Nutritional status and food habits of tribal children (1-5 yrs) : A study in Mayurbhanj district of Odisha

■ CHANDRASHREE LENKA, P. SAMANTARAY **AND** D. JENA

■ **ABSTRACT :** Nutritional status and food habits of 350 children (0-5 years) was assessed in 11 Anganwadis of Udala ICDS project, Mayurbhanj district of Odisha by using random purposive sampling method with the help of pretested questionnaire. Data on anthropometric measurements and food intake were collected by using required tools. Majority of the parents were agricultural labourers with low socio-economic condition. Problem of malnutrition was more among girls in comparison to boys. Mean height, weight, head circumference, mid-upper arm circumference and chest circumference of both tribal boys and girls were found to be lesser than NCHS standard, Wolanski standard and ICMR standard. The mean food and nutrient intake of the tribal children was found to be less than the recommended dietary allowances. The amount of consumption of all foods decreased with the severity of malnutrition. Significant difference in the intake of the different food items was observed between normal and moderately malnourished children and between normal and severely malnourished children.

■ **KEY WORDS :** Malnutrition, Nutritional status, Anthropometric measurement

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See end of the paper for authors' affiliations

Correspondence to :
CHANDRASHREE LENKA
Department of Home Science,
R.D. Women's College,
BHUBANESWAR (ODISHA)
INDIA
Email:jagannathseeds@gmail.com

Malnutrition is the biggest single cause of infant and child mortality in the poor countries of the world including India. Extensive growth failure in children below five years in India, exposes them to a high survival and developmental risk. The risk of death from several of the most common childhood diseases is doubled for a mildly malnourished child, trebled for a moderately malnourished child and multiplied by more than ten times for a severely malnourished child (UNICEF, 1995). In terms of concentration of the tribal population, Odisha ranks second and homes about 62 different tribal communities and 93 schedule caste communities. According to official estimates of the children reported to be malnourished 12.2 per cent are moderately malnourished and 3.12 per cent are severely malnourished. From district-wise information Mayurbhanj has the highest proportion of malnourished children followed by Balasore, Koraput and Dhenkanal etc. (UNICEF, Odisha, 1991). As a result of the plans, policies and programmes of health and nutrition, although the infant child under 5 years and maternal mortality rates have declined, the life expectancy at birth has raised, the number of normal children has increased and that of number of severely malnourished children decreased, but those are like a drop in the ocean considering the magnitude of the problem.

As nutritional status of children below 5 yrs is an indicator of health status of a particular community, the present research is designed to study the nutritional status and dietary habits of tribal children below 5 years in Mayurbhanj districts of Odisha to know the health status of the children in that area.

■ **RESEARCH METHODS**

For the present study Udala ICDS Project was selected as a representative area for survey of Mayurbhanj district of Odisha. Out of 103 Anganwadi centres, 11 Anganwadi centres namely, Jualia, Nuasahi, Kutling, Chuliaposi, Adapal, Nayaranga matia, Godhimara, Kanakpada, Salamunduli, Bhurudubani, Urmal were selected by random purposive sampling method for the study. 350 children (0-5 years) of

both the sexes were selected randomly to know their socio-economic condition, dietary habits and nutritional status. The data was on socio-economic condition of families were collected by using interview cum questionnaire method. The data on food intake of the respondents were collected by using 24 hours recall method. Anthropometric measurement such as weight was recorded by using weighing machine and height, mid-upper arm circumference, head circumference and chest circumference were recorded by using measuring tape. The mean and standard error of all the measurements were calculated and compared with NCHS, ICMR and Wolanski standard.

■ RESEARCH FINDINGS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Socio economic condition :

Out of 350 surveyed children, 173 were male and 177 were female, nuclear family (51.36%) system was found to be more prevalent in that area but the size of family was more than 5 members *i.e.* 5-7 in majority cases. Majority (64%) of the respondents belonged to Majhi, Bathudi and Santal caste. Percentage of illiteracy was high among female (31.4%). Majority of the parents were agricultural labours (72.27%) and having income Rs. 2000 to 4000 (57.73%). 87.7% families were staying in mud houses. 61% families were drinking water from open well and 90 per cent of the families were going to open field for defecation.

Age and sex of the surveyed children :

The age and sex of the children is viewed with more importance to know the nutritional status of a community as they are considered most vulnerable groups of the society. The distribution of surveyed children (0-5 years) according to their age and sex is shown in Table 1.

It is observed from Table 1 that out of 350 children surveyed, 173 (49.43%) were male and 177 (50.57%) were females. It was seen that maximum children belonged to the age group of 4 to 5 years *i.e.* (24.29%) out of which 10.86 per cent males and 13.43 per cent were females followed by 3-4 years *i.e.* (18.86%) followed by 7-12 month *i.e.* 12.57 per cent. It was also observed that there were more percentage of males (18.86%) than females (12.85%) in the age group of 0-18 months, where as, there was more percentage of females in the age group of 19-24 months and, 31-36 months. Similar findings were also reported by Lenka *et al.* (1992).

Nutritional assessment :

Nutritional status is one of the critical indicators of health, therefore,5 regular nutritional assessment is important to monitor the health of the children. In the present study, anthropometric measurements and clinical assessments were done to know the health status of the children.

In the present study anthropometric measurements such as weight, height, mid-arm circumference, head circumference and chest circumference of children were noted down. The mean and standard error of all the measurements were calculated. The results obtained are expressed in Table 2.

Weight :

It was observed from the Table 2 that the mean weight of boys and girls were less than the standards of National Council of Health Statistics irrespective of age *i.e.* up to 5 years of age group. The percentage of mean weight of boys and girls of 0-6 month and 7-12 months were very less in comparison to NCHS standard *i.e.* 55.68 per cent, 53.54 per cent, 66.86 per cent and 70.70 per cent, respectively, which may be due to prolonged breast feeding and late introduction of weaning food. After 1 year, the children slowly proceed to normal condition since they started taking normal home prepared diet and also they may increase their body resistance power to diseases. It was also interesting to note that as the age advanced the percentage of deficiency to NCHS standard decreased in case of boys whereas in case of girls it fluctuated from time to time Similar findings were also observed by Sharma

Table 1 : Age and sex distribution of tribal children							(n=35)
Sr. No.	Age in month	Male		Female		Total	
		No.	%	No.	%	No.	%
1.	0-6	18	5.14	17	4.86	35	10
2.	7-12	24	6.86	20	5.71	44	12.57
3.	13-18	24	6.86	08	2.28	32	9.14
4.	19-24	11	3.14	17	4.86	28	8.0
5.	25-30	16	4.57	15	4.29	31	8.86
6.	31-36	09	2.57	20	5.71	29	8.28
7.	37-48	33	9.43	33	9.43	66	18.86
8.	49-60	38	10.86	47	13.43	85	24.29
	Total	173	49.43	177	50.57	350	100

and Kalia (1990) Lenka, *et al.*(1992) and Dahiya and Kapoor (1992).

Height :

It is seen from Table 3 that boys were taller than the girls upto the age of 24 months but after that the girls were taller than the boys upto the age of 36 months. After that again boys were taller than the girls from 37 months to 60 months of age group. The mean height of the boys were 85.13 per cent to 87.94 per cent and the mean height of the girls were 81.26 per cent to 88.52 per cent of NCHS standards. This showed that the children were moderately undernourished.

The difference in heights between different age groups was statistically significant for both boys and girls. Similar findings were also observed by Lenka *et al.*(l992), Sharma and Kalia (1990) and Dahiya and Kapoor (l992).

Mid arm circumference :

Measurement of the circumference of the mid-upper arm may prove to be a useful and practical means of assessing protein-calorie deficiency of early childhood. Keeping this hypothesis in view mean, mid-arm circumference of the children

was studied and analyzed .

It was observed from Table 4 that the percentage of mid-arm circumference of the boys to Wolanski standard was 73.59 per cent to 85 per cent whereas, for girls it was 73.29 per cent to 85.28 per cent. According to mean distribution of mid-arm circumference of children, it was observed that boys were severely malnourished upto to the age of 12 months, after that boys were moderately malnourished upto the age of 60 months. In case of girls, it was observed that they were severely malnourished upto the age of 18 months after that girls were moderately malnourished upto the age of 60 months. Thus, it can be concluded that as the age advanced the degrees of malnutrition decreased. Similar findings were also observed by Lenka *et al.* (1992) and Dahiya and Kapoor (1992).

Head circumference :

It was observed that mean head circumferences of the boys and girls were slightly below the NCHS standard *i.e.* 92.32 per cent to 95.72 per cent of the NCHS standard in case of boys whereas in case of girls, *i.e.* 91.31 per cent to 95.43 per cent of the NCHS standard. It was also interesting to note that head circumference of boys was more than the girls upto

Sr. No.	Age in months	Weight of boys(kg)	Weight of girls (kg)	NCHS standard		Percentage	
				Boys (kg)	Girls (kg)	Boy	Girl
1.	0-6	4.3 ± 0.33	3.86±0.31	7.85	7.21	55.68	53.54
2.	7-12	6.82 ± 0.3	6.7±0.23	10.2	9.53	66.86	70.30
3.	13.18	7.88 ± 0.3	6.95±0.52	11.5	10.8	68.52	64.35
4.	19-24	8.27 ± 0.43	7.71±0.28	12.3	11.4	67.23	64.78
5.	25-30	9.2 ± 0.33	9.79±0.26	13.5	12.9	68.14	75.89
6.	31-36	10.61 ± 0.73	10.27±0.35	14.6	14.1	72.62	72.83
7.	37-48	11. 48 ± 0.29	12.29±0.29	16.7	15.96	68.74	70.73
8.	49-60	13.4 + 0.41	12.79±0.26	18.7	17.66	71.65	72.42
		F = 66.5**	F=89. 05**				

Table 2 : Mean weight of tribal boys and girls of the surveyed area compared with NCHS standared

** Indicate significance of value at P= 0.01

Sr. No.	Age	Height of boys (in cm)	Height of girls (in cm)	NCHS standard		% of NCHS standard	
				Boys (cm)	Girls (cm)	Boy	Girl
1.	0-6	58.83±2.24	63.82±1.24	67.8	65.9	86.76	81.92
2.	7-12	65.54±0.81	63.61±1.24	76.1	74.3	86.12	84.92
3.	13-18	72.29±1.5	69.28±1.72	82.4	80.9	87.73	85.63
4.	19-24	75±1.48	70.29±1.05	85.6	86.5	87.61	81.26
5.	25-30	79.5±0.83	79.07±1.27	90.4	91.3	87.94	86.60
6.	31-36	81±2.33	83.3±1.37	94.9	94.1	83.35	88.52
7.	37-48	87.67±1.09	88.67±1.14	102.9	101.6	85.13	86.68
8.	49-60	95.96±1.16	95.26±0.92	109.9	108.4	87.31	87.87
		F=87.37**	F=130.2**				

Table 3 : The mean height of tribal boys and girls in comparison to NCHS standard

** Indicate significance of value at P=0.01

the age 60 months irrespective of age groups. From the analysis of the measurements of the mean head circumference between the age groups, it was observed that the mean difference in head circumference of both boys and girls was statistically significant. Similar findings were also observed by Sharma and Kalia (1990) and Dahiya and Kapoor (1992).

Chest circumference :

It was observed that as the age increased the percentage of mean chest circumference of boys and girls to ICMR standard was also increased. The percentage of mean chest circumference of boys to ICMR standard varied from 92.82 per cent to 98.92 per cent whereas in case of girls it varied from 92.18 to 98.07. This showed that the children were mildly malnourished. It was also observed that mean chest circumference of boys were more than the girls in all age groups except in 13-24 months. It was also observed that the difference in chest circumference between different age groups was statistically significant for both boys and girls. Similar findings were also observed by Sharma and Kalia (1990), Lenka *et al*. (1992) and Dahiya and Kapoor (1992).

Chest and head ratio :

Chest and head ratio is used as an indicator of protein calorie malnutrition of early childhood. The distribution of chest/head ratio of the surveyed tribal children (0-3 years) as compared with ICMR standard is shown in Table 5.

It was observed from Table 5 that the chest/head ratio of boys and girls upto the age of 1 year was same and the percentage of chest/head ratio to the ICMR standard was 98.97 per cent in both the sexes which showed presence of moderate degrees of malnutrition. Chest/head ratio of the boys belonging to 1-2 year was 97.98 per cent and 2-3 year was 100 per cent of the ICMR standard whereas in case of girls it was 61.87 per cent of the ICMR standards in 1-2 year age group and 100.98 per cent of the ICMR standard in 2-3 years of age. This showed the presence of moderate degrees of malnutrition upto the age of 2 years in case of boys and upto the age of 1 year in case of girls. The girls were severely malnourished between the age of 1-2 years. The values for circumference of chest and head indicated that the chest circumference taking over the head by 30 months. Sharma and Kalia (1990) also observed that chest and head ratio was less than one in all age groups till the age of four years.

Mean food intake of children of age 1 to 3 years :

The mean food intake of all the food items consumed by children was found to be the less than recommended dietary allowance. The amount of consumption of all foods decreased with severity of malnutrition. It was noted that the diet predominantly consisted of cereals with least attention to protective foods such as pulses, fruits, milk, green leafy vegetables and other vegetables. It was observed that milk, sugar and jaggery consumption was found to be nil in stunted group whereas fruit, milk, sugar and jaggery was totally nil in wasted and stunted group. The mean percentage deficiency of different food stuffs consumed by the wasted and stunted group to RDA was 24.82 per cent, 87.5 per cent, 70 per cent, 78.15 per cent, 37.5 per cent, 45.4 per cent and 72.9 per cent for cereals, pulses, green leafy vegetables, other vegetables, root

Table 4: Mean mid-arm circumference of the surveyed children (0-5 years) as compared to Wolanski standard						
Sr. No.	Age	MUAC of boys (in cm)	MUAC of girls (in cm)	Wolanski standard		Percentage	
				Boys (cm)	Girls (cm)	Boy	Girl
1.	0-6	10.67±0.45	10.65±0.55	14.5	14.3	73.59	74.47
2.	7-12	12.08±0.4	12.48±0.4	16.0	15.6	75.5	80.0
3.	13-18	13.05±0.4	11.8±0.27	15.7	16.1	83.12	73.29
4.	19-24	12.38±0.46	12.81±0.27	16.3	15.9	75.95	80.57
5.	25-30	13.63±0.33	13.03±0.41	16.4	16.4	83.12	79.45
6.	31-36	13.77±0.46	13.56±0.29	16.2	15.9	85.0	85.28
7.	37-48	13.56±0.25	13.48±0.2	16.9	16.9	80.23	79.76
8.	49-60	13.86±0.22	13.92±0.22	17.0	16.9	81.53	82.37
		9.1**	10.35**				

** Indicate significance of value at P=0.01

Table 5: Mean chest/head ratio of the surveyed tribal children (0-3yrs) as compared with ICMR standard						
Sr. No.	Age in year	Chest/Head ratio of boys (in cm)	Chest/Head ratio of girls (in cm)	ICMR standard chest/head ratio		Percentage	
				Boys (in cm)	Girls (in cm)	Boy	Girl
1.	0-1	0.96 ± 0.04	0.96 ±0.004	0.97	0.97	98.97	98.97
2.	1-2	0.97 ± 0.01	0.99 ± 0.01	0.99	1.0	97.98	61.87
3.	2-3	1.01 ± 0.01	1.03 ± 0.01	1.01	1.02	100	100.98

and tubers, fats and oil and non-vegetarian foods, respectively. It was observed during the survey that non-vegetarian foods included mostly roasted dry fish *i.e.*, 5 – 10 g in their diet. The intake of green leafy vegetables was less due to disliking by most of the children and intake of meat, fish and egg was low probably due to low income of the families. Similar findings were also observed by Devi *et al.*(1990) and Kanwar *et al.* (1994).

Mean food intake of children of age 3 to 5 years :

The distribution of mean food intake of children of different nutritional status (3-5 years) showed that normal children consumed all foods in more quantity than malnourished children. However, the intake of cereal, leafy vegetables, roots and tubers were only 5.71per cent, 8.8 per cent and 19.9 per cent deficient to the RDA, ICMR, respectively. The intake of all foods reduced with severity of malnutrition except the intake of other vegetables, roots and tubers, fruits and non-vegetarian foods. It was also observed that wasted and stunted children consumed more amount of other vegetables and sugar and jaggery than the stunted group but the consumption of pulses was very less in comparison to other groups. Milk was not consumed at all by the children aged 3-5 years age group. Similar findings were also observed by Devi *et al.* (1990).

C.R. value for mean food intake of children of different nutritional status :

An attempt was made to see whether there really existed any difference in the intake of individual food items and occurrence of different grades of malnutrition in children.

Therefore, C.R. value was calculated between two different grades of malnutrition for intake of a particular food item.

Table 6 shows C. R. value for mean food intake of children of 1-3 years of age groups. It revealed that there was significant difference existing in the intake of green leafy vegetables, roots and tubers and non-vegetarian foods between normal and wasted grades of malnourished children belonging to 1-3 years of age group, whereas differences in intake of other food items were found to be non-significant. Similarly significant difference was found to be existing only in the intake of fats and oils between wasted and stunted group of children at 5 per cent level of significance and between stunted and wasted and stunted group of children at 1per cent level of significance. No significant difference was found in the intake of food items between wasted and wasted and stunted groups of malnourished children except pulses at 5 and level of significance. Highly significant difference was found to be existing in the intake of all food items between normal and stunted group children except pulses. Similarly highly significant difference was found to be existing in the intake of all food items between normal and wasted and stunted groups of children except roots and tubers.

Therefore, it can be concluded that there was no real difference in the intake of different food items of children suffering from two consecutive grades of malnutrition except for green leafy vegetables, roots and tubers, fats and oils and non-vegetarian food. Only significant difference was found in the intake of almost all food items between normal and stunted of children and normal and wasted and stunted grades of malnourished children.

Perusal Table 7 reveals interesting results. Highly

Table 6 : C.R. value for mean food intake of tribal children of different nutritional status (3 to 5 years)							
Grades of children	Cereals	Pulses	Green leafy vegetable	Other vegetables	Roots and tubers	Fats and oils	Non-veg
Normal and wasted	1.91	0.359	3.09**	2.30	3.46**	1.04	3.36**
Wasted and stunted	1.58	0.478	0.90	0.29	0.13	2.26*	0.07
Stunted and wasted stunted	0.01	1.60	0.13	0.63	0.74	2.65**	0.06
Wasted and Wasted stunted	1.43	2.38*	0.59	0.96	0.90	0.82	0.01
Normal and stunted	3.17**	0.76	3.74**	1.96*	2 97**	4.88**	3.09**
Normal and wasted stunted	2.87**	2.57**	3.01**	2.29*	1.71	2.88**	2.46

*and ** Indicate significance of value at P=0.05 and 0.01, respectively

Table 7: C.R. value for mean food intake of tribal children of different nutritional status (3 to 5 years)							
Grades o children	Cereals	Pulses	Green leafy vegetable	Other vegetables	Roots and tubers	Fats and Oils	Non-veg
Normal and wasted	0.696	2.89**	3.26**	3.16**	3.256**	3.148**	2.038*
Wasted and stunted	0.738	0.688	0.911	1.05	0.989	0.47	0.75
Stunted and wasted stunted	0.899	0.295	0.374	0.255	1.80	2.13*	2.91**
Wasted and Wasted stunted	1.655	1.234	1.486	1.486	0.995	1.81	2.24*
Normal and stunted	1.462	3.498**	3.64**	1.857	1.98*	0.93	1.37
Normal and wasted stunted	2.447*	4.148**	4.476**	1.72	4.02**	4.19**	3.89** '

*and ** Indicate significance of value at P=0.05 and 0.01, respectively

significant difference was found to exist in the intake of all food items between normal and wasted grades of children belonging to 3-5 years of age group except cereals whereas no significant difference was found in the intake of all food items between wasted and stunted grades of malnourished children. Similarly, significant difference was found to exist only in the intake of fats and oils (2.13, p<0.05*) and non-vegetarian foods (2.91, P<0.01**) between stunted and wasted and stunted grades of malnourished children.Significant differences was found to be in the intake of non-vegetarian foods between wasted and wasted and stunted grades of malnourished children. Highly significant difference was found in intake of pulses, green leafy vegetables and roots and tubers between normal and stunted grades of children, whereas highly significant difference was found to exist in the intake of food items except other vegetables between normal and wasted and stunted grades of malnourished children. Therefore, it can be concluded that there was no real difference in the intake of different food items by the tribal children between the two consecutive grades of malnutrition whereas highly significant difference was found in the intake of food items between normal and moderately malnourished children and between normal and severely malnourished children.

Mean nutrient intake of the children (1-3 years) of different nutritional status :

The distribution of mean nutrient intake of the children (1-3 year) of different nutritional status showed that the intake of protein, vitamin-A and vitamin-C by the normal children was greater than the RDA,1CMR standard where as the intakes of calorie, calcium, iron, thiamine and riboflavin were 31.3 per cent, 24.14 per cent, 29 per cent 7.6 per cent, 55.42 per cent deficit than the recommended allowance, respectively. On the whole, it was observed that the intake of protein was nearer to the RDA by all the children where as the calorie intake was 52.65 per cent to 31.3 per cent deficit, which may be due to low income of the parents. Inclusion of dry fish in their diet may raise the level of protein of their food. However, it was also observed that the intake of nutrients decreased with the severity of malnutrition. The grade - IV children consumed lower quantities of all the nutrients than other children except vitamin - C. Similar findings were also observed by Devi *et al.* (1990).

Mean nutrients intake of the children of different nutritional status (3-5 years) :

The distribution of mean nutrient intake of the children (3-5 years) showed that the mean nutrient intake of normal children was more than the wasted, stunted and wasted and stunted children. The intake of protein, calcium, P-carotene and vitamin C by normal children was more than the RDA, where as calorie intake was 36 per cent deficit than the RDA.

It was also observed that the mean protein intake was 2.84 per cent, 9 8 1per cent, 10.07 per cent and the mean calorie intake was 38. 25 per cent, 40.9 per cent and 42.04 per cent deficit than the RDA by wasted, stunted, and wasted and stunted children, respectively. The differences in intake of nutrients by wasted children and stunted children were not varying significantly but there was a wide difference in the intake of nutrients by stunted children and wasted and stunted children.

The above food record showed that the intake of all foods was reduced as the severity of malnutrition increased in both the age groups.

Clinical assessment of children :

Clinical examination has always been and remains, an important practical method for assessing the nutritional status of a community.

It was observed that out of 350 surveyed children, 33.4 per cent children were not showing any clinical signs of nutritional deficiency where as 66.6 per cent children were suffering from different types of nutritional, non-nutritional and infectious diseases.

Some symptoms of protein calorie- malnutrition was also observed on face such as 4 per cent children were suffering from odema on face and body, 2 per cent were suffering from moon face condition. 3.4 per cent children were suffering from angular stomatistis whereas 4 per cent children were suffering from spongy gum and bleeding gums. Mottled enamel of teeth was found in 3.14 per cent cases whereas conjunctivitis was found in 4.57 per cent children. Ear infection was very common in this area. 19.7 per cent children were suffering from waxy discharge of ear where as 30.5 per cent children were suffering from skin infection *i.e.* scabies or eczema which may be due to prevailing unhygienic condition in the area. Knock knee condition was observed in 1.14 per cent children which was a clear symptom of rickets where as 43.4 per cent children were suffering from pot belly condition which was a clear symptom of protein energy malnutrition.

Summary and conclusion :

The results of the present study revealed very interesting conclusion with regard to socio-economic condition of the parents, nutritional status of the children (1-5 years) food and nutrient intake and clinical assessment. Nuclear family system was found to be more prevalent. The parents were basically agricultural labourers belonging to lower socio-economic status and living in mud-houses. Educational status of father was better than mothers, majority of families were drinking water from open well and having the habit of going to open field for defecation.

The problem of malnutrition was found to be more acute among girls in comparison to boys. Occurrence of different degrees of malnutrition increased with the advancement of age. Mean height, weight, head circumference, mid-upper arm

circumference and chest circumference of both tribal boys and girls were found to be lesser than the NCHS standard, Wolanski standard and 1CMR standard, respectively which showed prevalence of marked malnutrition in children in the tribal community. It was observed that the anthropometric measurements behaved with a similar fashion without any effect to gender consideration. Chest/head ratio was found to be less than one till two years of age group.

The mean intake of all the food items consumed by the tribal children (1-5 years) was found to be less than the recommended dietary allowances. The amount of consumption of all foods decreased with the severity of malnutrition. The mean nutrient intake of the normal tribal children was greater than RDA for protein, vitamin-A and vitamin-C. The mean intake of protein was nearer to RDA, whereas calorie intake was deficit by fifty per cent of the required amount. Inclusion of dry fish in their meal may raise the protein level of their diet. Results of clinical survey revealed that fifty seven per cent of tribal children were suffering from different types of nutritional, non-nutritional and infectious diseases.

Thus, it can be concluded that low socio-economic condition, illiteracy, ignorance about health practices, unhygienic living condition, improper food and nutrient intake, unavailability of health facilities were the major causes of prevalence of malnutrition among children in the studied area.

Therefore, educational level of the parents and utilisation of health facilities should be improved to prevent the malnutrition by imparting nutrition education to the parents. They should be educated regarding nutritive value of food stuffs available in their locality. Government should ensure effective utilisation of health services through social mobilisation, demand generation and community involvement.

Authors' affiliations:
P. SAMANTARAY, Department of Home Science, Bhanja Vihar, BERHAMPUR (ODISHA) INDIA

D. JENA, College of Home Science, Orissa University of Agriculture and Technology, BHUBANESWAR (ODISHA) INDIA

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