries are still malnourished and more than half of underweight children live in South East Asia region (SEAR).[1] The effect of malnutrition brings devastation in the individual's, community's and ultimately nation's standard of living. The high levels of under nutrition in children in South Asia pose a major challenge for child survival and development. Preschool age is an important stage of life where the nutrition plays an important role and has long lasting effects in the later years of life.

Nutritional status of children is an indicator of nutritional profile of the entire community. Studies conducted worldwide shows that 150 million (26.6%) are underweight, while 182 million (32.5%) are stunted all over the world. More than half of the worlds under nourished people live in India. 54% children are underweight, 52% are stunted, and while 17% are wasted.[2] United Nation Children Emergency Fund (UNICEF) reported that worldwide; more than 150 million under-five children i.e., 25% of the world's children are malnourished. It is now recognized that 53%

deaths in under-five children in developing countries are attributable to malnutrition.[3]

In India 43% of children below 5 years of age are underweight (<2SD) and 15.8% severely underweight (<3SD).[4] Nutritional assessment in the country serves as appropriate data gathering processes to enable accurate planning and implementation of interventions to reduce morbidity and mortality associated with under nutrition. Anthropometric measurements remain the most practically useful means for the assessment of the nutritional status of a population. Weight, height and mid arm circumference are considered as the most sensitive parameters for assessing nutritional status of under-five children. The use of appropriate anthropometric indicators allows the identification of the nature and extent of protein energy malnutrition in the country.[5]

Early childhood malnutrition can have lasting effects on growth and functional status. The inadequate energy and protein intake leads to malnutrition in the form of wasting, stunting and underweight.[6] Universalization of ICDS, with quality improvement, can help to break the vicious cycle of malnutrition and poverty. It is an essential step towards the realization of children's fundamental right to nutrition, health and education. Malnutrition studied by growth assessment not only serves as a mean for evaluating health and nutritional status of children, but also provides an indirect measurement of the quality of life of an entire population. Keeping in view the above said, the present study was carried out in anganwadis of urban and rural ICDS projects in Karimnagar to assess the nutritional and health status of under-five children covered under the ICDS project.

METHODS

The conducted study was a community based cross-sectional study undertaken in the rural and urban anganwadi centers of Karimnagar ICDS Project. The study was carried out for a period of one year from March-2013 to February-2014. By random sampling method anganwadi centers were selected in both rural and urban areas. A total of 846 children, 423 each from rural and urban anganwadi centers were selected for the study. The sample size for this study was calculated to be 846 children were selected 423 each from both rural and urban anganwadi centers using the formula $n=z\alpha 2p(100-p)/\varepsilon 2$ considering the estimated prevalence of under nutrition (48%) from previous studies and the margin of error on p (put at 5%) with 10% non-response rate. The data was collected using pre-designed and pre-tested questionnaire the anganwadi teacher and mothers of these children after taking verbal consent from them. The study protocol was approved by the institutional ethics committee of the institute. Data was analyzed by using Epi info version 7 and statistical measures obtained were numbers, percentages, mean values and standard deviation. Chi square test was used to test the significance.

Inclusion criteria

All the children attending the selected anganwadi centers were included.

Exclusion criteria

Children with previous history of disease, children with congenital abnormalities, and children who are not cooperative were excluded.

RESULTS

The base-line characteristics of the respondents are depicted in Table 1. In the present study the females (53.5%) were more compared to boys (46.5%), out of the total sample surveyed. Most (58.3%) of them were between 2-3 years. Majority, 64.2% children belonged to nuclear families and 25.2% belonged to joint families.

Table 1: Distribution of base-line characteristics of respondents.

Variables		Groups		Total (%)
		Rural (%)	Urban (%)	
Age interval	1-2	32 (3.8)	19 (2.2)	51 (6.0)
	2-3	218 (25.8)	275 (32.5)	49 (58.3)
	3-4	122 (14.4)	117 (13.8)	239 (28.3)
	4-5	51 (6.0)	12 (1.4)	63 (7.4)
Sex	Female	259 (30.6)	194 (22.9)	453 (53.5)
	Male	164 (19.4)	229 (27.1)	393 (46.5)
Type of family	Nuclear	272 (32.2)	271 (32.0)	543 (64.2)
	Joint	107 (12.6)	106 (12.5)	213 (25.2)
	Extended	44 (5.2)	46 (5.4)	90 (10.6)
Total		423 (50)	423 (50)	846 (100)

Table 2 shows the socio-demographic characteristics of the respondents. A total of fathers (88.8%) were educated and 83.8% mothers were educated. Regarding socioeconomic status in rural area 23.0% belonged to lower middle class and 22.3% belonged to upper middle class. While in urban area 22.9% belonged to upper middle class and 20.3% belonged to lower middle class.

Table 3 reveals that among the 846 children 365 (43.1%) and 376 (44.4%) were completely immunized in rural and urban areas respectively, whereas only 58 (6.9%) and 47 (5.6%) were partially immunized in rural and urban areas respectively.

Table 4 depicts the mean and standard deviation of different variables. From the table it is observed that mean weight is 11.29 kg, mean head circumference is 47.68 cm, mean MAC is 13.45 cm, mean BMI is 14.55 and mean value of height was 87.71 cm. Standard deviation values were as follows; weight-1.96; head circumference-3.13; MAC-1.22; BMI-1.99 and height-6.19.

Table 2: Socio-economic characteristics of respondents.

Variables		Groups		Total (%)
		Rural (%)	Urban (%)	
Education of Father	Illiterate	35 (4.1)	51 (6.0)	86 (10.2)
	Primary	0	12 (1.4)	12 (1.4)
	Middle	97 (11.5)	74 (8.7)	171 (20.2)
	High school	195 (23)	150 (17.7)	45 (40.8)
	Intermediate	38 (4.5)	58 (6.9)	96 (11.3)
	Graduate	58 (6.9)	73 (8.6)	131 (15.5)
	Post graduate	0	5 (0.6)	5 (0.6)
Education of mother	Illiterate	66 (7.8)	71 (8.4)	137 (16.2)
	Primary	4 (0.5)	12 (1.4)	16 (1.9)
	Middle	141 (16.7)	118 (13.9)	259 (30.6)
	High School	153 (18.1)	122 (14.4)	275 (32.5)
	Intermediate	25 (3.0)	56 (6.6)	81 (9.6)
	Graduate	34 (4.0)	39 (4.6)	73 (8.6)
	Professional	0	5 (0.6)	5 (0.6)
Occupational status of father	Unskilled worker	207 (24.5)	269 (31.8)	476 (56.3)
	Semi-skilled worker	17 (2.0)	10 (1.2)	27 (3.2)
	Skilled worker	70 (8.0)	110 (13.0)	180 (21.3)
	Farmer	108 (12.8)	25 (3.0)	133 (15.7)
	Semi-professional	9 (1.1)	9 (1.1)	18 (2.1)
	Professional	12 (1.4)	0	12 (1.4)
Occupational status of mother	Housewives	172 (20.3)	307 (36.3)	479 (56.6)
	Unskilled worker	153 (18.1)	72 (8.5)	225 (26.6)
	Semi-skilled worker	8 (0.9)	13 (1.5)	21 (2.5)
	Skilled worker	25 (3.0)	27 (3.2)	52 (6.1)
	Farmer	65 (7.7)	4 (0.5)	69 (8.2)
Socio-economic status	Lower middle	195 (23.0)	172 (20.3)	367 (43.4)
	Upper	13 (1.5)	5 (0.6)	18 (2.1)
	Upper lower	26 (3.1)	52 (6.1)	78 (9.2)
	Upper middle	189 (22.3)	194 (22.9)	383 (45.3)
Total		423 (50)	423 (50)	846 (100)

Table 3: Immunization status of children attending anganwadi centers.

Immunization status	Group		Total (%)
	Rural (%)	Urban (%)	
Complete	365 (43.1)	376 (44.4)	741 (87.6)
Incomplete	58 (6.9)	47 (5.6)	105 (12.4)
Total	423 (50)	423 (50)	846 (100)

Table 4: Mean and standard deviation of different variables.

Variable	Number	Minimum	Maximum	Mean	Standard deviation
Weight	846	6.5	16.5	11.29	1.96
Head circumference	846	39	81	47.68	3.13
MAC	846	11	17	13.45	1.22
BMI	846	10	20.3	14.55	1.99
Height	846	71	10.7	87.71	6.19

In Figure 1, bar chart distribution of IAP grading of nutritional status of children in anganwadi centers. According to IAP classification of malnutrition, in rural area 118 (13.9%) children were graded as mildly malnourished, 58 (6.9%) as moderately malnourished and 8 (0.9%) as severely malnourished. In urban area 116 (13.7%) children were graded as mildly malnourished, 82 (9.7%) as moderately malnourished, 25 (3.0%) as severely malnourished and 8 (0.9%) children as very severely malnourished. 239 (28.3%) and 192 (22.7%) are the number of normal children in rural and urban areas respectively. Among total 846 children surveyed, 415 (49.1%) children are malnourished, of which 184 (21.7%) belonged to rural area and 231 (27.3%) to urban area.

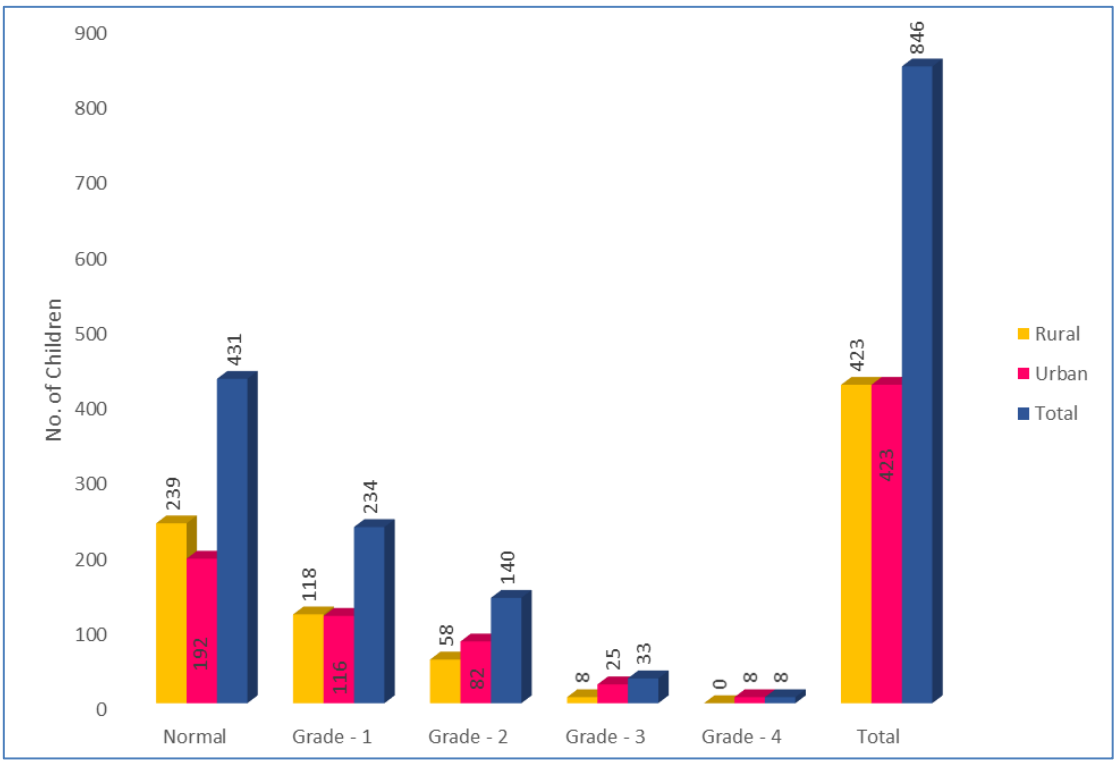

Figure 1: IAP grading of nutritional status of anganwadi children.

Table 5: Nutritional grading of children based on their socio-demographic characteristics.

Variables		Malnutrition		Total	Chi-square value
		Absent	Present		
Sex	Female	251 (29.7)	202 (23.9)	453 (53.5)	20.077 (p<0.001)
	Male	180 (21.3)	213 (25.2)	393 (46.5)	
Socio-economic status	Lower middle	168 (19.9)	199 (23.5)	367 (43.4)	13.729 (p=0.003)
	Upper	13 (1.5)	5 (0.6)	18 (2.1)	
	Upper lower	44 (5.2)	34 (4.0)	78 (9.2)	
	Upper middle	206 (43.1)	177 (20.9)	383(45.22)	
Educational status of mother	Professional	0	5 (0.6)	5(0.6)	26.296 (p<0.001)
	Graduate	52 (6.1)	21 (2.5)	73(8.6)	
	Diploma	42 (5.0)	39 (4.6)	81(9.6)	
	High school	129 (15.2)	146(17.3)	275(32.5)	
	Middle school	141 (16.7)	118 (13.9)	259 (30.6)	
	Primary school	4 (0.5)	12 (1.4)	16 (1.9)	
	Illiterate	63 (7.4)	74 (8.7)	137(16.2)	
Immunization status	Fully immunized	400(47.3)	341 (40.3)	741(87.6)	1.316 (p=0.251)
	Partially immunized	31(3.7)	74 (8.7)	105 (12.4)	
Attendance	Regular	375(44.3)	285 (33.7)	660 (78.0)	2.233 (p=0.135)
	Irregular	56(6.6)	130(15.4)	186 (22.0)	
Total		431(50.9)	415 (49.11)	846 (100)	

Table 5 shows nutritional grading of children based on socio-demographic characteristics, which showed that out of the total children surveyed, 415 (49.1%) children are malnourished, of which 25.2% are males and 23.9% are of female children. Maximum number of children were malnourished who belonged to lower middle class 199 (23.5%), while highest number of children belonging to upper middle class, 206 (43.1%) were having normal nutritional status. Mothers of maximum number of malnourished children were educated up to high school 146 (17.3%) and middle school 118 (13.9%) level. More number of 341 (40.3%) fully immunized children were malnourished when compared to partially immunized children, 74 (8.7%). Among the malnourished children 285 (33.7%) were regularly attending the anganwadi center and 130 (15.4%) were irregular.

DISCUSSION

Malnutrition is an important cause of ill health and mortality among children in developing countries. Malnutrition present in early age continues to have long lasting effects in the later years of life. In India, around half of the children are suffering from under nutrition and is an issue of grave concern. ICDS serve as an important intervention to tackle this problem and there is a need to analyze the profile of children attending these services. The present study deals with evaluation of malnutrition and morbidity pattern among the children attending anganwadi centers in rural and urban areas of Karimnagar.

In this study, out of the total children surveyed, marked gender wise differences were observed among the children attending AWCs. The majority of the girls (30.6%) were in rural areas compared to boys accounting for 19.4%, whereas boys were more in numbers (27.1%), compared to girls (22.9%) in urban anganwadi centers.

In a study conducted by Shanawaz et al in ICDS centers of urban Hyderabad to study the nutritional status it was found that 49.5% were boys and 50.5% were girls, the finding is very much similar to our study, whereas, in a study done by Mohammed et al in ICDS centers in rural Bangalore to study the nutritional status of children aged 2- 6 years it was found that 49.4% were boys and 50.6% were girls.[7,8] The marginal differences were because of differences in geographical area, service provision and attitude of the community in the studied area and variation in sampling technique and sample size.

Regarding educational status of the parents, in this study majority 23.0% and 17.7% of the fathers were educated up to high school level in rural and urban areas respectively. Similar to father's educational status, mothers were also educated up to high school level with 18.1% and 14.4% in rural and urban areas respectively in this study. Similarly around 16.7% of the mothers in rural area and 13.9% in urban areas were educated up to middle school.

In this study, most of the (36.3%) children's mothers were housewives in urban area when compared to rural area where around 20.3% were housewives. In the context of occupational status of the fathers, it has been observed that majority of the fathers were unskilled workers in rural (24.5%) and urban (31.8%) areas.

In a study done by Vaid et al on "nutritional status of ICDS and non- ICDS children", the median educational qualification of the mother's whose children attended ICDS Centers were middle pass and the median occupation were labourer whereas the median educational qualification of the mother's whose children not attended ICDS centres were illiterate and all were housewives.[9] Raman et al conducted a study to assess the immunization and nutritional status of under-five children in urban slums Jamnagar city, which showed that the overall literacy status of mother was 57.33%. Out of them, 37.56% were educated up to primary schooling, 17.11% had completed their secondary schooling. Only 12 (2.66%) mothers were educated to higher secondary or higher level.[10]

In another study conducted by Bant on prevalence of protein energy malnutrition among anganwadi children of Hubli, 30.88% of mother were illiterate, 28.97% were studied up to high school. A total 35.44% of fathers were educated up to high school and around 26.17% were illiterate. A majority, 91.7% of mother occupation were housewife. 56.47% of fathers were laborers by occupation and around 29.55% were self-employed. About 53.52% of study subjects were belonging to class V socioeconomic status and 36.32% were in class IV.[11]

Socioeconomic status is one of the important determinant of health and wellbeing of children. Among the total children surveyed, in the rural area majority (23.0%) of them belonged to lower middle class. But in urban areas most (22.9%) of them belonged to upper middle class. A study done to know the epidemiology of malnutrition among under five children in rural area of Karnataka by Mangala et al, showed that among the normal children, 62.6% children belonged to class I and class II (good) socioeconomic background and among the malnourished children 54.5% belonged to class III, IV and class V (low) socioeconomic background.[12]

A study done by Patel et al, to assess the nutritional and the morbidity profile of children aged 2-5 years showed, with respect to socioeconomic status, 80% children belonged to class IV and V according to modified B.G. Prasad's classification. 36.6% of children's fathers were educated up to primary level followed by 31.1% up to secondary level. 41.3% of mothers were uneducated and 39.3% were educated up to primary level. Regarding occupation, 74.2% of children's fathers were labourers. 90% of the children's mothers were housewives and 9.33% were labourers and a few were doing a job or self-employed.[13]

Almost an equal number of children are attending regularly to the anganwadi centers in both rural (37.9%) as well as urban (40.1%) areas in this study. Immunization is very well covered in anganwadi centers, in this study, 43.1% children in rural and 44.4% in urban areas were fully immunized. Although childhood immunization programs have led to substantial reductions in measles, poliomyelitis, diphtheria, tetanus, and whooping cough, a significant proportion of children under five years of age still die every year as a result of vaccine-preventable diseases and malnutrition serve as an important risk factor. More child deaths could be prevented through optimal use and wider coverage of current existing vaccines and reaching the children who need them the most.

In a study conducted by Raman et al to know the immunization and nutritional status of under five children in urban slums Jamnagar city, it was seen that 75.11% children were fully immunized, 13.33% were partially immunized and 11.56% were not immunized at all.[10]

In the present study, 32.2% were nuclear families, 12.6% were joint families and 5.2 % were 3-generation families. Lakshmi et al conducted a study to assess the nutritional status of rural preschool children and its mediating factors in Mysore showed that, half of the families were nuclear, 14% were joint families and 36% were extended families.[14]

According to the IAP classification of protein energy malnutrition in children, in this study, 28.3% in rural and 22.7% in urban areas are categorized under normal nutritional status, while 21.7% and 27.3% children are malnourished in rural and urban areas respectively. The majority of the children are categorized as mildly malnourished with almost an equal number in rural (13.9%) and urban (13.7%) areas.

Among the malnourished children, 25.2% were males and 23.9% were females in the present study. In a study conducted by Stalin et al, to know the prevalence of underweight and its risk factors among under five children in a rural area of Kancheepuram district in Tamil Nadu, showed that females (62.6%) were more malnourished than males (44.0%).[15] Female child by virtue of gender discrimination, remain neglected in terms of nutrition and care and tends to be more malnourished compared with a male child. However, we obtained around equal numbers of male and female children having malnutrition.

Out of the total sample surveyed malnutrition was present in 49.1% children. Among them malnutrition was more (23.5%) in children who belonged to lower middle class and the next highest percentage (20.9%) was seen in children belonging to upper middle class. With regard to the educational status of mothers of anganwadi children, malnutrition was highest in children whose mothers were educated only up to middle school (13.9%) and high school (17.3%) level.

CONCLUSION

The current study was undertaken to evaluate the health and nutritional status of children attending the rural and urban anganwadi centers of Karimnagar ICDS project. The immunization coverage was better in anganwadi centers, in this study 87.6% were completely immunized and 12.4% were partially immunized. About anthropometric measurements, the mean weight is 11.29 kg, mean head circumference is 47.68 cm, mean mid arm circumference is 13.45 cm, mean BMI is 14.55 and mean height is 87.71 cm. Based on MAC, 37.8% children in rural and 41.4% in urban area were malnourished. According to IAP classification of malnutrition, 27.7% children were mildly malnourished, 16.5% were moderately malnourished, 3.9% were severely malnourished and 0.9% were very severely malnourished. High prevalence of malnutrition was observed among children in both urban and rural area warrants urgent attention. ICDS projects should be periodically studied to evaluate the impact of interventions. Further exploratory studies are required to find of several risk factors of malnutrition.

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