
Nutritional status of Jenukuruba preschool children in Mysore district, Karnataka

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ABSTRACT

Background: Poor nutritional status of tribal children observed in different studies across the country calls for a need to introspect for various factors affecting it to seek remedial measures.

Objectives: Study the nutritional status of preschool children and know the prevalence of malnutrition and associated socio-demographic variables.

Methods: Community based study was done in Jenukuruba tribes of Mysore district in the month of July-August 2011 among 220 children aged 1-5 years. Socio-demographic information and anthropometric measurements were obtained by using standard techniques. Height and weight of each child was compared with WHO child growth standards-2006 reference data for that particular age and sex to get W/A, H/A and W/H indices, and below 2 SD of the reference median on any of these indices were considered as underweight, stunted and wasted respectively.

Results: Prevalence of underweight, stunting and wasting was 38.6%, 36.8% and 18.6% respectively which was statistically significant with respect to age; and not significant with respect to sex, literacy status of mother, family type, SLI and Immunization status.

Conclusion: Poor nutritional status in this children calls for government and NGO's to take immediate steps in uplifting the socioeconomic standard of the tribal community.

Keywords: Jenukuruba, underweight, preschool children

INTRODUCTION

Preschool children constitute the most vulnerable segment of any community. Their nutritional status is a sensitive indicator of child health. Growth during childhood is widely used to assess adequate health, nutrition and development of children. It is well documented that chronic under-nutrition is associated with serious health impairment later in life which reduce the quality of life.

Malnutrition is still considered as one of the major public health problems in many countries affecting more than 30% of children under 5 years of age. Under-nutrition is most important cause of death in this age group in developing countries in which nutritional deficit is common. The majority of deaths associated with malnutrition occur in children who are marginally malnourished. About 50% of the children less than 5 years of age in India are moderately or severely undernourished. Moreover, several studies have shown that degree of under-nutrition is higher among the

underprivileged communities which include tribal population of our country.

Key indicators for India from NFHS 3 (2005-06) reveal that in children less than 3 years of age, 40.4% are underweight (Karnataka - 33.3%) and about 42.4% are stunted. Many studies across the country have been done to know the nutritional status of under five children among various tribal communities of our country.^{1,2,3} A study carried out to assess the nutritional status of preschool children of Gond tribal community in Madhya Pradesh observed 60% of children to be underweight. Micronutrient deficiencies such as anaemia and vitamin A deficiency were common among them. Unhygienic personal habit and adverse cultural practices relating to child rearing, breast feeding and weaning were also prevalent among them.⁴

However, there are still many communities left untouched, each of them having their own unique socio cultural milieu. Out of the 50 scheduled tribes of Karnataka, Jenukuruba tribe (total.

population – 35,068) is one of the primitive tribal groups who have so far remained isolated from other groups. However, they have now started living in permanent settlement and established contact with other communities. This is a maiden study till date except for a study done among tribal school children.⁵ Therefore, the present study was undertaken to assess the overall nutritional status and associated socio demographic factors influencing it so as to provide baseline information of this community needed for further intervention if any

MATERIALS AND METHOD

Study type – Community based cross sectional observational study.

Study Duration – August and September 2011.

Study population/ subjects- Jenukuruba tribe (total population – 35,068), concentrated mainly in Hunsur, HD kote, Nanjangud and Periyapatna taluk of Mysore district, is one of the two primitive tribal groups of Karnataka who have so far remained isolated from other groups, and have now started living in permanent settlement and contact with other communities. They live in about 167 Haadis. Children aged one to five years belonging to Jenukuruba tribal community of Mysore district were the study subjects.

Sample size- Using the formula, $n = 4pq / I^2$, where p is 45% with 15% permissible error and 95% confidence interval based on NFHS 3 data, (2005-06) with 45% of children aged less than 3 years are stunted), total sample size (n) required was 217. Therefore, 220 children from one to five years were included for the present study.

The required number of subjects was obtained from HD Kote taluk (about 35 km from Mysore City) where there are 87 haadis out of the total 167 haadis of the district where Jenukurubas live. Out of the 87 haadis, top ten haadis having maximum family units in order were selected for the present study for the sake of convenience.

In each selected haadi, with a random start from the centre of the haadi, the consecutive households were visited till the required number of 220 children of 1 to 5 years was obtained. From any household only one subject was included. Institution Ethical

Committee approval was obtained prior to the start of the study. After an informed consent, socio demographic information was collected by interviewing the parent or guardian using a pre-designed and pre-tested proforma during house-to-house visit. Complete immunization status was defined as “any child who had been administered all the recommended vaccines up to one year of age (i.e. 1 dose of BCG, 3 doses of DPT, 3 doses of OPV and 1 dose of measles vaccine)” as per Government of India guidelines; and incomplete immunization status as “one who have not received one or more recommended vaccines up to one year of age as per UIP guidelines”. Anthropometric measurements were done using standard techniques. Weight was measured without any footwear and with minimal clothing nearest to 0.1 kg using a standard portable weighing machine (Smart Care Electronic Scale-Model No SCG 2006A6-1). Height: The length for children aged 1-2 years was measured using an infantometer. The child was placed on board with head positioned firmly against the fixed head board, the knees extended by firm pressure and the feet fixed at right angles to the lower legs. Then the upright foot piece was moved to obtain firm contact with the heels and the length was measured to the nearest 0.5 cm. For children between 2 to 5 years, standing height was measured without any foot wear to nearest 0.5 cm using a standard calibrated bar. The children were made to stand straight with heels, buttocks, shoulders and back of head touching the rod. Head was held comfortably erect with the lower border of orbit of the eye in the same horizontal plane as the external canal of the ear and the arms hanging loosely by the sides with palms facing the thigh. The headpiece was then lowered gently making contact with the top of head. Prevalence of malnutrition (stunting, wasting, and underweight) by age and sex classification was based on WHO reference curves. Standard of Living Index (SLI) of an household – The SLI was adapted from the tool used for NFHS – 3 having scores ranging from 0-67 and having 10 variables taken under consideration- house type, toilet facility, main fuel for cooking, source of drinking water, separate room for cooking, ownership of house/ agricultural land/irrigated land, livestock and durable goods and were classified as low, medium and high SLI- scores of 0-14, 15-24 and 25-67 respectively.

Statistical analysis – Data obtained was entered in MS excel spread sheet, analyzed and interpreted in terms of mean, SD and percentages as appropriate. Epi Info 2002 version 04 Software was used for further analysis like Chi-square test/ Z test and $p < 0.05$ was used as definition of statistical significance. WHO Anthro software version 3.1.0 was used to classify the malnutrition status. The height and weight of each child was compared with the WHO child growth standards, 2006 reference data for that particular age and sex to get weight for age, height for age and weight for height indices. Children below two standard deviation of the reference median on any of these indices were considered as malnourished and termed as underweight, stunted and wasted respectively.¹⁷

RESULTS

Table- 1 shows that out of the total 220 children in the study population, there was almost equal distribution of both boys (n=103) and girls (n=117) in general and within each age group.

Table- 2 shows overall mean weight was 12.33 ± 2.5 kg and 11.05 ± 2.25 in boys and girls respectively and mean height was 89.8 ± 10.4 and 86.9 ± 10.28 in boys and girls respectively. There was an increase in mean weight and height with respect to age and was more in boys than in girls. Present study did not reveal any major clinical manifestations of nutritional deficiency disorders except for two cases of pyoderma.

Table- 3 reveals that overall prevalence of underweight, stunting and wasting were 38.6%, 36.8% and 18.6% respectively, which was statistically significant with respect to age and not

Table 1: Age and sexwise distribution of study subjects.

Age (in months)	Males	Females	Total
	No. (%)	No. (%)	No. (%)
12-23	19 (44.2)	24 (55.8)	43 (19.5)
24-35	18 (32.1)	38 (67.8)	56 (25.5)
36-47	18 (48.7)	19 (51.3)	37 (16.8)
48-59	48 (57.1)	36 (42.9)	84 (38.2)
Total	103 (46.8)	117 (53.2)	220 (100.00)

Table 2: Mean and SD of weight and height according to the age of study subjects.

Age (in months)	Males			Females	
	Children Observed	Weight (kg) (mean ?SD)	Height (mean ?SD)	Children Observed	Weight (kg) (mean ?SD)
12-23	19	---	75.52±4.70	24	8.17±1.25
24-35	18	10.71±1.34	84.44±6.14	38	10.40±1.08
36-47	18	12.46±1.38	89.61±4.93	19	12.04±1.13
48-60	48	13.74±2.65	99.04±5.49	36	13.12±1.69
Total	103	12.33±2.5	89.8±10.4	117	11.05±2.25

significant with respect to sex, literacy status of mother, family type, standard of living index and immunization status.

DISCUSSION

It is seen in the present study that there is almost equal distribution of both boys and girls in general and within each age group compared to overall sex ratio of 972 females per 1000 males in ST population of Karnataka (Census 2001) been maintained in this particular tribal population.

It is seen that there is an increase in mean weight and height with an increase in age. The mean weight and height of male children was more than female children in this study, similar to a study in Madhya Pradesh among Gond tribal children but the mean values of our study is more than the Gond children.⁴ This may be due to the variation in diet, cultural and racial factors. About 52.3% and 69.1% of fathers and mothers of study subjects respectively were illiterates and not more than 5% had studied beyond middle school. Poor literacy status among the parents of study subjects is quite obvious compared to literacy rate of 72.6% in Mysore district (Census 2001) and similar to study done among Shabar tribal community of Orissa where 43% of the mothers were illiterate.

Complete immunization status were observed in 85% of children which is better than state level coverage of Karnataka (76.7%- DLHS 3).

However, there is a need to ensure complete immunization among other children which is feasible through education of the family members for the same.

Table 3: Prevalence of underweight, stunting and wasting according to various socio-demographic factors among the study subjects.

Socio-demographic factor	Classification	Total number of Children Observed No (%)	Underweight No (%)	Stunting No (%)	Wasting No (%)
Age in months	12-23	43(19.5)	11(25.6)	13(30.2)	12(27.9)
	24-35	56(25.5)	21(37.5)	18(32.1)	10(17.9)
	36-47	37(16.8)	11(29.7)	14(37.8)	3(8.1)
	48-59	84(38.2)	42(50.0)	36(42.9)	16(19.0)
	Total	220(100.0)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 8.935$ p= 0.03	$\chi^2 = 2.661$ p= 0.447	$\chi^2 = 5.174$ p= 0.160
Sex	Male	103(46.8)	37(35.9)	38(36.9)	16(15.5)
	Female	117(53.2)	48(41.0)	43(36.8)	25(21.4)
	Total	220(100)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 0.602$ p = 0.438	$\chi^2 = 0.000$ p = 0.983	$\chi^2 = 1.229$ p = 0.268
Literacy status of mother	Illiterate	152(69.1)	64(42.1)	63(41.4)	29(19.1)
	1 st -4 th std	54(24.5)	15(27.8)	13(24.1)	09(16.7)
	4 th -7 th std	12(5.5)	06(50.0)	05(41.7)	03(25.0)
	Above 7 th std	2(0.9)	0(0)	0(0)	0(0)
	Total	220(100)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 5.37$ p= 0.147	$\chi^2 = 6.457$ p= 0.091	$\chi^2 = 0.936$ p=0.817
Family Type	Nuclear	35(15.9)	09(25.7)	09(25.7)	08(22.9)
	Joint	69(31.4)	24(34.8)	25(36.2)	15(21.7)
	Three-Generation	116(52.7)	52(44.8)	47(40.5)	18(15.5)
	Total	220(100)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 3.28$ p= 0.194	$\chi^2 = 1.52$ p= 0.468	$\chi^2 = 8.79$ p= 0.012
Standard of living index	Low	185(84.1)	75(40.8)	70(38.0)	37(20.1)
	Medium	35(15.9)	10(28.6)	11(31.4)	04(11.4)
	Total	220(100.0)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 1.840$ p= 0.175	$\chi^2 = 0.552$ p= 0.457	$\chi^2 = 1.456$ p= 0.228
Immunization status	Complete	186(84.5)	71(38.2)	69(37.1)	35(18.8)
	Partial	34(15.5)	14(41.2)	12(35.3)	06(17.6)
	Total	220(100)	85(38.6)	81(36.8)	41(18.6)
			$\chi^2 = 0.109$ P= 0.741	$\chi^2 = 0.040$ p =0.841	$\chi^2 = 0.026$ p =0.741

Note: 1. Wherever the expected value of a cell was <5, Fisher Exact test was used.
2. Figures in the parenthesis indicates percentage.

Overall prevalence of underweight, stunting and wasting was 38.6%, 36.8% and 18.6% respectively. Underweight was found to be high in children belonging to 48-59 months and least in 12-23 months age group. Our prevalence is almost similar to a study conducted in tribal area near Jabalpur with underweight prevalence of 33.9%, stunting in 21.5% and wasting in 26.4% of children while severe degree of underweight, stunting and wasting was present in 27.7%, 30.1% and 6.5% of children respectively.⁴ A much higher prevalence was seen in Koramudi tribal children- underweight-52.9%, stunting-49.6% and wasting-22.7%.¹⁰ Overall ST population data available at the national level as per NFHS 3, prevalence of underweight, stunting and wasting was 54.5%, 54% and 27.6% respectively which is higher than our study probably attributed to availability of health services both from government as well as NGO existing in this area. According to NFHS 3 report (2005-06) the total prevalence of underweight, stunting and wasting in Karnataka was found to be 33.3%, 42.4% and 18.9% and these are comparable to the result found in the present study.¹⁹ The present study has used the recent WHO child growth standards 2006 which is more authentic and applicable to any part of the world and the findings of this study is more reliable and can be used as reference in studies conducted in other parts of our country.¹⁷ About 1/3 rd of the study population having underweight and stunting but with no difference between male and female children is good sign of absence of gender bias. However, a much higher prevalence of under-nutrition among Bhil tribal children was observed- underweight (69.3%), stunting (63.4%) and wasting (58.7%). In girls, prevalence of underweight (72.7%) and wasting (61.1%) was higher in comparison to boys (66.2% underweight and 56.4% wasting). However, boys suffered more by under-

nutrition than girls in the age group of 4-6 years.²⁰ No statistically significant relationship seen with respect to literacy status of mother, type of family, SLI and immunization status means that there may be other factors operating to influence the nutritional status.

CONCLUSION

This study has shown that with increase in age of the child, the prevalence of underweight is also increasing and that malnutrition exists in this community along with unfavorable socio demographic factors, which calls for a need to improve the living conditions of the tribal population and provision and adequate utilization of available health and nutritional supplementary services to this community through intersectoral approach. A further detailed study to know the dietary habits of the family and the child in particular will go a long way to suggest specific intervention measures for the same.

ACKNOWLEDGEMENT

The authors acknowledge the financial assistance given by ICMR –New Delhi under STS 2011.

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