

Assessment of Nutritional Health Status of School Going Children of Mankirdia Tribes – A Comparative Study on Primitive Tribes in Odisha

Gargi Dhar

Assistant Professor, School Of Graduate Studies, Department Of Public Health, Jigjiga University, Ethiopia and Academic Counsellor, Ignou, India

Abstract

Mankirdia, a primitive tribal group (PTG) of Orissa are socioeconomically shrinking population than the other PTGs (Lodha and Kharia) residing in the same geographical location and lower socio-economic status is reflecting on the nutritional status of children of this community. A cross sectional study was undertaken to assess nutritional health status in relation to daily nutrient intake of primary school going children (6-11 yrs) of those primitive tribal groups of Mayurbhanj District, Odisha by using primary data (collected by interview schedule, observation) as well as secondary data. Four tools were used to assess the nutritional health status of 60 respondents [30 respondents from Mankirdia and 30 respondents from other PTGs (Lodha and Hill Kharia); keeping boys' and girls' participation in equal ratio]: (I) Anthropometric Assessment (II) Clinical Nutrition Survey Chart, (III) Dietary recall method, (IV) Food frequency questionnaire. The daily nutrient intake of Mankirdia children are not adequate and those deficiencies reflecting on the nutritional health status of these children. These outcome are alarming for us. Now, it's time to reconsider the approach and implementation of existing policies and welfare schemes. Otherwise, decades after decades development programmes will run, but PGTs will not be able to come out from their nomenclature.

KEYWORDS: Nutritional Health status; School going children; Primitive tribal groups (PTG); Mankirdia, Lodha and Hill Kharia; Odisha.

Introduction

There are certain tribal communities, who have declining or stagnant population, pre-agriculture level of technology, are economically backward, living close to the nature and have low literacy rate. Seventy-five such groups/ communities have been designated as Primitive tribal groups (PTGs) in our country. Orissa has 13 such Primitive tribal groups (PTGs) namely Bondo, Chutkia kondh, Didayi, Dongria Kondh, Hill Kharia, Mankirdia, Bihor, Juang, Kutia Kondh, Loanjia, Saora, Lodha, Paudi Bhuyan and Saora. Till date, they are forest dwelling tribals and are socially, economically and educationally backward and relatively underexposed to the rest of the world. They live in remote hilly areas, and most of them primarily being dependent on traditional skills of arts and craft, hunting, collection of forest products for selling as well as their own use, shifting cultivation, and isolated habitation. Among them, Mankirdia tribe, weakest among this weaker section [the growth rate negative, literacy rate of Mankirdia (5.49%)] in relation to other primitive tribal population of Odisha like, Hill Kharia and Lodha staying at the same geographical location. Several focused interventions for tribal development and improvement in their health and nutritional status have been initiated in the last three decades, but the fruits of development have not been reflected among the development indicators specified for the tribal community by Government.

The tribal population is not a homogeneous, their life styles, needs and problems are different. So there is a need of differential area-specific need assessment, strategies

and programmes to improve access to and utilization of nutrition- health services have to be developed for each of the tribal areas. With this backdrop, the present study has been undertaken to assess daily nutrient intake and Nutritional health status of primary school children of Mankirdia tribe in relation to other primitive tribal population of Odisha like, Hill Kharia and Lodha, staying at the same geographical location. The objectives of the present study are as follows: (i) To study nutritional health status of primary school children in Mankirdia tribe and other tribal population in Odisha (ii) To identify nutrient intake for the primary school children in Mankirdia tribe and other tribal population in Odisha; (iii) To assess relation between existing nutritional health status and daily nutrient intake.

Materials and Methods

Cross sectional study design has been adopted for this study. The sampling for the study has been done in four different systematic steps. These are: 1. Selection of district; 2. Selection of tribe; 3. Selection of village and households; 4. Selection of Respondents for In-Depth interview. In Orissa, Mayurbhanj district was selected first, for the study, as it constitutes 16 percent of tribal population of the state. Most vulnerable PTG(on basis of literature review), Mankirdia was the main focused group of this study along with two other PTG ; Hill Kharia and Lodha residing at the same geographical location were selected for the study. There are 168 Mankirdia households, 245 Hill Kharia households and 64 Lodha households from different Villages of Udala, Kaptipoda and Khunta block of Mayurbhanj District. We selected the 200 households for the study by simple random sampling method. Purposive sampling method was used to collect the respondents for the study. We interviewed only one child from each selected household. Total 60 respondents keeping boys and girls participation in equal ratio were selected for study and divided into two groups: (i) Group -I (respondents size: 30, from Mankirdia tribes) (ii) Group -II [respondents size: 30, from PTG of the same district Hill Kharia(15) and Lodha(15)]. School going children in the age group of 6-11 years, free from any genetical disorders were included after obtaining oral/written consent.

Primary data (collected by interview schedule and observation) as well as secondary data [Recommended Dietary Allowances, Balanced Diet Chart; Nutritive value of Indian foods published by National Institute Of Nutrition(NIN), ICMR; demographical details on Tribal community of Odisha published by Scheduled Castes and Scheduled Tribes Research and Tribal Institute, Bhubneswar, Odisha, WHO Growth Reference 5-19YRS, BMI-for-age (5-19 years) for boys and girls were used for this study. Four tools were used in this study (I) Anthropometric Assessment for BMI calculation (II) Clinical Nutrition Survey Chart for assessment of clinical signs in nutritional surveys (revised & adopted WHO, 1963) (III) 3days Dietary recall method and (IV) Food frequency questionnaire for daily nutrient intake assessment.

Results & Discussion

Assessment Of Nutritional Status on basis of BMI : Nutritional status was assessed on basis of BMI of Mankirdia and other PTG (Lodha and Hill Kharia) according to WHO recommendation and presented in frequency percent (Table:1). In Mankirdia community, 35% children are at the stage between Thinness and Normal; 13.3% are at Thinness and 1.7% are normal. In other PTG (Lodha and Hill Kharia), 43.3% children are at the stage of between Thinness and Normal; 5% are at Thinness and 1.7% are at overweight. So, overall Nutritional status of Mankirdia children is under threatened condition in comparison to the other PTGs. These results supporting the survey report by (RMRC, Bhubneswar, 2009) on PTGs (Kharia, Mankirdia, Paudi

Bhuyan and Dongria Kondh). The extent of undernutrition by Gomez classification was 64.2% in school-age children (6-12yrs), due to increased nutritional demand during growth spurt. The overall prevalence of chronic-energy-deficiencies (CED) was about 42% in Kharia/ Mankirdia.

Assessment of Nutritional Status on basis of Clinical Signs: The assessment of nutritional status on basis of clinical signs of Mankirdia and other PTG, irrespective of sex was presented in frequency percent. From the Table 2, it is clear that 33.3% Mankirdia children are under weight and short stature, 13.3% are normal and 3.3% are edematous. Whereas, 31.7% children of other PTGs are normal, 16.7% of other PTGs are under weight and short stature and 1.7% are edematous. General health status of other PTGs is superior to Mankirdia community. Table 3 showing that in Mankirdia community, hair of 16.7% children are lack of lustre, 10% children having thin & dull hair, 6.7% having dyspigmentation of proximal part of hair with lack of lustre and 16.7% of Mankirdia children having normal hair. In other PTG, 30% children having normal hair, hair of 13.3% are lack of lustre, 5% of other PTG children having thin & dull hair, 1.7% having dyspigmentation of proximal part of hair with lack of lustre. The results suggested (Table 4) that only 3.3% Mankirdia children having moon face, rest are normal. In other PTG, all the children having normal facial structure. It can be concluded from Table 5 that 6.7% Mankirdia children have Bitot's spot and 6.7% are suffering from night blindness. In other PTG, only 3.3% children have Bitot's spot and 3.3% are suffering from night blindness. The results showing (Table 6) that only 5% Mankirdia children have bleeding gum and in other PTG, 8.3% children are suffering from this problem. In Mankirdia community, 16.7% children have stained teeth, 3.3% have dental caries, 13.3% children have both the problems, and rest 33.3% children have normal teeth. In other PTG (Lodha and Hill Kharia), 13.3% children have stained teeth, 5% have dental caries, 21.7% children have both the problems (Table 7). From the results in Table 8, it is clear that 18.3% Mankirdia children have dry skin, 1.7% have pigmentation on skin. In other PTG (Lodha and Hill Kharia), 3.3% children have dry skin, rest of the children have normal skin. From Table 9, it is clear that all PTG children have pale mucous membrane. From the Table 10, it is clear that 10% Mankirdia children have pot belly, 5% have pigeon breast, 3.3% have faulty posture, 8.3% have pot belly along with faulty posture, 3.3% have pigeon breast and faulty posture, and 1.7% have pot belly and pigeon breast. In other PTG (Lodha and Hill Kharia), 8.3% pot belly along with faulty posture, only 3.3% have faulty posture and 1.7% have pot belly. In comparison to Mankirdia children, Other PTG (Lodha and Hill Kharia) has much better Muscular & Skeletal health. Nutritional health status on the basis of observed clinical signs of the other PTGs was much better than Mankirdia children.

Assessment Of Nutrient Intake : Table 11 showing mean of daily nutrient intake of Mankirdia children and Table 12 showing mean of daily nutrient intake of Other PTG (Lodha and Hill Kharia) children in all four age-sex category (6yrs-all , 7-9yrs-all, 10-11yrs Boys and 10-11yrs Girls). From Table 11 and Table 12 , it is clear that excluding protein, carbohydrate and vitamin C intake; fat, energy, calcium, iron, carotene are consumed in very less amount by the all PTGs, in comparison to the ICMR recommendation for Indian population. As they are taking rice as a staple food, so they are consuming huge amount of carbohydrates. They non-vegetarian, their protein intake is adequate. Most of the days, they are taking Sajina sago, which rich source of vitamin C. Other than these three, they are rarely /never taking milk, using very little amount of oil for cooking; so calcium, fat and energy intake was always

inadequate. Similar observations noted by Bulliyya et al (2006), in a study conducted on three primitive tribal groups (Kharia, Mankirdia and Paudi Bhuyan) which indicated vulnerability to nutritional insufficiency due to seasonal variation in food availability and intake.

Relation between Nutritional Status (BMI) and Daily Nutrient Intake: The daily nutrient intake of each respondent was categorized on the basis of BMI for boys & girls for age 5-19yrs. First category(Below Normal/Under nutrition): the children at the stage of thinness and between thinness – normal as per WHO recommendation; Second category(Normal): those were at the stage of normal as per WHO recommendation and third category(Overweight): those were at the stage of Overweight as per WHO recommendation. Table 13 showing Distribution of Mankirdia and other PTG children (frequency percent) by their BMI with their Daily Nutrient Intake. [For Mankirdia: no overweight children were there in the study sample; For Other PTG: no normal children were there in the study sample]. From the findings of the present study, it is clear daily nutrient intake of these children are not adequate and those deficiencies reflecting on the nutritional health status in terms of onset of clinical signs and nutritional grade of BMI.

Protein–Energy deficiency symptoms are prominent; as clinical signs were observed due to lack of protein-energy (dryness-thinness- pigmentation of hair, moon face, pot belly, muscle wasting, under-weight, short stature). Whereas daily protein intake was > 75% of recommended allowances, but fat and energy intake was very low. So, protein must be utilized as energy source, rather than not been a part of development and protection of body of these children. So, these PTG children are getting malnourished as well as lacking immunity. They taking cereals more than the recommendation, so it is obvious their carbohydrate consumption levels are at or above 75% of total energy, but unable to overcome chronic energy deficiency of these children. According to FAO Corporate Document (1998), when carbohydrate consumption levels are at or above 75% of total energy there could be significant adverse effects on nutritional status by the exclusion of adequate quantities of protein, fat and other essential nutrients. The results of the present study also supporting observation of Sukhamte (1977). He illustrated that people belonging to calorie deficient condition, but not suffering from shortage of protein; will not be able to utilize the protein fully for lack of energy. He also added that Children brought up on this diet, will show a marked retardation of body growth to start with and eventually adapt themselves to low body-weight and a low degree of physical activity consistent with their intake of energy and other nutrients. In addition to that, Johansson et al (1992) reported that chronic protein-energy malnutrition during the period of growth and development causes permanent disturbances of salivary gland function and tooth structure. This observation is also supporting our results; we also reported dental caries in these children. In addition to that, these PTGs are frequently taking edible wild leaves, fruits, seeds, roots & tubers, nutritive value and anti-nutritional factors present in these foods, are not yet unidentified. These wild foods can create hindrance to absorb the protein.

In these PTGs, Calcium intake is < 50% Of RDA in most of the cases, which is supported by the observed clinical signs on muscular & skeletal system related to calcium deficiency. Mean consumption of iron is < 50% Of RDA in more than 90% children of these PTGs , which is indicating onset of iron deficiency symptoms like pale mucous membrane, stained teeth. In this study, pale mucous membrane was observed in all respondents. Presence of clinical signs on eyes(Bitot's spot, Night

blindness) and on skin (xerosis, pigmentation) was observed in these children, which was supporting results from this study related to daily carotene intake, which was < 50% of RDA by 80% of these PTG children. Daily vitamin C intake was > 75% of recommended allowances that was documenting the very low incidence of vitamin C deficiency symptom like bleeding gum.

Mankirdia are still socioeconomically backward; due to poverty, nuclear but larger family size, unavailability of jungle food due to seasonal variation, on average taking general staple food 20 days in a month and lack of awareness related to health-hygiene-diet, suffering from chronic energy deficiency as well as micronutrient deficiencies, in comparison to other PTGs (Lodha and Hill Kharia) residing at same area. But they are getting their rights with the assistance of those NGOs workers, like Indira Avash/ Mo-curiah houses, tube well, voter identity card, ration card, BPL card, getting widow pensions, old age pensions, getting rice from Antodaya Anno Yojna, having school and mini-anganwadi centre at their villages, children's admission at Asharam schools. If this assistance was enough, then these children from Mankirdia community were not going to suffer from malnutrition. Then where is the problem?

The need of the hour is to "train and build up a team of their own people to do the work administration and development". I have seen in two villages, where anganwadi workers do not know, how to operate simple bathroom scale for body weight measurement. Even NGO field workers do not know, how to measure height with a simple measuring tape. So, there is a need for formal training for these working fellows and frequent workshops on basic health-hygiene and nutrition for these villagers by using modern media to contact mass. By nature, Mankirdia people are like that if one of the members of their community accepting something, rest of the community will be ready to accept. After imparting knowledge, there is a need of regular follow-up, which can only possible by the forming a team from their own people.

In words of Neil Jacoby, Education holds the key of all round development, in terms of changes income, customs, habits and ways of doing things. In light of this concept, Government has opened residential and non-residential schools in these PTGs inhabited areas. But about 50% of the children confessed me that; they are going to school just to eat. Moreover, they complained regarding their teacher's absenteeism. So, what to do?

Actually, traditional form of education is not applicable for the students of the PTGs. There is need for simple educational curriculum specially for them, in aim at enhancing literacy only. School timing can be changed considering local conditions of PTG areas. Private sectors may be encouraged to invest in elementary education in the areas inhabited by PTGs. Recruitments norms of the teachers can be like that to reduce teacher's absenteeism, only local persons having some knowledge of tribal language and culture, will get the preference in the appointment. Implementation of modern mass media for teaching in the schools for the PTGs inhabited areas, which will stimulate senses, feeling and emotions for propagating the light of education easily.

These PTGs are living in the hilly and interior areas, where density of population is not so high. Government medical facilities are not their easy accessible range. Low birth weight, non-availability of professional attendance at birth, lack of post natal and prenatal care in terms of medicine and diet, poor coverage of childhood immunization causing onset of poor nutritional status of these Mankirdia children. They are mainly depending on their traditional healers, ASHA-didi and ANM-didi. Activities of these health workers were not satisfactory for them. They reported me, instead of giving

medicines to the PTGs; these health workers are selling the medicines in the market. So, there is a need for regular field supervision by the senior official to stop this corruption.

These PTGs are worst victims upon the policy of treating forests as national wealth. As their folklore, economy and diet woven around the forest, so their socioeconomic well-being cannot be ensured ignoring their dependency on forest. Their empowerment may be in such a way, which will ultimately help in biodiversity conservation practice. Along with the financial assistance, Government have to empower them considering individual's skills rather than implementing on community as a whole, so that they will get the opportunity to work daily, and all can eat food regularly, not to die just for starvation.

Above all, they themselves have to be make them aware to think over on their present situation, to find out the probable solutions, by providing them physical, electronic, economic and knowledge connectivity. Those solutions have to be incorporated in the Govt. schemes. Otherwise, decades after decades development programmes will run, but PGTs will not be able to remove this nomenclature "Primitive Tribal Group". So, it is the high time; we have to think about the Mankidias, the weakest among the weaker sections.

References

Balgir RS, Murmu B, Dash BP.(1998) Health and nutritional status of ashram school children in two districts of Orissa. *Indian J Nutr Dietet.*35, pp 329-338.

Balgir RS, Murmu B, Dash BP.(1999) Physical growth, health and nutritional status of the ashram school tribal children in Northern Orissa. *Indian J Nutr Dietet.*36, pp 443-452.

Balgir RS. (2008) A cross-sectional study of growth and physical development in fifteen major scheduled tribe communities of Orissa, India. *Int J Child Adolescent Health.*1:2, pp 43-252.

Balgir RS. (2010) Health Scenario of Major Tribals of Northern Orissa in Relation to Human Growth, Development and Nutrition and the Role of Genetic Factors in Smell and Tasting Abilities in Children. *Online Journal of Health and Allied Sciences.* 9(4). Pp 234-245

Balgir, R S , Murmu, B and Dash, B.P. (1998) Health and Nutritional status of Ashram school children in two districts of Orissa. *The Indian Journal of Nutrition & Dietetics.* 35, pp 329-38.

Balgir, R S , Kerketta, A.S, Murmu, B and Dash, B.P. (2002) Clinical assessment of health and nutritional status of Gond children in Kalahandi District of Orissa. *The Indian Journal of Nutrition & Dietetics.* 39, pp 31-37.

Bulliyya G, Mallick G, Sethy PGS and Kar SK. (2006) Prevalence of iodine deficiency disorders among Dongria Kondh a primitive tribal community in Niyamgiri mountains area of Rayagada district, Orissa. *Tribal Health. Proceedings of National Symposium.* pp 235-49.

Dash, J. (2007) The society and economy of the Hill Kharia in development perspective. *Adivasi.*47(1-2)pp 25-40.

FAO Corporate Document Repository. Consumption patterns and food availability: Carbohydrates in human nutrition(FAO Food & Nutrition Papers 66). (1998). Availableonline at: <http://www.fao.org/docrep/W8079E/W8079E00.htm>.

FAO/ WHO Expert Committee on Medical Assessment of Nutritional Status, WHO Tech. Rep. Ser. 258. (1963). Expert Committee on Medical Assessment of Nutritional status. Geneva, World Health Organisation, pp 49-60.Gopalan,C., RamaSastri, B.V.

- and Balasubramanian, S.C. (2004) Nutritive Value of Indian Foods 1st ed., ICMR, National Institute of Nutrition, Hyderabad, India.
- WHO. (2012) Growth Reference 5-19YRS, BMI-for-age (5-19 years). Available online at: http://www.who.int/growthref/cht_bmifa_boys_z_5_19years.pdf
- WHO. (2012). Growth Reference 5-19YRS, BMI-for-age (5-19 years). Available online at: http://www.who.int/growthref/cht_bmifa_girls_z_5_19years.pdf.
- Hubbard VA, Hubbard LR. (1997) Clinical assessment of nutritional status. In: Walker WA, Watkins JB, editors. Nutrition in Pediatrics: Basic Science and Clinical Applications, 2nd edition. Hamilton, ON: BC Decker; pp 7–28.
- Johansson I, Saelbtröm A-K, Rajan BP, Parameswaran A. (1992). Salivary Flow and Dental Caries in Indian Children Suffering from Chronic Malnutrition. Caries Res. 26, pp 38–43.
- Mahaparta N, Babu Geddam JJ, Marai NS, Murmu B et al. (2000) Nutritional status in preschool children in drought affected Kalahandi district of Orissa. Indian J Medical Research. 111(3), pp 90-94.
- NFHS-3. National Family Health Survey-3(2005-06). (2007) International Institute of Population Sciences, Mumbai, India.
- Office of The Registrar General & Census Commissioner, India. (2001) Data Highlights: The Scheduled Tribes Census of India 2001]. Available Online at: http://www.censusindia.gov.in/Tables_Published/SCST/dh_st_orissa.pdf.
- Ota, A. B and Mohanty, S.C. (2010) Population profile of Schedule Tribes in Orissa. Scheduled Castes & Scheduled Tribes Research and Training Institute, Bhubneswar, India.
- Regional Medical Research Centre, Bhubneswar. (2009) Malnutrition. In: Tribal Health Research in Orissa. ICMR, RMRC, Bhubneswar India.
- Sahoo, L.K. (2011) Socio-Economic Profile of Tribal Populations in Mayurbhanj and Keonjhar Districts. Orissa Review. pp 63-68. Available online at: [http://orissa.gov.in/e-magazine/Orissa review/ 2011/ may/ engpdf/63-68.pdf](http://orissa.gov.in/e-magazine/Orissa%20review/2011/may/engpdf/63-68.pdf).
- Sukhatme, P V. (1970) Incidence of protein deficiency in relation to different diets in India. British Journal of Nutrition. 24, pp 477-487.
- Turrell G, Hewitt B, Patterson C and Oldenburg B. (2003) Measuring socio-economic position in dietary research: is choice of socio-economic indicator important? Public Health Nutr. 6, pp 191–201.
- Working Group, National Institute of Nutrition. (2007) Dietary Guidelines for Indians-A Manual. 1st ed. reprint. ICMR, National Institute of Nutrition, Hyderabad, India.

Table 1: Nutritional Health status of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

		Nutritional status on basis of WHO recommendation, 2007				Total
		Thinness	Between Thinness-Normal	Normal	Over weight	
Community	Mankirdia	Count 8	Count 21	Count 1	Count 0	Count 30
		% of Total 13.3%	% of Total 35.0%	% of Total 1.7%	% of Total .0%	% of Total 50.0%
Other PTG		Count 3	Count 26	Count 0	Count 1	Count 30
		% of Total 5.0%	% of Total 43.3%	% of Total .0%	% of Total 1.7%	% of Total 50.0%

Table 2: General Health status of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

		Community		Total
		Mankirdia	other PTG	
General health status	Normal	8	19	27
		13.3%	31.7%	45.0%
	% of Total			
	under wt, short stature	20	10	30
		33.3%	16.7%	50.0%
	% of Total			
	Edematous	2	1	3
		3.3%	1.7%	5.0%
	% of Total			

Table 3: Clinical Signs Observed on Hair of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

		clinical signs on hair				Total
		Normal	Lack of lustre	lack of lustre & thinness	dyspigmentation of proximal part of hair+ lack of lustre	
Community	Mankirdia	Count 10	Count 10	Count 6	Count 4	Count 30
		% of Total 16.7%	% of Total 16.7%	% of Total 10.0%	% of Total 6.7%	% of Total 50.0%
other		Count 18	Count 8	Count 3	Count 1	Count 30

PTG	% of Total	30.0%	13.3%	5.0%	1.7%	50.0%
------------	-------------------	--------------	--------------	-------------	-------------	--------------

Table 4: Clinical Signs Observed on Face of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

			Clinical signs on face		Total
			Normal	Moon face	
Community	Mankirdia	Count	28	2	30
		% of Total	46.7%	3.3%	50.0%
	other PTG	Count	30	0	30
		% of Total	50.0%	.0%	50.0%

Table 5: Clinical Signs Observed on Eyes of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

			Clinical signs on eyes		
			Normal	Bitot spot	night blindness
Community	Mankirdia	Count	22	4	4
		% of Total	36.7%	6.7%	6.7%
	other PTG	Count	26	2	2
		% of Total	43.3%	3.3%	3.3%

Table 6: Clinical Signs Observed on Gum of Mankirdia and other PTG (Lodha & Hill Kharia) frequency percent

			clinical signs on gums		Total
			Normal	bleeding gum	
Community	Mankirdia	Count	27	3	30
		% of Total	45.0%	5.0%	50.0%
	other PTG	Count	25	5	30
		% of Total	41.7%	8.3%	50.0%

Table 7: Clinical Signs Observed on Teeth of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

			clinical signs on teeth				Total
			normal	stained teeth	caries	stained teeth & caries	
Community	Mankirdia	Count	10	10	2	8	30
		% of Total	16.7%	16.7%	3.3%	13.3%	50.0%
	other PTG	Count	6	8	3	13	30
		% of Total	10.0%	13.3%	5.0%	21.7%	50.0%

Table 8: Clinical Signs Observed on Skin of Mankirdia and other PTG (Lodha & Hill Kharia) in frequency percent

			clinical signs on skin			Total
			Normal	Dryness	pigmentation	
Community Mankirdia	Count	18	11	1	30	
	% of Total	30.0%	18.3%	1.7%	50.0%	
other PTG	Count	28	2	0	30	
	% of Total	46.7%	3.3%	.0%	50.0%	

Table 9: Clinical Signs Observed on Mucous Membrane of Mankirdia and other PTG (Lodha & Kharia) in frequency percent

			clinical signs on mucous membrane	Total
			Pallor	
Community Mankirdia	Count	30	30	30
	% of Total	50.0%	50.0%	50.0%
other PTG	Count	30	30	30
	% of Total	50.0%	50.0%	50.0%

Table 10: Clinical Signs Observed on Muscular & Skeletal System of Mankirdia and other PTG (Lodha & Kharia) in frequency percent

			clinical signs on muscular & skeletal system						Total
			normal	pot belly	faulty posture	pigeon breast	faulty posture & pigeon breast	pot belly & faulty posture	
Community Mankirdia	Count	11	6	2	3	2	5	1	30
	% of Total	18.3%	10.0%	3.3%	5.0%	3.3%	8.3%	1.7%	50.0%
other PTG	Count	22	1	2	0	0	5	0	30
	% of Total	36.7%	1.7%	3.3%	.0%	.0%	8.3%	.0%	50.0%

Table 11: Daily Average Nutrient Intake of Mankirdia children

PARAMETERS	PARTICULARS	MANKIRDIA			
		Boys/Girls(6yrs)	Boys/Girls(7-9yrs)	Boys(10-11yrs)	Girls(10-11yrs)
PROTEIN INTAKE	RDA (gm)	20.1	29.5	39.9	40.4
	Actual(gm)	21.2	26.6	36.7	34.06
FAT INTAKE	RDA (gm)	25	30	35	35
	Actual(gm)	8.77	8.57	9.2	8.29
CARB. INTAKE	RDA (gm)	0	0	0	0
	Actual(gm)	278.88	278.83	301	281.13
ENERGY INTAKE	RDA (Kcal)	1350	1690	2190	2010
	Actual(Kcal)	1304.45	1334.61	1437.4	1336.76
CALCIUM INTAKE	RDA (mg)	600	600	800	800
	Actual(mg)	216.92	220.89	226.14	221.96
IRON INTAKE	RDA (mg)	13	16	21	27
	Actual(mg)	6.73	6.78	7.11	6.77
CAROTENE INTAKE	RDA(µg)	3200	4800	4800	4800
	Actual(µg)	1547.49	1648.23	1819.94	1479.76
Vit C INTAKE	RDA (mg)	40	40	40	40
	Actual(mg)	39	38.05	37.78	39.82

Table 12: Daily Average Nutrient Intake of Other PTG (Lodha & Kharia) children

PARAMETERS	PARTICULARS	OTHER PTG(Lodha & Kharia)			
		Boys/Girls(6yrs)	Boys/Girls(7-9yrs)	Boys(10-11yrs)	Girls(10-11yrs)
PROTEIN INTAKE	RDA(gm)	20.1	29.5	39.9	40.4
	Actual(gm)	22.9	27.26	38.06	39.85
FAT INTAKE	RDA (gm)	25	30	35	35
	Actual(gm)	8.86	9.22	9.16	9.57
CARB. INTAKE	RDA (gm)	0	0	0	0
	Actual(gm)	289.74	328.77	338.11	338.02
ENERGY INTAKE	RDA (Kcal)	1350	1690	2190	2010
	Actual(Kcal)	1379.69	1448.9	1589.05	1599.63
CALCIUM INTAKE	RDA (mg)	600	600	800	800

	Actual(mg)	195.77	211.82	235.76	195.67
IRON INTAKE	RDA (mg)	13	16	21	27
	Actual(mg)	6.95	7.58	7.72	7.72
CAROTENE INTAKE	RDA(µg)	3200	4800	4800	4800
	Actual(µg)	1457.81	1560.15	2023.64	1461.58
Vit C INTAKE	RDA (mg)	40	40	40	40
	Actual(mg)	40.91	37.65	34.78	34.78

Table 13: Distribution of respondents (Mankirdia and other PTG) by their Nutritional status/grade (on basis of BMI) with their Daily Nutrient Intake in Frequency percent

PARAMETERS	PARTICULARS	MANKIRDIA [N (frequency%)]		OTHER PTG[N(frequency%)]	
		BELOW NORMAL	NORMAL	BELOW NORMAL	OVER WEIGHT
PROTEIN INTAKE	<25% RDA				
	<50% RDA				
	<50-75% RDA				
	>75% RDA	29 (97)	1 (3.33)	29 (97)	1 (3.33)
FAT INTAKE	<25% RDA	12(40)		6(20)	
	<50% RDA	17(56.67)	1(3.33)	22(73.33)	
	<50-75% RDA			1(3.3)	1(3.33)
	>75% RDA				
ENERGY INTAKE	<25% RDA	3(10)			
	<50% RDA	1(3.33)		9(30)	
	<50-75% RDA	17(56.67)		20(66.67)	
	>75% RDA	8(26.67)	1(3.33)		1(3.33)
CALCIUM INTAKE	<25% RDA	9(30)		11(36.67)	
	<50% RDA	20(66.67)		17(56.67)	1(3.33)
	<50-75% RDA		1(3.33)		
	>75% RDA				
IRON INTAKE	<25% RDA	5(16.67)			
	<50% RDA	24(80)		26(86.67)	1(3.33)
	<50-75% RDA		1(3.33)	3(10)	
	>75% RDA				
CAROTENE INTAKE	<25% RDA	5(16.67)		7(23.33)	1(3.33)
	<50% RDA	20(66.67)		20(66.67)	
	<50-75% RDA	4(13.33)		2(6.67)	
	>75% RDA		1(3.33)		
VITANIN C INTAKE	<25% RDA				
	<50% RDA				
	<50-75% RDA				
	>75% RDA	29(97)	1(3.33)	29(97)	1(3.33)