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Nutritional Assessment among Tribal Population of Gram Panchayat – Umariya Dadar, of District Bilaspur of Chhattisgarh

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Abstract

The nutrition is essential to ensure healthy growth, strong immune system, neurological, cognitive development and proper organ formation and function among individual. The present study aims to assess the nutritional status among male tribal population of gram panchayat-Umariya Dadar, Bilaspur. To fulfill the objective of the present study subject were randomly selected individuals and measured for anthropometric characters and interviewed for the socio-demographic status. Worldwide nutritional assessment indicator body mass index used to assess the level of nutrition. The One Way ANOVAs test shows that the average value of somatometric measurements statistically different in-between age group. Among them, there are significant age and tribe differences found between nutritional statuses.

Keyword: Tribal group; Body length; Body circumference; Skin fold thickness and Body mass index.

Introduction

Nutrition is a core pillar of human development and concrete a large-scale programming which not only can reduce the burden of undernutrition and deprivation in countries but also can enhance the progress of nations (Pandey & Singru 2012). The nutritional status is the current body status of a person related to their state of nourishment (the consumption and utilization of nutrients). It determined by a complex interaction between internal factors (age, sex, behaviour, physical activity, disease, etc.) and external factors (food safety, cultural, social and economic circumstances, etc.). Nutrition is essential to ensure healthy growth, proper organ formation and function, a strong immune system and in neurological and cognitive development during early childhood (UNICEF-WHO-World Bank: Joint Child Malnutrition Estimates, 2012). Health and nutrient investments may be a particularly important form of human capital investments for low-income populations including those in developing countries (Mincer, 1974; Becker, 1975; Grossman, 1972; Edwards and Grossman, 1978; Behrman, 1988 and Behrman and Deolalikar, 1987). One in three children suffers from stunting and one in every two children from underweight in India (NFHS-3 and NFHS-

4). In India, 38.4 %, 21% and 35.7% of under five-year aged children found stunted, wasted and undernourished. India is one of the few countries in the world where malnutrition is predictors of health outcome among preschool children.

Worldwide, Malnutrition is associated with more than half of all deaths of children (Pelletier et al., 1995). Malnutrition affects growth potential and risk of morbidity and mortality during childhood and older-aged population. Malnourished children are likely to grow as malnourished adults who face heightened risks of disease and death (Haq, 1984; Roberts et al., 1986; Karim et al., 1985 and Das and Gupta, 1990). In South Asia and South-East Asian countries, India ranks first in the prevalence of undernutrition with 43 % and 48 % children <5 years of age being underweight and stunted in rural areas (Pasricha and Biggs, 2010) while the figures are much higher in tribal children (55% of underweight, 54% of stunting and 28% of wasting) (IIPS, 2007). The prevalence of undernutrition was highest in Bihar (33%) and lowest in Uttarakhand 19.9 % among children (5–18 years of age). Chhattisgarh stands at 3rd position concerning undernourished (<2 SD) children of 5–18 years of age group (Clinical Anthropometry Survey, 2014).

Chhattisgarh is currently facing several challenges in improving the health and nutritional status of the population. Malnutrition is prevalent in this state on a large scale. Nutritional deficiency is more chronic among SC and ST and illiterate women in rural Chhattisgarh. About 41% of women and 31.8% of men in Chhattisgarh had body mass index below normal (Mapping the health indicator of Chhattisgarh: A public health perspective, Abhiruchi Galhotra et al., 2016). The state of Karnataka, Gujrat, Madhya Pradesh and Orissa are highly affected by adult malnutrition and more than half of the adults having BMI <18.5 kg/m^2. Patterns of child and adult malnutrition overlap in that both sex and show extremely poor nutritional status in the state of Gujrat, Orissa, Arunachal Pradesh, Karnataka, Maharashtra, Madhya Pradesh and Andhra Pradesh. In the last 20 years, there has been an improvement observed in the nutritional status of the Indian population. This improvement results from not only changes in food intake but also socio-economic factors increased the availability of potable water, lower morbidity and improvement of health facilities (Nutrition and Consumer protection, Nutrition Country Protection, Agriculture and Consumer Protection Department). Bhattacharya et al., (2004) examine the relationship between nutritional statuses, poverty and food insecurity for household members of various ages. While poverty was predictive of poor nutrition among preschool children, food insecurity does not provide any additional predictive power for this age group. The children of Bihar, Madhya Pradesh and Orissa are found to be affected most as far as nutritional levels are concerned. High female illiteracy in Bihar, Orissa and Madhya Pradesh seems to be one of the causes for such results (Bharati et al., 2007). Bhattacharya et al., (2004) have found that poverty was predictive of poor nutrition among preschool children; food insecurity does not provide any additional predictive power for this age group. An anthropometric study conducted in government and public schools of Delhi and this study revealed that the prevalence of stunting was 9.9% in upper socioeconomic class girls and 35.3% in lower-middle-class girls (Kapoor G. et al.,1992). Given cited findings, the present study will aim to find out the nutritional status among children and the adult male population of Gram panchayat – Umariya Dadar, Bilaspur, Chhattisgarh, India.

Objectives

The present investigation aims to find out the nutritional status among target population.

Study area

The cross-sectional investigation conducts in gram panchayat Uamaiya Dadar of tehsil Kota of district Bilaspur, Chhattisgarh. The studies gram panchayat is situated 38 km away from the district headquarters. Umariya Dadar has a total population of 1749 peoples and out of the male population are 525 and female are 498. Overall 740 tribal individuals (842 male and 814 female) are living in 238 houses of Umariya Dadar. This village has a lower literacy rate compared to Chhattisgarh.

Materials and Methods

The cross-sectional study conducts to assess the anthropometric profile and current trend of nutritional status among randomly selected 180 tribal individuals of aged 6–85 years from gram panchayat Umariya Dadar of district Bilaspur, India using door to door survey method. Consent from individuals/participants/respondent and head of household taken before the interview about socio-demographic, economic status, educational level marital status, occupational status, source of drinking water other socio-economic variables and for the anthropometric measurements. Nutritional level assesses as per WHO classification. The

collected data processed with SPSS V.21; MS excel for analysis and WHO anthro plus soft use for nutritional analysis.

Results and Discussion

In the presents study anthropometric measurement were taken from overall 180 male individuals to estimated nutritional status among them and the descriptive statistics of anthropometric measurements presented in Table 1.

Table 1 the average body weight of male participants was 41.74 ± 13.633 kg and lies between 13 kg – 70 kg. The average body weight of pool data found lower than school-going male children of Jagdalpur, Chhattisgarh (i.e. 43.73 ± 8.2 kg); scheduled caste women of district Banda, Uttar Pradesh (i.e. 44.3 ± 8.16 kg) and Bidi worker of Central India (Male 56.6 ± 11 kg for male and 50.6 ± 9.85 kg for female) (Kumar & Gautam, 2015 & 2016; Kumar et al., 2019) and higher than school-going children girls children of Jagdalpur (40.56 ± 6.74 kg). Similarly, the calculated average body stature and sitting height was 151.3 ± 16.43 cm and 58.37 ± 9.9 cm respectively. These body heights were found less than Korku women of Betul (Raikwar and Sharma, 2018); school-going male children of Jagdalpur (Kumar et al. 2019); Bidi worker of Central India (Kumar and Gautam, 2014) and higher than Scheduled Castes women of Banda(Kumar and Gautam, 2016). Among them, fat composition measurement was indicated that the average value of Mid Upper arm circumference (MUAC) is 21.68 ± 4.3 cm and the mean value of waist circumference (74.13 ± 7.98 cm.) and hip circumference (84.75 ± 6.09 cm). The mean value of biceps skinfold thickness, triceps skinfold thickness, sub-scapular skinfold thickness and supra-iliac skinfold thickness was measured i.e. 3.52 ± 1.6 mm, 6.57 ± 2.5 mm, 8.24 ± 3.6 mm and 7.6 ± 3.72 mm taken respectively. The average value of body circumference and skinfold thickness measurements were showing difference with above cited studied population. The nutritional status was calculated among them using body mass index. The average body mass index calculated was 18.02 ± 6.74 kg/m^2. Overall average body mass index of them was found lower than the national level and above cited studied population.

Table 1: Descriptive statistics of somatometric measurements of male individuals

Somatometric Measurement	N	Minimum	Maximum	Mean	SD
Weight	180	13	70	41.74	13.633
Body Stature	180	105.0	176.4	151.366	16.4319
Sitting Height	84	45	106	58.37	9.908
Mid upper arm circumference	178	3	30	21.68	4.383
Waist circumference	84	53.5	98.0	74.137	7.9802
Hip circumference	83	72.0	100.1	84.745	6.0924
Biceps skin fold thickness (BISF)	177	1.5	15.0	3.524	1.6642
Triceps skin fold thickness (TISF)	177	3.0	20.0	6.573	2.5412
Sub-scapular skin fold thickness (SUSSF)	177	2.0	23.0	8.243	3.6229
Supra-iliac skin fold thickness (SISSF)	176	2.0	22.0	7.601	3.7248
Body Mass Index (BMI)	180	8.32	94.52	18.0273	6.74560

The age wise descriptive statistics of somatometric measurements among individuals is presents in Table 2.

It is apparent from Table 2 that the body weight and height were increasing with proceeding age group. The average value of weight and height had a statistical change in the following age group. Respectivily, the average value of mid-upper arm circumference and skinfold thickness (biceps, triceps, sub-scapular and supra-iliac) were statistically increased with proceeding age and start declining from 65 years of age and 51 years of age respectively. Although, the waist circumference and hip circumference also increased with proceeding age group and vary from 64.6 ± 7.83 cm to 79.05 ± 9.83 cm and 80.80±5.8 cm to 86.73 ± 7.41 cm respectively. Likely, the average body mass index increased with successive age. In early aged participants (6-20 years), the average value of BMI found lowest, i.e. 15.69 ± 3.63 kg/m^2. Averagely, individuals of 36–50 years of age

were found overweighted (BMI 37.2 kg/m^2). One way ANOVAs test indicates that the age wise statistically changes in the mean value of body weight, mid-upper arm circumference, skinfold thickness (bicep, sub-scapular, supra-iliac), waist circumference and body mass index except for triceps skinfold thickness and hip circumference ($p < 0.0001$).

Table 2: Age wise descriptive statistics of somatometric measurement among individuals

Variable	Age (in years)										F	Sig.
	(6–20 yrs)		(21–35 yrs)		(36–50 yrs)		(51–65 yrs)		(>65 yrs)			
	M	SD	M	SD	M	SD	M	SD	M	SD		
Weight	32	12.35	52.85	6.58	49	6.58	50.75	9.43	49.9	4.27	38.7	0.000
Body Stature	140.11	16.70	162.75	5.99	159.54	7.67	163.08	7.82	162.34	5.42	30.3	0.000
MUAC	18.99	3.90	24.98	2.44	24.49	2.84	23.03	4.09	23.07	3.08	26.9	0.000
BISF	3.45	1.25	4.16	2.61	3.19	1.41	3.53	1.63	2.9	9.32	1.8	0.121
TISF	6.08	1.7	7.03	3.18	6.68	2.9	7.2	3.25	8.57	3.10	2.5	0.040
SUSSF	6.73	2.18	10.39	3.99	9.19	3.99	9.7	5.02	9.00	3.46	9.6	0.000
SISSF	6.13	2.21	9.63	4.24	8.48	4.79	8.8	3.82	9.14	3.71	8.2	0.000
WC	64.6	7.83	73.08	6.35	73.7	7.31	79.05	9.83	77.62	6.98	3.9	0.005
HPC	80.80	5.80	85.04	5.39	84.47	5.83	86.73	7.41	83.91	7.46	.92	0.454
BMI	15.69	3.63	22.17	12.98	37.22	103.86	18.97	2.55	18.71	1.57	7.07	0.000

Nutritional status of any individual is dependent on age and sex and as well as their ethnicity and other socio-demographical variables (Kumar and Gautam, 2014). Among the present studies male participant the age wise nutritional status (BMI) is present in Figure 1.

The Figure 1 shows that the level of undernutrition based on BMI is higher among male individuals of aged 6–20 years and more than half of participants of aged >51 years were found under nourished of aged. On the other hand lowest prevalence of undernutrition is observed among the 21–35 and in 36-50 years old males. The prevalence of overweight is highest (8.8%) among the 21–35 and in 36–50 yrs of age group. On the other hand lowest prevalence (2.3%) of overweight is observed among the 6 to 20 year of males. It has been clearly observed that there is significant age differences in nutritional status based on BMI among studied males (χ^2 = 23.299, df = 8 and $p < 0.05$).

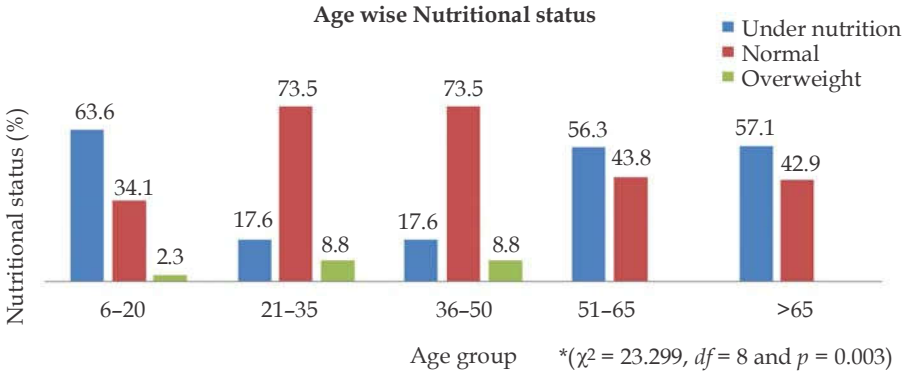

Fig. 1: Age wise distribution of level of nutritional status among male participants

Similarly, the tribe wise distribution of nutritional status among them is display in figure 2. It is apparent from figure 2 that the highest prevalence of undernutrition found among the Agariya tribe (66.7%) and the lowest in other community participants (44.4%). The prevalence of nutritionally normal participants (50%) found high among the Birhor tribe whereas overweight highly prevalent among other tribe participants and it's found lowest in the Gond tribe that is 33.3 % and 1% respectively. Figure 2 clear that the prevalence of under nutrition and malnutrition was found statistically differ in following tribal groups (χ^2 = 28.16, df = 8 and p = 0.0001).

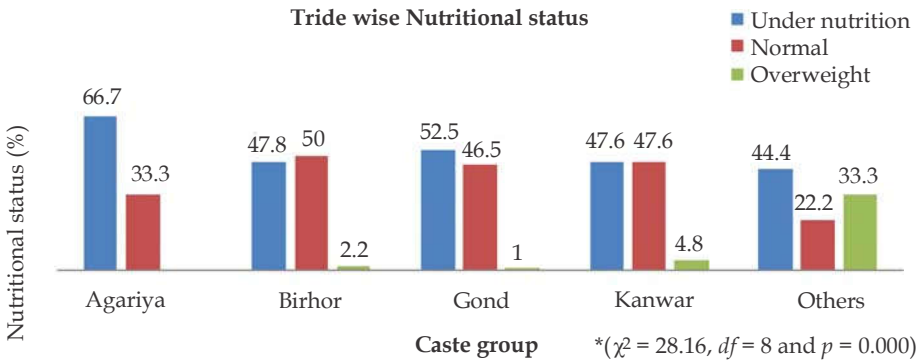

Fig. 2: Tribe wise distribution of level of nutritional status among male participants

Conclusion

Malnutrition is one of the major health problems in developing countries. Its proportion was higher in the tribal population. A large tribal populations were facing the double burden of malnutrition. In the present study, the descriptive statistics of their anthropometric profile shows that the average values of these anthropometric measurements found lower than references values and indicated their poor growth and nutritional status.

The average body mass index was indicated that they were found as nutritionally normal. ANOVAs test reveals that age-wise significant difference reported in their anthropometric measurement and their nutritional indicators except for triceps skinfold thickness and hip circumference. Although, the tribe wise and age-wise chi-square analysis show that the level of nutritional status based on body mass index was found statistically change ($p < 0.05$). Further, the prevalence of under nutrient found higher among early ages and late aged male individuals and adult population also had overweight. It can be concluded that the studies a male population of the cited village have a poor anthropometric profile and their level of nutritional status was found poor and comparative less than with previously studied population. So there is required to conduct further investigation to find the determinants of poor anthropometric profile and nutritional status as well as community-based health and nutritional improving programmes and schemes.

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