Community Medicine Section

Malnutrition Among Under-Five Children of Kadukuruba Tribe: Need to Reach the Unreached

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ABSTRACT

Introduction: Poor nutritional status of tribal children observed in different parts of India, calls for introspection into various factors influencing it, in order to seek remedial measures.

Objectives: To assess the prevalence of malnutrition among under-five children of Kadukuruba tribe and socio-demographic factors associated with it.

Materials and Methods: Community based cross-sectional study was done in Kadukuruba tribes of Mysore district over a period of one year among 101 under-five children. Socio-demographic information and anthropometric measurements were obtained by using standard techniques. Height and weight of each child was compared with World Health Organization (WHO) child growth standards-2006 for that particular age and sex to get W/A, H/A and W/H Indices and below 2SD of the reference median on these indices were considered as underweight, stunted and wasted respectively.

Results: Prevalence of underweight, stunting and wasting was 60.4 %, 55.4% and 43% respectively which was significantly associated with respect to age, presence of ration card in the family and egg in the child's diet.

Conclusion: Significantly higher prevalence of under-nutrition was noted among under-five children in this community. This calls for educating mothers and other caretakers in the family regarding increased nutritional requirements with increasing age, strengthening Public Distribution System (PDS) and ensuring egg made available in the regular weekly Menu at all Anganwadi's.

INTRODUCTION

Under-five children constitute the most vulnerable segment of any community. Their nutritional status is a sensitive indicator of child's health. Growth during childhood is widely used as a marker to assess adequate health, nutrition and development of children. It is well documented that chronic undernutrition is associated with serious health impairment later in life which has the significant impact on 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 five years of age. Undernutrition is most important cause of death in this age group in developing countries where nutritional deficit is common. About 50% of the children under five years old in India are moderately or severely undernourished. Moreover, several studies have shown that degree of undernutrition is higher among the underprivileged communities which include tribal population as well.

Key indicators for India from National Family Health Survey (NFHS) - 3 (2005-06) has revealed that 40.4% (Karnataka - 33.3%) of children under three years are underweight and about 42.4% are stunted [1]. Many studies across the country have been conducted to know the nutritional status of under five children and also among various tribal communities [2-5].

However, there are still many communities left untouched, each of them having their own unique socio cultural milieu. Out of the 50 scheduled tribes (STs) of Karnataka, Kadukuruba is a tribal community spread in two Taluks of Mysore District, India still living in and around forest fringe.

There are no published literature available on nutritional status of underfive children belonging to Kadukuruba tribes of southern India.

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 which is needed for further inter vention if any.

MATERIALS AND METHODS

This Community based cross-sectional study was conducted over a period of one year (January to December 2013) in Kadukuruba Tribe. Total population of this community is 4,465. They reside in 15 settlements known as Haadi's which are concentrated mainly in HD Kote and Periyapatna Taluk of Mysore District. Overall there are 893 families belonging to this community. Sample size - Using the formula $n= 4pq / l^2$, where p is 55% with 10% absolute permissible error and 95% confidence interval (Based on 2005-06 NFHS-3 data with 55% of ST children aged less than five years underweight), total sample size (n) required was 99. Therefore, 101 under five children were included for the present study.

Method of data collection- A list containing Kadukuruba settlements/ haadi's were collected from Integrated Tribal Development Project Office at Mysore City. First haadi was selected randomly by Lottery Method. Subsequently, every alternate haadi was selected by systematic random sampling technique. From any household only one subject was included. After obtaining an informed consent from the mother, socio demographic information was collected by using a predesigned and pretested structured proforma by interview technique. Anthropometric measurements was done using standard techniques. All houses were visited till all under-five children present in the haadi on the day of study were covered.

Prevalence of malnutrition (underweight, stunting and wasting,) by age and sex classification was based on World Health Organization (WHO) reference curves. Standard of Living Index (SLI) of a family was documented using SLI used in NFHS – 2. Institution Ethical committee approval was obtained prior to the start of the study.

Age (In months)	Boys	Girls	Total
	No. (%)	No. (%)	
0-11	05(38.5)	08(61.5)	13(12.9)
12-23	08(40.0)	12(60.0)	20(19.8)
24-35	11(57.9)	08(42.1)	19(18.8)
36-47	09(50.0)	09(50.0)	18(17.8)
48-59	19(18.8)	12(11.9)	30(30.7)
TOTAL	52(51.5)	49(48.5)	101(100.0)

[Table/Fig-1]: Age and sex wise distribution of study subjects

Age (in months)	Males			Females		
	No of Children	Weight (Kg) (Mean ± SD)	Height (cm) (Mean ± SD)	No of Children	Weight (Kg) (Mean ± SD)	Height (cm) (Mean ± SD)
0-11	05	6.37±2.70	59.4±10.03	08	6.13±1.52	64.00±3.05
12-23	08	7.37±1.06	71.25±4.62	12	7.75±2.26	73.91±9.96
24-35	10	9.5±1.17	81.11±4.28	07	8.28±1.11	77.71±13.14
36-47	09	10.83±1.62	74.66±26.04	09	10.38±1.90	88.61±3.63
48-59	18	12.44±1.91	97.94±4.22	11	12.90±1.15	96.40±5.76

[Table/Fig-2]: Mean and SD of weight and height according to the age of study subjects

STATISTICAL ANALYSIS

Data obtained was entered in MS excel spread sheet, analysed and interpreted in terms of mean, SD and percentages as appropriate. SPSS version 22 was used for further analysis like Chi-square test / Z-test for difference between proportions. The association and differences were interpreted to be statistically significant at p<0.05. 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 and below three standard deviation as severe grade of malnutrition [6].

RESULTS

Total of 101 under-five children and their mothers were included in the study. Mean age of mothers was 23.98±3.62 years. Fifty two (51.5%) of them had male children. forty eight (47.5%) were from nuclear family. Fifty two (51.5%) belonged to low Standard Living Index. All children were given breast milk as their first feed and colostrum was also given to all.

[Table/Fig-1] shows age and sex wise distribution of total 101 children included in the study population. Overall there was almost equal distribution of both boys (n=52) and girls (n=49) and also across all the age groups.

[Table/Fig-2] shows increase in mean weight and height with respect to age in both sex. No statistically significant difference was found between the sex in each age groups of mean height and weight.

Present study revealed 25(24.7%) children having history of respiratory infection, one child having history of diahorrea two weeks prior to the date of study. Seven children had pallor and four had hair changes/dyspigmented on clinical examination.

[Table/Fig-3] reveals that overall prevalence of underweight, stunting and wasting were 60.4%, 55.4% and 43% respectively which was statistically significant with respect to age (underweight and stunting), presence of ration card in the family (underweight and wasting) and egg in the diet of the child (underweight, stunting and wasting). No significant relationship was seen with respect to other factors like sex, mother's age, mother's education and occupation, type of family, family size, number of children, birth order, milk in diet, mother's BMI and SLI.

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).

It is seen in the present study that there is an increase in mean weight and height with an increase in age in both sex and no statistically significant difference was observed between age groups and between boys and girls in mean weight and height similar to a study done in Madhya Pradesh among Gond tribal preschool children [7]. This finding complies with the biological plausibility.

Our study has shown overall prevalence of underweight, stunting and wasting to be 60.4%, 55.4% and 43% respectively. Jabalpur study among preschool children of Gond tribes of Madhya Pradesh [7] found underweight prevalence of 61.6% , stunting in 51.6% and wasting in 32.9% while severe degree of underweight, stunting and wasting was present in 27.8%, 30.3% and 6.5% of children respectively. Prevalence of underweight was found to be similar in both sexes similar to our study. Although overall prevalence among koramudi tribal children [2] aged 2-13 years of underweight-52.9%, stunting-49.6% and wasting -22.7% with severe underweight, stunting and wasting was 16.0%, 24.4% and 1.7% respectively, which is much less than our present study and boys had 1.45,1.6 and 2.0 times greater risk of underweight, stunting and wasting contrary to our study where no significant difference was seen reflects no gender bias perse in terms of nutritional care of children. Overall ST population data available at the national level as per NFHS 3 has revealed prevalence of underweight, stunting and wasting as 54.5%, 54% and 27.6% respectively which is almost similar to our study except wasting which was high in our study. 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% much less than found in the present study. About half of our study population having underweight, stunting and wasting but with no difference between male and female children is good sign of absence of gender bias. But increase in prevalence with increase in age can be attributed to inadequate supplementation of food at family level, early start of complementary feeding as early as three months though this study found that 92.1% children where breastfed within one hour, bottle feeding rate was 3% but continued breastfeeding rate of 95.1% at age one year dropped to 59.6% at age two years. This calls for supplementary food distribution has to be optimized and made available to the beneficiaries. However, a much higher prevalence of undernutrition 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). Also, boys suffered more by undernutrition than girls in the age group of 4-6 years [8]. Prevalence of underweight, stunting and wasting was 33.9%, 26.1% and 19.4% respectively in Lodha children aged 1-14 years of Paschim Medinipur district of West Bengal [2] Study among Paniyas, Bettakurumbas, Kattunaickens, Mullakurumbas and Irulas of Nilgiris region revealed

Variable	Category	Total Number of children	Number of normal children	Underweight	Stunting	Wasting
Age (in months)	0-11	13	04(30.7)	06(46.2)	06(46.2)	04(30.8)
	12-23	21	03(14.2)	16(80.0)	12(60.0)	09(45.0)
	24-35	18	01(5.5)	16(84.2)	15(78.9)	09(47.4)
	36-47	18	02(11.1)	11(61.1)	12(66.7)	08(47.1)
	48-59	31	12(38.7)	12(38.7)	11(35.5)	13(41.9)
		101	22(21.8)	61(60.4)	56(55.4)	43(43.0)
p-value				0.005	0.029	0.894
Sex	Male	52	10(19.2)	28(53.8)	30(57.7)	25(49.0)
	Female	49	12(24.5)	33(67.3)	26(53.1)	18(36.7)
	p-value			0.752	0.650	0.490
Mothers Age in years	16-20	24	02(8.3)	16(66.7)	16(66.7)	10(41.7)
	21-25	20	05(25.0)	13(65.0)	10(50.0)	11(55.0)
	>25	43	11(25.6)	25(58.1)	22(51.2)	18(42.9)
	p-value			0.752	0.411	0.610
Mothers Working Status	Working	38	08(21.1)	24(63.2)	20(52.6)	18(47.4)
	Housewife	63	14(22.2)	37(58.7)	36(57.1)	25(40.3)
	p-value			0.659	0.650	0.490
Mothers Education Status	Illiterate/primary	35	05(14.2)	23(65.7)	24(68.6)	15(44.1)
	Middle school	21	07(33.3)	09(42.9)	10(47.6)	05(23.8)
	High school and above	45	10(22.2)	29(64.4)	22(48.9)	23(51.1)
	p-value			0.181	0.154	0.112
Type of Family	Nuclear	48	13(27.1)	27(56.3)	27(56.3)	19(39.6)
	Joint	53	09(16.9)	34(64.2)	29(54.7)	24(46.2)
	p-value			0.417	0.877	0.507
Family Size	≤ 4	48	11(22.9)	27(56.3)	29(60.4)	19(39.6)
	5-8	50	09(18)	33(66.0)	27(54.0)	23(46.9)
	>8	03	02(66.6)	01(33.3)	0(0)	01(33.3)
	p-value			0.383	0.119	0.721
Number of children	One	33	03(9.1)	24(72.7)	22(66.7)	15(45.5)
	Two	57	14(24.5)	33(57.9)	30(52.6)	26(45.6)
	Three and above	11	05(45.4)	04(36.4)	04(36.4)	02(20.0)
	p-value			0.086	0.175	0.301
Birth Order	First	53	08(15.1)	36(67.9)	32(60.4)	25(47.2)
	Second and above	48	14(29.1)	25(52.1)	24(50.0)	18(38.3)
	p-value			0.104	0.295	0.371
Ration Card	Yes	85	22(25.8)	46(54.1)	47(55.3)	31(36.9)
	No	16	00(0)	15(93.8)	09(56.3)	12(75.0)
			P value	0.003	0.944	0.005
Egg in Diet	Yes	77	17(22.1)	45(58.4)	44(57.1)	33(43.4)
	No	6	00(0)	06(100.0)	01(16.7)	06(100.0)
	p-value			0.044	0.055	0.008
Milk in Diet	Yes	67	13(19.4)	42(62.7)	41(61.2)	31(46.3)
	No	15	03(20.0)	09(56.3)	06(37.5)	08(53.3)
	p-value			0.635	0.086	0.620
BMI category of Mother	<18.5	31	07(22.5)	19(61.3)	20(64.5)	13(41.9)
	≥ 18.5	65	14(21.5)	40(61.5)	33(50.8)	28(43.8)
	p-value			0.981	0.205	0.867
Standard of Living	Low	52	12(23.1)	33(63.5)	29(55.8)	22(43.1)
	Medium/ High	48	10(20.8)	28(58.3)	27(56.3)	20(41.7)
	p-value			0.599	0.961	0.882

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

G I,II and III Malnutrition to be 40% ,28% and 6% respectively in under five children [9]. A cross-sectional study was conducted in villages inhabited by Sahariya tribal community (specifically women in reproductive age group and children under five years) in three districts of MP. Underweight, stunting and wasting among under-five children were 59.1%, 57.3% and 27.7% respectively. Low food security was found in 90% of HHs and the odds of children being underweight and stunted when belonging to HHs with low

and very low food security was found to be significant (p = 0.01 and 0.04 respectively). Study concluded that system strengthening, community empowerment and nutrition education may play a pivotal role in addressing this [10]. Similarly prevalence of wasting, an indicator of acute malnutrition was 21.3%, 0.5% with Bitot Spots and angular stomatitis in 1.5% of tribal 1-5 year tribal children of Khammam District of Andhra Pradesh [11]. However, much higher prevalence of all studies including our study was seen in kinnaura of Kinnaur of Himachal Pradesh [12] where prevalence of underweight was 93.3%, stunting-86.6% and wasting -85.3%. This wide variations in prevalence across the country and UNICEF [13] stating that children from ST population having poorest nutritional status on almost every measure and the high prevalence of wasting in this group (28%) calls for identifying factors unique in each place and work towards seeking remedies for the same.

It is observed that our study prevalence is more than the national, state prevalence. It is also seen in the present study that proportion of mild/moderate and severe under nutrition was almost equal. This clearly shows to optimize efforts to manage mild/moderate on domiciliary basis and prevent them moving to severe grade if no intervention is done. Also, it calls for initiating at the earliest domiciliary treatment even to severe acute malnutrition which is about 22% in this study to revert them back to normalcy at the earliest.

Clinical PEM features was not seen and Vitamin A Deficiency prevalence was 2.6%,3% dental caries in Kodaku preschool children in central India [4] whereas our study showed seven children with pallor, four with hair changes/dyspigmentation, dental caries (3%) and no child had features of Vitamin A deficiency on examination.

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.

CONCLUSION

Significantly higher prevalence of under-nutrition was noted among under-five children in this community. It was significantly associated with respect to age, presence of ration card in the family and egg in the child's diet.

RECOMMENDATION

Above findings calls for educating mothers and other caretakers in the family regarding increased nutritional requirements with increasing age. There is an urgent need to ensure availability of ration cards to each family under Public Distribution System (PDS) at the earliest to meet the basic nutritional needs of the family and to continue the supplementation of weekly egg distribution to under-five children through Anganwadi's to prevent malnutrition and if possible scale up the programme to increase twice or thrice weekly egg supplementation to prevent malnutrition.

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