

Prevalence of Undernutrition among Tribes of Nabarangpur and Mayurbhanj District of Odisha.

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Introduction.

Nutrition remains a major health issue in India for centuries . In recent past, India has made a considerable progress in social and economic aspects but the improvement in nutritional status has been less impressive (Griffith and Bentley, 2001). In general, various tribal populations are among the most underprivileged people in India. This because of their geographical isolation, uncertainty of food supply, lack of adequate health care facilities and awareness and their belief system and cultural practice.

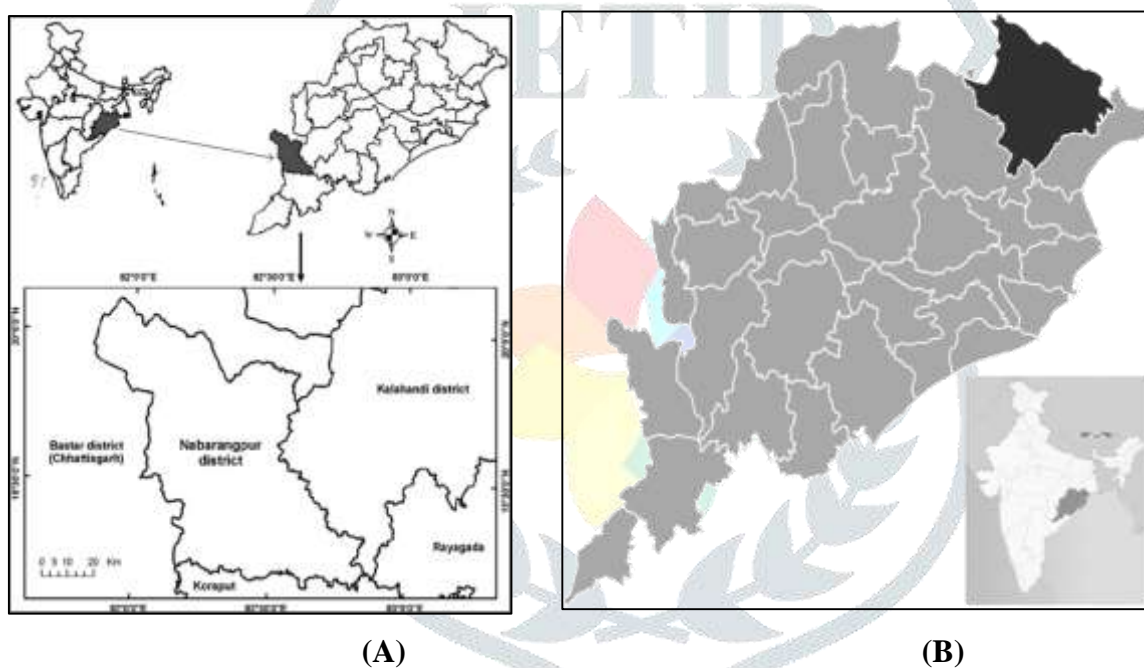
To have a comprehensive idea about the development process of a community, it is very much essential to have the knowledge of nutritional status of the community. Undernutrition is a major health issue in developing countries like India. The basic causes of undernutrition and infections in developing countries are poverty, poor hygienic conditions and access to healthcare facilities (Mitra, 1985; WHO,1990). Assessment of nutritional status is considered as a measure of health. Body Mass Index (BMI) is the most widely used method of assessing the nutritional status as it is in-expensive, non-invasive, and suitable for large scale survey (Lohman et al., 1988; Ferro-Luzzi et al., 1992; James et al., 1994). BMI is generally considered a good indicator of not only nutritional status but also the socio-economic condition of a population, especially adult population of developing countries. Keeping in view the points, the present study attempted to determine the nutritional status of the Bhotra, Amanatya and Saora Tribes of Turunji Village in Nabarangpur District, and Santals of Tiring Block of Mayurbhanj District, Odisha. The study further attempts to compare the nutritional status of the participants with the other tribal populations of Eastern India and to investigate the factors influencing nutritional status of these communities.

Area and People

The tribes of Odisha account to 22.8% of the states total population. There are 62 tribal communities in Odisha, 13 out of which are categorized as Particularly Vulnerable Tribal Groups(PVTG). Both Nabarangpur and Mayurbhanj are tribal dominated districts of Odisha with 55.8% and 58.70% of total population of the district are tribes. Nabarangpur district is home to about 48 different tribal communities out of which 13 tribal communities constituting 97.07% of the total tribal population of the district. The rest 35

categories of tribes constitute only 2.93% (Odisha District Gezetteers, Nabarangpur, Gopabandhu Academy of Administration [Gazetteers Unit], General Administration Department, Government of Odisha, 2016). Bhotra, Gond ,Paroja, Kandha, Amanatya, Saora and Holva are some tribal groups of the district.

About 18 out of 62 tribal groups of Odisha are found in Mayurbhanj District. The Major Tribes found in the district are Santals, Kolhas, Ho, Bhuyan, Bhumij and Bathudi. The primary occupation of these tribal groups is daily agricultural and manual labours. Their traditional occupation used to be settled cultivation, gathering, and fishing. Many people travel to nearby cities for the purpose of unskilled labours. To summarize, the tribes of the district are very much lagging behind in socio economic aspects and have a very low literacy rate. The present study focuses on Amanatya, Bhotra and Soara Tribes of Nabarangpur District And Santals of Mayurbhanj District.



Map 1: Geographical location of Nabarangpur District and Mayurbhanj District Odisha

Bhotra: Bhotra synonymous with Bhottada, Bhattra and Dhottada are widely distributed in Koraput and Kalahandi districts of Odisha, Bastar area of Madhya Pradesh. Out of 4.51 lakh populations in the state 3.25 lakh Bhatras live in Nabarangpur district as per 2011 census. The Bhotras are one of the numerically major agricultural tribe of the district. They are primarily settled agriculturists and cultivators.

Amanatya: Amanatyas, also known as Omanatya, Omaito and Omanaito are Odia speaking cultivating tribal people who live in the north of Jeypore and south of Nabarangpur. They are dominantly found in the undivided Koraput district. Their population accounts to 28736 in Odisha out of which 17,463 are in Koraput, and 10746 in Nabarangpur district as per 2011 census. Amanatya are largely found in Nandahandi

block of Nabarangpur district. Settled cultivation is the mainstay of their subsistence economy. It is supplemented by wage earning, animal husbandry, forest collection, hunting, fishing and khali stitching etc.

Saora: The Saoras also called Savara, Saura, Sabara, Sahar, Saur and Sora is a major tribe in the State of Odisha. The tribe having reference in the epigraphic records and ancient literature of India is very widely distributed throughout the State of Odisha. They are mostly concentrated in Gajapati, Sambalpur, Puri and Rayagada districts. In Nabarangpur district, their population is 7369 with a Male population of 3531 and female population of 3838. The Saora depend upon land and forest for their subsistence. In recent times settled agriculture has taken precedence over shifting cultivation.

Santals: The Santals, one of the populous tribal communities of India, are mainly found in the districts of Mayurbhanj, Keonjhar and Balasore in the State of Odisha. Besides, they are also found in the neighbouring states like Jharkhand, West Bengal, Bihar and Assam. Their population in the district of Mayurbhanj is 638104 according to 2011 census. They speak Santali language which belongs to the Munda group of Austro-Asiatic sub family of languages. The Santali has its own script called "Olchiki" invented by Pundit Raghunath Murmu. By their physical features the Santals have long head, brownish body colour and flat nose.

Study Design:

Fieldwork for this research was carried out in Turunji village under Dhondra Panchayat of Nandahandi block of Nabarangpur district, Odisha and three villages namely Changua, Talasa and Badadobra villages of Tiring Block of Mayurbhanj District. The village Turunji is divided into three hamlets namely Badagaon, Naikguda and Damunaikguda. Out of these three settlements, Badagaon is the biggest and is inhabited by scheduled tribal communities such as Amanatya / Omanatya, Bhattra/ Bhotra and Saura, scheduled caste communities such as Gauda and Biswakarma / Bindhani (ironsmith), other religious group such as the Christians. The villages Changua, Talasa and Badagobra of Mayurbhanj District are dominated by Santal population with a small caste population which includes Lohars and Patras.

Materials and Methods.

The present study was undertaken to understand the pattern of height, weight, Body Mass Index (BMI) among the four tribal communities such as Bhotras, Amanatyas and Santals of Nabarangpur and Mayurbhanj District, Odisha. For the present study data were collected from 376 individuals consisting of 194 males and 182 females. Individuals who voluntarily participated in the survey were only considered in the present work. Necessary ethical clearance was made at the institutional level to conduct this research. Anthropometric measurements such as height and weight were taken to compute the Body Mass Index of these individuals. Anthropometry is an important tool for assessment of nutritional status of individuals or

of a community. Hence, measurements such as height and weight were taken and Body Mass Index was calculated to evaluate the extent of malnutrition in these three tribes. The primary information about the subject who participated in the study, like name of the tribe, and sex was recorded in a structured schedule. Standard techniques were followed while taking all the anthropometric measurements. Standing height and weight was measured to the nearest 0.1 cm and 0.1 kg respectively. Stature was measured by using anthropometric rod and weight was by using manual weighing machine. Circumference measurements were taken using a measuring tape and skin fold measurements were taken by using skinfold calliper. Body mass index (BMI) is calculated as the weight in kilograms divided by the square of the height in meters (kg/m^2). Nutritional status was evaluated using WHO guidelines (1995). The following cut-off points were utilized: CED: BMI <18.5; Normal: BMI = 18.5–24.9; Overweight: BMI \geq 25.0. Two trained anthropologists were involved during the data collection process. One anthropologist took all the measurements while the other entered all the data in the data sheet in order to avoid measurement and data entry bias.

Data on socio-economic conditions of the village were collected from each households using a questionnaire/schedule (National Family Health Survey (NFHS)- 4, 2015 -16). The questionnaire/schedule was completed using information on family size, education, income/expenditure, household assets/liabilities, information on general health and hygienic practices and awareness, etc. The information were collected from household heads and were crosschecked from several other sources. All statistical analysis were undertaken using the SPSS Statistical Package version 20 for Windows (SPSS, 2011, Chicago). Descriptive statistics such as Mean and Standard Deviation (SD) for each variable was estimated for the selected anthropometric variables.

Result

In Table 1, Anthropometric characteristics of adult individuals (>20 years) presented.

Table 1: Distribution of anthropometric variables across the study participants.

| Variables | Amanatya (n=28) | | Bhotra (n=100) | | Saora (n=72) | | Santal (n=176) | |
|---------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Male (n=12) | Female (n=16) | Male (n=52) | Female (n=48) | Male (n=36) | Female (n=36) | Male (n=94) | Female (n=82) |
| Height (cm) (SD) | 160.33 (±9.07) | 156.00 (±4.69) | 163.54 (±5.57) | 149.75 (±5.75) | 166.33 (±4.35) | 153.00 (±5.12) | 162.22 (±6.27) | 150.20 (±5.07) |
| Weight (kg) (SD) | 54.67 (±9.71) | 46.00 (±1.41) | 54.92 (±6.04) | 44.50 (±5.45) | 51.22 (±6.61) | 43.67 (±2.91) | 54.79 (±11.41) | 47.51 (±8.30) |
| BMI | 21.33 (±1.5) | 18.75 (±0.95) | 20.46 (±1.85) | 19.67 (±1.55) | 18.56 (±2.0) | 18.89 (±1.45) | 20.75 (±3.71) | 21.03 (±3.66) |
| Min waist | 70.33 | 74.25 | 73.31 | 74.17 | 72.33 | 68.89 | 76.53 | 75.12 |

| | | | | | | | | |
|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| (cm) (SD) | (±9.60) | (±2.63) | (±6.21) | (±6.56) | (±5.59) | (±5.15) | (±9.45) | (±8.97) |
| Max hip | 87.33 | 89.00 | 86.31 | 85.67 | 85.33 | 84.00 | 86.39 | 85.92 |
| (cm) (SD) | (±6.02) | (±2.58) | (±4.44) | (±6.88) | (±3.90) | (±3.42) | (±7.62) | (±7.91) |
| WHR (SD) | 0.80 | 0.83 | 0.85 | 0.85 | 0.85 | 0.82 | 0.89 | 0.87 |
| | (±0.05) | (±0.28) | (±0.60) | (±0.45) | (±0.38) | (±0.38) | (±0.06) | (±0.5) |
| Conicity | 1.20 | 1.25 | 1.18 | 1.20 | 1.18 | 1.18 | 1.21 | 1.23 |
| Index(SD) | (±0.08) | (±0.02) | (±0.08) | (±0.08) | (±0.08) | (±0.08) | (±0.09) | (0.08) |

Table 1 indicates that the mean height of Among the four tribal groups under study the Saora males are tallest (166.33 ± 4.35 cm) followed by the Bhotras (163.54 ± 5.57 cm), the Santals (**162.22 ± 6.27**) and the Amanatya (160.33 ± 9.07 cm). Among the females, the Amanatyas are the tallest (156.00 ± 4.69 cm) and the Santals (**150.20 ± 5.07**) and the Bhotra females are the shortest (149.75 ± 5.75) cm. The mean weight of males of the three tribal communities Amanatya (54.67 ± 9.71) kg, Bhotra (54.92 ± 6.04 kg), Saora (51.22 ± 6.61 kg) and Santals (**54.79 ± 11.41**) which is greater than the females of the four tribal communities Amanatya (46.00 ± 1.41 kg), Bhotra (44.50 ± 5.45 kg), Saora (43.67 ± 2.91 kg) and Santals (**47.51 ± 8.30**) respectively. This indicates that the females are shorter and lighter than the males. The mean The Bhotras males have a higher BMI value (21.33) as compared to the Santals ($20.75 (\pm 3.71)$), Amanatya (20.46) and the Soaras (18.56) respectively. Among females the Santals have higher BMI value (**21.03 ± 3.66**) when compared with Bhotras (BMI 19.67 ± 1.55), Amanatyas (BMI 18.75 ± 0.95) and Saoras (BMI 18.89 ± 1.45). The Mean Waist Hip Ratio (WHR) of is higher among the Santals than other three tribal groups under study. The Mean Conicity Index of Santal males is highest (**1.21 ± 0.09**) followed by Amanatyas (**1.20 ± 0.08**), Bhotras (**1.18 ± 0.08**) and Saoras (**1.18 ± 0.08**). Whereas in Females the Mean Conicity Index is Higher among the Amanatyas (**1.25 ± 0.02**) than the Santals (**1.23 ± 0.08**), Bhotras (**1.20 ± 0.08**) and Saoras (**1.218 ± 0.08**).

Table 2: Nutritional status of the population based on BMI

| Tribe | Sample size | CED (BMI <18.5) | Normal (BMI 18.5-25) | Overweight (BMI >25) |
|-----------------|-------------------|---------------------|-------------------------|-------------------------|
| Amanatya | Male : 12 | 0 | 12 (100%) | 0 |
| | Female: 16 | 8 (50.0%) | 8 (50.0%) | 0 |
| Bhotra | Male: 52 | 4 (7.69%) | 48 (92.39%) | 0 |
| | Female: 48 | 8 (16.6%) | 40 (83.4%) | 0 |
| Saora | Male: 36 | 16 (44.44%) | 20 (55.56 %) | 0 |
| | Female: 36 | 12 (33.33%) | 24 (66.67%) | 0 |
| Santal | Male: 94 | 29 (30.85 %) | 53 (56.38%) | 12 (12.76%) |
| | Female: 82 | 23 (28.04 %) | 49 (59.75 %) | 10 (12.19%) |
| | Male : 100 | 49 (25.26%) | 133 (68.56%) | 12(6.18%) |

| | | | | |
|--------------|-------------------|---------------------|---------------------|--------------------|
| Total | Female:100 | 51 (28.02%) | 121 (66.48%) | 10 (5.49 %) |
| | Total: 200 | 100 (26.60%) | 254 (67.55%) | 22 (5.85%) |

The rate of undernutrition among the three tribal groups are compared in Table 2. The rate of under nutrition is very high in Santals, Saora population and among the Amanatya females. The highest frequency of undernutrition is found among the Amanatya females i.e, 50.0% followed by Saoras (male = 44.44% ; female =33.33%), Santals (male = 30.85% ; female =28.04%) and Bhotras (males =7.69%; females= 16.6%). Total population shows that 26.00% of overall population (including both male and female) fall under CED level. None of the individuals are found overweight or obese among the Amanatya, Bhitra and Saoras of Nabarangpur but instances of overweight individuals are found among the Santals of Mayurbhanj District.

Discussion

The study shows a high prevalence of CED among Santals, Amanatyas and Saoras. The Bhotras have a low percentage of CED but this cannot be neglected. While comparing our study with other studies among various tribes of Eastern India we find a coherence that in most studies females have a lower BMI value than the males. But in Oraon, Santal (Dattabanik, 2007 and Present Study) and Saora (present study) the females have higher BMI value than that of the males.

Under nutrition remains a major issue among the tribes of India. Several recent studies (Bose and Chakravarti, 2005, Ghosh and Bharati, 2006, Mittal and Srivastava,2006, Bose et al., 2006, DattaBanik et al., 2007, Mondal, 2007, Mukhopadhyay, 2010, Goswami, 2012, Bisai and Bose, 2012, Das and Bose, 2014,) have highlighted the nutritional status of various tribes of Eastern India such as Oraon, Bhumij, Bathudi, Juangs, Lodha, Dhimal, Santal, Mankidia, Savara, KoraMudis etc.

Table 3 shows the prevalence of CED or undernutrition among the tribes of Eastern India.

Table 3: Prevalence of CED among the tribes of Eastern India.

| Tribe | Sample size | Mean BMI | CED (BMI<18.5) (%) | Study Area | Reference |
|---------------|--------------------|-----------------|--------------------------------------|-------------------|-------------------------------|
| Oraon | Male – 200 | 18.8 (2.0) | 47.0 | Jalpaiguri | Mittal and Srivastava,2006 |
| | Female – 150 | 19.7 (2.4) | 31.7 | | |
| Lodha | Male – 157 | 19.5 (2.7) | 45.2 | PaschimMedinipur | Mondal, 2007 |
| | Female- 199 | 19.3 (2.6) | 40.7 | | |
| Dhimal | Male: 159 | 19.5(2.5) | 27.0 | Darjeeling | DattaBanik et al., 2007 |
| | Female:146 | 19.1(2.6) | 46.4 | | |

| | | | | | |
|-----------------|------------|-------------|-------|--------------|-------------------------------|
| Santal | Male:400 | 18.5(2.1) | 55.0 | Bankura | DattaBanik et al., 2007 |
| | Female:400 | 18.7 (2.3) | 52.5 | | |
| Bhumij | Male: 244 | 18.9 (2.6) | 48.4 | Balasore | Goswami, 2012 |
| | Female:223 | 18.5 (2.0) | 58.3 | | |
| Mankidia | Male:124 | 19.3 (2.2) | 48.4 | Mayurbhanj | Goswami, 2011 |
| | Female:136 | 18.6 (2.8) | 59.5 | | |
| Juang | Male:414 | 19.4 (2.7) | 51.9 | Keonjhar | Goswami, 2013 |
| | Female:423 | 18.3 (2.9) | 62.9 | | |
| Bathudi | Male:226 | 18.4 (1.9) | 52.7 | Keonjhar | Bose and Chakravarti, 2005 |
| | Female:183 | 17.9 (2.5) | 64.5 | | |
| Savara | Male: | 19.3 (2.1) | 38.0 | Keonjhar | Bose et al., 2006 |
| | Female: | 18.9 (2.7) | 49.0 | | |
| KoraMudi | Male: | 18.7 (1.8) | 48.0 | Bankura | Bose et al., 2006 |
| | Female: | 18.3 (2.1) | 56.4 | | |
| Amanatya | Male : 12 | 21.3 (1.5) | 0 | Nabarangapur | Present study |
| | Female: 16 | 18.6 (0.9) | 50.0 | | |
| Bhotra | Male: 52 | 20.5 (1.8) | 7.69 | Nabarangapur | Present study |
| | Female: 48 | 19.7 (1.5) | 16.6 | | |
| Saora | Male: 36 | 18.6 (2.0) | 44.44 | Nabarangapur | Present study |
| | Female: 36 | 18.9 (1.4) | 33.33 | | |
| Santal | Male : 94 | 20.75 (3.7) | 30.85 | Mayurbhanj | Present Study |
| | Female: 82 | 21.06 (3.6) | 28.04 | | |

These studies reveal that there is a very high prevalence of CED among the tribes of Eastern India. Studies show that the percentage of CED is higher in females as compared to males whereas in Oraon, Lodha, Santal, and Saora (present study) the prevalence of CED is higher in case of males. The present study shows a high percentage of CED among the Saoras and Amanatyas and Santals. The Bhotras have a lower CED level but this cannot be neglected. This implies that the tribes of Eastern India are under serious nutritional stress. This might be due to their poor socio-economic conditions, lack of education, food habits and lack of awareness about health and healthcare facilities. The government should play a pro-active role in increasing the socio-economic conditions and hence reducing the rate of undernutrition among the tribal groups of eastern India.

Conclusion

The present study among the four tribal groups of Nabarangpur and Mayurbhanj district of Odisha reveals that the prevalence of undernutrition is very much common irrespective of their habitat and cultural variations. Females are the worst sufferers as compared to their male counterparts. When the results of the present studies were compared with other studies among the tribes of Eastern India, it shows a similar trend

in terms of undernutrition. . Although a higher percentage of CED is observed among the Santals, instances of overweight or obesity were found. This might be due to influence of modern dietary habit and lifestyle which encroached into the tribal traditional pattern of living due migration and contact with modern societies. However, this distinct inter-tribal difference is due the variation in their poor socio-economic condition, poor literacy rate, food habits, lack of awareness and health care facilities. Therefore, better education and employment opportunities will enhance their overall development. Keeping this in mind, formulation and implementation of culture and gender specific nutritional intervention programs for upliftment of these tribal groups is imperative. Since undernutrition has several underlying causes, future investigations should aim at identifying the likely causes of high prevalence of undernutrition among these tribes.

Acknowledgements

I would like to thank all the subjects for their cooperation and patience during the study span. I also express my indebtedness towards my teachers for their guidance and cooperation during the fieldwork and preparation of the research article.

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