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Dietary assessment of tribal children (3-5 years) suffering from different degrees of malnutrition in Odisha

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The objectives of the study was to compare food and nutrient intake of the children suffering from different degrees of malnutrition and to asses the causes of food insecurity among the respondents. One hundred and fifty tribal children belonged to 3 to 5 years to age group were selected by random purposive sampling method from eleven anganwadis of udala ICDS project of Odisha for the present study and the data was collected with the help of required tools. The results of the study indicated that 32 per cent children were normal, 34 per cent children were wasted, 22 per cent were stunted and 12 per cent children were wasted and stunted. Joint family system (68%) was found to be prevalent in that area. Most of the parents were agricultural labourers having low education and low income. Prevalence of malnutrition was more among girls in comparison to boys. The mean food and nutrients intake of the respondents was found to be deficient in comparison to RDA except normal children. Parboiled rice was found to be their staple food. Fruit and milk consumption was found to be nil in the diet of all children except normal children. The food and nutrient intake of the respondents was found to be decreased with the severity of malnutrition. The most important causes for food insecurity was found to be poverty, wrong perception about Anganwadi food, working mother (88%), ignorance of mother (70%), dislike of food by the child and insanitary conditions of the households. Thus it can be concluded that strategies for reducing malnutrition should be focused on education of parents, health care facilities and improving the food security of the households.

Key Words : Tribal, Malnutrition, Wasted, Stunted, Food intake, Nutrient intake

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INTRODUCTION

The children are the most vulnerable group of the community to the vagaries of malnutrition. Therefore adequate intake of nutrients and maintenance of good health must be ensured during childhood. Childhood malnutrition is one of the major public health problems throughout the world. It results from multifaceted and complex risk factors such as disadvantageous conditions of the family, food insecurity, in sufficient in take of food and poor health which ultimately affects physical, intellectual social and cognitive development of the children. Orissa is one of the most scenic state in eastern India, occupies a unique place in the tribal map of the country having largest number of tribal communities with a population of 8.15 million constituting 22.8 per cent of state's population and 9.7 per cent of the total tribal population of the country. Tribal children are most vulnerable for malnutrition because of their poor parental attributes and disadvantageous environmental condition (Govt. of Orissa, 1990). The government has envisaged a multi sectoral approach and direct and specific interventions to address the issue of malnutrition through the implementation of various schemes and programmes through the state governments and the Union territory administrative systems. In spite of the sincere efforts of

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government malnutrition in children under five years of age continues to be among the highest in the world in India. Keeping these facts in mind, the present research is designed to asses the food and nutrient of the tribal children (3-5 years) suffering from different degrees of malnutrition in Odisha. The objectives of the research were :

– To know the demographic profile of the respondents.

– To study the food and nutrient intake of the children suffering from different degrees of malnutrition.

– To asses the causes of food insecurity among children.

METHODOLOGY

The present research was conducted at Udala ICDS project of Mayurbhanj District of Odisha during the year 2013. One hundred and fifty children belonged to 3 to 5 years of age group were selected by random purposive sampling method for the present study. Collection of data was done with the help of pretested and predesigned questionnaire by interviewing the parents and by observation method. Food intake of the respondents was recorded with the help of 24 hours dietary recall method and after wards the cooked amount was converted in terms of its raw amount and was compared with the RDA. Measuring Scale or measuring tape and weighing machine was used to record the height and weight of the respondents, respectively. The children were classified in to different degrees of malnutrition by using Water lows classification.

Water lows classification (1997) :

Water Low's classification defines two groups for protein energy malnutrition with retarded growth in which a drop in the height/age ratio points to chronic condition of shortness/stunting (Table A). Malnutrition with low weight for a normal height, in which the weight for a height ratio is indicative of an acute condition of rapid weight loss or wasting. In the present study weight for height and height for age was used combinely to assess the grades of malnutrition in children. The standard of weight for height and height for age was compared with NCHS standard.

OBSERVATIONS AND ASSESSMENT

The results of the present investigation were tabulated, statistically analyzed and discussed in Tables 1 to 5.

Table A : Waterlow's classification

W/H - H/A	> m - 2 SD	< m - 2 SD
> m - 2SD	Normal	Stunted
< m - 2SD	Wasted	Wasted and Stunted

m - mean, SD-Standard deviation of standard error.

Demographic profile of the respondents :

Information on demographic profile of the respondents revealed that out of 150 respondents 71 were boys and 79 were girls. 44 per cent children were in the age group of 3-4 years and 56 children were in the age group of 4-5 years. Most of the children belonged to joint family *i.e.* 68 per cent with 4-6 family members. 28 per cent of the parents were found to be illiterate and 43 per cent of were educated upto class five. Children were belonged to different tribal castes like Santal, Lodha and Bhumija. 63 per cent of the of the parents were working as Agricultural labourers either in their own land or in others land and 42 per cent of the parents had income less than Rs.30,000 per annum. 52 per cent families had less than 2.5 acres of land and 92 per cent families had kitchen garden. 62 per cent families keeping poultry for the purpose of meat and 72 per cent families had farm animals for the purpose of cow dung and manure for their land. 92 per cent of the parents were using Ph.D. Water or tube well water for the purpose of drinking and cooking. Only 7 per cent of the parents were giving boiled water to their children. Even if latrine / Community latrine is available only 18 per cent of the respondents used it for defecation and rest of the respondents used open field for defecation. Washing hands properly before eating was found only among 20 per cent respondents (Table 1).

Nutritional status of children according to water low's classification :

Out of total surveyed children 32 per cent children were normal, 34 per cent children were wasted, 22 per cent children were stunted and 12 per cent children belonged to wasted and stunted (severely malnourished) grades of malnutrition (Table 2). However severeity of malnutrition was found to be more in girls (38 %) in comparison to boys (29.9 %) which may be due to negligence of of girl child by the parents. Similar findings was also observed by Maurya and Jaya (1997); Jelliffee (1966); Samantaray and Jena (1996); Sen (1994);

Swaminathan (1995); Bhattacharya *et al.* (1988) and Dwivedi *et al.* (1992).

Dietary habits :

It was observed that cent per cent of the respondents were non-vegetarian and were taking 3-4 meals per day along with Anganwadi supplied diet. Rice pan cake prepared out of parboiled rice was commonly consumed by them in their break fast or at the time of snacks. They used to take Anganwadi supplied food for breakfast, lunch and in the dinner they took whatever food is prepared in their house *i.e.* mostly parboiled rice with dal/vegetables / non vegetarian foods (Arora, 1992 and Saxena, 1996).

The Anganwadi supplied Chura Muan (Rice flake and Jaggery) sprouted green gram with sugar in the morning as breakfast and rice and dalma on Monday and Thursday, Rice and Egg on Wednesday / Friday and Saturday and Soybean and Rice on Tuesday in Lunch. Two packets Sattu is also supplied to 3-5 years children per month, but the parents usually did not feed this to their children by saying that is not of good quality and will cause stomach problem (Dahiya and Kapoor, 1992).

Mean food intake of the respondents (3 to 5 years) according to their nutritional status :

It was observed that the normal children were consuming adequate amount of cereals, *i.e.* parboiled rice, pulses, roots and tubers and non-vegetarian foods (egg).

Table 1 : Demographic profile

Sr. No.	Characteristics		Frequency	Percentage
1.	Age -	3 - 4 years	66	44
		4 - 5 years	84	56
2.	Sex -	Boys	71	47.3
		Girls	79	52.7
3.	Joint family		102	68
4.	Education of the parents			
	- Illiterate		41	28.0
	- U.P. (5^{th} class)		64	42.7
	- M.E. (7^{th} class)		28	18.7
	- 10^{th} and above		16	10.7
5.	Occupation of parents			
	- Agriculture		94	62.7
	- Business		18	12.0
	- Govt. or private job		38	25.3
6.	Family income less than Rs. 30000/- per annum		63	42
7.	Land owned less than 2.5 acres		78	52
8.	Keeping - Poultry		93	62
	- Farm animals		108	72
9.	Using - Ph.D. water / tube well water		138	92
10.	Used open field for defecation		123	82
11.	Washing hands before eating		30	20

Table 2 : Nutritional classification of children (3-5 years) with regard to age and sex

Nutritional status	Normal		Wasted		Stunted		Wasted and stunted		Total	
age in years	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
3-4 years	10	08	11	10	06	08	06	07	33	33
(37-48 months)									(22)	(22)
4-5 years	16	14	12	18	08	11	02	03	38	46
(49-60 months)									(25.3)	(30.7)
Total	26	22	23	28	14	19	08	10	71	79
	(17.3)	(14.7)	(15.3)	(18.7)	(9.3)	(12.7)	(5.3)	(6.7)	(47.3)	(52.7)

N.B.-Numbers in parenthesis indicate percentage of children

Table 3 : Mean food intake of tribal children according to different nutritional status (3 to 5 years)

Grades of children intake of food items (g/ml/day) ± S.E.		Normal (48)	Wasted (51)	Stunted (33)	Wasted and stunted (18)	Recommended allowances ICMR (1990)
Cereals	Actual intake	274.59 ±4.38	268.22 ±4.49	245.64 ±4.29	240.55 ±3.71	
	% of excess/deficiency	1.7(+)	0.62 (-)	9.02	10.91	270
Pulses	Actual intake	29.59 ±1.67	20.5 ±1.28	15.26 ±1.27	10.48 ±1.01	
	% of deficiency 16.3	16.3	41.4	56.4	70.05	35
Green leafy vegetables	Actual intake	35.6 ±4.42	26.93 ±3.64	21.29±5.0	18.89 ±4.01	
	% of deficiency	28.8	46.14	57.42	62.22	50
Other vegetables	Actual intake	13.57 ±2.76	3.86 ±1.36	6.77 ±2.42	7.59 ±2.12	
	% of deficiency	54.76	87.13	77.43	74.7	30
Roots and tubers	Actual intake	19.02 ±2.16	17.39±1.54	18 ±2.14	10.8 ±1.60	
	% of deficiency	4.9	13.05	10.0	46.0	20
Fruits	Actual intake	17.04 ±2.38	-	-	-	50
	% of deficiency	65.92	-	-	-	
Milk	Actual intake	52±0.25	-	-	-	
	% of deficiency	79.2	-	-	-	250
Sugar and jaggery	Actual intake	20.71±0.45	16.9±0.54	15.64±0.44	12.58±0.99	40
	% of deficiency	48.2	57.75	60.9	68.5	
Fats and oils	Actual intake	9.16±0.25	8.31±0.11	8.39±0.14	8.07±0.38	
	% of deficiency	63.36	66.76	66.44	67.72	25
Non-veg	Actual intake	18.88±4.19	13.64±1.57	15.32±1.6	8.25±1.82	
	% of deficiency	37.07	54.53	48.93	72.5	30

Number in parenthesis indicates sample number studied.

Table 4 : Mean nutrient intake of tribal children of different nutritional status (3-5 years)

Grades of children Nutrient intake per day		Normal (48)	Wasted (51)	Stunted (33)	Wasted and stunted (18)	Recommended allowances ICMR (1990)
Protein (g)	Actual intake	30.93	29.15	27.06	26.98	30
	% of deficiency/excess	+3.1	-2.84	-9.8	-10.08	
Energy (Kcal)	Actual intake	1330.78	1143.57	1038.76	1014	1690
	% of deficiency/excess	-21.25	-32.33	-38.53	-40.0	
Calcium (mg)	Actual intake	289.66	241.34	203.8	131.07	400
	% of deficiency/excess	-27.58	-39.66	-49.05	-67.23	
Iron (mg)	Actual intake	10.26	9.34	8.85	5.34	18
	% of deficiency/excess	-43.0	-48.1	-52.5	-70.33	
β-carotene (µmg)	Actual intake	1555.7	1200.47	1098.37	600.7	1600
	% of deficiency/excess	-2.77	-24.97	-31.35	-62.4	

Table 5 : Reason for food insecurity

Sr. No.	Characteristics	Frequency	Percentage
1.	Poverty	83	53.3
2.	Insanitary condition	108	28.0
3.	Illiteracy of mother	52	34.7
4.	Working mother	132	88
5.	Dislike of food by the child (Vegetables, egg etc.)	83	55.3
6.	Wrong perception about anganwadi food	92	61.3
7.	Diseased condition of mother	28	18.7
8.	No other family members to look after	38	25.3
9.	Alcoholic father	69	46.0
10.	No proper knowledge of mother about childcare	105	70.0
11.	Diseasesed condition of the child	29	19.3

Food consumption was found to be very less deficient in their diet *i.e.* 4.9 per cent for roots and tubers to 79.2 per cent for milk consumption. However dislike for consumption of green leafy vegetables, other vegetables, fruits and milk was found among the children (Table 3). Except normal children the diet of the all other children was found to be deficient in all food items Fruit and Milk consumption was found to be nil in wasted, stunted, wasted and stunted children. Even though Anganwadi supplying rice, dal, egg, vegetables, soya bean etc. to the children, the stunted and wasted and stunted children could not consume it in adequate amount because of their illness. Consumption of all food items was found to be decreased with the severity of malnutrition. However parboiled rice was found to be their staple food and its deficiency was less in comparison to other food items. Similar findings was also observed by Mishra *et al.* (1998); Lenka *et al.* (2013); Pandya *et al.* (2015); Bhuyan *et al.* (1997); Sodha *et al.* (2015) and Chainani *et al.* (1994).

Mean nutrient intake of the respondents according to different nutritional status :

The mean protein intake of the normal children was found to be more than RDA *i.e.* by 3.1 per cent whereas the mean energy intake was found to be deficient by 21.25 per cent. The protein intake was found to be adequate in normal children because of inclusion of pulses, egg and soya bean in their diet. Micro-nutrients such as calcium, iron and vitamin-A (Table 4) was also found to be deficient in normal children's diet which may be due to low consumption of milk, vegetables and other food items. Further it was also observed that the mean macro and micro nutrients intake of all other children suffering from various degrees of malnutrition *i.e.* wasted stunted, wasted and stunted children was also less than RDA which may be due to dislike towards food stuffs and poor health condition. However the mean nutrient intake of the respondents was found to be decreased with severity of malnutrition. Similar findings was also observed by Kanwar *et al.* (1994); Maurya *et al.* (1997); Okeke and Nnnanyelugo (1994) and Rohini *et al.* (1990).

Causes of food insecurity :

An attempt has been made to know the reasons for low consumption of food stuffs by the respondents which ultimately lead them to suffer from malnutrition (Table 5). Insanitary condition, working mother, poverty, wrong perception about Anganwadi supplied food, no proper knowledge about child care, dislike of the children towards food were found to be major causes for low food intake of the children. It was also interesting to note that even though food is available, the food could not be utilized by the children because of their ill health, illiteracy and ignorance of the parents and family members. Gupta *et al.* (2014) found in their studies that children from very low food secure households were 5.92 time more under weight and 4.14 times more stunted than food secure households. Similar work related to the present investigation was also carried out by Kent (1993); Labadorious (2001); Sidhu *et al.* (1993) and Swaminathna (1987).

Conclusion :

Even though Government is trying hard to combact malnutrition by supplying foods and medicines through different schemes and programmes still than the programmes are not successful because of its improper utilization. Therefore necessary steps should be taken to educate parents and family members which is highly essential to combact malnutrition at the grass root level as all of us know the parents are the real builders of the society as well as the nation.

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