

AGE-ASSOCIATED CHANGES IN SOME ANTHROPOMETRIC MEASUREMENTS AMONG RURAL AND URBAN SIKH HARIJAN FEMALES OF AMRITSAR (PUNJAB)

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Abstract: *A cross-sectional study of morphological age changes with special reference to ageing has been conducted on rural and urban Sikh Harijan females of Amritsar during the year 2001. The data were collected from 340 rural and 345 urban Sikh Harijan females ranging in age from 20–80 years. Three anthropometric measurements (height, sitting height, and weight) were taken on each subject, and subischial length and body mass index (BMI) were computed from these parameters. The analysis of the data demonstrated that after an initial increase, there was a decline in height and sitting height with age while there were little age changes in subischial length in both groups. Sitting height seems to play a major role in shrinkage in stature contributing about 4.5 cm in rural females and 4.4 cm in urban females whereas subischial length has been found to decrease only 2.8 cm in rural females and 2.5 cm in urban females. In the case of body weight and body mass index after a period of increase up to 40–49 years and 50–59 years, respectively, there was a trend of decline in both groups. The present results suggest that the process of ageing is delayed in Scheduled Caste females than the other populations of Punjab.*

Keywords: *Anthropometric measurements; Ageing; Adults; Females; Sikh Harijan; Rural; Urban; Punjab.*

Introduction

Ageing is a biological phenomenon which affects all living organisms. It is a continuous process of changes throughout the whole life span of an organism. In human beings, ageing takes the form of morphological and functional involution as a progressive and irreversible change which affects most of the organs and leads to a gradual decline in all activities of the individual (Shock 1970, Kohn 1971). Various anthropometric studies provide very useful information about age-related changes in adult body size in developed countries (Damen et al. 1972, Durnin and Womersley 1974, Erickson 1976, 1978, Himes and Mueller 1977, Rossmann 1977, Parizkova and Eislet 1980, Frisancho 1990, Kelley and Kroemer 1990, Sorkin et al. 1999, Perissinotto et al. 2002, Dangour 2003). But there are very few studies on the effect of ageing on anthropometric measurements from developing countries like India (Singal and Sidhu 1981, Sidhu and Sidhu 1987, Yassin and Terry 1991, Kinsella and Suzmaft 1992, Ghosh et al. 2000, Sandhu et al. 2000). Therefore, in the present sample, an attempt has been made to study the trend of age changes in some anthropometric measurements among rural and urban Sikh Harijan females of Amritsar district of Punjab. Sikh Harijans are generally those Scheduled Caste people who are locally known as 'Majhabis'. These people claim Sikhism as their religion. They are generally addressed as Dalits. Rural and urban Sikh Harijan females generally work as agricultural labourer or cleaning the cattle sheds in the homestead of

rich landowners. Urban Sikh Harijan females usually get employment as sweeper in the offices, schools and hospitals, and also work in the houses for taking care of cleanliness. Socio-economic status of Sikh Harijans is lower than the other populations of Punjab. Most of the urban life is dependent on Scheduled Caste people for cleanliness of their dwellings, streets and working places. The females of Scheduled Caste community are usually menial workers.

Material and Methods

The results of the present study are based on cross-sectional data collected during the year 2001 from 685 adult females (340 rural Sikh Harijans and 345 urban Sikh Harijans) ranging in age from 20 to 75 years. All subjects were drawn from Amritsar city and surrounding areas. Each subject was contacted individually at her residence. A record of age was made for each individual. In most of the cases, the data of birth had to be ascertained through association with some important festivals, historical events or other relevant incidents pertaining to the individual herself. With the cross-questioning, it was possible to ascertain nearly the correct age of the subjects. Three anthropometric measurements, i.e. height, sitting height and weight, were taken on each subject. The techniques, as given by Weiner and Lourie (1981), were followed for taking these measurements. Body mass index (BMI) and subsischial length (the difference between stature and sitting height) were computed.

The data have been arranged in six groups, each of 10-year duration, except the last age group which included all subjects beyond the age 70 years.

Results

Table 1 presents the mean and standard deviation of stature, sitting height, subsischial length, weight and BMI of rural and urban Sikh Harijan females of Punjab.

Table 1. Mean and standard deviation (SD) of some anthropometric characteristics in adult rural and urban Sikh Harijan females of Punjab.

Age groups (yr.)	n	Height (cm)		Sitting height (cm)		Subsischial length (cm)		Weight (kg)		BMI (kg/m ²)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Rural females											
20-29	83	158.60	5.00	80.10	2.60	78.50	2.90	52.85	6.50	21.01	1.20
30-39	60	160.70	4.70	80.80	2.40	78.90	2.10	54.30	5.20	21.03	1.10
40-49	61	159.80	4.30	81.60	1.90	79.20	3.00	55.80	4.10	21.85	1.30
50-59	53	158.50	5.20	80.50	2.00	78.00	2.80	55.60	5.60	22.13	1.90
60-69	43	154.90	4.10	78.40	2.10	76.50	2.70	50.20	4.50	20.92	1.60
70+	40	153.70	2.90	77.30	2.50	76.40	2.90	48.25	4.00	20.42	1.50
Urban females											
20-29	80	157.10	4.80	79.60	2.00	77.50	3.00	50.90	5.25	20.62	1.30
30-39	65	159.80	5.20	81.40	2.30	78.40	2.80	52.75	5.00	20.66	1.00
40-49	60	158.20	5.70	80.30	2.70	77.90	2.50	54.50	4.85	21.78	1.40
50-59	55	155.80	4.60	79.80	1.90	76.00	1.90	54.20	4.25	22.33	1.80
60-69	40	153.60	3.90	77.60	2.10	76.00	2.50	51.00	5.01	21.67	1.90
70+	45	152.90	4.00	77.00	2.20	75.90	3.20	47.13	5.60	20.17	2.00

The average height of adult rural and urban Sikh Harijan females is 158.6 cm and 157.1 cm at age 20–29 years, respectively. It is also noteworthy that rural females are taller than urban females at all age groups. Maximum height of 160.7 cm and 159.8 cm is attained at the age of 40–41 years among rural and urban females, respectively. After 40–49 years, there is a gradual trend of decline in stature. However, the decrease is sharp in the following age groups in both the groups. Sitting height increases slightly up to 40–49 years (Table 1). After this, a trend of decline sets. Sitting height contributes about 4.5 cm and 4.4 cm for shrinkage in height among rural and urban females, respectively.

Among rural Sikh Harijan females, subischial length also increases up to 30–39 years, but in urban females it increases up to 40–49 years, then it decreases, thus showing a total increase of only 0.7 cm and 0.9 cm, and decrease of 2.8 cm and 2.5 cm with age among rural and urban females, respectively.

It is apparent from Table 1 that among Sikh Harijan females, body weight has shown a progressive tendency of increase up to 40–49 years, after which it declines. A total gain of 2.95 kg and 3.60 kg in weight from age group 20–29 to 40–49 years has been observed in rural and urban Sikh Harijan females, respectively. After the age of 40–49 years, a trend of decline sets which continues up to 70+ years. A total loss of 7.55 kg in rural females and 7.35 kg in urban Sikh Harijan females has taken place from age group 40–49 to 70+. Among rural females, maximum loss (5.40 kg) in weight is observed from age group 50–59 to 60–69 years, but among urban females maximum weight loss (3.85 kg) is observed from age group 6–69 to 70+. Weight and BMI also varied with age, but in contrast with linear body measurements both weight and BMI increased in value until the 40–49 and 50–59 year age group, respectively, after which they began to decline.

Discussion

This paper presents cross-sectional data on some anthropometric measurements of rural and urban Sikh Harijan adult females of Punjab with special reference to senescence. It is a general belief that no change in height takes place after maturing. But critical analysis of height during this period indicates that it is not so. It increases slightly between twenties and thirties, and then decreases (Trotter and Glesser 1951, Lasker 1953, Pett and Ogiliva 1956, Marquer and Chamla 1961, Stoudt et al. 1965, Howells 1970, Himes and Mueller 1977, Stinson 1989, Yassin and Terry 1991, Orr et al. 2001, Dangour 2003). In the economically prosperous populations, the decline in stature is noticed in mid-twenties of life (Pett and Ogiliva 1956, Durnin and Womersley 1974, Himes and Mueller 1977, Singal and Sidhu 1981) whereas in Scheduled Caste females of the present series, there is an increase in stature up to 30–39 year age group, followed by a trend of decline. Thus, it is apparent from the present sample that the process of ageing is delayed by about a decade or so in poor populations. Any change of increase or decrease in stature is best understood by studying the sitting height and subischial length separately. It is known fact that shortening of stature with age is primarily due to shrinkage in sitting height which is due to narrowing of the vertebral disks as well as shortening of the individual vertebra. In the present sample, sitting height contributes about 4.5 cm and 4.4 cm for shrinkage in height among rural and urban Sikh Harijan females of Punjab, respectively. But the total decrease in subischial length with age is only 2.8 cm among rural Sikh Harijans and 2.5 cm in urban Sikh Harijans. Thus, it is apparent from the present sample that the decrease in length of lower extremities is considerably less than

that of sitting height. Similar results have been reported by Marquer and Chamla (1961), Hertzog et al. (1969), Damon et al. (1972), Himes and Mueller (1977), Singal and Sidhu (1981), and Frisancho (1990). The change in stature could also be due to secular factors, because the cross-sectional data on adults, like the present one spread over seven decades, even a minor increase per decade due to secular factors, if any, will naturally show a trend of decrease with age.

It is also apparent from Table 1 that weight also varied with age, but in contrast with the linear body measurements, body weight increased until the age group 40–49 years, after which weight began to decline. The well-known increase in weight in middle years, followed by a decrease in old age, is reported by many investigators from all over the world (Pett and Ogiliva 1956, Stoudt et al. 1965, Damon et al. 1972, Novak 1972, Sidhu and Sidhu 1987). Singal and Sidhu (1981) studied the Jat Sikh and Bania females of Punjab and observed a total gain of 8.70 kg and 11.28 kg from age group 20–24 to 40–44 years and 20–24 to 45–49 years, respectively. A total decrease of 8.78 kg and 14.51 kg has taken place after the peak value up to 70+ age group in Jat Sikh and Bania females, respectively. When the results of the present study are compared with the above mentioned study, it appears that among rural and urban females the weight gain (2.95 kg and 3.60 kg) and weight loss (7.55 kg and 7.35 kg) with age is quite less. Sikh Harijan females of the present sample are mainly engaged in hard manual work and moreover they are poor. This may be one of the major factors for the least increase and decrease of body weight with ageing. Similar results have been reported by various investigators (Lee and Lasker 1958, Albrink and Meigs 1971, Sidhu and Sidhu 1987). The present analysis demonstrated that after an initial increase, BMI decreased after age group 50–59 years. The results of this investigation are in concordance with the report of Elia (2001) which shows a decline in BMI after 60 years of age.

While comparing anthropometric measurements in rural and urban Sikh Harijan females, it was noticed that rural females are taller and heavier than the urban females, but the differences were statistically non-significant at all age groups and pooled data.

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