

Body composition of two tribal populations of Keonjhar, Orissa, India: A comparison

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Abstract

There exists virtually no data on body composition among Indian tribes. The objective of the present study was to record the body composition of two tribal populations, namely, Bathudis and Savars. This cross-sectional study was conducted in Anandapur village of Keonjhar District, Orissa, India. A total of 409 (226 men and 183 women) Bathudi and 600 Savar (300 men and 300 women) adult (> 18 years) individuals were studied. Anthropometric and body composition variables were measured or computed following standard techniques and equations. Both the tribes had similar height. Savars had greater mean values (except for FFM and FFMI in men) of all anthropometric and body composition variables compared to Bathudis, in both sexes. In conclusion, the present study provides unique data on body composition profile of adult Bathudis and Savars, two tribal populations of Orissa, eastern India. These data may form a valuable source of comparison.

BACKGROUND

As per latest census, India has more than 84 million tribals who constitute 8.2% of the total population¹. India probably has the largest number of tribal communities in the world². The vast majority of the tribal population reside in rural areas of the country. The tribal populations of India are recognized as socially and economically vulnerable³. Bathudis and Savars are two such tribes whose mother tongues are Panchapargania (Indo-Aryan) and Savar (Austro-Asiatic), respectively. They are inhabitants of three eastern provinces of India: Orissa, Bihar and Jharkhand. In Orissa, the majority of the Bathudis are found in districts Keonjhar, Mayurbhanj and Sundargarh whereas Savars are mostly inhabit the districts of Keonjhar, Cuttack, Dhenkanal and Ganjam⁴.

Hitherto, majority of the studies on body composition from India- have been restricted to non-tribal populations⁵. Therefore, there exists virtually no data on body composition among Indian tribes. In view of this, the objective of the present study was to investigate ethnic differences in body composition between adult Bathudis and Savars, two tribal populations of Keonjhar District, Orissa, India. We could not locate any previous study that has dealt with this objective in these ethnic groups.

SAMPLE

The sample size of this study consisted of 409 (226 men and 183 women) Bathudi and 600 Savar (300 men and 300 women) adult (> 18 years) individuals.

DATA COLLECTION

This study was conducted in collaboration of Associated Social Service Agency (ASSA), a non-governmental organization based at Sailongchhak, Anandapur, Keonjhar District, Orissa. Prior permission and ethical approval was obtained from local community leaders as well as relevant authorities before commencement of the study. Information on age and ethnicity were obtained from all subjects with the help of a questionnaire. The data on Bathudis were collected from the villages Gahira, Kalora Gadira and Pathurkundi. The data on Savars were obtained from the villages Bonianiposi, Morabali, Panchapalli and Sailong. All these villages are in Anandapur region of Keonjhar district of Orissa, India. These villages are located approximately 150 kms from Bhubaneswar, the provincial capital of Orissa. Adult residents of all houses in these villages were contacted. The response rates were 76% and 83% for Bathudi men and women, respectively. Similar response rates were observed among Savars (74% = men; 83% = women). The vast majority of the subjects were illiterate and very low-wage earning manual labourers. Thus, they belonged to the low socioeconomic class.

All anthropometric measurements were made by trained

investigators using the internationally accepted standard protocol⁶. Height (Harpender anthropometer) and weight (Libra weighing scale) were recorded to the nearest 0.1 cm and 0.5 kg, respectively. Biceps, triceps, subscapular and suprailiac skinfolds were measured to the nearest 0.1 mm using a harpenden skinfold caliper. Technical errors of measurements (TEM) were computed and they were found to be within acceptable limits⁷.

Data Management and Statistical Analyses:

The following derived indices were computed following standard equations: Body mass index, BMI (kg/m²) = weight / height². Sum of skinfolds (mm) = Biceps + triceps + subscapular + suprailiac Percent body fat (PBF) was calculated using Siri's equation⁸, PBF = (4.95/density – 4.50) x 100.

Density was derived following Durnin & Womersley's age and sex-specific equations⁹, using the SUMSF.

Fat mass (FM), fat free mass (FFM), fat mass index (FMI) and fat free mass index (FFMI) were computed using following standard equations:

$$FM (kg) = (PBF/100) \times Weight (kg)$$

$$FMI (kg/m^2) = FM (kg) / height^2 (m^2)$$

$$FFM (kg) = Weight (kg) - Fat mass (kg)$$

$$FFMI (kg/m^2) = Fat free mass (kg) / height (m)^2$$

The distributions of most of the variables were not significantly skewed and thus parametric statistics were applied. Students t test was used to compute ethnic differences in anthropometric and body composition variables within the same sex. Statistical analyses were performed using the Statistical Package for Social Science (SPSS) Version 11.0 program. Statistical significance was set at p < 0.05.

RESULTS

The characteristics of the two tribal populations are presented in Table 1 (men) and Table 2 (women). There were no significant ethnic differences in mean age in both sexes. Both the tribes had similar height. Savars had greater mean values (except for FFM and FFMI in men) of all anthropometric and body composition variables compared to Bathudis in both sexes.

Figure 1

Table 1: Characteristics of the two tribal populations: Males.

Variable	Bathudis (n = 226)	Savars (n = 300)	t	p
Age (years)	38.01 (14.38)	38.90 (15.26)	0.68	0.4977
Height (cm)	159.37 (6.40)	159.60 (6.52)	0.40	0.6867
Weight (kg)	46.94 (6.29)	49.09 (6.49)	3.82	0.0002
BMI (kg/m ²)	18.45 (1.94)	19.26 (2.14)	4.47	0.0001
Sum of skinfolds (mm)	24.42 (8.22)	31.19 (7.34)	9.94	0.0001
PBF (%)	10.55 (4.40)	14.28 (3.31)	11.10	0.0001
FM (kg)	5.12 (2.66)	7.12 (2.26)	9.31	0.0001
FFM (kg)	41.82 (4.57)	41.97 (4.88)	0.36	0.7201
FMI (kg/m ²)	2.00 (1.00)	2.79 (0.86)	9.72	0.0001
FFMI (kg/m ²)	16.45 (1.33)	16.47 (1.56)	0.15	0.8769

Figure 2

Table 2: Characteristics of the two tribal populations: Females

Variable	Bathudis (n =183)	Savars (n = 300)	t	p
Age (years)	35.57 (13.18)	38.01 (13.99)	1.90	0.0579
Height (cm)	149.17 (6.65)	148.50 (5.62)	1.18	0.2368
Weight (kg)	39.82 (6.15)	41.60 (6.52)	2.97	0.0031
BMI (kg/m ²)	17.90 (2.54)	18.84 (2.67)	3.82	0.0002
Sum of skinfolds (mm)	32.31 (8.35)	35.87 (8.84)	4.38	0.0001
PBF (%)	21.70 (3.50)	23.20 (3.40)	4.65	0.0001
FM (kg)	8.77 (2.58)	9.80 (2.74)	4.10	0.0001
FFM (kg)	31.05 (4.01)	31.80 (4.10)	1.97	0.0497
FMI (kg/m ²)	3.94 (1.12)	4.43 (1.19)	4.49	0.0001
FFMI (kg/m ²)	13.96 (1.64)	14.41 (1.64)	2.93	0.0036

COMMENT

The present study provides unique data on body composition profile of adult Bathudis and Savars, two tribal populations of Orissa, eastern India. These data may form a valuable source of comparison.

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