

Prevalence of Under-nutrition among the Juangs

A study on a particularly vulnerable tribal group of Odisha, India

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Abstract

This study is undertaken to determine the overall prevalence of under-nutrition based on body mass index (BMI) of the Juangs, a vulnerable tribal population of Odisha, India. A total of 414 adult males and 423 adult females (≥ 18 years) were considered for anthropometric data from fifteen villages under two blocks of Keonjhar district of Odisha, India. Height and weight were recorded and the body mass index (BMI) was computed using the standard equation. It is observed that the Juang males show relatively higher mean height and weight in comparison with the females. There is a significant sex difference of mean BMI ($t=5.68$; $p<0.001$) between the Juang males and females. Overall, the extent of under-nutrition ($BMI<18.5 \text{ kg/m}^2$) is found to be very high among the Juangs ($N=481$, 57.5%) which exhibits their poor nutritional condition especially of the women. This paper also provides strong evidence that, in general, tribal populations of Eastern India are experiencing serious or critical nutritional stress. Hence immediate appropriate nutritional intervention programs are needed for implementation among all these ethnic groups.

Key words: Under-nutrition, Body Mass Index, Juang, Tribe, Odisha

Introduction

Nutrition has been a major health issue in India for centuries. Chronic hunger and under-nutrition is the worst tribulation of the poverty that still plagues millions of households in India. India, in recent past, has made a considerable progress in social and economic fronts but improvement in nutritional status especially of the women is found to be lagging behind (Ghosh et al 2009, 13-20). Tribal are particularly vulnerable to malnutrition because of their geographical isolation, uncertainty of food supply, lack of adequate health care facilities and due to certain traditional belief systems and cultural practices. Assessment of nutritional status is considered as a measure of health and it is necessary for planners to understand the food and nutrition situation among these

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under privileged populations, for upliftment of these vulnerable groups. There are certain tribal groups who are techno-economically backward, have low level of literacy, pre-agricultural level of technology, declining or stagnant population and are relatively less acculturated. Keeping an eye upon their development, Government of India has classified and declared these tribal groups as particularly vulnerable tribal groups (PTGs). Juangs are one such particularly vulnerable tribal group found only in Odisha state.

Although adult nutritional status can be evaluated in many ways (Lohman, Roche & Martorell, 1988), the body mass index (BMI) is most widely used because its use is inexpensive, non-invasive and suitable for large scale surveys (WHO, 1995; Ulijaszek & Kerr 1999, 165-177; Lee & Nieman, 2007). Data are scarce on the nutritional status of various tribal populations of India (Yadu et al 2000, 409-410; Khongsdier 2002, 484-9; Arlappa et al 2005, 23-39; Adak et al 2006, 161-178; Bose et al 2007). It has been recently suggested (Bose and Chakraborty 2005, 3-7; Bose et al 2007; Datta Banik et al 2007, 348-352; Goswami 2011) that it is imperative to evaluate the nutritional status of the various unexplored tribes of India especially Eastern India which is relatively ignored.

In view of this, the objective of the present study is to report the anthropometric characteristics and determine the nutritional status, based on BMI of the Juang tribe (male and female) of Odisha, India. Studies dealing with the nutritional status of the Juang tribe are lacking and measures required for their upliftment is seriously wanting. Therefore the present study is an endeavor to unveil the nutritional status of the tribe. The results are further compared with the data available on the body mass index of various other tribal populations of Eastern India.

Material and Methods

This study was conducted during the year 2010. The data on the Juangs were collected from fifteen villages under two blocks (Banspal and Telkoi) of Keonjhar district of Odisha, India. Thus adult males and adult females (≥ 18 years) residents of all the houses in the study villages were contacted. Out of the total 515 households covered, 414 males and 423 females were considered for the anthropometric data only from those who were willing to give their measurements. Prior consent was sought before taking the anthropometric measurements.

Prior permission and ethical approval was obtained from local community leaders as well as relevant authorities before commencement of the study. The anthropometric data were taken using the standard techniques of Lee & Nieman (2007). Height and weight were recorded to the nearest 0.1cm and 0.5 kg respectively. Technical errors of measurement (TEM) were computed and they were found to be within acceptable limits (Ulijaszek and Kerr 1999, 165-177).

BMI was computed using the following standard equation:

$$\text{BMI} = \text{weight (Kg)} / \text{height}^2 (\text{m}^2)$$

Nutritional status was evaluated using internationally accepted BMI guidelines (WHO 1995). The following

cutoff points were used:

- Under-nutrition: BMI < 16.0 (Severe)
- BMI =16.0-16.9 (Moderate)
- BMI = 17.0-18.4 (Mild)
- Normal: BMI = 18.5-24.9
- Overweight: BMI ≥ 25.0

Means and standard deviations of all anthropometric variables were computed for each sex separately. Student’s t-test was performed to test for differences of mean BMI between the Juang males & females.

Results

The anthropometric characteristics of the Juangs (males & females) are presented in Table-I. The mean BMI of the Juang males (19.4 kg/m²) is appreciably higher than the females (18.3 kg/m²). Thus a significant sex difference of mean BMI (t – 5.68; p<0.001) is observed among the Juangs. Table-II represents the nutritional status of the tribe (male and female) based on their BMI. Overall, the rate of under-nutrition (N-481, 57.5%) is found to be high among the Juangs. The study reflects that the extent of under-nutrition among the females (62.9%) is very high which indicate that the Juang women is under serious nutritional stress.

Table-I: Anthropometric characteristics of the Juang tribe.

Variable	Male (n-414)	Female (n-423)
	Mean (SD)	Mean (SD)
Height (cm)	160.9 (7.3)	153.9 (7.6)
Weight (in Kg)	50.2 (7.2)	43.4 (6.9)
BMI (Kg/ m ²) *	19.4 (2.7)	18.3 (2.9)

**Significant sex difference of mean BMI; p<0.001*

Table-II: Prevalence of under-nutrition based on BMI among Juang tribe

Sex	Under-nutrition (BMI<18.5 kg/m ²)	Normal (18.5≤BMI<25.0kg/m ²)	Overweight (BMI≥25.0 kg/m ²)
Men	215 (51.9)	189 (45.6)	10 (2.4)
Women	266 (62.9)	153 (36.2)	4 (0.95)
Both sexes combined	481 (57.5)	342 (40.9)	14 (1.7)

Percentages are shown in parentheses

The rate of undernutrition among the Juang women is much higher than other tribal population of Eastern India (Table III) as reported in several recent studies (Bose and Chakraborty 2005, 3-7; Mittal and Srivastava, 2006, 385; Adhikary, 2007; Mondal, 2007; Datta Banik et al 2007, 348-352; Ghosh and Malik 2007, 143-149; Goswami, 2011; Goswami 2012). This highlights the undernourished condition of the Juang women.

Table III: Mean BMI and prevalence of under-nutrition among the tribes of Eastern India

Tribe	Sample size	Mean BMI (Kg/m ²) (SD)	Under-nutrition (BMI < 18.5 kg/m ²) (%)	Study area	Reference
Oraon	M - 200	18.8 (2.0)	47.0	Jalpaiguri	Mittal and Srivastava (2006)
	F - 150	19.7 (2.4)	31.7		
Lodha	M - 157	19.5 (2.7)	45.2	Paschim	Mondal (2007)
	F - 199	19.3 (2.6)	40.7	Medinipur	Adhikary (2007)
Dhimal	M - 159	19.5 (2.5)	27.0	Darjeeling	Datta Banik et al (2007)
	F - 146	19.1 (2.6)	46.4		
Santal	M - 400	18.5 (2.1)	55.0	Bankura	Ghosh and Malik (2007)
	F - 400	18.7 (2.3)	52.5		
Bhumij	M - 244	18.9 (2.6)	48.4	Balasore	Goswami (2012)
	F - 223	18.5 (2.0)	58.3		
Mankidia	M - 124	19.3 (2.2)	48.4	Mayurbhanj	Goswami (2011)
	F - 136	18.6 (2.8)	59.5		
Juang	M - 414	19.4 (2.7)	51.9	Keonjhar	Present study
	F - 423	18.3 (2.9)	62.9		
Bathudi	M - 226	18.4 (1.9)	52.7	Keonjhar	Bose & Chakraborty (2005)
	F - 183	17.9 (2.5)	64.5		

Standard deviations are presented in parenthesis

Discussions

Under-nutrition remains to be an everlasting problem in Asian countries (Wickramasinghe et al 2004, 114-8). Studies worldwide (Strickland & Ulijaszek 1994, 98-109) and from India (Yadav et al 1999, 101-6; Khongsdier 2001, 374-383; Khongsdier 2002, 484-489; Gogoi & Sengupta 2002, 271-3; Bose and Chakraborty 2005, 3-7; Adak et al 2006, 161-178; Bisai & Bose 2008, 87-94) have utilized BMI to study nutritional status of the tribal population. Therefore, the use of BMI and WHO (1995) BMI-based cut-off points for the evaluation of under-nutrition are expropriate for use among the tribal populations of India. Several recent studies (Bose & Chakraborty 2005, 3-7; Mittal and Srivastava 2006, 385; Mondal, 2007; Adhikary, 2007; Datta Banik et al 2007, 348-352; Ghosh & Malik 2007, 143-9; Goswami, 2011; Goswami, 2012) have highlighted the nutritional status of the various tribes (Oraon, Bathudi, Lodha, Dhimal, Santal, Bhumij, Mankidia) of Eastern India. But pragmatic information on the nutritional status (based on BMI) of the Juang tribe is lacking. In view of this, the current study is an effort to present certain unique data on the nutritional status of the Juangs.

The results of the present study indicated that the prevalence of under-nutrition among the Juangs (both male and female) was very high. The rate of undernutrition among the Juang women is much higher than other tribal population of Eastern India as reported in several recent studies (Bose & Chakraborty 2005, 3-7; Mittal and Srivastava 2006, 385; Mondal, 2007; Adhikari, 2007; Datta Banik et al 2007, 348-52; Ghosh and Malik 2007, 143-9; Mondal, 2007; Goswami, 2011; Goswami, 2012).

The present study warrants a need of a focused programme on health communication with better nutrition designed intervention. Thus the nutritional status of all the tribes is to be monitored regularly emphasizing on their overall escalation and immediate appropriate nutritional intervention programmes are needed for implementation.

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